The tip of the iceberg & beyond

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Evaluation of an aggression reduction program
for special elementary education:
Classical effect study & consideration of child and context

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Evaluation of an aggression reduction program
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Contents

Chapter 1 Introduction

This thesis considers the aggressive behavior of special elementary school children. We study the effects of an intervention program that is developed to reduce children's aggressive behavior. Furthermore, we take a close look at the implementation of the program, the children's motives for behaving aggressively and the impact of the classroom context on children's aggressive behavior. These three issues are considered to help explain the effectiveness of the program.

The thesis is organized as follows. In Part I we describe the first study (Chapter 3) in which we consider the effects of the school-based[1] social skills intervention program TRAffic 8-12. The program is aimed at reducing aggressive behavior in special elementary school children. This first study is a classical effect study in the sense that we compare pre- and post-intervention scores of children's aggressive behavior, and we consider the moderating effects of children's motivation and intervention group composition on the program outcomes.

In part II of the thesis we look beyond the results of the classical effect study. We define a classical effect study as a study in which the intervention program and its effects are conceptualized in terms of a medical model (Ahn & Wampold, 2001; Wampold, Ahn & Coleman, 2001). In a medical model the specific program ingredients are assumed to be responsible for the efficacy of that program. This traditional and persistent view of intervention programs brings with it a focus on pre- and post-intervention scores, or outcome research (Lewis, 2004). However, solely focusing on outcome gives very limited insight into how and why changes in behavior occur and how and why an intervention program works or does not work. Hunsberger (p. 617, 2007) describes it as follows:

"Like the proverbial tip of the iceberg, test scores or behavioral changes are only surface manifestations of a much larger entity, most of which is invisible from a distance."

The question is: How can we go beyond the tip of the iceberg and get closer to this 'entity', gaining more insight into behavioral changes and effectiveness of intervention programs? Following the contextual model (Wampold, Ahn &

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[1] We define *school-based* as 'developed to be implemented in school settings', and not as 'developed to be implemented school-wide'.

Coleman, 2001) and the field of dynamic systems thinking (e.g. Valsiner, 1998; Van Geert, 1998; 2000; 2003), which are explained further in this chapter, we focus on three issues in part II of this thesis that help us go deeper than the tip of the iceberg. First, we evaluate the implementation of the TRAffic 8-12 program in the schools in a qualitative way (Chapter 4). We answer the question of how the program is carried out by the program trainers and which contextual factors influence the implementation. Special attention is given to the role of the teachers and their implementation as well as to the sustainability of the program techniques in real life situations outside the program meetings. Second, we focus on the so-called 'inner logic' of the children (Chapter 5). The central question is: What do children say when asked why they behave aggressively? The answer to this question will provide insight into the children's motives for behaving aggressively. Finally, we consider the influence of the classroom composition on the aggressive behavior of the children (Chapter 6). One of our assumptions is that the influence of the social skills intervention context on the children's aggressive behavior will be weaker than the influence of their regular classroom context.

Before the studies are further introduced we present our definition of aggressive behavior. We also shortly discuss the occurrence of aggressive behavior in children in general and, more specifically, the characteristics of the special elementary school children that are the subject of this thesis. Finally, an overview is presented of the field of aggression reduction programs in which TRAffic 8-12 is situated.

1.1 Definition of Aggressive Behavior

The definition of aggressive behavior is a major problem in the field of aggression research (Tremblay, 2000). There are many distinguishable forms and functions of aggressive behavior (Little, Jones, Henrich & Hawley, 2003) and they are often aggregated in studies on the topic. In the absence of a clear definition, this aggregation is problematic as an understanding of the development of subtypes of aggressive behavior is made difficult. Tremblay (2000) urges researchers to specify the type of aggressive behavior they want to address.

Most aggression researchers accept the following general definition: *aggression is behavior that causes or threatens material or immaterial harm to another person, whether it was intended or not* (see for example Loeber & Hay, 1997). In our study we accept this definition, but further specify it into four types of aggressive behavior: 1) physical aggression (e.g. kicking, hitting), 2) verbal aggression (e.g. name-calling), 3) indirect

aggression, also called relational aggression (e.g. gossiping), and 4) negativism (e.g. irritating others). Additionally, we also assessed general behavioral problems associated with Attention Deficit Hyperactive Disorder (ADHD), Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD).

1.2 Aggressive Behavior and Special Elementary School Children

Aggressive behavior occurs in all children, especially in young children. Some physical aggressive behavior in the first years of life is common (Loeber & Farrington, 2000). As children grow older they learn to control their behavior. They develop social skills, and physical aggression transforms into a limited degree of verbal and relational aggression (Van der Ploeg, 2009). There is, however, a subgroup of children that fail to control their aggressive behavior. Severely aggressive behavior at a young age has proven to be a strong predictor of a number of problems later in life, such as delinquency and violence (Loeber & Farrington, 2000). However, not all children who initially show high levels of aggressive behavior develop aggressive behavioral patterns later in life; just as some young children who are not aggressive can develop into aggressive adults (Van der Ploeg, 2009). Changes in developmental trajectories, and the development of aggressive behavior in general, are determined by a complex interaction between child-specific, family, and environmental factors (Kazdin, 1995; Loeber & Hay, 1997).

Van der Ploeg (2009) roughly estimates that 86% of the Dutch youth eventually develop a non-aggressive behavior pattern, while 14% continue having problems with aggressive behavior. Concerning children in elementary school specifically, approximately 9% of the children show problematic aggressive behavior (Van Lier & Crijnen, 2005). At the elementary school level, name-calling, bullying and threatening other children are problems that most Dutch schools have to deal with daily. Severe forms of bullying are present in almost 40% of all Dutch schools. The percentages for physical violence and threats are slightly lower (Dekker, Diepeveen & Krooneman, 2003).

The children who participated in the studies of this thesis are elementary school students in Cluster 4 education. Cluster 4 education in the Netherlands is special education organized for children with behavioral and/or psychiatric problems. Children are placed in this type of education when they meet the following criteria (www.renn4.nl):

1. a psychiatric diagnosis or developmental pathology is determined according to the Diagnostic and Statistical Manual of Mental Disorders, fourth edition, (DSM-IV) or the International Statistical Classification of Diseases and Related Health Problems, tenth edition, (ICD-10), or if there are severe behavioral problems;
2. the problems are present both at school and at home or in leisure time;
3. the child has been or still is actively involved in child care services;
4. there is a severe and structural limitation with respect to involvement in education, and;
5. the care provided by regular education is insufficient, making participation in regular education impossible.

Taking these inclusion criteria into account, it is obvious that, in Cluster 4 schools, the rates of aggressive behavior are higher than in regular education. While children in Cluster 4 schools show a variety of behavioral problems, externalizing behavioral problems like aggression are most prevalent (Drost & Bijstra, 2008). Teachers are specially trained to educate and deal with children in Cluster 4 education, however, they still need extra assistance in coping with children's behavioral problems (Huyghen, 2007).

Because of the poor prognosis of children who are severely aggressive at a young age – together with high costs for society – the development of effective interventions has a high priority in the scientific world (Brezinka, 2002; Koot, 2002). Practitioners, such as teachers or youth workers, also urge for effective ways to deal with children's aggressive behavior that they encounter in their daily work.

1.3 TRAffic 8-12 in the Field of Aggression Reduction Intervention Programs

In this section we describe a number of aggression reduction intervention programs and approaches. By doing this, we aim to contrast TRAffic 8-12 with the wide field of aggression reduction programs. Also, we explain our motivation for our choice for the TRAffic 8-12 program.

1.3.1 Intervention Settings

TRAffic 8-12 is an intervention program which is implemented in the school setting. School is considered to be a highly suitable context to carry out intervention programs aimed at reducing children's aggression since children spend a

large part of their time in school (Roede, 1999). Also, the normal structure of schools allows for systematic intervention, focused on children's behavior.

Intervention programs which focus on reducing aggression in children are also implemented in other settings such as at home and in the community. Obviously only focusing on aggression in the school setting does not do justice to the influence of other elements in children's social networks on their behavior. Multisystemic treatment (MST), targeting the individual, family, peer, school, and community factors (i.e. all the settings in which the child functions), is one of the most effective ways in reducing violence and aggression in children (Curtis, Ronan & Borduin, 2004; Kazdin, 2000; Ogden & Hagen, 2006). Also home-based interventions with a primary focus on improving parents' parenting skills, such as the Functional Family Therapy and Parent Management Training, are very effective in reducing aggression and violence in children and adolescents (Brezinka, 2002; Kazdin, 2000).

The social-ecological approach (Bronfenbrenner, 1977) of MST (i.e. including all or many of the elements in a child's social network) seems to be the most effective way to reduce children's aggression. However the large amount of effort required in order to successfully implement this type of treatment in all settings is not always realistic and therefore can not always be realized (Bijstra & Nienhuis, 2003; Brezinka, 2002). This conclusion is supported by the findings in Curtis, Ronan and Borduin's (2004) meta-analysis of MST outcomes. The analysis revealed that, although the efficacy studies[2] showed high effect sizes (d=0.81), the effectiveness studies[3] showed much smaller effect sizes (d=0.26).

MST is not always an attractive choice for schools as the implementation requires much time and effort. Meanwhile, teachers are left struggling with their students' behavior and need immediate help, and schools are searching for ways to deal with the problematic behavior of their students (Van Overveld & Louwe, 2005). A popular and much-used program that reduces aggression in children in the school setting is a social skills intervention (SSI) program[4], such as TRAffic 8-12 (Bijstra &

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[2] MST is studied in highly controlled conditions and implemented by research staff.

[3] MST is studied in real-world conditions and implemented by practitioners.

[4] The label 'social skills intervention program' is no longer considered to be appropriate since many of these programs do more than teach children new skills. Authors such as Beelmann, Pfingsten and Losel (1994) and Van Overveld and Louwe (2005) suggest using the label 'social competence program'. We chose to continue working with the original label, since the program that is studied in this thesis is known under that label.

Nienhuis, 2003; Van Overveld & Louwe, 2005). Most SSI programs are easy to implement as children's behavioral problems can be targeted directly. The programs are also popular because they often have an attractive design and price.

1.3.2 Strategies of School-Based Social Skills Intervention Programs

The TRAffic 8-12 program is developed for children in special education schools (Cluster 4 education) who show aggressive behavior problems. For these children an indicated strategy (Farmer, Farmer, Estell & Hutchins, 2007) is used, meaning that the program is focused on children who already show problematic behavior. The aim is to change problematic behavior, replacing it with more acceptable and desired behavior. TRAffic 8-12 is distinguishable from other Dutch school-based SII programs with an indicated strategy in the sense that it focuses specifically on children with (symptoms of) ADHD and/or a Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS). Recent figures show that children with ADHD and PDD-NOS form a substantial group within Cluster 4 education (Bijstra & Strijker, 2001; Huyghen, 2007). Because many school-based SSI programs are considered not to be suitable for children with ADHD and PDD-NOS (see Chapter 2 for an explanation), the TRAffic 8-12 program is one of the few programs with an indicated strategy that is suitable for children in Cluster 4 education.

Besides an indicated strategy, school-based SSI programs can also have other levels of strategy. A school-based SSI program with a universal strategy, for example, focuses on all children in the classroom as well as on their teachers. The aim is to prevent the development of behavioral problems by teaching children general coping or social skills and to improve teachers' pedagogical skills. An example of a Dutch universal school-based SSI program is the Dutch version of PATHS from the United States, called *PAD (Programma Alternatieve Denkstrategieen)*. Louwe and van Overveld (2008) showed that *PAD* was effective in reducing aggressive behavior in 6- and 7-year old boys in regular and special[5] education, but not in Cluster 4 education. Other programs employ a selective strategy which focus on children who show social-emotional problems. The aim is to teach these children

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[5] Special education in the Netherlands is education organized for children who need extra attention due to learning and behavior problems. This type of education is different from Cluster 4 education, since the latter is focused on children with more severe psychiatric and behavioral problems.

social skills that help protect them from the development of more severe behavioral problems.

1.3.3 Theoretical Approaches and Training Techniques in School-Based Social Skills Intervention Programs

In the TRAffic 8-12 program training techniques are used from the social-learning and the social-cognitive approach. In Chapter 2 these techniques are discussed extensively. Several studies have indicated that aggression reduction intervention programs with a combination of a behavioral and a cognitive approach have the largest effects (Wilson, Gottfredson & Najaka, 2001; Wilson, Lipsey & Derzon, 2003). Other school-based SSI programs also use training techniques based on the self-control approach and the perspective taking approach. Nowadays most school-based SSI programs combine two or more theoretical approaches. Below we give a description of all four approaches.

According to the *social-learning approach* (Bandura, 1978), children may have acquired aggressive behavior by observing aggressive models in their environment, for example, a family member, peers or the media. As these children grow up with aggressive role models, it is assumed that they view aggression as an acceptable tool in conflict resolution and that they lack the necessary skills to handle conflicts in a constructive way (Crick & Dodge, 1996). Training techniques that are used within this approach are modeling, ignoring, reinforcement of adequate behavior by using individual and/or group contingencies, role playing and time-out. An example of a program with a social-learning approach is the American Good Behavior Game (with a Dutch version called *Taakspel*). The central training technique relies on interdependent group contingencies, which involves reinforcing some level of desired *group* behavior or performance standard for a group of children (Tingstrom, Sterling-Turner & Wilczynski, 2006).

According to the *social-cognitive approach* (Crick & Dodge, 1996; Orobio de Castro, 2004), the children's interpretation of the conflict situation is crucial in the development of aggressive behavior. Some children develop 'reactive aggressive' behavior, meaning that they tend to attribute inaccurate hostile intentions to others, and that they feel attacked very quickly. Their aggressive behavior is thought to diminish when their distorted cognitions (for example "He is angry with me" while in fact the other child is just joking) are corrected. In intervention programs with this approach, training techniques are used that teach children how to interpret their own

and others' emotions, feelings and intentions. An example of a program with a social-cognitive approach is Lochman's Coping Power Program (Lochman & Wells, 2004) from the United States (with a Dutch version called *Minder boos en opstandig*). The program focuses on improving children's problem-solving skills and their perception of conflicting situations. Besides SSI programs, Cognitive Behavior Modification (CBM) is also used in schools to reduce aggressive behavior. The aim of CBM is to modify underlying cognitions and thought processes that affect externalizing behavior (Robinson, Smith, Miller & Brownell, 1999).

According to the *self-control approach* (or the neurodevelopmental approach), negative affect such as irritability, inhibition problems and impulsivity produce aggressive tendencies (Berkowitz, 1989; Sugden, Kile, Hendren, 2006). Children with aggressive behavior are assumed to be impulsive and quick tempered (Crick & Dodge, 1996). These children require new skills to regulate and control their emotions. Training techniques such as relaxation techniques, avoidance techniques, and thinking before acting (Stop-Think-Do method) are used in programs with this approach. The Dutch program *Zelfcontrole,* developed by Van Manen (2001), is an example of a program which focuses on self-control skills in aggressive children.

Finally, some intervention programs focus on the improvement of *perspective taking and moral reasoning.* According to Selman's theory of perspective taking, aggressive children may persist in a strong 'me-centeredness', or egocentric bias, and may have a low level of perspective taking (Gibbs, Potter, Barriga & Liau, 1996; Selman & Demorest, 1984) due to a delay in socio-moral development. These children have difficulties with taking the perspective of others, empathizing with others, and restraining aggressive behavior. One of the techniques used in programs with this approach is discussion of situations with moral dilemmas. An example of a program with a perspective taking approach is Equip, which has an American and a Dutch version. The program aims at motivating adolescents and equipping them with the ability to help each other and learn from each other's positive behavior.

1.4 The Effects of School-Based Intervention Programs and the Motivation for the Studies in this Thesis

In this section we present an overview of the current literature covering the effects of school-based social skills intervention (SSI) programs and the factors that

have a moderating[6] or mediating[7] influence on those effects. Finally we outline the motivation for the four studies described in the present thesis.

It is not an easy task to present a general picture of the effects of school-based SSI programs. Interventions under study are often not described in detail. Furthermore, different intervention programs, strategy levels, approaches and training techniques are studied together in meta-analyses and either common terms are used differently or there is no common vocabulary (Hahn et al., 2007). Consequently, from the meta-analyses discussed in this section we can only derive general conclusions based on groups of intervention programs, which are similar in that they are school-based and focus on preventing or reducing behavioral problems.

With respect to the interpretation of the findings from effect studies, it is also important that many of the empirically studied programs are not the ones that are being used in the daily practices of schools (Kazdin, 2000; Wilson, Gottfredson & Najaka, 2001). In a meta-analysis of the effects of school-based intervention programs on aggressive behavior, Wilson, Lipsey and Derzon (2003) found that from the 334 intervention programs that could be coded with effect sizes, only 26 were so-called 'practice programs' that are routinely provided in schools. The other 308 intervention programs were so-called 'demonstration programs', which are implemented under highly controlled conditions and evaluated by a researcher for mainly research or demonstration purposes.

1.4.1 *Effects of School-Based Intervention Programs*

Both internationally and nationally (i.e. the Netherlands) there is a growth in the number of school-based SSI programs targeting children's disruptive, antisocial and/or aggressive behavior (Beelmann, Pfingsten & Losel, 1994; Van Overveld & Louwe, 2005). Especially in the United States this growth is accompanied by a wealth of (meta)studies on the effects of those programs (e.g. Beelman, Pfingsten & Losel, 1994; Blake & Harmin, 2007; Hahn et al, 2007; Kazdin, 2000; Quinn, Kavale, Mathur, Rutherford & Forness, 1999; Reddy, Newman, De Thomas & Chun, 2009; Schneider, 1992; Stage & Quiroz, 1997; Sukhodolsky, Kassinove & Gorman, 2004;

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[6] A moderator variable is a variable that affects the direction or strength of the relation between the independent variable (intervention) and the dependent variable (aggressive behavior) (Baron & Kenny, 1986).

[7] A mediator variable is a variable that accounts for the relation between the independent variable (intervention) and the dependent variable (aggressive behavior) (Baron & Kenny, 1986). The independent variable has an influence on the dependent variable *via* the mediator variable.

Wilson, Gottfredson & Najaka, 2001; Wilson, Lipsey & Derzon, 2003). The Netherlands are behind in carrying out effect evaluations of intervention programs (Brezinka, 2002; Van Overveld & Louwe, 2005). The studies that are conducted in the Netherlands are often short of qualitatively good research designs and follow-up data. In order for school staff to make well-founded choices from the wide array of intervention programs, they need better insight into the effectiveness of those programs. The study of the effects of TRAffic 8-12 (Part I, Chapter 3) contributes to the need for more research into the effectiveness of Dutch school-based intervention programs.

Most meta-studies show moderate effect sizes (*d* ranging from 0.40 to 0.67) of school-based intervention programs for behavioral problems such as aggressive behavior (Beelmann, Pfingsten & Losel, 1994; Schneider, 1992; Sukhodolsky, Kassinove & Gorman, 2004; Wilson, Gottfredson & Najaka, 2001). Some meta-studies show a more pessimistic picture, with (very) small effect sizes below *d* is 0.20 (Quinn, Kavale, Mathur, Rutherford & Forness, 1999; Wilson, Lipsey & Derzon, 2003 (practice programs)), while, in other studies, the findings are encouraging with effect sizes of, for example, *d* is 1.00 (Blake & Harmin, 2007; Hahn et al, 2007; Kazdin, 2000; Reddy, Newman, De Thomas & Chun, 2009; Wilson, Lipsey & Derzon, 2003 (demonstration programs)). In general, from all the meta-studies a picture arises of a moderate effectiveness of school-based intervention programs, with large variabilities both between and within programs (e.g. Stage & Quiroz, 1997; Wilson, Gottfredson & Najaka, 2001).

Since the aim of aggression reduction programs is to structurally decrease children's aggressive behavior, it is important to get insight into the long-term effects of such programs. In Schneider's (1992) meta-analysis of the effects of 79 social skills programs, only a third of the studies provided follow-up data and those studies showed a very diverse picture (some positive long-term results, others no long-term results). Also Van Overveld and Louwe (2005), who listed the effect studies of Dutch social competence programs, concluded that there is a lack of follow-up research on the effects of intervention programs. Dutch studies that did provide follow-up data often found no effects of social competence programs in the long term. A serious problem with school-based intervention programs seems to be the generalization of learned skills to situations other than the training situation and the lack of continuity of such learned skills (Beelmann, Pfingsten & Losel, 1994). In order to provide more insight into the long-term effects of school-based intervention

programs, the behavior of the children in our study was assessed, not only directly after the children finished the TRAffic 8-12 program, but also six months and two years after the program had ended (see Chapter 3).

As mentioned before, most meta-studies, such as the ones presented above, show a wide variability of intervention program effects. This finding has led many researchers to shift their focus from studying general effects of programs to a focus on which programs work best for whom and under what conditions (Kazdin, 2000). Answering these types of questions is assumed to give insight into the reasons for the variability of program effects. A limited focus on how effective a program is or which program is most effective does not do justice to the complexity of real world circumstances in which children, and contexts in which children operate, vary greatly. In the following section we go deeper into this issue.

1.4.2 Moderating and Mediating Effects of Child, Context and Treatment Factors on Program Outcomes

Kazdin (2000) states that few data exist of the influence of child, contextual and treatment factors on intervention outcomes. However, an increasing number of studies have begun to address the issue of moderators and mediators.

Child characteristics. Age, gender, degree of behavioral problems, type of psychiatric disorders, IQ and academic skills are the main factors that are studied with respect to their moderating effects on program outcomes (Beelmann, Pfingsten & Losel, 1994; Kazdin, 2000; Nangle, Erdley, Carpenter & Newman, 2002; Quinn, Kavale, Mathur, Rutherford & Forness, 1999; Wilson, Gottfredson & Najaka, 2001; Wilson, Lipsey & Derzon, 2003). Some studies show moderating effects of these child characteristics on program outcomes, yet other studies do not.

A child characteristic that has been given little attention so far is the child's own need and motivation to change behavior (Bijstra & Nienhuis, 2003). La Greca, Silverman and Lochman (2009) consider motivation for change to be a very probable and important moderator of treatment effects. In the contextual model of intervention the client's (in our case child's) 'desire to grow and develop' is emphasized as one of the common factors that determine program effectiveness (Wampold, Ahn & Coleman, 2001). In our study of the effects of TRAffic 8-12 (Chapter 3) we address the question of whether the program is more effective for children who are motivated to change their behavior than for children who are not

motivated. The influence of IQ, psychiatric diagnosis and qualification for school transfer to a regular school on the effects of TRAffic 8-12 is also studied.

Contextual factors. A dominant mediating variable that is thoroughly studied is peer influence in aggression reduction intervention groups (see for example Ang & Hughes, 2001; Arnold & Hughes, 1999; Dishion, McCord & Poulin, 1999; Mager, Milich, Harris & Howard, 2005; Van Lier, Vitaro & Eisner, 2007; Van Lier, Vuijk & Crijnen, 2005). Dishion, McCord and Poulin (1999) were among the first to report about the possible negative influence of placing antisocial youth together in an intervention context. Since then, several studies have been conducted on peer contagion effects in intervention groups. All of these intervention studies support the deviancy training hypothesis which states that there was peer reinforcement of inappropriate behavior during intervention meetings. However, the results are not unequivocal with respect to the factors and processes that may mediate the negative effects of grouping antisocial children together (Arnold & Hughes, 1999; Van Lier, Vitaro & Eisner, 2007). For example, it is still uncertain to whom, and under which particular intervention circumstances, peer contagion effects are most harmful.

The study of the effects of TRAffic 8-12 (Chapter 3) aims to contribute to the field of research of peer influences in intervention groups. We focus on the effect of intervention group composition by comparing the effects of a group-based format of TRAffic 8-12 with the effects of TRAffic 8-12 in an individual setting. The strength of our design is that we compare the results of the *same* program in a different format (group versus individually). Most studies on differential effects resulting from intervention group composition compare different programs, which may influence the results.

Treatment factors. Many specific training techniques exist within the cluster of school-based intervention programs[8]. In some cases differences between training techniques are studied on the level of their theoretical approach: behaviorally oriented, cognitive-behaviorally oriented, and self-control oriented[9]. In other cases the techniques themselves are studied with respect to their moderating effect (e.g. feedback, group contingencies, self management, and modeling). Some meta-studies show that there are no differences in program outcomes between major training techniques (e.g. Schneider, 1992), while other meta-studies do show differences

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[8] See section 1.3.3 for a description of techniques used in SSI programs.
[9] In section 1.3.3 we also described the perspective taking approach. This approach however has not been studied with respect to its moderating effect, and therefore is not mentioned in this section.

between training techniques (Stage & Quiroz, 1997; Sukhodolsky, Kassinove & Gorman, 2004; Wilson, Gottfredson & Najaka, 2001). Also, intervention programs that use the same training techniques show varying effects on children's behavior (Wilson, Lipsey & Derzon, 2003).

General characteristics of intervention programs, such as quality of implementation of the program, also play a moderating role in program outcomes. Gottfredson (2000, in Junger-Tas, 2002) even suggests that the quality of implementation might be more important than the particular program itself. The studies that provide information about implementation show that when an effective program is carried out as intended (i.e. effective implementation) there are better program outcomes (Durlak & DuPre, 2008; Wilson, Lipsey & Derzon, 2003). If effect studies are not accompanied by implementation data it is difficult to determine whether the program itself did not work or if the program was not carried out correctly (Hahn et al., 2007; Schneider, 1992). Although a growing number of researchers stress the importance of implementation data, many intervention researchers still fail to assess relevant aspects of implementation (Domitrovich & Greenberg, 2000). In Chapter 4 of this thesis we present a qualitative study of the implementation of TRAffic 8-12. We study how and to what extent the program trainers and the children's teachers implemented the TRAffic 8-12 program and the program techniques.

Although the shift in focus towards what works best for whom and under what conditions is an important step forward in effectiveness research, we are still confronted with ambiguous results. Both child characteristics, contextual factors such as peers' behavior, and training techniques have varying moderating and mediating effects on treatment outcomes, as was mentioned in the studies presented above. As we continue to find these ambiguous results, the picture of program effectiveness does not become clearer, but in fact, may be becoming even cloudier. The question that arises is: Are we looking in the right direction and at the necessary phenomena? In the final section we consider this question and (further) describe the motivation for the three studies in part II of this thesis.

1.4.3 Looking Beyond the Tip of the Iceberg

As we already mentioned in the beginning of this chapter, by limiting our focus to outcome research we miss crucial information about how and why behavior

changes. As a result we continue having problems with explaining how and why interventions work or do not work. Therefore, in part II of this thesis we take a look beyond the program outcomes that are discussed in part I. Inspired by two alternatives for the focus on outcome, a contextual model of intervention programs and a dynamic systems approach of behavior change, we aim to explain the effectiveness of the TRAffic 8-12 program. These two alternative conceptualizations, which emphasize the role of context and the interplay between person (i.e. child) and context, lead to the motivation for the three studies in part II of the thesis. Before we describe these three studies we first explain the contextual model and the dynamic systems approach of behavior change and intervention.

The focus on outcome in intervention research results from our conceptualization of an intervention program in terms of a medical model (Wampold, 2001): the child has a certain deficit (i.e. aggressive behavior because of poor social skills) which can be fixed with a particular treatment (i.e. a social skills intervention program in which techniques such as reinforcement and modeling of prosocial behavior are used). Since the program is assumed to fix the problem, the problem should be disappeared or be diminished after the program. If the medical model is 'true' then we should find clearer and less ambiguous evidence in our studies for the effectiveness of specific intervention programs with specific problems than what is presently found in meta-studies. In sections 1.4.1 and 1.4.2 we concluded that studies of general effectiveness as well as studies of moderating and mediating effects of child, contextual and treatment factors show ambiguous results. Also, in several extensive meta-analyses Wampold (2001)[10] showed that there is no evidence that treatments can be matched to clients on the basis of their etiology. Following these findings, Wampold and Bhati (2004) state that evidence based studies focus on less important factors such as the treatment itself. Other factors such as the role of the therapist appear much more important than the treatment itself. Wampold (2001) proposes a contextual model of intervention, in which intervention is viewed as a process in which contextual factors such as the relationship between trainer and client, the trainer's and client's belief in the rationale of the treatment and the therapist's allegiance to a treatment determine the success

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[10] Although Wampold's model and his research on common factors apply mostly to adult psychotherapy, it is our belief that his ideas and research also apply to other interventions such as SSI programs for children.

of an intervention program. Wampold (2001) showed that these so-called 'common' factors are strongly related to psychotherapy outcomes.

Why are intervention programs so often developed, implemented and studied from a medical model perspective? The static approach to behavior taken by psychology researchers and developers of intervention programs plays an important part in this. The medical model implies a static approach to behavior: the dependent variable, aggressive behavior, is associated with the independent variable, the intervention program (Lichtwarck-Aschoff & van Geert, 2004; Van Geert & Steenbeek, 2005). Behavior is, however, the product of an ongoing and cyclical interaction between person and context (Lichtwarck-Aschoff & van Geert, 2004; Van Geert, 2003) and should therefore be considered to be dynamic instead of static (Lichtwarck-Aschoff, 2008). In this sense, behavioral change in intervention contexts should be considered more as a process in which person and context mutually determine each other. The dynamic systems approach provides a framework for examining behavioral change in intervention contexts as a process that is determined by interactions between person and context. A dynamic system is defined as a set of elements that mutually influence each other in time (Van Geert, 2003). Each combination of person and context can be different, both between individuals, resulting in inter-individual differences in the change process, as well as within individuals at different time points, resulting in a varying change process. From this perspective of unique person-context combinations, the examination of moderating and mediating factors seems futile as we can think of countless combinations. What is therefore needed is a consideration of common factors (Wampold, 2001) or causal scenarios (Cartwright, 2009) that determine whether an intervention program is successful or not.

In Chapter 4 we evaluate the implementation and sustainability of the TRAffic 8-12 program. Not only do we look at the actual implementation and sustainability of the program, as we announced in section 1.4.2, but we also focus on processes in the school context that influence the trainer and teacher implementation of TRAffic 8-12. It is necessary to take these processes or conditions of the program into account because, in school practice settings, contextual conditions seem to play a vital role in program effectiveness (Louwe & van Overveld, 2008). Our implementation study pays special attention to the implementation and sustainability of program techniques by the children's teachers. In schools, teachers form an important part of children's context, or system. Even if they are not the ones that

carry out an intervention program they determine, to a large degree, the success of that program, especially in the long term since teachers are the ones that can support children in applying their newly learned skills in real life situations (Louwe & van Overveld, 2008).

In Chapter 5 we consider the children's concerns that motivate their aggressive behavior. We study their inner logic: What do children say when asked why they behave aggressively? The children's motives are important determinants of behavior as behavior is intentional; it is aimed at realizing certain personal or social goals and concerns ((Steenbeek, 2006; Steenbeek & van Geert, 2005; 2007; 2008). In dynamic models of social interaction goal-orientation is an important general principle of behavior (Steenbeek, 2006). If we want to understand changes in behavior in intervention contexts, then we must take into account children's goals and concerns that underlie their aggressive behavior.

In Chapter 6 we focus on the impact of the classroom context on the children's aggressive behavior. Children's behavior is not only influenced by the intervention group composition, but also by the classroom composition (see for example Barth, Dunlap, Dane, Lochman & Wells, 2004). We expect the temporary context of the intervention program to have a much weaker impact on the children's aggressive behavior than the permanent context of the classroom (Cluster 4 education; higher rates of aggressive behavior). To test this hypothesis we study how the behavioral trajectories of a subgroup of aggressive children change when they transfer from special education (higher rates of aggressive behavior) to regular education (lower rates of aggressive behavior). We compare this study with the results of the intervention study[11].

1.5 The Present Thesis: The Tip of the Iceberg and Beyond

In the present thesis the aggressive behavior of children in Cluster 4 education is considered. The thesis is divided into two parts. In part I we describe the school-based social skills intervention program TRAffic 8-12 (Chapter 2) and a classical effect study of the program (Chapter 3). In particular, the moderating

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[11] Chapter 6 consists of a published article in which we want to confront the temporal impact of intervention group composition (group versus individual) with the more permanent impact of classroom composition on children's aggressive behavior. We chose to insert the article in its original form. Therefore, the study of the influence of intervention group composition (Chapter 3) will be repeated in Chapter 6.

influence of children's motivation and intervention group composition on the program outcomes is studied. So, in part I we only look at the proverbial tip of the iceberg - the program outcomes.

In part II we look beyond the tip of the iceberg. The program outcomes alone do not give us any insight into why and how the children's behavior changes or does not change. Following the contextual model and dynamic systems thinking we focus on the program implementation, sustainability, and school processes (Chapter 4), the children's motives for behaving aggressively (Chapter 5), and the impact of the classroom context in which children operate daily (Chapter 6). Insight into these three issues is needed in order to further understand the effectiveness of the TRAffic 8-12 program.

In Chapter 7 a summary of the findings from this thesis is presented. We discuss the implications of these findings for practice and for further research. We also present our first step in building a dynamic model of the real-time development of a child's aggressive behavior in interaction with the environment. Finally, we describe a teacher-focused web-based aggression reduction intervention program that we developed in reply to the findings from this thesis.

Part I

The Tip of the Iceberg
A Classical Effect Study of TRAffic 8-12

Chapter 2 The Dutch School-Based Social Skills Intervention Program TRAffic 8-12

2.1 Introduction

In schools social skills intervention programs are popular for improving children's social competence (Bijstra & Nienhuis, 2003). The programs have different aims such as reducing aggression or strengthening resilience in children. **TRA**ffic 8-12, which is short for **T**raining for the **R**eduction of **A**ggression for 8 to 12 year old children, is a social skills program. It aims at reducing anger and aggression in children in special education elementary schools.

In this chapter TRAffic 8-12 is described in detail. We explain the development of the program shortly. We then elaborate on the theoretical principles underlying the program, describe the target group, and present the format and structure of the program.

2.2 The Development of the Program

Since 1998 two Dutch institutions have been working on the development of TRAffic 8-12, together with the University of Groningen. These two institutions are the Regional Expertise Centre for Cluster 4 education in the north of the Netherlands (*RENN4*) and the *Seminarium voor Orthopedagogiek*. *RENN4* is an expertise centre for all Cluster 4 schools in the north of the Netherlands. In the Netherlands there are four types of special education: Cluster 1 (visually impaired), Cluster 2 (auditory and communicatively impaired), Cluster 3 (physically and mentally impaired), and Cluster 4 (behavioral and / or psychiatric problems). The inclusion criteria for Cluster 4 education are listed in Chapter 1. The *Seminarium voor Orthopedagogiek* in the Netherlands is a teaching and training institute for teachers, professional educators and social workers who deal with parents and children who need specialized care.

Special focus in the interdisciplinary collaboration is the development of an intervention program for children with persistent aggressive behavior that is connected to, and results from, their psychiatric problems (like an Attention Deficit Hyperactivity Disorder (ADHD) or a Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS)). A version for adolescents was first developed

(Jongsma, 1997), followed by a version for younger children[12] (Dijkema & Oosterhof, 2000). The effects of the first version, i.e. for 8 to 12 year old children, has been studied (see Chapter 3) and evaluated with respect to its content. The results of the content evaluation were used to adjust version 1 and create version 2 of TRAffic 8-12. The second version of the program is evaluated in the study that is described in Chapter 3.

2.3 Theoretical Approach and Techniques of the Program

In Chapter 1 we described four theoretical approaches in social skills programs that are considered to be relevant in the development of aggressive behavior: 1) the social-learning approach, 2) the social-cognitive approach, 3) the self-control approach, and 4) the perspective taking approach. Nowadays most social skills programs, including TRAffic 8-12, combine two or more of these approaches. The training techniques in TRAffic 8-12 are based on the social-cognitive and the social-learning approach. In the next sections we describe these approaches together with the techniques that are used in the TRAffic 8-12 program.

2.3.1 The Social-Cognitive and the Social-Learning Approach

In terms of theoretical models, the social-cognitive information processing (SIP) model by Crick and Dodge (1996) is a frequently used model as a basis for social skills programs. A number of steps are distinguished in the processing of social information. Several studies indicate that aggressive children differ from non-aggressive children in each of these steps (Crick & Dodge, 1996). The perception of social information is step 1, and the encoding and interpretation of this information is step 2. Aggressive children seem to give more attention to hostile information than to neutral information compared to non-aggressive children. Furthermore, aggressive children appear to be more likely than non-aggressive children to attribute hostile intent to peers' actions. Step 3 and 4 refer to the selection of goals and to the generation of possible responses. Aggressive children are more likely than their non-aggressive peers to select goals that are damaging to their peer relations (e.g. getting revenge). They also generate responses that are more aggressive and less prosocial than those generated by their non-aggressive peers. Next, the possible responses are

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[12] The version for adolescents and the first version for 8-12 year-old children is called Reduction Aggression Method, in short RAM training (*Reductie Agressie Methodiek*). We changed the name because younger children made fun of the name. The Dutch word RAM relates to beating someone up. Trainers expressed the need for a new name, and we chose the name TRAffic 8-12.

evaluated (step 5) and finally (step 6) the chosen response is carried out. Aggressive children evaluate aggressive responses as more favorable than non-aggressive children. Therefore, in the final step aggressive children tend to select more aggressive strategies and less positive and prosocial behavior compared to non-aggressive children.

The social-learning approach is applied in almost all social skills programs. Central to the social-learning theory is the assumption that behavior is acquired behavior (Bandura, 1978). Children learn aggressive behavior by observing aggressive behavior in parents, siblings, peers or the media (modeling). If the acquired aggressive behavior is also reinforced by significant others or by personal satisfaction, aggressive behavior can become part of a child's behavior repertoire.

Both social-cognitive and social-learning mechanisms play important roles in the development of aggressive behavior in children. Therefore, program developers have searched for ways to translate elements of these mechanisms into techniques that can be used to reduce aggression in children. In the following section we explain how this was done in TRAffic 8-12.

2.3.2 Training Techniques

In TRAffic 8-12 the techniques of the 'Stop sign' and the 'Traffic circle' are derived from the social-cognitive approach. The Stop sign technique uses the three colors of a traffic light to represent three actions children should take in a conflict situation:

- Action 1, the red light: 'Calm down when you are in a fight', which corresponds with the first two steps of the SIP model (perceiving and interpreting social information).
- Action 2, the orange light: 'Think before you act', which corresponds with step 3, 4 and 5 of the SIP model (goal selection, response generation, and evaluation of responses).
- Action 3, the green light: 'Do what you think is best', which corresponds with the last step in the SIP model (reaction).

When a child is able to 'stop' (red light), he or she may be more able to think about the possible reactions to the situation and the consequences of those actions (orange light). Orobio de Castro, Bosch, Veerman and Koops (2003) showed that the method of 'Stop and Think' may have a beneficial effect if children are also trained in terms of *what* to think and if they have positive experiences when using the new

method. This condition is met in the program, in part, by using the technique of the Traffic circle. With the use of the Traffic circle children learn that there are three behavior alternatives in anger evoking situations: fighting, withdrawing, and solving. A 'real' traffic circle with three sideways represents the three behavior alternatives. During role play children practice three social skills (listening, asking, discussing) that helps them react adequately.

Following the social-learning approach, modeling and positive reinforcement are the two important components of the TRAffic 8-12 program. By watching a DVD[13], specifically produced for TRAffic 8-12, children are confronted with both adequate and inadequate examples of children's behavior in conflict situations (modeling). This way they learn to distinguish between types of behaviors and to follow examples. Trainers also function as role models.

Adequate behavior of children is reinforced during the program meetings. During training meetings trainers are taught to reinforce children's adequate behavior by complimenting and encouraging them. There are also individual rewards (stickers when a child cooperates well during a meeting) and group rewards (when the group complies with certain group rules). Trainers first discuss what went well (positive feedback) and they then address the less adequate behavior (for example not (effectively) applying certain skills). Role play can be an opportunity to start such discussions.

Finally, generalization to daily life is considered crucial as the main goal of the program is to reduce aggression outside the training situation. Trainers and teachers must put a lot of energy into helping the children transfer the learned principles from the training situation to the classroom and the playground. Ideally, teachers are highly involved and are even present at the program meetings. During the program, so-called 'conflict forms' are used to stimulate generalization of principles to daily life. After children are involved in a fight or conflict, they fill in the form with regards to the degree of anger felt, the conflict partner, reason, topic, and the reactions/behaviors. These conflict descriptions from daily life have a central role during the program meetings. During role play trainers have the opportunity to teach children alternative ways to resolve their conflicts other than with aggression.

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[13] The production of the DVD was made possible with a grant from the Hermen J. Jakobsfund (*Seminarium voor Orthopedagogiek*).

2.4 The Target Group

TRAffic 8-12 is especially suitable for children with ADHD and PDD-NOS, two psychiatric disorders often treated as contra-indications for social skills intervention programs (i.e. children with these psychiatric disorders are considered unsuitable for participation in social skills intervention programs). Although there are legitimate reasons to handle ADHD and PDD-NOS as contra-indications, the exclusion means that an important group of children with frequent aggressive behavior is not reached. Also, recent figures show that children with ADHD and PDD-NOS form a substantial portion of Cluster 4 education (Bijstra & Strijker, 2001; Huyghen, 2007). Therefore, TRAffic 8-12 was developed with the specific problems of children with ADHD and PDD-NOS in mind.

Because of their impulsivity and attention problems, children with ADHD have difficulties in adequately perceiving and interpreting social information. Much attention is paid to these first two steps in the processing of social information. This is done, for example, by intensively elaborating on how to use the Stop sign or on how to calm down. Children with PDD-NOS often experience difficulties in understanding social information. Therefore, the importance of facial expressions, posture and body language is stressed in the program, with the help of the Stop sign, among other things. Visual tools such as an anger thermometer, a real stop sign, a real traffic circle and a DVD also have a prominent role in the program. Especially children with PDD-NOS appear to benefit from visual tools.

2.5 Format and Structure of the Program

2.5.1 Format

In the standard format, children are trained in groups of six with two therapists in each group. The children attend 14 meetings of approximately 45 minutes. In this study we also developed another TRAffic 8-12 version in which children can be trained individually. Only minor adjustments were necessary for the individually-trained version. The training for the therapists consists of three meetings in which the basic principles of the program are outlined. The trainers study literature and the DVD and they practice extensively with the components of the program with the use of the program handbook.

2.5.2 Structure

       The first meeting serves as an introduction to the TRAffic 8-12 program. Meetings 2 and 3 cover the subject of anger. More specifically, in meeting 2 children learn how to recognize their own feelings of anger and in meeting 3 they learn how to recognize anger in others. The Stop sign is introduced in meeting 4, and in meeting 5 the Traffic circle is introduced. Both models are practiced with the use of DVD fragments, role play and other games in meetings 4 to 7. From meeting 8 on, three specific social skills are practiced, mainly through role play and the use of DVD fragments. The Stop sign and the TRAffic circle maintain a prominent role in each meeting. During the last meeting (meeting 14) the children choose an activity that they would like to do and for which they receive a certificate.

2.6 Effectiveness of the TRAffic 8-12 Program

       The TRAffic 8-12 program can be considered a theoretically well-founded program (see www.nji.nl for the criteria). The next necessary step is an effect study to determine whether the program is potentially effective in reducing children's aggressive behavior. In Chapter 3 the outcomes of TRAffic 8-12 are described for a group of 74 children with aggressive behavior problems in Cluster 4 elementary education. Because the TRAffic 8-12 program has a sound theoretical basis, the expectation that the program will be effective in reducing children's aggressive behavior is plausible. However, we expect the program to have a minimal to moderate, and only temporary effect, on the behavior of the children. In Chapter 3 the reasoning behind this expectation is explained. Moreover, the main goal of the effect study is not to determine the effectiveness of the program in general, but to consider the possible moderating influence of the children's motivation and the intervention group composition on aggression reduction.

Chapter 3 The Effects of TRAffic 8-12 on Aggressive Behavior and Behavioral Problems of Special Elementary School Children. The Influence of Motivation and Intervention Group Composition[14]

3.1 Introduction

In a previous study of the effects of the first version of TRAffic 8-12 a pre- and a post-test were conducted in which teachers completed a questionnaire measuring aggressive behavior of the children in their class. The results were ambiguous: a number of children profited from the program while others did not or even became more aggressive (Roede, Bijstra, Derriks & Moorlag, 2001). Existing literature provides several explanations for ambiguous results from school-based social skills intervention programs (see Chapter 1). The present study focuses on two possible moderating factors: children's motivation and intervention group composition. The influence of these two factors on TRAffic 8-12 outcomes is considered in this effect study, which has been funded by the Child Stamps Foundation in the Netherlands (*Stichting Kinderpostzegels Nederland*).

3.2 Theoretical Framework and Motivation for the Study

3.2.1 A Dynamic Systems View of TRAffic 8-12 Effects

The main goal of the study in this chapter is to consider the moderating influence of children's motivation and intervention group composition on TRAffic 8-12 outcomes. First, we take a look at the TRAffic 8-12 effects for the whole group of children, because these results have implications for the moderator study. For example, if we find a large effect for TRAffic 8-12 for all children, then a difference between motivated children and unmotivated children has much bigger practical significance than if we find small or no effects for TRAffic 8-12 for all children together. We expect that the TRAffic 8-12 program will only have a small to moderate effect on the children's aggressive behavior directly after the program is finished when we consider all children together. In the long term, these effects are assumed to diminish. The basis for this hypothesis is explained below.

Interventions for childhood aggression are among the most thoroughly studied type of intervention programs (Granic, O'Hara, Pepler & Lewis, 2007). Programs with an 'evidence-based' label are popular as the label gives the impression that the program 'works'. However, a considerable amount of variability and ambiguity remains concerning intervention program outcomes (e.g. Stage & Quiroz, 1997; Wilson, Gottfredson & Najaka, 2001). As we described in Chapter 1, a reason for these findings lies in the conceptualization of aggression reduction programs, which in turn determines the way we study intervention effects, i.e. a focus on outcome. In the traditional view of intervention programs such as TRAffic 8-12, the interventions are considered to be independent 'medicine' that 'cure' aggression (the medical model, Ahn & Wampold, 2001), and the effects of which are not considered to be influenced by the context in which they are applied. However, when an intervention program is implemented, for example in a school setting, it becomes part of a dynamic system (Lichtwarck-Aschoff & van Geert, 2004). Below we present an alternative dynamic systems view of the implementation of an intervention program such as TRAffic 8-12. This view considers the dynamic nature of behavior as well as the influence that the context has in which an intervention program is implemented.

A dynamic system is a set of connected variables that mutually affect each other. Applying the dynamic systems approach to an aggressive child in a classroom stetting implies that the child's behavior, one variable in the dynamic system, does not come about 'on its own'. The child's behavior and other variables in the system, such as the behavior of the peers in the classroom and the teacher's approach to teaching, mutually influence each other through complex, non-linear and iterative interactions; they can not be viewed independent of each other (Lichtwarck-Aschoff & van Geert, 2004). First, a social skills intervention program exists as an exogenous factor in the system that is intended to influence the behavior of the child. As soon as the child starts following the program, the program also becomes part of the dynamic system. This, in turn, means that the results of the program can not be considered independent of the dynamic system, i.e. the child, the peers in the classroom and the teacher (Bijstra & Nienhuis, 2004).

The social skills intervention program can be viewed as a temporary perturbation of an otherwise relatively stable system; in the case of TRAffic 8-12 the child follows 14 meetings in a new context in which new behavioral skills are taught. Meanwhile, the influence of the classroom context remains the same. Before the

program is implemented the system is in a stable state, or attractor; the child shows a certain level of persistent aggressive behavior that is preserved by the state of all the variables in the system (i.e. the child itself, the peers in the classroom and the teacher). The intervention program is aimed at pulling the system out of its attractor; i.e. tries to change the aggressive behavioral pattern of the child. However, the program is not focused on the external causal mechanisms that account for the child's aggressive behavior, only on the mechanisms *within* the child, such as poor social skills, distorted cognitions or low self-control[15]. As a result, the positive impact of the program is likely to diminish quickly after it finishes, meaning that the system returns to its original attractor state, i.e. the child shows the same behavioral pattern as before the program started.

With the present study we aim to show that an intervention program such as TRAffic 8-12, which does not intervene in the causal mechanisms that contribute to the child's behavior and are part of the child's relevant context, is unlikely to have a lasting positive impact. Therefore, we conduct a classical effect study of the social skills intervention program TRAffic 8-12. Both the short-term effects and the long-term effects are considered. Our hypothesis is that the program will not have a lasting impact on the aggressive behavior of the children. So, if we find short-term effects of TRAffic 8-12, then we expect those effects to disappear some time after the program has finished.

Together with the main question concerning the general program effects, we consider three sub-questions. We will briefly look at three factors that might affect the program outcomes. Children's IQ and their psychiatric diagnosis are two factors that are frequently considered to be related to intervention program outcomes. Kazdin and Crowley (1997) studied several child moderators of cognitive-behavioral treatment. One of their conclusions was that IQ was weakly related to treatment outcome, where higher IQ predicted a better outcome. They also concluded that children with more symptoms from the range of DSM disorders at intake performed less well after treatment. In this study we investigate whether the children's IQ is related to program outcomes and whether children with no psychiatric diagnosis benefit more from the TRAffic 8-12 program than children with a psychiatric diagnosis. Also, we compare the children who stayed in Cluster 4 education with the

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[15] Multisystemic treatments target not only individual, but also family, peer, school, and community factors (i.e. all the settings in which the child functions). Our reasoning only applies to social skills intervention programs that solely focus on teaching children new skills.

children who transferred to a school of regular education after the program had finished. One could hypothesize that the children who are qualified to transfer to a regular school are the ones who benefit more from the program.

3.2.2 Children's Motivation

Most aggression reduction programs do not pay attention to the opinions, needs, and goals of the children themselves (Bijstra & Nienhuis, 2003), and these omissions are hardly discussed in literature. However, we think that they deserve much more attention. Adults may be more used to talking *to* children instead of talking *with* them when their behavior causes problems. Especially younger children are often not actively involved in the decision concerning treatment, their perspective on their problematic behavior, whether they are motivated for treatment or not, and whether the program meets their needs. With respect to aggression reduction programs it is mostly parents, teachers and psychologists who refer children to aggression reduction programs.

For an intervention program to succeed, 'supply and demand' must correspond (Collot d'Escury-Koenigs, Snaterse & MacKaay-Cramer, 1995). In youth services it is increasingly recognized that children actively contribute to their development and education (De Winter, 2000; Raad voor Maatschappelijke Ontwikkeling, 2001). La Greca, Silverman & Lochman (2009), for example, underline the need to consider the influence of motivation to change on program outcomes. In the present study we will address the question of whether the TRAffic 8-12 program is more effective when children are motivated to change their behavior (see section 3.3.4 for a full description of our definition of motivation).

Obviously, our plea in the preceding section for a dynamic systems view of intervention programs applies to both motivated and unmotivated children. Based on this view, we do expect to find differential effects of TRAffic 8-12 depending on the children's motivation. Following the view of dynamic systems, children are not only influenced by the context they are part of, they also actively influence their context. We assume that motivated and unmotivated children have a differential influence on their context. For example, a child who is motivated to change its behavior might be more likely to actively seek contact with children in the classroom who show prosocial behavior than children who are unmotivated. For the motivated child this means that the negative influence of the aggressive behavior of other

children in the classroom may diminish and the positive impact of the intervention program may grow.

3.2.3 Intervention Group Composition

Aggression reduction programs are usually carried out in group format. However, group training may have a negative effect because children learn inadequate behavior from each other instead of adequate behavior from the therapist and the program. Several researchers documented these iatrogenic effects (Dishion, McCord & Poulin, 1999). We studied the phenomenon of iatrogenic effects for two reasons.

First of all, several studies have documented harmful effects on treatment participants (Ang & Hughes, 2001; Arnold & Hughes, 1999; Dishion, McCord & Poulin, 1999), while not all group treatments result in negative effects. Ang and Hughes (2001) concluded from their meta-analysis that skill training in groups comprised of only antisocial boys produced smaller benefits than the mixed groups or individual training. On the other hand, Mager, Milich, Harris and Howard (2005) found that children in mixed groups showed less positive interactions than children in homogenously aggressive groups. Arnold and Hughes (1999) argued that more studies into the effects of grouping antisocial peers on treatment gains are needed. According to them, the best way to do this is by investigating experimentally if random assignment of children with problem behavior to skills training in homogenous versus mixed groups produces differential effects. In the present study we will test whether individual skills training delivers better results than group skills training. The strength of our design is that we compare the results of the *same* program in a different format (group versus individual). Most studies on differential effects due to intervention group composition compare different programs, which may influence the results.

A second reason to study iatrogenic effects in our sample of elementary school children is the growing focus on the circumstances in which grouping aggressive children results in negative effects (Arnold & Hughes, 1999). In recent years American researchers have begun to study mediating factors and processes that help explain the presence and absence of adverse effects of grouping aggressive children. A factor that has been given little attention so far is the influence of age. Most studies on iatrogenic effects involve adolescents. It is assumed that the strength of the association between boys' aggressive behavior and that of their friends

increases with age (Arnold & Hughes, 1999). Unfortunately, in their meta-analysis, Ang and Hughes (2001) do not differentiate effects of grouping antisocial peers according to age, although their database of studies did give them the opportunity to do so (24 studies with children aged 6-12, 17 studies with children aged 13-18). Shechtman (2003) did compare outcomes in reduction of aggression for group and individual treatment in elementary school children and found no differential effects. In the present study we want to explore whether the frequently found differential effects of skills programs for adolescents due to group composition are also found in Dutch elementary school children.

Until now, just one study has been conducted in the Netherlands that touches on the topic of peer influence in intervention group settings. Van Lier, Vuijk and Crijnen (2005) studied the effect of the Dutch version of the American Good Behavior Game. One of their conclusions was that children who initially scored high on antisocial behavior showed, together with a decrease in antisocial behavior after the program, increasing affiliation with less antisocial peers. The researchers hereby provided evidence for positive peer influence in an intervention setting.

We must note that the differences between group-trained and individually-trained children are expected to be small. In section 3.2.1 we explained our ideas about the functioning of intervention programs from a dynamic system perspective. Following these ideas, we wonder whether the intervention program pushes the individually-trained children in the right direction, i.e. towards a less aggressive behavioral style. As opposed to the group-trained children, the individually-trained children might benefit a little bit from the nonaggressive context in which they learn prosocial skills. However, the possible differential effect of group composition can only be small considering the fact that the intervention program does not change other causal mechanisms in the contexts of both individually-trained and group-trained children.

3.2.4 Research Questions

In the present study three main questions are addressed:

1. What are the short- and long-term effects of TRAffic 8-12?
   a. Is children's IQ related to the effects of TRAffic 8-12?
   b. Do children without a psychiatric diagnosis benefit more from TRAffic 8-12 than children with a psychiatric diagnosis?

    c.   Do children who are later qualified to transfer to a regular school benefit more from TRAffic 8-12 than children who stay in Cluster 4 education?

2. Do children who are motivated to change their behavior profit more from TRAffic 8-12 than children who are unmotivated?
3. Is TRAffic 8-12 more effective for individually-trained children than for group-trained children?

3.3 Method

The present study was conducted in a school setting and implemented by school staff. In different phases of the study we had to take into account the limitations of the school context (i.e. limited time, sickness of teachers, etcetera), for example when recruiting the sample, carrying out the program, and collecting data for the children's behavior. Despite these limitations we believe that such a practice oriented research provides us with valuable information about the functioning of aggression reduction programs in the context of a school (see Chapter 4 for the implementation study).

3.3.1 Participants

The children in this study were students from a Cluster 4 school. The teachers selected children to participate in the study. We approached teachers of four Cluster 4 schools and explained the objectives of the study to them as well as the time investments needed if they were to participate. If they were interested in participating, we asked them which children they thought would profit from TRAffic 8-12. Selection criteria were: aggressive behavior problems, diagnosed with an Attention Deficit Hyperactive Disorder (ADHD) or a Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS) or similar problems, and a feeling of incompetence of the teacher in handling a child's problem behavior despite extra care and attention within the existing structure. Because we did not make use of questionnaires to select children with high aggression scores, children might vary in aggressive behavior at the start of the study. We asked the parents of the selected children to provide written informed consent. All of them agreed, resulting in a sample of 74 children. The number of subjects was chosen on the basis of a power analysis. The power analysis revealed that a total N of 74 children was necessary on the basis of an alpha of 0.10 and a power of 0.80, and under the assumption of a

moderate effect (d=0.50). Also, the number of 74 children was more or less the limit of children we could ask to participate due to limitations of resources that were available.

In Table 1 the characteristics of the participants are shown. The information was gathered from the children's school files. We used the information of IQ and psychiatric diagnosis to answer the research questions of the influence of those two variables on TRAffic 8-12 outcomes.

Most children in the sample were boys (95%), most children were 8 to 12 years old (91%) and most children were of Dutch nationality (72%). Sixty-six percent of the children had an IQ between 80 and 120 and 63% had a diagnosis of ADHD or PDD-NOS or show symptoms of these disorders. At baseline the teachers rated the behavioral problems of the majority of the children to be of clinical levels. Scoring in a clinical range means that less than 5% of the children in a normal sample score higher levels of behavior problems than the children in our study. Furthermore, most children came from either two-parent families (45%) or a single-parent family (32%). Finally, with respect to the educational level finished by the children's parents, there is a fairly even distribution over the different levels of education.

Table 1
Characteristics of the participants (N = 74)

Variable	N	%
Sex		
Boy	70	95
Girl	4	5
Age		
< 8 years	1	1
8 - 12 years	67	91
> 12 years	6	8
Ethnicity		
Native	53	72
Mixed	9	12
Foreign	2	3
Missing*	10	13

Table 1 continue

Variable	N	%
Intelligence Quotient		
< 80	5	7
80 – 100	32	43
> 100 – 120	17	23
> 120	2	3
Missing*	18	24
Diagnosis		
ADHD or symptoms of ADHD	13	18
PDD-NOS or symptoms of PDD-NOS	13	18
Combination of above	17	23
ADHD or symptoms combined with another diagnosis	3	4
Rest	5	7
No diagnosis	21	27
Missing*	2	3
Behavioral problems, norm scores at baseline**		
Attention problems		
Normal range	30	41
Sub-clinical range	11	15
Clinical range	26	35
Missing	7	9
Hyperactivity problems		
Normal range	22	30
Sub-clinical range	6	8
Clinical range	39	53
Missing	7	9
ODD symptoms (Oppositional Defiant Disorder)		
Normal range	14	19
Sub-clinical range	12	16
Clinical range	41	56
Missing	7	9
CD symptoms (Conduct Disorder)		
Normal range	21	28
Sub-clinical range	10	14
Clinical range	36	49
Missing	7	9

Table 1 continue

Variable	N	%
Family composition		
Two-parent family	33	45
Single-parent family	24	32
Two-parent family with one stepparent	11	15
Foster or adoption family	4	5
Missing[*]	2	3
Education father / mother[***]		
Elementary / lower vocational	17	23
Secondary, lower general / intermediate vocational	23	31
Secondary, higher general / pre-university	8	11
Higher professional / university	15	20
Missing[*]	11	15

[*] No information in the children's files.

[**] See section 3.3.5 for information about the rating scale.

[***] We combined the educational level of the father and the mother by determining the highest level of education that was finished by father, mother or both.

3.3.2 Trainers

Both employees and psychology trainees of the participating schools were recruited as trainers. The groups and some individual children were trained by creative and psycho-motor therapists (six), teachers (two) and a child psychologist. Psychology trainees carried out the rest of the individual treatments. Obviously, employees and trainees differ in the amount of experience they have within Cluster 4 education. However, it was not possible to have all children trained by employees. We could guarantee a minimum level of equality between the different groups of trainers by offering them the same training. This training consisted of three meetings in which the basics of the program were explained. The trainers studied assigned literature, watched the TRAffic 8-12 DVD and they practiced the components of the program extensively with the use of the program handbook.

3.3.3 Research Design

We used a semi-experimental design (see Figure 1). Before the baseline (*T0*[16]) the children's motivation was determined by interviewing them (see section 3.3.4). At *T0* (December '03) teachers and parents completed the questionnaires, after which the first half of the participants was trained (session 1). At *T1* (March

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[16] T is Time point.

'04) these children had finished the program and teachers and parents completed questionnaires again for all participants. This way the second group, who had not been trained yet, functioned as a control group for the first half of the participants. After *T1* the second group was trained and at *T2* (June '04) teachers and parents filled in the questionnaires for the third time. In January '05 (six months after the last training session) and June '06 (two years after the last training session) children participated in a fourth (*T3*) and fifth (*T4*) assessment.

	Motivation Oct '03	Baseline T0 Dec '03	Intervention Jan-March '04	T1 March '04	Intervention Apr-June '04	T2 June '04	T3 Jan '05	T4 June '06
Teacher		quest's		quest's		quest's	quest's	quest's
Parents		quest		quest		quest	quest	quest
Children session 1	interview		3 groups (*N*=18) & 17 individual					
Children session 2	interview				2 groups (*N*=15) & 15 individual			

Figure 1. Research design (quest('s) is questionnaire(s)).

Because of a number of difficulties that came about during the first training session, a second session in which a group of children was supposed to be trained, was cancelled. The reasons for the cancellation are described in Chapter 4, in which the implementation study of the TRAffic 8-12 program is described. Because of the cancellation, six children from the original sample did not participate in the program. Three other children did not attend the program because they were transferred to another school during the school year. These nine children functioned as a control group at *T1*, together with the children trained in session 2. We carried out a third session with a new group of children in February 2005, in which we were able to design a number of conditions in such a way that certain difficulties could be avoided. The children in this session were treated as a separate sample that was added to the study at a later stage. The third session is discussed in Chapter 4.

3.3.4 Motivation and Intervention Group Composition

Children's motivation was determined by interviewing them with an interview instrument designed by Singer, Doornenbal and Okma (2002). The aim of the instrument is to talk with children about their (aggressive) behavior, their underlying reasons and concerns, about what they want to change and what they think is needed to change. In earlier studies this instrument was used for other target groups (such as children with dyslexia). The instrument was adjusted for the study of aggressive children.

The starting point of the interview was a conflict the child experienced with a peer. All questions that followed about actions, goals, concerns, emotions etcetera revolved around this conflict. In Chapter 6 the interview and the results are described extensively and completely. For the purpose of this study, i.e. determining the children's motivation, the answers to three interview questions were used:

- Did you think about handling things differently after the conflict ended?
- Would you like to learn what you can do to have less conflict with other children?
- Could you indicate what you would like to learn from the following list:
  o to stay friends;
  o to have less fights;
  o to become more aware of when another person gets angry;
  o to talk instead of scream, hit or walk away;
  o to make up after a conflict.

When a child answered positively to one or more of the questions described above, he or she was able to describe what he or she wanted to learn and when the goal corresponded with the whole story, or with the TRAffic 8-12 goals, then the child was called motivated, otherwise a child was assigned to the unmotivated group. The researcher evaluated each interview (as motivated or unmotivated), and two master students from Developmental Psychology independently evaluated half of the interviews (also as motivated or unmotivated). Out of 74 interviews, 57 interviews were evaluated as being in the same motivation category and 17 interviews did not have evaluation agreement. The researcher and the students watched the interviews again, discussed them and came to an agreement for all interviews. In Table 2 the distribution of the motivation condition over the training sessions is presented.

In order to avoid a systematic influence of other factors on the results of the program, we attempted to divide the children randomly over the two treatment formats (group versus individual). However, because this study was not purely

experimental, but directly imbedded in the practice of the school, we had to take
several issues into account. Some children were assigned to the group format
because their teacher wanted to train the whole class. Other children were assigned
to a certain session because the school preferred that period. We also had to take
into account an equal distribution of motivated and unmotivated children over the
two treatment formats, which limited the possibility of random assignment. See
Table 2 for the distribution of motivation and intervention group composition over
the training sessions. There were nine children who initially would participate in the
second training session. In the end, these children were not trained because of
reasons explained in Chapter 4. The teachers and parents did assess the children's
aggressive behavior and behavioral problems. Therefore, this subgroup of children
could function as a control group together with the session 2 trained children at *T1*.

Table 2
Distribution of motivation and intervention group composition over training sessions (N = 74)

		Session 1	Session 2	Not trained	*Total*
Motivation	Motivated	15	14	2	*31*
	Unmotivated	19	14	5	*38*
	Indefinable/not interviewed	1	2	2	*5*
	Total	*35*	*30*	*9*	*74*
Treatment format	Group	18	15	-	*33*
	Individually	17	15	-	*32*
	Not trained	-	-	9	*9*
	Total	*35*	*30*	*9*	*74*

3.3.5 Measures

The children's behavior was assessed by both teachers and parents. Teachers
were asked to assess the children's aggressive behavior in the school setting by
conducting the Aggressive Behavior Checklist (*Agressievragenlijst*) developed by Krol
(1998). This checklist measures the frequency of four types of aggressive or
antisocial behavior: physical aggression (5 items), verbal aggression (6 items), indirect
aggression (4 items), and negativism (11 items). On a 5-point Likert scale the teacher
gives an indication of the frequency of a particular behavior: (almost) never (score 0),
once every month (score 1), once every week (score 2), once every 1 or 2 days (score
3), and more than once a day (score 4). Scores are calculated by adding up the scores
per item within each subscale. Because the number and the degree of detail of the
items per subscale differ considerably, we used weighted scores. Another reason to

use weighted scores is that we wanted a change in one subscale to weigh as much in the total score of aggressive behavior as a change in another subscale. The weighted subscale scores were added up to determine the total score on aggressive behavior. Cronbach's α is .84 for Physical Aggression, .89 for Verbal Aggression, .84 for Indirect Aggression and .95 for Negativism.

Teachers as well as parents assessed general behavioral problems by using the Dutch version of the Disruptive Behavior Disorders (DBD) rating scale (Oosterlaan, Scheres, Antrop, Roeyers, & Sergeant, 2000). The use of this scale was motivated by the suggestion of the program developers that the program might also affect more general behavioral problems associated with disorders such as ADHD, Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD)[17]. Since the teachers rated the behavior of the same children by means of two different rating scales (the Aggressive Behavior Checklist and the DBD rating scale), we could have combined these ratings in order to get a more reliable estimation of the children's improvement. However, since the two scales do not provide a measure of the same underlying construct this was not an option.

The DBD rating scale consists of 42 items with behavior descriptions that correspond with the characteristic symptoms of ADHD, ODD and CD. There are four answer alternatives: not applicable (score 0), weakly applicable (score 1), applicable (score 2) and highly applicable (score 3). Scale scores can be determined on the attention deficit subscale, the hyperactivity subscale, the ODD subscale, and the CD subscale. Because the Dutch version of the DBD rating scale is a standardized rating scale, percentile scores can also be obtained and translated into norm scores. Because we were mainly interested in the effect of the program on behavioral problems in general, only the total scale scores were analyzed. Because the subscales are highly correlated this was not problematic. We did not analyze the norm scores.

3.3.6 Analysis

For several reasons we decided to use random permutation techniques for all our statistical tests. First of all, some children in some intervention groups were from the same classroom, making the sample partly dependent. Second, at each

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[17] We will refer to behavioral problems associated with ADHD, ODD and CD with the general term 'behavioral problems'. Obviously, aggressive behavior can also be referred to as a behavioral problem, but because we assessed aggressive behavior separately we made a distinction in these terms.

assessment we were confronted with missing data and at *T3* and *T4* the number of assessments became quite small. Third, variations in the sample groups were quite large. All of these constraints in our sample make it very difficult, if not impossible, to use conventional statistical techniques. Random permutation tests are much more flexible. The empirical distribution of data is compared with a sample distribution that has roughly the same statistical features. Therefore it is possible to work with small and dependent samples with missing data (see for example Boosman, van der Meulen, van Geert & Jackson, 2002; Todman & Dugard, 2001). A limitation of random permutation tests is the fact that it is a relatively laborious and little used technique. However, with random permutation and comparable techniques we can make the same statistical comparisons or calculations as with standard techniques such as t-tests, f-tests, et cetera. The main difference with the standard techniques is that the distributions are not analytically calculated, but are approximated – to any required degree of accuracy – by means of randomizations of the data. Although the disadvantage of randomization is its relatively laborious nature, its major advantage is that it is free of specific assumptions (e.g. the assumption that data are normally distributed), which makes it highly suitable for statistical calculations on data sets where many of the assumptions required for standard statistical test are not met, or where it is unsure that such assumptions are met.

In a random permutation test, the empirical distribution of data is compared with a random distribution that is determined by randomly reshuffling the empirical data, in accordance with the null hypothesis. This reshuffling is carried out a great number of times (e.g. 10000 times). The resulting random distribution is a close approximation of the 'exact' null hypothesis distribution of the current dataset (given all its peculiarities, such as a small sample size). In the next step of the analysis, the empirical distribution is compared with the random distribution (null hypothesis). If both distributions differ significantly from one another, the conclusion is that the empirical distribution is likely to differ from the distribution expected on the basis of the null hypothesis and that the differences between the groups that were compared are meaningful.

Besides an estimation of the statistical significance, we also made an estimation of the clinical relevance of children's behavioral changes by calculating the effect sizes (*d*) (Cohen, 1988). Generally, an effect size smaller than 0.20 is considered negligible, an effect size between 0.20 and 0.49 is called small, an effect size between 0.50 and 0.79 is called mid-high, and an effect size above 0.80 is

considered high. Since we conducted our power analysis under the assumption of a moderate effect (d=0.50), we decided that the conclusion of a meaningful change after the TRAffic 8-12 program would only hold when both teachers and parents gave an estimation of an improvement in the children's behavior of half a standard deviation. Also, we must take into account the presence of observer bias. The teachers and parents did of course know that their rating occurred before and after the intervention, and thus it is likely that the post-intervention ratings contain a positive bias. Therefore, a small effect size in the expected direction might very well be ascribed to this observer bias.

Research question 1: What are the short- and long-term effects of the TRAffic 8-12 program? Two comparisons were made to determine the short-term effects of TRAffic 8-12: a) the difference-scores[18] of the trained children in session 1 were compared to the difference-scores of all the children that were not (yet) trained between *T0* and *T1,* and b) pre-intervention scores were compared with post-intervention scores for all trained children[19]. In order to determine the long-term effects, the following comparisons were made: a) the scores at *T0* were compared with the scores at *T2* (six months after baseline[20]) for the session 1 trained children, b) scores at *T0* were compared with scores at *T3* (one year after baseline) for all trained children who stayed in Cluster 4 education[21], and c) scores at *T0* were compared with scores at *T4* (two-and-a-half years after baseline) for all trained children who stayed in Cluster 4 education. Our hypotheses were that 1) the trained children would show higher difference-scores (= decrease in aggressive behavior/behavioral problems) than the untrained children, and 2) the trained

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[18] A difference-score is determined by subtracting the post-intervention score from the pre-intervention score. A positive difference-score means a decrease in aggressive behavior or behavioral problems, a negative difference-score means an increase in aggressive behavior or behavioral problems.

[19] Pre-intervention scores are *T0* for the session 1 trained children and *T1* for the session 2 trained children. Post-intervention scores are *T1* for the session 1 trained children and *T2* for the session 2 trained children.

[20] With the analyses of long-term effects we chose to compare post-intervention scores with baseline scores instead of the scores directly after the program had ended because children ended the program at different time points (*T1* and *T2*) resulting in varying periods between directly after the program and *T3* and *T4* . This way we could analyse the session 1 and session 2 trained children together. In order to be consistent we also used the baseline scores in analysis a, although here the problem of children ending the program at different time points is not present (in analysis a only the children trained in session 1 are analyzed).

[21] In the analyses of the long-term effects we only wanted to include children who stayed in Cluster 4 education, since one of our assumptions is that a change in school context to a regular school might have an impact on children's behavior (see Chapter 6 for a study on the effects of transfer to a regular school). By excluding the children who transferred to a regular school after the program had ended we kept a coherent sample.

children would show only very small (short-term) or no (long-term) decreases in aggressive behavior and behavioral problems after the program compared to before.

The influence of IQ on program outcomes was considered by calculating the correlation between IQ and the short-term difference-score of all trained children (i.e. *T0-T1* for the session 1 trained children, *T1-T2* for the session 2 trained children). Our hypothesis was that higher IQ's would be accompanied by higher difference-scores. We compared diagnosed and non-diagnosed children with respect to their short-term difference-scores with the use of permutation techniques. The hypothesis was that the children with no psychiatric diagnosis would show higher difference-scores than the children with a psychiatric diagnosis. Finally, with respect to the influence of qualification for a school transfer, we compared the difference-scores of the children who stayed in Cluster 4 education with the difference-scores of the children who transferred to regular education. We hypothesized that the children who transferred to a regular school would show higher difference-scores than the children who stayed in Cluster 4 education.

Research question 2: Do children who are motivated to change their behavior profit more from the TRAffic 8-12 program than children who are unmotivated? In order to answer this question we took both session 1 and session 2 trained children and we split the group in two on the basis of the children's motivation. This resulted in a motivated and an unmotivated group. We performed two tests: a) the difference-scores of the motivated children were compared to the difference-scores of the unmotivated children, and b) pre-intervention scores were compared with post-intervention scores for the two groups separately. Our hypotheses were that 1) the motivated children would show higher difference-scores than the unmotivated children, and 2) the motivated children would show decreases in aggressive behavior and behavioral problems after the program compared to before, while the unmotivated children would not show such decreases. We based this hypothesis on the assumption that motivation to change and a good correspondence between the contents of a program and the motivation of the child delivers better results for an intervention program.

Research question 3: Is the TRAffic 8-12 program more effective for individually-trained children than for group trained children? Again, we took session 1 and session 2 trained children together and divided the group into the group trained (GT) and the individually-trained (IT) children. We performed two tests: a) the difference-scores of the IT children were compared to the difference-scores of

the GT children, and b) pre-intervention scores were compared with post-intervention scores for the two groups separately. Our hypotheses were that 1) the IT children would show higher difference-scores than the GT children, and 2) the IT children would show decreases in aggressive behavior and behavioral problems after the program compared to before, while the GT children would not. We based this hypothesis on the assumption that the peer effect in the group (aggressive children only) will negatively influence the effect of the intervention program.

3.4 Results

Remember that the pre-intervention score is *T0* (December '03) for the children trained in session 1 and *T1* (March '04) for the children trained in session 2. The post-intervention score is *T1* for the session 1 children and *T2* (June '04) for the session 2 children. In the tables, for each row the scores in italic are compared.

3.4.1 Research Question 1: Short-term Effects, Long-term Effects and the Influence of IQ, Psychiatric Diagnosis and School Transfer

Short-term effects. The first main question of this study was whether the TRAffic 8-12 program would deliver short- and long-term effects in the reduction of children's aggressive behavior and behavioral problems. First we compared the difference-scores (*T0 - T1*) of the children who were trained in the first session with the difference-scores of the children who were not (yet) trained at that moment.

Contrary to our expectation, both teachers' and parents' ratings showed (very) small increases in children's aggressive behavior and behavioral problems, both in the trained and the untrained children (see Table 3). The untrained children did show bigger increases, but comparing the untrained with the trained children with respect to their difference-scores revealed no significant differences (p=0.21, 0.44 and 0.37) between the two groups. Also, these differences are likely not to be clinically relevant since the effect sizes of the differences between the trained and the untrained children were very small (d=0.18, 0.03 and 0.10).

Table 3

Differences between trained (session 1) and untrained children at T1 with respect to difference-scores (T0-T1) in aggressive behavior and behavioral problems

	Trained (Teacher ratings: N of children=30, Parent ratings: N of children=12)			Untrained (Teacher ratings: N of children=28, Parent ratings: N of children=16)				
	M_{T0} (s)	M_{T1} (s)	DS^1	M_{T0} (s)	M_{T1} (s)	DS^1	p	d
Teacher ratings								
Aggressive behavior	72.5 (27.3)	76.5 (24.6)	-4.0	69.2 (31.8)	78.5 (39.2)	-9.3	0.21	0.18
Behavioral problems	31.0 (19.5)	32.1 (18.3)	-1.1	39.1 (15.6)	40.7 (16.1)	-1.6	0.44	0.03
Parent ratings								
Behavioral problems	38.9 (13.3)	39.7 (12.5)	-0.8	35.9 (20.5)	38.3 (16.6)	-2.4	0.37	0.10

[1] *DS* is difference-score (*T0-T1*).

We then compared the average pre-intervention scores with the average post-intervention scores for session 1 and session 2 trained children together (within-group analysis).

Table 4

Differences between pre- and post-intervention scores of aggressive behavior and behavioral problems of trained children in session 1 and session 2

	M_{pre}^1 (s)	M_{post}^2 (s)	p	d
Teacher ratings (N of children=55)				
Aggressive behavior	*76.6* (35.1)	*72.9* (31.8)	0.28	0.11
Behavioral problems	*37.5* (20.1)	*33.2* (18.6)	0.02*	0.22
Parent ratings (N of children=26)				
Behavioral problems	*37.0* (16.9)	*36.0* (18.7)	0.35	0.06

[1] The pre-intervention score is *T0* for the session 1 trained children and *T1* for the session 2 trained children.

[2] The post-intervention score is *T1* for the session 1 trained children and *T2* for the session 2 trained children.

* Significant at $p \leq 0.05$

The teachers and the parents rated the children's aggressive behavior and behavioral problems as being lower after the program compared to before (see Table 4). Only the teachers' ratings showed a significant decrease in children's behavioral problems after the program (p=0.02). The size of the improvement is, however, small (d=0.22), especially when we take the presence of a positive observer bias (i.e. the raters know that the ratings occurred before and after the program) into account. Also, we cannot be sure whether this result could be ascribed to the program, because there was no comparison with untrained children.

Taking both analyses together, we must conclude that children's participation in the TRAffic 8-12 program did not result in significant decreases in their aggressive behavior and behavioral problems directly after the program had ended. The results confirmed our hypothesis that TRAffic 8-12 would show no or only very small effects on the behavior of the children.

Long-term effects. We made three comparisons: a) session 1 trained children: compare *T0 – T2* (six months after baseline), b) session 1 + 2: compare *T0 – T3* (one year after baseline), and c) session 1 + 2: compare *T0 – T4* (two-and-a-half years after baseline). As we noted before, with respect to analyses b and c we only analyzed the subgroup of children who stayed in Cluster 4 education, at least until *T3* and/or *T4*. This means we had to do with a reduced sample. Another factor that contributed to the reduction of the sample was the decrease in commitment of participating teachers. *T3* and *T4* fell in new school years, so new teachers had to assess the children's behavior. They did not voluntarily choose for participation in the study, and this may explain the higher frequency of no-reply in these later assessments.

First we checked whether there were effects of TRAffic 8-12 in the session 1 trained children three months after the program had ended (i.e. six months after baseline, at *T2*). Remember that directly after the program had ended at *T1*, the trained children in session 1 did not show any differences compared to the untrained children at that moment. Three months later the teachers' ratings showed a significant decrease in the children's behavioral problems (p=0.01) (see Table 5). However, the magnitude of this improvement is, again, considered to be small (d=0.26). Teachers' ratings of aggressive behavior and parents' ratings of behavioral problems did not show any decreases after the program compared to before. The

teachers' ratings even showed a very small, but non-significant, increase in children's aggressive behavior.

Table 5

Differences between pre- (T0) and post-intervention (T2) scores of aggressive behavior and behavioral problems of trained children in session 1

	M_{T0} (*s*)	M_{T2} (*s*)	*p*	*d*
Teacher ratings (*N* of children=31)				
Aggressive behavior	*76.9* (24.5)	*77.6* (28.3)	0.56	-0.03
Behavioral problems	*32.9* (19.8)	*28.4* (15.0)	0.01*	0.26
Parent ratings (*N* of children=18)				
Behavioral problems	*43.3* (16.0)	*39.5* (16.9)	0.14	0.24

* Significant at $p \leq 0.05$.

Also, after a longer period of time TRAffic 8-12 did not result in significant decreases in aggressive behavior and behavioral problems (see Table 6 and Table 7). The teachers' ratings showed (small) increases in aggressive behavior both one year after baseline (at *T3*) and two-and-a-half years after baseline (at *T4*), and also a small increase in behavioral problems two-and-a-half years after baseline. These increases were not significant and had negligible effect sizes. The teachers' ratings did show a very small decrease in behavioral problems one year after the program, and the parents' ratings showed decreases in children's behavioral problems both one year and two-and-a-half years after the program. However, these decreases were also not significant and had negligible effect sizes.

Table 6

Differences between pre- (T0) and post-intervention (T3) scores of aggressive behavior and behavioral problems of trained children who stayed in Cluster 4 education

	M_{T0} (*s*)	M_{T3} (*s*)	*p*	*d*
Teacher ratings (*N* of children=28)				
Aggressive behavior	*68.8* (29.2)	*71.2* (37.5)	0.60	-0.07
Behavioral problems	*35.4* (16.3)	*34.4* (20.1)	0.40	0.06
Parent ratings (*N* of children=22)				
Behavioral problems	*41.2* (19.9)	*37.9* (17.5)	0.24	0.18

Table 7

Differences between pre- (T0) and post-intervention (T4) scores of aggressive behavior and behavioral problems of trained children who stayed in Cluster 4 education

	M_{T0} (s)	M_{T4} (s)	p	d
<u>Teacher ratings</u> (N of children=15)				
Aggressive behavior	*68.8* (30.2)	*78.6* (41.0)	0.74	-0.28
Behavioral problems	*38.9* (16.9)	*41.3* (21.2)	0.64	-0.13
<u>Parent ratings</u> (N of children=15)				
Behavioral problems	*34.5* (20.4)	*33.8* (18.7)	0.44	0.04

In sum, our hypothesis that TRAffic 8-12 would not result in decreases in children's problematic behavior on the long-term was confirmed. In general, our analyses showed that both in the short- and the long term the TRAffic 8-12 program did not have the required effect size of d=0.50.

 IQ, Psychiatric Diagnosis and School Transfer. We investigated the relationship between IQ and the effects of TRAffic 8-12 by calculating the correlation between IQ and the difference-score of all trained children[22]. Remember that a positive difference-score means a decrease in aggressive behavior and behavioral problems and a negative difference-score means an increase in aggressive behavior or behavioral problems. The correlation coefficient between IQ and difference-scores in teachers' ratings aggressive behavior was 0.11 (N of children=43), 0.17 between IQ and teachers' ratings of difference-scores in behavioral problems (N of children=43), and 0.21 between IQ and parents' ratings of difference-scores in behavioral problems (N of children=20). All correlations were positive, which meant that the higher the IQ of the children, the higher the difference-score in problem behavior. This result was in the direction we expected: children with a higher IQ have profited more from the program. However, all correlations were very small and not significant (aggressive behavior p=0,75, teachers' ratings of behavioral problems p=0,85, parents' ratings of behavioral problems p=0,81). Based on these results, we had to conclude that there was no meaningful relation between IQ and the degree of difference score in aggressive

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[22] We used the short-term difference-score (i.e. *T0-T1* for the session 1 trained children, *T1-T2* for the session 2 trained children).

behavior and behavioral problems after TRAffic 8-12, and that we had to reject our hypothesis.

Furthermore, we studied whether there were differences between children with (symptoms of) a psychiatric diagnosis and children without such a diagnosis with respect to their difference score (pre-intervention - post-intervention) in problem behavior. We did not test parents' ratings of children's behavioral problems because too few parents in the undiagnosed group participated, and this group became too small to do any analyses on. The teachers' ratings showed decreases after the program in both children with and children without a diagnosis (see Table 8). Our analyses revealed no significant differences in the difference-scores between the two groups (p=0.42 for aggressive behavior and 0.60 for behavioral problems). Also, the effect sizes were negligible (d=0.05 and 0.05). This means that we had to reject our hypothesis that children with no psychiatric diagnosis would profit more from the program than the children with a psychiatric diagnosis.

Table 8

Differences between diagnosed and undiagnosed children with respect to difference-scores (pre-intervention – post-intervention)

	Diagnosed (*N* of children=37)			Undiagnosed (*N* of children=18)			*p*	*d*
	M_{pre}[1] (*s*)	M_{post}[2] (*s*)	*DS*[3]	M_{pre}[1] (*s*)	M_{post}[2] (*s*)	*DS*[3]		
<u>Teacher ratings</u>								
Aggressive behavior	73.4 (30.4)	70.3 (26.8)	*3.1*	83.3 (43.4)	78.4 (40.5)	*4.9*	0.42	0.05
Behavioral problems	35.4 (20.4)	30.8 (18.0)	*4.6*	41.7 (19.3)	38.1 (19.3)	*3.6*	0.60	0.05

[1] The pre-intervention score is *T0* for the session 1 trained children and *T1* for the session 2 trained children.

[2] The post-intervention score is *T1* for the session 1 trained children and *T2* for the session 2 trained children.

[3] *DS* is difference-score (pre-intervention score – post-intervention score).

Finally we checked whether the children who transferred to a regular school profited more from the TRAffic 8-12 program than the children who stayed in Cluster 4 education. We tested whether children who transferred to a regular school some time after the end of the program had higher difference-scores (pre-intervention – post-intervention) than the children who stayed in Cluster 4 education. Except for parents' ratings of the behavioral problems of the children

who stayed in Cluster 4 education, teachers' and parents' ratings showed decreases after the program in aggressive behavior and/or behavioral problems of both children who transferred to a regular school and children who stayed in Cluster 4 education (see Table 9).

Table 9

Differences between children who transferred to a regular school and children who stayed in Cluster 4 education with respect to difference-scores (pre-intervention – post-intervention) in aggressive behavior and behavioral problems

	Transfer to regular (Teacher ratings: N of children=12, Parent ratings: N of children=8)			Stay in Cluster 4 (Teacher ratings: N of children=42, Parent ratings: N of children=13)				
	M_{pre} (s)	M_{post} (s)	DS	M_{pre} (s)	M_{post} (s)	DS	p	d
Teacher ratings								
Aggressive behavior	66.0 (31.9)	61.3 (34.7)	4.7	78.7 (35.7)	75.9 (30.9)	2.8	0.42	0.05
Behavioral problems	24.8 (16.9)	18.1 (11.5)	6.8	39.8 (18.3)	37.3 (18.3)	2.5	0.17	0.25
Parent ratings								
Behavioral problems	40.0 (15.7)	34.6 (15.7)	5.4	40.5 (17.4)	44.1 (16.8)	-3.6	0.05*	0.33

* Significant at p ≤ 0.05.

Our analysis revealed that, based on the teachers' ratings, there was no difference in difference-scores of aggressive behavior and behavioral problems between the two groups. Parents' ratings of children's behavioral problems did show a significant difference between the groups, where the children who transferred to regular education (decrease in behavioral problems) seemed to have profited more from the program than the children who stayed in Cluster 4 education (increase in behavioral problems) (p=0.05). According to the classification of effect sizes, the difference between the groups in terms of effect size was small (d=0.33). However, given the p-value of 0.05 and the fact that this effect size was the second biggest effect size found in our analyses, this effect size cannot be neglected. On the other hand, caution is required with the conclusion that the children who transferred to a regular school profited more from the program than the children who stayed in Cluster 4 education, since we must also take the presence of a positive observer bias into

account. Also, the teachers did not observe any differences between the two groups. Our conclusion is that we do not have enough grounds to accept the hypothesis that children who transferred to a regular school would profit more from the TRAffic 8-12 program than the children who stayed in Cluster 4 education.

3.4.2 Research Question 2: Children's Motivation

Our second main question was whether motivated children would profit more from the TRAffic 8-12 program than unmotivated children. First we compared the difference-scores of the motivated children with the difference-scores of the unmotivated children. Both teachers' and parents' ratings showed decreases in the aggressive behavior and the behavioral problems of the motivated children after the program (see Table 10).

Table 10

Differences between motivated and unmotivated children with respect to difference-scores (pre-intervention – post-intervention) in aggressive behavior and behavioral problems

	Motivated (Teacher ratings: N of children=27, Parent ratings: N of children=10)			Unmotivated (Teacher ratings: N of children=25, Parent ratings: N of children=13)				
	M_{pre}[1] (s)	M_{post}[2] (s)	DS[3]	M_{pre}[1] (s)	M_{post}[2] (s)	DS[3]	p	d
Teacher ratings								
Aggressive behavior	86.7 (34.2)	82.0 (31.7)	*4.7*	67.1 (30.8)	67.9 (29.2)	*-0.8*	0.23	0.18
Behavioral problems	40.6 (20.8)	35.7 (17.5)	*4.9*	34.5 (18.9)	32.4 (19.8)	*2.1*	0.25	0.14
Parent ratings								
Behavioral problems	34.7 (19.0)	34.1 (22.4)	*0.6*	37.9 (15.7)	39.1 (14.5)	*-1.2*	0.36	0.11

[1] The pre-intervention score is *T0* for the session 1 trained children and *T1* for the session 2 trained children.

[2] The post-intervention score is *T1* for the session 1 trained children and *T2* for the session 2 trained children.

[3] *DS* is difference-score (pre-intervention score – post-intervention score).

According to our expectation, the teachers' ratings showed less decrease in the behavioral problems of the unmotivated children, where the teachers' ratings of

aggressive behavior and the parents' ratings of behavioral problems showed even a small increase after the program. Our analysis, however, showed that the differences between motivated and unmotivated children were not significant (p=0.23, 0.25 and 0.36), and are also not likely to be clinically relevant (d=0.18, 0.14 and 0.11).

   We also compared pre-intervention scores with post-intervention scores for the two groups separately. Teachers' ratings showed a significant decrease in the behavioral problems of the motivated children after the program (p=0.05), but not in the children's aggressive behavior (see Table 11). The effect size of the improvement was small (d=0.26). The parents' ratings did not show significant decreases in the behavioral problems of the motivated children. In the unmotivated group we did not find significant decreases in the teachers' or the parents' ratings.

Table 11

Differences between pre- and post-intervention scores of aggressive behavior and behavioral problems of motivated and unmotivated children

	Motivated (Teacher ratings: N of children=27, Parent ratings: N of children=10)				Unmotivated (Teacher ratings: N of children=25, Parent ratings: N of children=13)			
	M_{pre} (s)	M_{post} (s)	p	d	M_{pre} (s)	M_{post} (s)	p	d
Teacher ratings								
Aggressive behavior	86.7 (34.2)	82.0 (31.7)	0.21	0.15	67.1 (30.8)	67.9 (29.2)	0.60	-0.03
Behavioral problems	40.6 (20.8)	35.7 (17.5)	0.05*	0.26	34.5 (18.9)	32.4 (19.8)	0.21	0.11
Parent ratings								
Behavioral problems	34.7 (19.0)	34.1 (22.4)	0.50	0.03	37.9 (15.7)	39.1 (14.5)	0.64	-0.07

* Significant at p ≤ 0.05.

   Summarizing, although we found a significant improvement in one criterion for the motivated children, together with a small effect size, we do not have enough grounds to accept the hypothesis that motivated children would profit more from the TRAffic 8-12 program than the unmotivated children, especially given the probability of the presence of a positive observer bias.

3.4.3 Research Question 3: Intervention Group Composition

The final main question was whether individually-trained children would profit more from the TRAffic 8-12 program than group-trained children. Again, first the difference-scores (pre-intervention – post-intervention) of the individually-trained (IT) children were compared with those of the group-trained (GT) children.

Table 12

Differences between individually-trained and group-trained children with respect to difference-scores (pre-intervention – post-intervention) in aggressive behavior and behavioral problems

	Individually-trained (Teacher ratings: N of children=24, Parent ratings: N of children=9)			Group-trained (Teacher ratings: N of children=31, Parent ratings: N of children=16)				
	M_{pre}[1] (s)	M_{post}[2] (s)	DS[3]	M_{pre}[1] (s)	M_{post}[2] (s)	DS[3]	p	d
Teacher ratings								
Aggressive behavior	68.0 (32.3)	59.4 (31.0)	*8.5*	83.3 (36.2)	83.4 (28.7)	*-0.1*	0.15	0.27
Behavioral problems	40.0 (14.6)	36.2 (16.0)	*3.8*	35.5 (23.6)	30.8 (20.3)	*4.7*	0.60	0.05
Parent ratings								
Behavioral problems	44.4 (17.9)	40.9 (19.2)	*3.5*	33.4 (15.8)	35.4 (16.9)	*-2.1*	0.13	0.34

[1] The pre-intervention score is *T0* for the session 1 trained children and *T1* for the session 2 trained children.

[2] The post-intervention score is *T1* for the session 1 trained children and *T2* for the session 2 trained children.

[3] *DS* is difference-score (pre-intervention score – post-intervention score).

The outcomes of the teachers' and the parents' ratings were in the expected direction: the IT children showed bigger decreases in aggressive behavior and behavioral problems after the program compared to the GT children (see Table 12). Moreover, teachers' ratings of aggressive behavior and parents' ratings of behavioral problems for GT children even showed a (very) small increase after the program. The analysis, however, revealed that the difference-scores in aggressive behavior and behavioral problems of both groups did not differ significantly from one another

(p=0.15, 0.60 and 0.13) and the effect sizes of the differences between the groups were also small to negligible (d=0.27, 0.05 and 0.34).

Table 13

Differences between pre- and post-intervention scores of aggressive behavior and behavioral problems of individually-trained and group-trained children

	Individually-trained (Teacher ratings: N of children=24, Parent ratings: N of children=9)				Group-trained (Teacher ratings: N of children=31, Parent ratings: N of children=16)			
	M_{pre} (s)	M_{post} (s)	p	d	M_{pre} (s)	M_{post} (s)	p	d
<u>Teacher ratings</u>								
Aggressive behavior	*68.0* (32.3)	*59.4* (31.0)	0.10	0.27	*83.3* (36.2)	*83.4* (28.7)	0.51	0.00
Behavioral problems	*40.0* (14.6)	*36.2* (16.0)	0.10	0.20	*35.5* (23.6)	*30.8* (20.3)	0.07	0.25
<u>Parent ratings</u>								
Behavioral problems	*44.4* (17.9)	*40.9* (19.2)	0.15	0.21	*33.4* (15.8)	*35.4* (16.9)	0.74	-0.12

Next, we compared pre-intervention scores with post-intervention scores for the two groups separately. There were no significant differences in teachers' and parents' ratings of aggressive behavior and behavioral problems before as compared to after the program for either the IT or the GT children (see Table 13). Since the effect sizes were also small the clinical relevance of the differences is also minimal. In sum, the IT children did not profit more from the TRAffic 8-12 program than the GT children, leading us to reject our hypothesis.

3.5 Conclusion and Discussion

In the present study we considered the general effects of TRAffic 8-12 and we investigated the role of two factors that might help explain the absence of positive results of many social skills programs that aim at reducing aggressive behavior in children. We studied the effect of children's motivation to change behavior and the effect of group composition (group versus individual training) on the effects of TRAffic 8-12. Teachers assessed children's aggressive behavior and behavioral problems associated with ADHD, ODD and CD, and parents also assessed children's behavioral problems.

Before we draw any conclusions we want to stress two points of significance with respect to the sample of the study. We worked with a limited sample of children in Cluster 4 education, a type of education for children with behavioral and psychiatric problems, and our results only apply to this group of children. Furthermore, during the study the sample size decreased. Later in the study we were confronted with new teachers and new schools because children moved on to higher grades. These new teachers and schools were less committed to the study and filled in the questionnaires less conscientiously, which is most likely why the number of assessments decreased. As a consequence, the different analyses were performed with varying (sometimes small) subsets of children. This means that it is possible that the reliability of our results was diminished. Eyeball inspection of the missing cases versus the cases that remained in the sample did not reveal any indication that the missing subjects formed a specific subset of the total sample and that the attrition of cases has resulted in a change of the composition of the remaining sample. In sum, there is no obvious justification for the critique that the results based on the reduced samples are significantly different from the results that would have been obtained if the total sample had remained intact, although the possibility that the sample has qualitatively changed because of case attrition can never be excluded.

3.5.1 Short-term Effects, Long-term Effects and the Influence of IQ, Psychiatric Diagnosis and School Transfer

Did the TRAffic 8-12 program have short- and long-term effects on the children's aggressive behavior and behavioral problems? The answer is no. First of all, participation in the TRAffic 8-12 program did not result in a decrease in aggressive behavior and behavioral problems in the short term: the trained children in session 1 and the untrained children did not differ in their change in behavior, neither in the teachers' or the parents' ratings. A within-group analysis with all the trained children did show a significant decrease in teachers' ratings of children's behavioral problems after the program. The effect size of this decrease was, however, minimal, which means that the clinical relevance of the behavioral change was small. Teachers' ratings of aggressive behavior and parents' ratings of behavioral problems did not show significant decreases after the program.

Second, with respect to the long-term effects in the session 1 trained children, the teachers' ratings of aggressive behavior and behavioral problems, and the parents' ratings of behavioral problems showed no changes three months after

the program had finished. Also, one year as well as two-and-a-half years after baseline there were no positive effects of the program on the children's behavior. These findings led us to the overall conclusion that TRAffic 8-12 did not result in a clinically meaningful decrease of the children's aggressive behavior and behavioral problems. In section 3.5.4 we elaborate on multiple explanations for the absence of long-term effects of TRAffic 8-12.

The IQ of the children and having a psychiatric diagnosis or not did not explain changes in behavior after the TRAffic 8-12 program. Some studies have shown that children with a high IQ profit more from an intervention program than children with a low IQ. In our study a higher IQ was only very weakly related to more decrease in problem behaviors. Children with a psychiatric diagnosis did not profit less from the program than children without a diagnosis. This finding might not be so surprising, since all children in our study were students in a Cluster 4 school and thereby meet the inclusion criterion of the presence of at least behavioral problems, among other inclusion criteria (see Chapter 1). Finally, according to the parents' ratings of behavioral problems, children who later transferred to a regular school profited more from the program than children who stayed in Cluster 4 education. Again, however, the effect size of the difference between these two groups was small. Teachers' ratings showed no differences between the two groups.

3.5.2 Children's Motivation

Did children who were motivated to change their behavior profit more from TRAffic 8-12 than unmotivated children? In our analyses we found insufficient evidence to support a confirmative answer. We did not find any differences between motivated and unmotivated children in how much they profited from TRAffic 8-12, either in the teachers' or in the parents' ratings. Motivated children did show a significant decrease in teachers' ratings of behavioral problems, but the clinical relevance of this improvement was small. However, the differences between the groups were in the expected direction; while motivated children showed small decreases in all ratings, unmotivated children showed small increases in two out of three ratings.

An explanation for the absence of any effect might be that children's motivation to change at the start of the program is not as important as the (development of) children's motivation to change *during* the program, and that these motivations are not related. The degree to which an intervention program is able to

stimulate children's interest is referred to as 'participant responsiveness' in implementation research. Participant responsiveness is one out of eight aspects of implementation that are crucial for the quality of the delivery of the program in a particular setting, and this quality, in turn, affects outcomes of intervention programs (Durlak & DuPre, 2008).

Another explanation for the absence of an effect of motivation might be the way we defined the children's motivation. Children were labeled as motivated if they had set a goal related to positive changes in behavior and if that goal fit with the topics that were discussed during the TRAffic 8-12 program. Children were labeled as unmotivated when they did not set such a goal. The way we defined motivation may have been too limited to find an effect. Limitations in child skills, such verbal skills or the ability to think systematically, for example, might have influenced the outcomes of the interview with respect to the conditions that we used to determine the children's motivation.

The questions that we used to determine the children's motivation were part of an extensive interview that was used to study children's perspectives on their own aggressive behavior. In Chapter 5 the results of those interviews are reported extensively. We study the children's perspective because we feel it is important to get more insight into children's own perspectives of why they behave aggressively. These underlying motives for aggression might give more insight into the children's behavior. For example, children who use aggression to defend themselves, and feel bad about that strategy, may be more motivated to change their behavior, and, as a result, the outcome of an intervention program might be much better for such children than for children who actually enjoy bullying other children. However, the actual set up of the study described in Chapter 5 did not allow us to use the results of the extensive interviews for a fixed determination of children's motivation.

3.5.3 Intervention Group Composition

Was the TRAffic 8-12 program more effective for individually-trained children than for group trained children? Again the answer is negative. We did not find differences between group-trained and individually-trained children in their gains from the program, although, again, the differences were in the expected direction (individually-trained children showed small decreases in all ratings while group-trained children showed small increases in two out of three ratings).

We studied the effect of group composition because several studies have documented harmful effects of grouping aggressive children together in intervention groups, were the intervention resulted in increases in problem behavior instead of decreases. In our study being trained in a group with only aggressive children did not result in an increase in aggressive behavior and behavioral problems. A reason for this might be that the social skills program was short. In 14 meetings, and for one hour per week, the children were grouped together or trained individually. This might be too short for grouping to have a negative effect.

Also, the grouping might not have had *more* of a negative effect than the natural context that surrounds the trained children in their daily lives, namely (the children in) the classroom. Cluster 4 education classrooms are comprised of mostly behaviorally and emotionally disturbed children. If we assume possible negative effects of grouping aggressive children together for only short periods of time in intervention groups, then we should assume even bigger negative effects of grouping children with behavioral problems together in Cluster 4 education classrooms[23]. Therefore, the grouping of aggressive children in intervention groups in Cluster 4 education might not have as much of a negative effect as it might have in a regular school, where only the few aggressive children, possibly from different classrooms, are grouped together.

3.5.4 Explanations for the Absence of TRAffic 8-12 Effects

There are multiple explanations for the fact that we did not find positive TRAffic 8-12 effects. In Chapter 1 of this thesis we outlined our view of intervention as a process that intervenes in a dynamic system in which the child and the context mutually influence each other in time. We explained that finding evidence for programs such as TRAffic 8-12 is very hard as long as the programs are viewed as 'medicine' that 'cure' 'static' problems such as aggressive behavior. Therefore, in Part II of this thesis we will look beyond the program outcomes. Below we present some additional explanations for the absence of long-term effects of TRAffic 8-12, some of which are related to the argument made here.

First of all, several effect studies have indicated that children with (high levels of) aggressive behavior respond less well to social skills treatment than children with low levels of behavioral problems (Louwe & van Overveld, 2008;

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[23] See Chapter 6 for a discussion of the study of the influence of the classroom context on children's aggressive behavior.

Schneider, 1992; Stage & Quiroz, 1997; Sukhodolsky, Kassinove & Gorman, 2004). This is especially true for children in Cluster 4 education who often show multiple behavioral, emotional and learning problems. These problems might be too severe and complex to be changed in a short social skills program such as TRAffic 8-12. Quinn, Kavale, Mathur, Rutherford & Forness (1999) suggest that these children need additional and individualized support and instruction along-side group-based social skills programs.

Second, changing children's behavior is a very complex task in any case. Acquiring new skills is a process that takes a long time (Bijstra & Nienhuis, 2003). As Quinn, Kavale, Mathur, Rutherford & Forness (1999) state, how can we expect changes in behavior after short social skills programs if we take years for teaching children how to read or do math? For children to apply newly acquired skills in the real world, ongoing support of teachers and other adults, also after the program has ended, is required. In Chapter 4 the sustainability of the TRAffic 8-12 program techniques by the children's teachers will be described. Sustainability can be considered an essential part of program implementation in achieving long-term effects of intervention programs. However, the majority of social skills programs, including TRAffic 8-12, do not provide guidelines for this purpose. The 'train and hope mentality' is still very persistent in schools. As early as 1977, Stokes and Bear criticized this mentality and stated that transference of acquired skills to other settings than the training setting should be actively included in program set-ups.

Third, a problem with aggression reduction programs with group designs, including TRAffic 8-12, is that they work under the assumption that aggression has similar roots for all children who participate. A fit needs to be made between a child's individual needs and the content of an intervention program (Quinn, Kavale, Mathur, Rutherford & Forness, 1999). In that regard the individual format of the TRAffic 8-12 program may have worked better than the group format if the program was fit with the child's individual needs. In Chapter 5 of this thesis we will consider individual differences in aggressive behavior by studying children's narratives about their aggressive behavior.

Fourth, and related to the previous issue, is the fact that most program developers do not take developmental findings into account. Nangle, Erdley, Carpenter and Newman (2000) state that even the most fundamental developmental considerations are frequently overlooked in program building and implementation. For example, research has shown that cognitive interventions are more effective in

older children and adolescents than in younger children, because this type of program requires more advanced social-cognitive skills. However, interventions with a social-cognitive approach are routinely applied to children of all ages and with all cognitive abilities, including TRAffic 8-12. This finding might very well affect program outcomes.

Fifth, without exploration of the implementation quality a program such as TRAffic 8-12 may be incorrectly judged as ineffective or a poorly developed program when the negative outcomes are in fact the result of poor delivery of the program (Domitrovich & Greenberg, 2000). Theoretically speaking, the elements of most social skills programs, including the TRAffic 8-12 program, should be effective in reducing aggressive behavior in children. The theories that underlie the program elements are well-grounded in scientific evidence and the translation of those theories into program elements is well-considered. It is, however, a challenging task to implement a well-considered program into the complexity of the real world. In schools, multiple factors have been found to influence the quality of program implementation, which in turn influences program outcomes (Durlak & DuPre, 2008). In Chapter 4 we present a qualitative evaluation of the implementation of TRAffic 8-12.

Sixth, we only measured the effect of TRAffic 8-12 on children's problem behavior, while the program was focused on teaching children new skills. If we would have measured children's prosocial behavior, we might have found an improvement after the program. Quinn, Kavale, Mathur, Rutherford and Forness' (1999) meta-analysis of the effects of social skills interventions, for example, showed that measures of prosocial behaviors resulted in greater effect sizes than measures of disruptive or aggressive behaviors. The latter proved to be the most resistant to change through social skills training. Thus, the assumption that problematic behavior decreases when children's prosocial behavior repertoire expands might be an incorrect one. Therefore, more intensive and individualized support might be needed.

Finally, by using teacher and parent questionnaires we can only make statements about their perception of children's (changes in) behavior. In this sense, observation is a better tool to determine real changes in behavior.

Part II

Beyond the Tip of the Iceberg
A Consideration of Child & Context

Chapter 4 A Qualitative Study of the Implementation and Sustainability of TRAffic 8-12 in School Practice Settings

4.1 Introduction

In Chapter 3 of this thesis we concluded that participation in the TRAffic 8-12 program, a school-based social skills intervention program aimed at reducing aggressive behavior in special elementary school children, did not result in a long-term reduction of children's aggressive behavior. In the effect study we solely focused on the program outcomes. This focus, however, does not reveal anything about *why* the program did not work in the long term. For the purpose of finding out why the program did not work, one of the issues we need to consider is the way in which the program is implemented by the trainers and the extent to which the training techniques are sustained by the children's teachers. Without consideration of the program implementation and sustainability we cannot determine whether the program itself did not work or the program was carried out insufficiently (Hahn et al., 2007; Schneider, 1992).

A second issue that needs to be considered is the (school) context in which the program is implemented. Successful implementation of an intervention program in practice settings such as schools is a complex task (Durlak & DuPre, 2008; Lochman, Boxmeijer, Powell, Qu, Wells & Windle, 2009; Massey, Armstrong, Boroughs, Henson & McCash, 2005). A growing body of evidence shows that teacher and school specific factors influence the effectiveness of school-based intervention programs (Lochman, 2003; Louwe & van Overveld, 2008; Ringeisen, Henderson & Hoagwood, 2003).

In the present study our first aim is to get insight into the quality of implementation of the TRAffic 8-12 program and the degree of sustainability of the TRAffic 8-12 training techniques in the four schools that participated in the study. Our second aim is to provide insight into contextual processes of the school that influenced the implementation and sustainability of the TRAffic 8-12 program. The current chapter searches for answers to the question of why the TRAffic 8-12 program did not show the desired results in the long term, despite the fact that the program is based on sound theoretical assumptions.

4.2 Implementation, Sustainability and the School Context

4.2.1 Program Implementation and Sustainability

Implementation consists of the actual efforts that are undertaken by the program implementers to carry out the new program and to integrate it in the organization (Zazzali, Sherbourne, Hoagwood, Greene, Bigley & Sexton, 2008). Implementation refers to 'what a program consists of when it is delivered in a particular setting' (Dane & Schneider, 1998) and whether or not it is delivered according to how it was designed (La Greca, Silverman & Lochman, 2009). The quality of implementation is determined by eight aspects (Durlak & DuPre, 2008): fidelity, dosage, quality, participant responsiveness, differentiation, monitoring of control / comparison conditions, program reach (i.e. participation rates, program scope) and adaptation. Fleuren, de Wilde, Mikolajczak, Stals and Paulussen (2009) conducted an extensive literature search for determinants of successful program implementation. From this search determinants were distinguished at four levels: 1) the intervention itself (e.g. relevance), 2) the program implementer (e.g. knowledge, skills, support), 3) the organization (e.g. commitment, time), and 4) the social-political context (e.g. legislation and rules).

Implementation is important to consider as research has shown that the quality of implementation has a high impact on program outcomes; programs that are carefully implemented and free of implementation problems are more effective than programs with implementation problems (Domitrovich & Greenberg, 2000; Durlak & DuPre, 2008). Therefore, a growing number of researchers stress the importance of implementation data. However, until now, most intervention researchers still fail to assess relevant aspects of implementation (Domitrovich & Greenberg, 2000). Durlak (1997), for example, found that less than five percent of 1200 prevention studies in mental and physical health and education provided implementation data. In the present chapter the implementation of the TRAffic 8-12 program by the program trainers is evaluated. Without this evaluation we cannot make conclusions about the potential effectiveness of TRAffic 8-12.

Sustainability of the training techniques after the program has ended is an important part of program implementation. Sustainability refers to the degree in which the training techniques continue to be implemented after the program has ended, with ongoing fidelity to the core principles of the program (Han & Weiss, 2005). Sustaining school-based programs is difficult, especially when the programs are external to the school system (Massey, Armstrong, Boroughs, Henson &

McCash, 2005). Involvement of teachers in the program is key to program sustainability in schools, especially when they are not the ones that carry out the original program. There are two factors that are important with respect to teacher sustainability: teachers' motivation to continue implementing the program and teachers' capability to continue implementing the program with fidelity (Han & Weiss, 2005).

Sustainability is important to consider because changing children's behavior is very complex. Applying new skills in real world situations is a process that takes a long time (Bijstra & Nienhuis, 2003). In this sense, the application of a short social skills intervention program such as TRAffic 8-12 should be seen as only the beginning of a long-term process of behavioral change. During this process children need ongoing support from relevant adults, especially after the program has ended. In schools, teachers are the ones that can support children in applying their newly learned skills in real life school situations (Louwe & van Overveld, 2008). Despite the fact that it is indisputably clear that sustainability is crucial for long-term program effects, most, if not all, social skills intervention programs fail to provide guidelines and support for teachers to sustain training techniques. Also, research reports are not accompanied by data for the degree of sustainability of training techniques after the program has ended. In the present chapter the sustainability of the TRAffic 8-12 training techniques by the children's teachers is evaluated. This evaluation is essential in understanding the long-term effectiveness of TRAffic 8-12.

The implementation and sustainability of a school-based social skills intervention program such as TRAffic 8-12 must be understood in the school context in which the program is carried out (Ringeisen, Henderson & Hoagwood, 2003). A second aim of the qualitative study presented in this chapter is to consider the influence of school contextual processes on the implementation and sustainability of TRAffic 8-12.

4.2.2 The School Context

'Evidence-based' (EB) or 'empirically supported' (ES) is the label that all intervention researchers and program developers aim to obtain for their program. An intervention program is labeled 'EB' or 'ES' if randomized controlled trials have proven it to be efficacious in highly controlled research conditions as well as effective in real world settings. The label is popular because it implies that a program 'works', i.e. the program 'cures' the problem, under the condition that the program is

implemented according to how it was designed. Furthermore, practitioners such as teachers or youth workers obviously prefer to buy and implement programs that work. However, evidence-based practice is also criticized.

One of the arguments against evidence-based practice is the notion that it is problematic to assume that the causal relations that accounted for a program's effectiveness in one context can be easily and identically transferred to another context (Cartwright, 2009). It is a common misconception to think that if an intervention program is implemented in new contexts, but in the same way that it was implemented in situations in which the program was found effective, it will be effective again (Fleuren, de Wilde, Mikolajczak, Stals & Paulussen, 2009; Lochman, 2003; Louwe & van Overveld, 2008). The effectiveness of an intervention program cannot be viewed as independent of the complex context in which it is implemented (Hughes, Cavell, Meehan, Zhang & Collie, 2005; Ringeisen, Henderson & Hoagwood, 2003).

Why is context so important when it comes to program implementation in practice settings? In the case of school-based programs, the implementation of a program is influenced by the interactions with the school context, consisting of children's teachers, peers in the classroom, school policy and available resources (Lichtwarck-Asschof & van Geert, 2004). Whether or not an intervention program is effective in changing a child's behavior is dependent on that context, i.e. on the causal relations in the school context that account for the effectiveness of the program[24] (Cartwright, 2009). School program elements will only be effective together with, or via, factors 'external' to the intervention program . We call this the context-dependency of causality.

A simple general illustration of the notion of context-dependency of causality is the fact that an assignment will only be carried out correctly if the person who receives the assignment understands it. In the field of intervention programs we can also find illustrations of the context-dependency of causality. For example, a developer of a new school-based intervention program is often successful in delivering the desired results to the target group, which motivates the developer to put the program on the market. However, when the program is implemented by people other than the program developer, suddenly the program is less successful (Louwe & van Overveld, 2008). Obviously, the program's effectiveness is, in part,

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[24] In the remainder of this chapter we will use the term 'school contextual processes' to refer to the causal relations in the school context that influence the effectiveness of an intervention program.

the result of a common factor, such as the person who delivers the program. It is likely that a program developer delivers his or her 'own' program with more enthusiasm and a stronger belief in the program elements compared to trainers who did not develop the program themselves. These so-called 'therapist' related factors have been proven crucial in program effectiveness (Wampold, Ahn & Coleman, 2001). Another example that illustrates how causality is dependent on the context is the role of peers or parents in the child's environment. Examples of prosocial behavior, provided in the intervention context, can only become effective in replacing antisocial behavior if, at the same time, there are no bad examples in the school context (i.e. aggressive peers) or the family context (i.e. deviant parenting) (Lichtwarck-Asschof & van Geert, 2004).

In sum, it is clear that context plays a crucial role in program effectiveness. The examples described above all seem very logical and might be seen as stating the obvious. An increasing number of researchers stress the importance of considering the influence of the school context on the effectiveness of intervention programs (Hughes, Cavell, Meehan, Zhwang & Collie, 2005; Lochman, 2003; Ringeisen, Henderson & Hoagwood, 2003). However, in research and publications we continue focusing on program outcomes without studying the role of the context in which the program is carried out. In order to achieve more successful implementation of school-based intervention programs, we need to improve our understanding of the school contextual processes that promote the success of intervention programs (Louwe & van Overveld, 2008). Additionally, we need insight into the conditions under which programs are found to be ineffective. These 'unsuccessful' conditions give us as much important information about school contextual processes that account for program effectiveness as the 'successful' conditions.

In this chapter we do not only look at the actual implementation and sustainability of the TRAffic 8-12 program, but we also focus on the contextual processes in the schools that influence the trainers' and teachers' implementation and sustainability of the program (techniques). By considering the school context in which the program is implemented, we aim to explain what caused the TRAffic 8-12 program to be insufficient in effectively reducing children's problematic behavior in the long term.

4.2.3 Questions and Design

Two questions are discussed in the present chapter:

1. What is the quality of the implementation of the TRAffic 8-12 program by the program trainers? And which school contextual processes influence the trainers' implementation?

2. To what extent do the children's teachers sustain the TRAffic 8-12 training techniques? And which school contextual processes influence the teachers' sustainability?

The questions are answered in the form of a discussion about the implementation and sustainability of the TRAffic 8-12 program and the school contextual factors that influenced these issues. The discussion is based on a combination of the researcher's personal observations and interviews with trainers and teachers.

The dominating quantitative methods used in intervention and implementation research, which consider primarily children's pre- and post-intervention scores, are not sufficient to capture school contextual processes. Because of this, a great deal of valuable information is lost (Domitrovich & Greenberg, 2000). Qualitative reports are much better resources for gaining insight into school processes. They capture a 'wisdom literature' of personal experiences and observations of the implementation of intervention programs. Unfortunately, these highly informative qualitative reports accompanying effect studies often do not get published, because they are labeled as 'weak' and 'second class', at best (Wendt & Slife, 2007). With the present study we fulfill the need for more qualitative reports that inform us about processes in the school context that influence program effectiveness.

4.3 Implementation and Sustainability of TRAffic 8-12 in four Special Elementary School Settings

4.3.1 Program Trainer Implementation of TRAffic 8-12 and the Influence of School Contextual Processes

Our first question was: What is the quality of the implementation of the TRAffic 8-12 program by the program trainers, and which school contextual processes influence the trainers' implementation of the program? Remember that the TRAffic 8-12 program was carried out in a group format for half of the children,

while the other half of the children received the program individually. Also, there were two training sessions; the first half of the children were trained between January and March 2003 (session 1), the other half of the children were trained between April and June 2003 (session 2).

During session 1 the program was not optimally implemented in the group-based format of TRAffic 8-12. Because of children's disobedient and aggressive behavior (such as disobeying rules or being inattentive during meetings) the trainers sometimes had to (temporarily) remove children from the meeting as their behavior was unacceptable and, as a result, the progress of the meeting was threatened. Removing children from meetings obviously influenced the dosage (how much of the program is delivered; children who were removed missed parts of the meeting) and the quality (how well components of the program were delivered; removing children disturbed the meeting) of the implementation.

There were two group trainers in session 1 who were not willing to train a group in the second session. They expressed the need for more support in managing the group. Although the subject of managing a group was discussed and practiced by using role play during the training for the program trainers, they found that the attention that was given to this subject was insufficient. One of the conditions needed for the group trainers to train a group again was the presence of, and collaboration with, the teacher of the children. In session 1 they experienced a difficult cooperation with the children's teacher because they disagreed on how to approach the children. The teacher believed that the children needed a very strict approach while the program trainers were more focused on providing safety for the children. This difference in approach resulted in an initial increase in children's problem behavior during the program meetings, as well as an increase in problem behavior when the children returned to the classroom after the program meetings.

The trainers of the groups in session 2 were more able to implement the TRAffic 8-12 program. This was because they had less difficulty managing the children's problem behavior than the session 1 group trainers. Because of the encountered problems in session 1, it was arranged that, in session 2, the children's teachers would be present at all meetings. The trainers valued the teacher's presence and recognized an improvement in the functioning of the group. The teacher could correct the children's behavior by using the standard classroom rules. As a result, children did not have to be removed from meetings, the meetings were not

interrupted as much as in session 1 and the program trainers were more able to carry out the full program.

Because the group trainers of session 1 urged for higher involvement of, and more cooperation with, the teachers, we arranged a third training session. In this session the teacher was not only present at the meetings (as in session 2), but he was a co-trainer. Together with a program trainer from the first session he trained the children from his own classroom. These children were not included in the sample of children that was studied in Chapter 3 for two reasons. First, not all the children in this sample were aggressive or had difficulties with managing their anger. Therefore, this sample was qualitatively different from the original sample. Second, we only performed a pre- and post test on teachers' and parents' ratings of aggressive behavior and behavioral problems[25]. We did not measure the children's behavior on the long term and we did not interview them with the inner logic interview instrument.

Both the teacher and the trainer evaluated the organization of the program very positively. The trainer observed that, in the third session, the children's behavior was more manageable than the behavior of the children in the first session. The teacher knew the children and was able to maintain the same rules and standards as used in the classroom outside the program. The teacher emphasized that children in Cluster 4 education depend on the familiar adults in their environment in order to function properly. According to him, the presence of the teacher could even be viewed as an essential condition for carrying out a program such as TRAffic 8-12 in Cluster 4 education. The presence of the group trainer was then a supplement to the teacher's role. So, in this third session the TRAffic 8-12 program was optimally implemented. The individual TRAffic 8-12 training sessions were also free of implementation problems stemming from children's disruptive behavior.

Another factor that is likely to have negatively influenced the implementation of the TRAffic 8-12 program is the trainers' low motivation to implement the program. For a successful implementation the program trainers need to be motivated to carry out the program (Zazzali, Sherbourne, Hoagwood, Greene, Bigley & Sexton, 2008). Therefore, the availability of necessary resources (such as

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[25] The comparison of pre- and post-intervention scores revealed a significant decrease in aggressive behavior in the teachers' ratings. The children trained in the third session also showed higher decreases in aggressive behavior and behavioral problems in the teachers' ratings compared to the children who were not trained, but also compared to the children trained in session 1 and session 2. The parents' ratings did not reveal differences between the training sessions.

time and space) to carry out the program is a prerequisite to successful implementation. Administrators of the four schools that participated in the study agreed to guarantee available time and space. In cases where teachers were co-trainers, substitute teachers were arranged in the classroom. When school therapists were co-trainers, they were given extra hours on top of their regular hours. Rooms were made available by the school administrators for the group and individual program meetings.

Despite the fact that agreements were made, the program trainers still experienced problems when they started implementing the program because resources were not sufficiently available. For example, in one case, in which a group of children was trained by a school therapist and a teacher, there were difficulties with the agreed substitution of the teacher. Due to organizational issues she was not available to carry out the first three meetings of the program, and thus, her co-trainer had to do these meetings alone. After the first three program meetings this problem was resolved, but the therapist's and the teacher's motivation to implement the program was reduced. They did not feel supported by their organization and they indicated that this influenced their enthusiasm and efforts to carry out the program.

In other cases the program trainers who trained children individually had problems with finding appropriate space to carry out the program meetings. Although the school administrators had indicated that certain rooms were available, the rooms were sometimes occupied for other purposes and the program trainers had to look for alternatives. The program trainers indicated that this created a somewhat 'chaotic feeling', which was not beneficial to the overall enthusiasm to carry out the TRAffic 8-12 program.

In sum, the implementation of the TRAffic 8-12 program was hampered by two factors: 1) with respect to group-based training: the program trainers' capability and skills to manage the children's behavior was insufficient and 2) many program trainers suffered from reduced motivation to implement the program. For both factors the school context played a crucial and conditional role. Behavior management of the group-trained children was less difficult when the children's teachers, who are an important element in the child's context, were present during the program meetings or when the teachers carried out the program themselves. The trainers' motivation was related to the availability of resources in the school context, such as time and space. In the Discussion section we will elaborate on how our findings are illustrations of the context-dependency of causality.

4.4.2 Teacher Sustainability of TRAffic 8-12 Training Techniques and the Influence of School Contextual Processes

Our second question was: To what extent do the children's teachers sustain the TRAffic 8-12 training techniques, and which school contextual processes influence the children's teachers' sustainability of the techniques?

Our assumption was that if teachers would make a well-founded choice for participation in the project (i.e. they are motivated) then the chances of successful sustainability of the techniques would be higher. First, in a general meeting we informed the teachers who were interested in the TRAffic 8-12 program about the effect study as well as the required time and efforts needed to participate in the project and to sustain the training techniques. The teachers who were enthusiastic after the meeting, who had one or more students in their classroom that met the inclusion criteria (see Chapter 3) and who felt that they could meet the requirements to participate in the project[26] were contacted. In individual meetings with those teachers we, once again, discussed practical issues such as required time and organizational issues. We explicitly discussed the required effort in the classroom: supporting children to apply the newly learned skills by active implementation of training techniques, with the aim of securing transfer and sustainability of learned skills. After these individual meetings teachers could still withdraw from participation in the project. In sum, at the start of the project we paid extensive attention to the selection of motivated teachers.

The participating teachers started off motivated; there were no signs that they were unmotivated. However, their motivation decreased during the implementation of the program because, as several teachers indicated, they did not see any improvement in the children's behavior. This decrease was expressed by, for example, less effort to support children in doing 'homework' for the TRAffic 8-12 program in the classroom (i.e. filling in conflict forms). Also, some teachers became unmotivated to fill in the questionnaires and/or stayed away from meetings in which project results were presented. Apparently, these teachers expected immediate improvements in behavior. They were not made sufficiently aware of the fact that changing children's aggressive behavior requires a lot of time in which considerable

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[26] Participation in the project involved attending frequent meetings, implementing and sustaining training techniques in the classroom and filling in questionnaires about children's behavior as part of the effect study described in Chapter 3.

efforts need to be made in terms of supporting the children to apply the newly learned skills.

Teachers' motivation was also influenced by the degree to which they felt capable of applying the training techniques. Our assumption was that if we involved teachers with the program as much as possible, then the chances that teachers would implement and sustain the techniques would be higher because they would feel more familiar with them (i.e. a sense of 'ownership'). In several ways, and with different intensities, we tried to involve the teachers in the program as much as possible.

In session 1 teachers attended a presentation about the program. They received the program handbook and were encouraged to prepare children for the meetings (through classroom discussions and short talks before children were taken out of the classroom by trainers) and to make evaluations with children after the meetings (through short talks when children returned to their classroom). Also, when the two central training techniques were introduced in the program meetings (the 'Stop sign' and the 'Traffic circle'), trainers organized a meeting with the teachers to explain these techniques and teachers were given the opportunity to use the real 'Stop sign' and 'Traffic circle' in their classrooms outside the program meetings. Finally, after the program had ended, the researcher organized individual meetings with the teachers to encourage them to keep using the two training techniques.

In session 2 we intensified these efforts because we observed that teachers were not applying the techniques in their classroom in the first session (i.e. there was no sustainability of training techniques). The trainers who trained children individually provided teachers with weekly reports about what children learned and how they responded during program meetings. In the group trainings the presence of one of the children's teachers was organized. Other teachers involved with the trained children were invited to regular meetings to inform them about the program meetings. In session 3 the teacher was optimally involved in the program as he trained the children of his own classroom himself (together with a group-trainer from the first session).

In all cases described above the efforts to secure sustainability of the training techniques were not effective. Most teachers did not prepare children for the program meetings nor did they evaluate the meetings with the children afterwards. Only a few teachers made use of the opportunity to use the real Stop signs and Traffic circles in their classroom during a short period of time. In individual

meetings with the researcher some teachers very clearly stated that they needed more guidelines on how to implement the techniques in the classroom. For example, one teacher said, when she was handed a document with an explanation of the techniques (Stop sign and Traffic circle), 'But how should I do this in the classroom? I do not know how to use them. I need a handbook that describes how I can actually use the techniques'.

In session 2 teachers were involved more intensively by organizing regular meetings between trainers and teachers or by increasing teacher attendance during the program meetings. In session 3 the teacher even implemented the program himself. However, these efforts still did not result in an improved transfer and sustainability of the training techniques. Both trainers and teachers mentioned that there was too much of a gap between practicing skills during the program meetings and actually applying the skills in the real world. Our expectation that teachers would be able to think of ways to implement the techniques in real life situations themselves was not correct. They indicated that they needed more support in integrating the techniques in their daily practices.

To sum up, the conclusion is that the teachers were not motivated enough and not capable enough to sustain the TRAffic 8-12 training techniques in the classroom. As a result, the children were not supported in applying their newly learned skills in real life situations. Simply providing the teachers with a description of the techniques and asking them to implement the techniques in their classroom was not sufficient for sustainability. With regards to the context-dependency of causality, another illustration is as follows: whether or not the training techniques were sustained by the teachers seemed to be independent of the techniques themselves and of the extent to which the teachers were informed about the contents of the techniques. Rather, individual processes within the teacher appear to play an important role. In the Discussion section we will elaborate on what these processes could be.

4.4 Discussion

In the present study the program trainer and the teacher implementation and sustainability of the TRAffic 8-12 program were considered. We also focused on school contextual processes that influenced the implementation and sustainability. We aimed at getting insight into reasons for the absence of long-term effects of TRAffic 8-12 on the children's aggressive behavior.

4.4.1 Program Trainer Implementation of TRAffic 8-12 and the Influence of School Contextual Processes

As we concluded in the preceding section, the implementation of the TRAffic 8-12 program was hampered by difficulties with the management of children's behavior and by reduced motivation to carry out the program. The program trainers indicated that they did not feel skilled and supported enough in managing the children's behavior in the groups. Research suggests that these problems influence the implementation of a program, i.e. a trainer's skillfulness and a sense of self-efficacy to carry out the program codetermine the quality of program implementation (Durlak & DuPre, 2008; Fleuren, Wiefferink & Paulussen, 2010). The program trainers valued the presence or active involvement of the children's teachers as a precondition for the implementation of the TRAffic 8-12 program in groups of children. In cases where this precondition was secured there were less, or no, problems with the management of children's behavior, which improved the implementation of the program. Further, the program trainers' motivation to carry out the TRAffic 8-12 program is also likely to have influenced program implementation. Research suggests that at the organizational level the presence of necessary material facilities codetermines implementation quality (Durlak & DuPre, 2008; Fleuren, Wiefferink & Paulussen, 2010). Although agreements were made about required resources to implement the program, problems arose with available time and space when the program started running. These problems resulted in reduced enthusiasm for the program.

The findings described above are examples of the context-dependency of causality. The effectiveness of the TRAffic 8-12 program was dependent on processes in the school context and not only on the program itself. The implementation of the program was threatened (i.e. the program was likely to be less effective) by the children's disruptive behavior. This behavior was less present when the teacher, a 'factor' in the child's context, was involved in the program meetings. Apparently, the presence of the teacher is an important determinant of children's behavior when they are part of a group of aggressive children. Furthermore, we must bear in mind that the cause of the implementation problems, i.e. the children's disruptive behavior, is related to the problems that are targeted in the intervention program (the aggressive behavior of the children). These problems cannot be viewed as independent of the children's context, in which the teacher plays a crucial role (Louwe & van Overveld, 2008). The reduced motivation is also an example of the

context-dependency of causality: the program is only likely to be effective if there are enough available resources in the environment to carry out the program. In dynamic systems modeling the amount of available resources are in fact described as important determinants of a system's dynamics (Van Geert, 1998).

The solution for the implementation problems might seem simple; the remedy being the presence or active involvement of the children's teachers in program meetings and providing the required resources. However, these solutions are not so simple because they are likely to be hindered by organizational problems. For example, if the teacher is present at program meetings that are implemented outside the classroom, then teacher substitution needs to be organized in order to educate the children in the classroom who are not participating in the program. We must keep in mind that schools are not primarily organized to facilitate the implementation of intervention programs (Massey, Armstrong, Boroughs, Henson & McCash, 2005). Above all, schools are focused on delivering the required education and meeting the standards of the Inspection of Education. Intervention programs such as TRAffic 8-12 are traditionally developed for use in clinical practices and not for school environments (Ringeisen, Henderson & Hoagwood, 2003). Ringeisen, Henderson & Hoagwood (2003) rightly pose the question of how we know whether intervention programs which are developed for clinically based systems are relevant and transferable to school environments. Later in this section we will elaborate on this issue.

Besides the presence of children's teachers, intensive and continued feedback during program implementation can be another way to provide support for program trainers in managing children's behavior during program meetings (Han & Weiss, 2005). The importance of feedback to program trainers has been noted by several researchers (e.g. Lochman, Boxmeyer, Powell, Qu, Wells & Windle, 2009). However, intensifying support for program trainers does not meet the needs of children in Cluster 4 education. Our finding that children's behavior was much better manageable when their teacher was present at the program meetings suggests that these children are very dependent on familiar adults and a familiar approach for their functioning.

4.4.2 Teacher Sustainability of TRAffic 8-12 Training Techniques and the Influence of School Contextual Processes

The children's teachers did not implement and sustain the TRAffic 8-12 training techniques in either the classroom outside the program or after the program had ended. This means that the children were not supported in applying the newly learned skills in real life situations. The study revealed that the teachers were not motivated and capable enough to (continue) implement(ing) the techniques. Exactly these two factors, motivation and skillfulness to continue implementing training techniques, are central to teacher sustainability (Han & Weiss, 2005). The teachers' motivation decreased during the project because, as they indicated, they did not observe any improvement in the children's behavior. Obviously, the teachers expected to see immediate improvements in behavior as a result of the children's participation in the program. Also, the information provided about the program and the techniques was insufficient according to the teachers. This was because, as they indicated, they needed more concrete guidelines in order to be able to implement the techniques in real life situations.

Again, we found evidence for the context-dependency of causality. The degree of sustainability of the TRAffic 8-12 training techniques, and therefore the potential effectiveness of the program, appeared to be independent on the techniques themselves and on the degree of familiarity with these techniques. However, individual processes within the teacher played a crucial role. Teachers' motivation to sustain the techniques was reduced because they expected to see immediate improvements in children's behavior during the implementation of the program by program trainers. A question we need to address here is 'How do teachers view their own role with respect to children's behavioral problems'? Teachers can be considered to be central change agents in children's development at school, not only at the educational level, but also with respect to the social-emotional functioning of children (Louwe & van Overveld, 2008). However, many school-based aggression reduction intervention programs such as TRAffic 8-12 are mainly aimed at changing children's behavior without consideration of the role of the teacher in the development of children's problematic behavior (Ringeisen, Henderson & Hoagwood, 2003). With interventions in the home setting, however, we see the opposite. Most home-based aggression reduction intervention programs are aimed at improving parents' child-raising skills. This lack of consideration for the influence that the teachers have on the children's problematic behavior is likely to

bring about an expectation in teachers that they do not have to invest in the process of improving children's behavior when an intervention program such as TRAffic 8-12 is implemented by others. In order to convince and motivate teachers to contribute to that process, several conditions need to be met.

First, since teachers have a critical role in program sustainability, they must be involved in the development and planning of an intervention program (Louwe & van Overveld, 2008; Ringeisen, Henderson & Hoagwood, 2003), and they must believe in the rationale of the program. When teachers are not consulted and are not involved, they may become uncooperative and resistant to the program and/or the researcher. In the TRAffic 8-12 project the teachers did not pro-actively choose for the program to be implemented. Rather, they were confronted with the program and offered the opportunity to participate in the project, which could have negatively influenced the teachers' motivation for the program and the project as a whole. This situation is different from that in which the teachers select a program themselves.

Second, teachers must be convinced of the need to expand or change their current classroom practices (Han & Weiss, 2005). The best way to achieve this is to show teachers that the children in their classroom are behaving better as a result of the investments that teachers are making in terms of improving their classroom practices.

This brings us to a third condition. The provision of feedback is a crucial condition for teacher sustainability of training techniques. Ongoing and in-depth performance feedback (orally or written) concerning the effects of teachers' classroom practices on children's behavior results in higher sustainability and, therefore, in higher improvement of children's problematic behavior (Han & Weiss, 2005). In the TRAffic 8-12 project the teachers did not receive any form of feedback. Furthermore, feedback would only have been effective in this project if the teachers would have observed an improvement in the children's behavior, which was not the case.

This leads to a fourth condition. For improvement in children's behavior to occur, teachers should have received more support in integrating the TRAffic 8-12 training techniques in their daily practices. If we want teachers to sustain training techniques in their classroom, then the techniques need to be suitable for integration into the teacher's curriculum. Research has shown that efforts directed at integrating training techniques into classroom curricula are associated with more positive child outcomes and long-term sustainability (Ringeisen, Henderson & Hoagwood, 2003).

In light of this finding, the request of the teachers for more guidelines to implement the TRAffic 8-12 techniques in the classroom is understandable. Obviously, it is impossible to provide teachers with ready-to-use 'recipes' that describe how to act in a particular situation with a particular child, since a large amount of variability exists between different teachers, children, classroom situations, etcetera. Rather, teachers should have been supported in finding ways to integrate the techniques in their existing classroom practices. This could have been achieved by, for example, discussing the difficult moments in the classroom and the ways in which teachers could adapt their approach by using the training techniques.

4.4.3 Conclusion

With respect to the implementation and sustainability of the TRAffic 8-12 program, our findings all point to one conclusion: in Cluster 4 education the children's teachers are crucial. If we want to avoid the organizational and implementation problems accompanying training sessions outside the classroom by program trainers who are 'unfamiliar' (to the children), then a classroom-based TRAffic 8-12 training implemented by the children's teacher is a much better option. Furthermore, teachers need to be involved in the choice for the program and need to be supported in findings ways to integrate program elements into the existing classroom practices. In this sense, a ready-to-use intervention program is not sufficient for achieving long-term results. Additionally, elements of the program need to be adjusted to the problems and the needs of the teacher. Finally, teachers need feedback on the effects of their efforts to improve the children's behavior.

The approach in our study illuminates the need to look further than program outcomes, and to consider the processes in the intervention setting that influence a program's effectiveness. These processes are captured best with qualitative reports. Our focus on processes in the school context revealed several factors that are crucial for program effectiveness. These factors show a high resemblance with the common factors highlighted in the contextual model of intervention. In the contextual model, factors such as the therapist (i.e. interpersonal skills, theoretical orientation) and the therapeutic relationship (i.e. alliance, engagement) are considered to be important, if not more so, than the treatment itself (Wampold, 2010). Our study showed that, for example, for the TRAffic 8-12 program to be implemented as well as sustained successfully, the teacher plays a conditional role. Most studies of common factors in successful programs have been

conducted in adult psychotherapy settings. In order to get more insight into the role of the therapist (or in this case, the teacher) in child focused interventions, more research is needed (Kelley, Bickman & Norwood, 2010).

Chapter 5 What Makes Children Behave Aggressively? The Inner Logic of Dutch Children in Special Education[27]

5.1 Introduction

March 2006. The headlines of the Dutch media report about a video on the internet of two teenage girls severely bullying another girl. The public is shocked. The girls involved, however, are not. The victim admits that she started the fight, but that she was right: *'I only slapped Lisa (perpetrator), because she slammed the door in my face.* And the perpetrators declare: *'If it had not been filmed nobody would have cared'* (Van der Mee & Veldhuijzen, 2006). As to the last remark, these kids may be right. Despite research of aggression at schools and anti-bullying and aggression reduction programmes in the Netherlands, many adults are not aware of the 'normality' of aggression from the perspective of youngsters and children.

In this paper we will discuss the children's perspective on their aggressive behaviour. By studying their perspective we want to get more insight into the question why children behave aggressively, and thus contribute to the improvement of intervention programmes aimed at reducing bullying and aggression.

5.2 Theoretical Framework

5.2.1 Dynamics of Aggressive Behaviour

During the last few decades, various intervention programmes have been developed to reduce bullying, based on different theoretical assumptions about aggression in schoolchildren. The older programmes, the so-called single factor programmes, focus on one or more specific aspects of social behaviour: learning adaptive social skills (Bandura, 1978); correction of distorted cognitions and lacks in social-information processing (Crick & Dodge, 1996); regulation of frustration and negative emotions (Berkowitz, 1989); perspective taking, correction of 'me-centeredness' and moral reasoning (Gibbs, Potter, Barriga & Liau, 1996; Selman & Demorest, 1984). More recently, eclectic programmes have been developed which cover multiple aspects of behaviour. Despite the fact that many of these programmes have shown promising results, a significant number of programmes have had

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This chapter is written in British English, because it has been published in a British journal.

ambiguous results (Gibbs et al., 1996; Quinn, Kavale, Mathur, Rutherford & Forness, 1999). Some aggressive children do profit from an intervention programme, while others do not (Brezinka, 2002; Kazdin, 2000; Prins, 1995; Stage & Quiroz, 1997). There are even programmes which show adverse effects for a subgroup of children (Arnold & Hughes, 1999; Dishion, Mc Cord & Poulin, 1999).

The ambiguous results of intervention programmes have challenged researchers to look for new approaches that focus on the dynamics of aggressive behaviour in specific situations and on individual styles (Lemerise and Arsenio, 2000). Musher-Eizenman, Boxer, Danner, Dubow, Goldstein & Heretick (2004) argue that by simultaneously considering multiple factors and exploring the ways in which they operate together, a much better understanding of aggressive behaviour can be achieved. In this respect there is also interest in the children's perspective: how children connect goals, emotions and behaviours during peer conflicts simultaneously (Murphy & Eisenberg, 2002).

In our study we have used children's narratives as sources of information about: a) the relationships between multiple factors of aggressive behaviour, and b) individual differences and different patterns of aggressive behaviour.

5.2.2 The Child's Inner Logic

In our study we have reconstructed the inner – subjective - logic of the child in their narratives of aggressive behavior (Okma, 2006; Singer, 2005). Therefore we have interviewed the children about how they view the situation in which they react aggressively; what they do in conflict situations (social actions and emotion regulation); what their goals, concerns and emotions are; how they regulate their emotions; how they view the emotions and concerns of their opponents.

The concept of inner logic and the interview instrument are based on a theoretical framework that elaborates on constructivist theories on the affective development of children (Miltenburg & Singer, 1999) and on current functionalist emotion theories (Cole, Martin & Dennis, 2004; Eisenberg & Spinrad, 2004; Hoeksma, Oosterlaan & Schipper, 2004). Constructivists stress the importance of *cognitive-affective structures* or scripts (Huesmann & Guerra, 1997), which are constructed by children in relation with significant others (Fischer et al., 1997). These structures lead to certain expectations, emotional and behavioural patterns, which are self-evident and logical to the child (Fischer et al, 1997; Miltenburg & Singer, 1999; Okma, 2006). Cognitions, emotions and behaviour are assumed to be a unity (see for

example Cole, Martin & Dennis, 2004; Eisenberg & Spinrad, 2004; Frijda, 1986; Hoeksma, Oosterlaan & Schipper, 2004).

Cognitive-affective processes start with the child noticing a change in its outer or inner world (Frijda, 1986). On the primary level, the child appraises the change with respect to its concern relevance. This may lead to automatic behaviour and feelings such as a defensive reflex or feelings of arousal. During the secondary appraisal the context, concerns, emotions, goals and plans of action are evaluated. To understand a child's motivation to act aggressively, it is not sufficient to ask only about its emotions (Singer, 2005). As a child develops its higher psychological functions, it becomes able to act deliberately in order to achieve a goal or to realize a concern. Therefore we should also focus on the child's goals and underlying concerns. Finally, the secondary appraisal results in goal directed actions: external by influencing the outer world; internal by influencing the inner world. The diagram of a cognitive-affective process is represented in Figure 1.
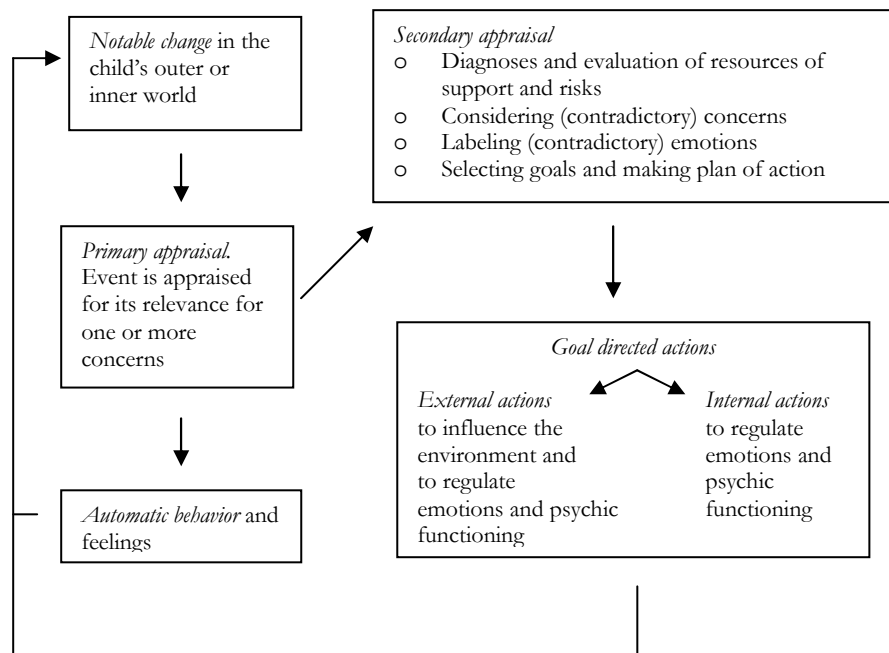

Figure 1. Diagram of a cognitive-affective process.

5.2.3 Profiles of Inner Logic

By analysing and comparing the narratives of different children we reconstruct profiles of inner logic; that is coherent patterns of situations that evoke aggression, actions, goals, concerns and emotions. In earlier research based on the information processing theory two coherent patterns of aggressive behaviour are found: reactive and proactive patterns of aggression (see for example Crick & Dodge, 1996; Merk, 2005; Orobio de Castro, 2004). Characteristic of reactive aggression is reacting to provocations or threats in a hot-blooded – angry - way, whereas proactive aggression is motivated in a cold-blooded way, anticipating a certain reward (Kempes, Matthys, de Vries & van Engeland, 2005). In Figure 2 we present the complete profiles of the two distinctive types of aggression.

Reactive aggression	Proactive aggression
- Situation: the child thinks he or she is being threatened or provoked - Action: impulsive and 'hot-blooded', loss of control - Goal: protection - Concern: preventing physical or psychological pain and not wanting to be bullied - Emotion: anger	- Situation: the child anticipates a certain reward - Action: bullying, dominating, 'cold-blooded' - Goal: domination or object acquisition. - Concern: position in the group, wanting to be the strongest / most powerful or just getting the desired object - Emotion: no anger

Figure 2. Reactive versus proactive aggression.

The distinction between proactive and reactive aggression is also being discussed (Polman, Orobio de Castro, Koops, Van Boxtel & Merk, 2007) and challenged. Bushman and Anderson (2001) state that the biggest problems with the reactive-proactive dichotomy is that it assumes a clear-cut distinction between the two types of aggression as regards their goals, whereas aggression can be motivated by many different goals. And it assumes anger to be present only with reactive aggression, whereas proactive aggression may be driven by anger as well.

In our study we look for the reactive and proactive patterns of aggressive behaviour in the children's narratives, but we do not confine ourselves to these two patterns and also take a critical look at the potential limits of the dichotomy.

Finally, we also explore how the different profiles of inner logic relate to children's actual aggressive behaviour as perceived by their teachers. And we explore the relation between the children's age and the type of profile we find.

5.2.4 Research Questions and Hypothesis

The questions we want to answer in this chapter are:

1. What is the inner logic of children's aggressive behaviour: how do they perceive the situation, what are their actions, goals, concerns, emotions, and emotion regulation strategies?

2. Can we construct profiles of inner logic from the children's narratives about their aggressive behaviour?

3. How do children's profiles of inner logic relate to their aggressive behaviour as perceived by the teachers? And how do the profiles relate to the age of the children?

As regards research question 2, we hypothesize that we will find a more differentiated picture than the two profiles consistent with reactive and proactive aggression. We expect to find additional profiles of inner logic.

5.3 Method

5.3.1 Participants

The sample in this study consisted of 64 Dutch children aged 8 to 12. All of them were in special education for students who meet one or more of the following criteria: they have a psychiatric disorder and there are severe socio-emotional or behavioural problems at school and at home or during their leisure time, causing academic problems. The teachers were asked to select the children: 1) who cause discipline problems because of aggressive behaviour; 2) who, according to the teacher, would benefit from an aggression reduction programme.

Based on the children's files and the behaviour questionnaires conducted by the teachers, the following profile of the participants arises. As we can see in Table 1, most of the children are boys (95%), most of them are 9, 10 or 11 years of age (19%, 38% and 23% respectively) and have a normal Intelligence Quotient (just 6% IQ < 80). Sixty-six per cent of the children have been diagnosed with (symptoms of) attention-deficit hyperactivity disorder (ADHD) and / or Pervasive Developmental Disorder-not otherwise specified (PDD-nos), either combined with other diagnoses or not. Finally, most children come from two-parent families (45%).

Table 1

Characteristics of the participants (N = 64)

Variable	N	%
Sex		
Girls	3	5
Boys	61	95
Age		
8 years	4	6
9 years	12	19
10 years	24	38
11 years	15	23
12 years	9	14
Intelligence Quotient		
< 80	4	6
80 – 100	26	41
> 100 – 120	17	27
> 120	2	3
Missing	15	23
Diagnosis		
ADHD or symptoms of ADHD	12	19
PDD-NOS or symptoms of PDD-NOS	12	19
Combination of above	15	23
ADHD or symptoms combined with another diagnosis	3	5
Rest	3	5
No diagnosis	17	26
Missing	2	3
Family composition		
Two-parent family	29	45
Single-parent family	20	31
Two-parent family with one stepparent	10	16
Foster-family	1	2
Adoption family	1	2
Missing	3	4

The teachers completed a behaviour questionnaire, the Dutch version of the Disruptive Behaviour Disorders rating scale (Oosterlaan, Scheres, Antrop, Roeyers & Sergeant, 2000). It examines whether and to what extent symptoms of the behavioural disorders ADHD, Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD) (the externalizing behaviour problems) are present in a child. In Table 2, we see that the children in our study score particularly high on the ODD (62% in

clinical range) and CD scale (53% in the clinical range). ODD and CD are the two behavioural disorders strongly connected with aggressive behaviour.

Table 2

Participants' norm scores on the Disruptive Behavior Disorders ratings scale (N = 60, four missing)

Disruptive behavior disorders	Clinical range		Sub-clinical range		Normal range	
	N	*%*	*N*	*%*	*N*	*%*
Attention problems	21	35	11	18	28	47
Hyperactivity problems	34	57	6	10	20	33
ODD (Oppositional Developmental Disorder)	37	62	10	17	13	22
CD (Conduct Disorder)	32	53	9	15	19	32

5.3.2 Interview Instrument

We started the interview by discussing a fictitious situation about a conflict between two children: a peer spoils the child's video game. Then we invited the children to tell about a peer conflict they had experienced. To uncover the different components of the cognitive-affective process involved in the conflict we asked open questions about the situation, the children's actions, goals, concerns and emotions, and the emotions of their opponents. To make the interview comprehensible for children diagnosed with ADHD and PDD-nos we used pictographs with faces expressing different emotions, an emotion thermometer to rate the severity of the situation, and a stop sign, which could be used when children did not want to answer a question or wanted to take a break.

5.3.3 Procedure

The interviews were held at school and lasted about an hour, sometimes more, depending on the story. The transcripts were regularly discussed with the interview trainer, to see whether the interview had been carried out in the right way.

5.3.4 Analysis

To analyse the children's inner logic, we constructed a category system for the main components of the inner logic in a deductive way based on the reactive and proactive aggression distinction and Selman's theory on perspective taking, and in an inductive way for unforeseen answers. The transcribed interviews were coded in

different categories with regard to: the situation at the onset of the conflict; the child's actions during the conflict; the emotions and emotion regulation; and support of the teacher or parents.

Situation. Starting points were: a) a neutral situation with no aggression on the part of the opponent, b) a situation in which the child considers itself as victimized by the opponent, and c) a situation in which the child actively bullies or hurts another child.

Actions: a) non-aggressive actions, b) a combination of non-aggressive and aggressive actions, and c) aggressive actions.

Goals and concerns[28]. Partly based on Selman's theory of perspective taking, Selman & Demorest, 1984): a) one-sided, b) two-sided (getting understanding + stopping aggression), and c) no goal (loss of control: "it just happens and I can not stop it"). For the one-sided category, a distinction was made between children who want to escape; who want to get revenge or settle the power balance; who want to dominate or bully other children. As to the concerns involved we distinguished a) social concerns (e.g. opponent has to be punished), b) personal concerns (e.g. avoiding punishment, bullying is fun), and c) moral concerns (e.g. revenge, it is not fair).

Emotions. We divided the emotions in a) positive emotions, and b) negative emotions. The negative emotions were divided into aggressor-related emotions such as anger and revenge, and victim-related emotions such as sadness, fear and confusion. We also asked the children how they thought their opponent felt during the conflict, using the same categories.

Emotion regulation: a) internal regulation, for instance, distraction by thinking of something else; b) external regulation by releasing anger and expressing emotions.

Support: looking for support from the teacher or parents.

5.3.5 Constructing Profiles of Inner Logic

To construct profiles of inner logic we started by analyzing differences in the perception of the situation, which resulted in three groups of children. Secondly, within each of these three groups we looked at the children's actions, whether they

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[28] The difference between a child's goal and concern can be explained as follows: a child's goal is the realization of his or her concern in a specific context.

used aggression and non aggressive actions. Finally, we analysed the children's goals, which resulted in five profiles (see Figure 3 Results section). From there on we studied the concerns and emotions, and reconstructed the inner logic of the children.

5.3.6 Reliability

Each interview has been coded by two independent reviewers. The inter-rater-reliability has been determined concerning the profiles of inner logic. We used the Cohen's Kappa, because it is a suitable measure for data with a nominal level. The inter-rater-reliability in this study can be judged as good (Cohen's Kappa is 0.73 for the profiles of inner logic).

5.4 Results

5.4.1 Components of Inner Logic

Perception of the situation. Almost all the narratives are situated in the play ground (59%) or in the classroom (19%). The majority of the children (81%) said that their opponent had started the conflict. They presented themselves as being victimized or provoked by their opponent. They were being pushed into the bushes, called names, kicked or laughed at when they fell to the ground. Just 8% of the children got into a conflict while playing together or by accident ('He kicked me by accident, he did not want to hurt me'). Eleven percent of the children depicted themselves as bullies. They started the conflict by deliberately interpreting a minor 'mistake' of their victim as a provocation.

Actions. A quarter of the children said that they reacted in a non-aggressive way (see Table 3). They said 'Go away' or 'I will get my teacher', or escaped by running away and getting help from the teacher. Only three children mentioned a combination of non-aggressive and aggressive actions. For instance Mike reported he first said 'Stop it', but his opponent did not stop teasing so he went to his teacher to get help. As this did not work either, he started defending himself by kicking back. Most children exclusively mentioned aggressive reactions (69% of the children). Kicking and hitting were mentioned most frequently. A few children's quotes: 'I hit them on the head', 'I grabbed him and banged his head to the wall', 'I hit her in the face with my hand.'

Table 3

Description and frequencies of actions mentioned by the children (N = 64)

Actions	N	%
<u>Non-aggressive actions</u>	<u>17</u>	<u>27</u>
Asking help from teacher	9	14
Talking	7	11
Walking away or pushing away	5	8
<u>Combination of non-aggressive and aggressive actions</u>	<u>3</u>	<u>5</u>
(first talking and asking help from teacher, when that does not help, then kicking or hitting)		
<u>Aggressive actions</u>	<u>44</u>	<u>69</u>
Hitting	23	36
Kicking	13	20
Calling names	6	9
Chasing	5	8
Getting somebody (throwing on the ground, blocking etc)	4	6
Throwing things	3	5
Pushing	2	3

Note. Some children mentioned more than one action. This means that the number of children in the subcategories do not equal the number of children in the main categories (underlined).

Goals. As to the goals, most children reported a one-sided goal (88%), see Table 4. They wanted to stop the aggressive behaviour of their opponent (77%) to protect themselves: 'So that I would be able to run away', 'So he will not hurt me anymore', or to get revenge and to maintain their position. They said: 'I just want to get back at him because he hit me'. Just 12% of the children with a one-sided goal reported they wanted to continue the conflict ('I like to hit him'; 'I like it when he gets mad'). Seven percent of the children had a two-sided goal with their actions; they wanted to stop their opponent and to get understanding for their situation. For instance Jan explained: 'They have to stop, they have to know that I do not like to be teased'. Finally, 5% reported not to have a particular goal. For instance Eric: 'It just happens, it is like you get a sort of tingling in your head, like I just have to throw that thing back. It is like there is someone with a remote control, pulling my strings'.

Table 4

Description and frequencies of goals that were mentioned by the children (N = 60)[a]

Goals	N	%
One-sided	53	88
Stopping aggression > escape (protection)	25	42
Stopping aggression > revenge (settling power balance)	21	35
Continuing aggression > domination (bullying)	7	12
Two-sided	4	7
Getting understanding + stopping aggression		
No goal	3	5
Loss of control		

[a] Four children were not able to answer the question what they wanted to achieve by their actions.

Concerns. As we see in Table 5, more than half of the children had social concerns. They wanted to stop the aggressive behaviour (same as their goals). Half of the children also reported a personal concern: 29% wanted to protect themselves because they felt bad ('I do not like fighting').

Table 5

Description and frequencies of concerns that were mentioned by the children (N = 58)[a]

Concerns	N	%
Social	33	57
Stopping aggression	26	45
Getting understanding	6	10
Teacher should punish	5	9
Personal	30	52
Protecting self-worth	17	29
Forestalling punishment	8	14
Prevention of loss of control	5	9
Bullying is fun	3	5
Being invincible	3	5
Moral	9	16
Revenge	6	10
Not fair	3	6

Note. Some children mentioned more than one concern. This means that the number of children in the subcategories do not equal the number of children in the main categories (underlined).

[a] Six children were not able to answer the question why it was important to them to achieve their goal.

Furthermore, some children reported concerns involving prevention of punishment or loss of control (14% and 9% respectively), pleasure (5%), and being invincible (5%). For example Peter simply states: 'I like to be the strongest'. Finally, 16% of all concerns mentioned are morally oriented. They wanted to get revenge for moral reasons (10%) or think it was not fair what their opponent did (6%).

Emotions. One third of the children selected just one emotion (33%), another third two emotions (30%), and 35% of the children three or more emotions. Most children mentioned emotions that are related to the release of aggressive behaviour, such as anger and revenge (aggressor-related). Tom said: 'I am really angry because they hurt me'. Victor wanted to get revenge and was angry as well: 'I think a lot about how I can get revenge'. A third of the children mentioned emotions that are related to being hurt. They mentioned being sad, scared, confused, ashamed or feeling guilty (victim-related). Only 22% of the children mentioned positive emotions. For instance Jack said: 'I feel normal, because I run faster and I am happy that she can not catch me'.

When asked about their opponent's feelings, the children attributed more victim related than aggressor related emotions; they thought their opponents felt afraid and guilty. But they also thought that their opponents felt happy and proud of what they did: 'He probably feels proud and thinks "Ha ha, there she lies on the ground, we did a good job"'. In general, the children described themselves as being angry and as being sad, while their opponents were described as being happy or as being proud but also feeling guilty and scared because of their aggressive behaviour.

Emotion regulation. Most children freely expressed their anger. As Harry stated: 'I just beat him up'. And Pete said: 'I just blow up, and then I will cool off…'. And most children tried to hide their sadness because they felt ashamed or were afraid that their opponent would continue. They knew that their crying would please and motivate their opponents. Only a few children felt ashamed that they had been teasing another child. Nico for instance: 'I teased him and I was angry with myself. Then it made me cry and blush'.

Only a third of the children mentioned some form of internal emotion regulation. Mike reported: 'I just continue playing and put it out of my head'. Or they tried to get involved in another activity. Rafaël let all emotions come out by crying in his room, while Brian tried to invoke a good feeling by thinking that he lives in a happy family. Instead of inner emotion regulation several children explained how they turn sadness or confusion into anger and aggressive behaviour. They described

complicated psychological processes between anger on the one hand and sadness, confusion, fear, shame or guilt on the other hand. They hid emotions by turning them into aggressive behaviour. For instance Rex told: 'I do not want them to see me sad, because I am part of a club. You can not be afraid; otherwise you will be kicked out of the club'. And Harry reported that, instead of showing his fear, he expressed his scared feelings by hitting the other boy. Furthermore, Kevin reported a distressing method to deal with his confusion. When someone attacks, he thinks: 'with the first blow [of your opponent] you pep yourself up and with the second you release the energy'. He had grabbed the other boy and thrown him on the ground.

Support. Thirty-nine percent of the children did not talk with their parents or teachers about the conflicts. Fear of being punished was the most frequent explanation for not talking or asking for help. Only children who were often victimized sought help from an adult. If by any chance the teacher let them down, some children where outraged. Bryan: 'Then I go to my teacher. And she just says that I have to leave the classroom. Then I am really angry and I slam the door'.

5.4.2 Profiles of Inner Logic

With the use of the three dividing criteria (perception of the situation, actions, and goals; see section 5.3.5), we were able to construct five profiles of inner logic of children with aggressive behaviour. In Figure 3, we present the way in which we constructed the profiles.

Table 6 presents the profiles of inner logic and the components with category percentages.
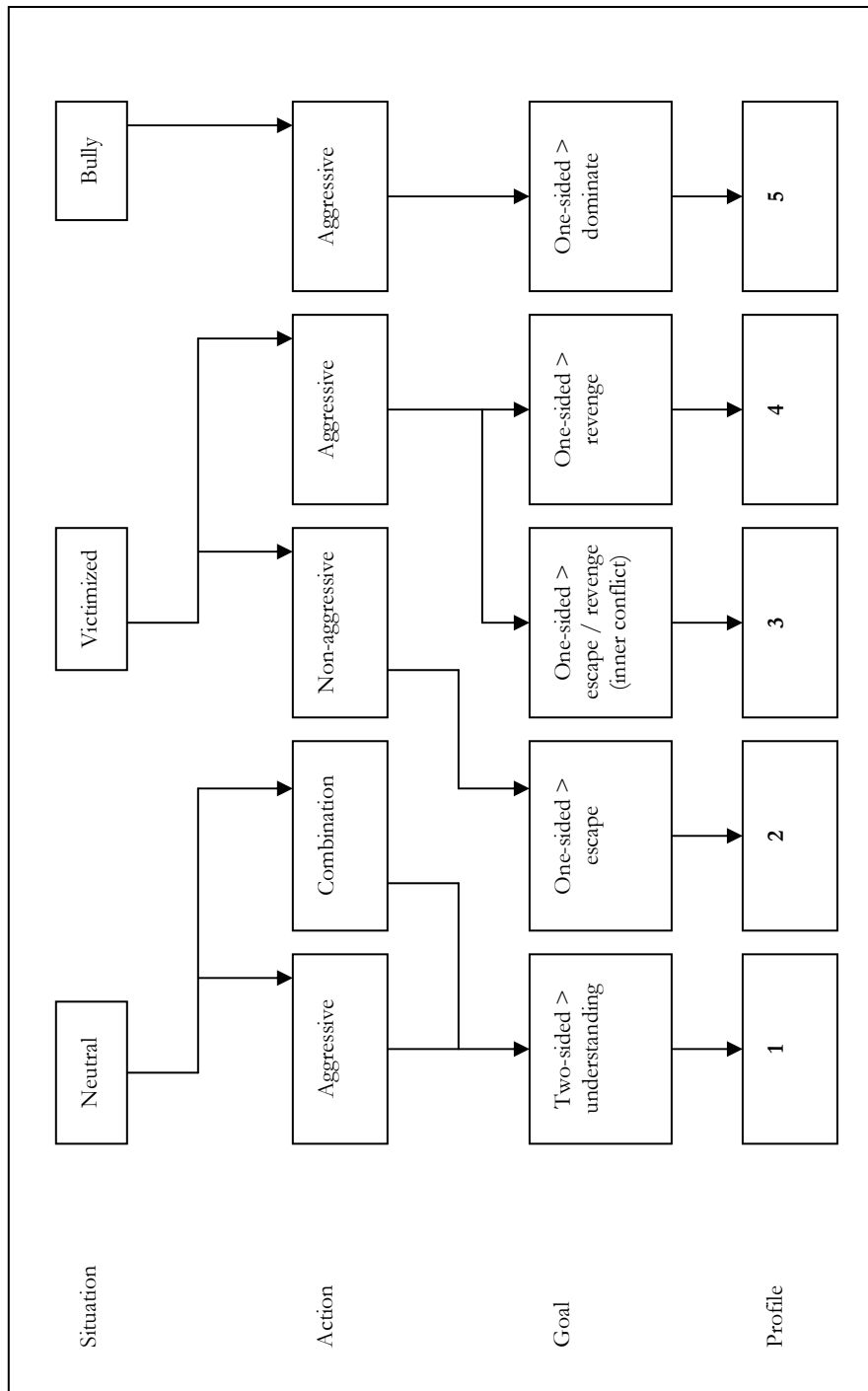
Figure 3. Schema of construction of profiles.

Table 6
Profiles of inner logic with category percentages (N = 64)

	PRF 1 understanding (N=5) %	PRF 2 escape (N=16) %	PRF 3 escape/revenge (inner conflict) (N=18) %	PRF 4 revenge (N=18) %	PRF 5 domination (N=7) %
Situation					
Neutral	100	-	-	-	-
Being victimized	-	100	100	100	-
Victimizing/bullying	-	-	-	-	100
Actions					
Non-aggressive	-	100	-	-	-
Non-aggr + aggressive	40	-	-	-	-
Aggressive	60	-	100	100	100
Goals					
One-sided					
Stop aggression > escape	20*	88	45	-	-
Stop aggression > revenge	-	12	-	100	-
Stop aggression > esc + rev	-	-	33	-	-
Continue aggression > dominate	-	-	-	-	100
Two-sided (get understanding)	80	-	-	-	-
No goal (loss of control)	-	-	22	-	-
Support					
Support	80	55	83	52	14
No support	20	44	17	48	86

* Based on Figure 3 this child would not fit with Profile 1, since children in Profile 1 only have two-sided goals (get understanding). However, based on the first dividing criterion (situation) the child does fall in Profile 1. Also, this child was somewhat unclear as to whether his goal was one-sided or two-sided. These facts made us decide to put this particular child in Profile 1.

Table 7

Frequencies and percentages regarding DBD scores within each profile (N = 60)

Disruptive behaviour disorders	Range	PRF 1 (N=5) N	%	PRF 2 (N=14) N	%	PRF 3 (N=16) N	%	PRF 4 (N=18) N	%	PRF 5 (N=7) N	%
Attention problems	Normal	3	60	9	64	2	13	12	67	2	29
	Sub-clinical	1	20	3	22	5	31	2	11	-	-
	Clinical	1	20	2	14	9	56	4	22	5	71
Hyperactivity problems	Normal	2	40	6	43	2	13	9	50	1	14
	Sub-clinical	1	20	3	21	2	13	-	-	-	-
	Clinical	2	40	5	36	12	75	9	50	6	86
ODD	Normal	-	-	5	36	2	13	6	33	-	-
	Sub-clinical	3	60	2	14	1	6	4	22	-	-
	Clinical	2	40	7	50	13	81	8	45	7	100
CD	Normal	3	60	7	50	2	13	7	39	-	-
	Sub-clinical	-	-	1	7	2	13	4	22	2	29
	Clinical	2	40	6	43	12	75	7	39	5	71

We also tested whether the children with different profiles of inner logic differ as to the extent in which they have behavioural problems according to their teachers (see Table 7). We used the Kruskal-Wallis Test, as this test is the best alternative for an ANOVA when dealing with ordinal data (clinical, sub-clinical and normal range). The Kruskal-Wallis test revealed only a significant difference between the profiles as far as attention problems are concerned: $\chi^2 (4) = 12.4$, $p = .015$.

With the use of a permutation test, differences between the profiles with respect to age were also considered. No significant differences were found (see Table 8). We will go into more detail about these results in a discussion of the separate profiles of inner logic.

Table 8
Mean age of the children per profile (N = 64)

Profile	Mean age	Standard deviation
Profile 1 Understanding	10.80	0.84
Profile 2 Escape	10.38	1.20
Profile 3 Escape/revenge	9.65	1.15
Profile 4 Revenge	10.37	1.07
Profile 5 Domination	10.00	0.82

The five profiles of inner logic look as follows:

1. Understanding. I try to get it right by explaining or fighting, so my opponent will understand and the conflict will be solved.
A good example of this profile is Arnold's story. Arnold teases his friend a little bit during a Nintendo game, but his friend does not like it, and starts playing with another child. This makes Arnold angry and they get into a fight. Arnold says: 'I wanted him to stop hitting, but I also did not want him to play with that other boy. He is my friend'. Arnold also feels ashamed because of his behaviour.

Profile 1 includes 8% of the children in our study. After the conflict is over, the children of this profile say they want to make up again. Contrary to the children in other profiles, none of these children think their opponent will feel proud or happy of what they did. They also mention attempts to regulate their emotions internally, by thinking of or focusing their attention on something else. And they try to find support with their teacher or parents.

As to the DBD scores, the children in this profile show a mixed picture. According to their teachers, 40% of the children scored within the clinical range of hyperactivity problems, ODD, and CD; 20% of these children scored in the clinical range with regard to attention problems. The mean age of the children in this profile was 10.8 years (standard deviation 0.84), which was the highest, but not significantly higher.

2. <u>Escape (protection)</u>. My opponent is bullying me without reason; I try to protect myself by running away or looking for help from the teacher (non-aggressive actions); and I succeed in escaping and putting a stop to being bullied.
Max fits very well in this profile. He tells how he is being chased by another boy. Max walks away, but the boy keeps on chasing him. Max says: 'I did not do anything else because he is a boy who gets angry very easily and I do not want to get into a fight'.

Profile 2 includes 25% of all the children in our study. The children in this profile report being teased or bullied by other children, but they do not choose to fight back. The fact that these children choose to react in a non-aggressive way makes them distinguishable from the other children. These children feel angry and want to take revenge, but they also feel sad because they do not want to get into a conflict. They regulate their anger internally (for example by continuing what they were doing and not thinking about it anymore). Afterwards, half of the children in this profile look for support with their teachers and parents.

The children in this profile also show a mixed picture of DBD scores, which is quite similar to the children in Profile 1. The mean age of the children was 10.38 years (standard deviation 1.20).

3. <u>Escape / revenge and inner conflict.</u> My opponent is bullying me without reason; I kick, hit, shout (aggressive actions) to defend myself, to draw the teacher's attention; to make clear that I don't want this; or because I am not able to control my anger and the opponents enjoy that, and I don't want that and I feel confused. Erik is a very good example of a child who reacts impulsively to someone else and feels bad about it afterwards. He says: 'Then I get my pill too late, maybe that is why I do it. It just happens spontaneously'. Afterwards he feels afraid, ashamed and confused because of his 'bad' behaviour.

Profile 3 includes 28% of all the children in our study. The children in this profile report being teased or bullied, some of them severely and every day. They react aggressively, but for different reasons, which makes this group quite heterogeneous. What these children have in common is that they feel in conflict with themselves about their behaviour. Some of these children describe themselves as victims of their own impulses: 'it is like there is someone with a remote control pulling my strings'. Their main concern is that they do not like to fight and want the teasing to stop. The children know that other children enjoy their outbursts; they are convinced their opponents feel happy and proud.

They think their opponents feel angry, but also proud of their own behaviour and guilty afterwards. Most children do not want to show their angry feelings, because they are afraid this will make the other one continue. Some children try to do something different in order to forget how they feel ('I try to draw nice paintings and then I will forget'). Some of these children talk to their teacher or parents, while others do not look for support because they are afraid they will be punished.

Compared to the children in the other profiles, these children score considerably high on the DBD questionnaire. Most children score in the clinical range; attention problems 56%, hyperactivity problems 75%, ODD 81%, and CD 75%. The mean age of the children in this profile was the lowest; 9.76 years (standard deviation 1.15), which was not significant.

4. Revenge (settling the power balance). Opponent is provoking me; I call him/her names and fight (aggressive actions); and win or stop my opponent.
Peter tells how he is being bullied, called names and provoked by another boy. In reaction he hits the other boy. He simply says: 'I wanted to get back at him, because he provoked me'.

Profile 4 includes 28% of all the children in our study. The children in this profile report being teased or bullied. They react in a direct, aggressive way to stop their opponent's aggressive behaviour. Almost all the children report a one-sided goal, i.e. to stop their opponent's aggression in order to get revenge or maintain their position. They think their opponent feels proud, but will also feel guilty and ashamed. Most of these children immediately express their anger without regulating their emotions inside. Half of the children do not look for support, because they know they are wrong, while the other half look for support because they are convinced they were right by fighting back. A subgroup of children within this

profile (20%) developed extreme forms of self-defence. They report at length about being victimized. To protect themselves, they have developed strategies that make them inconvincible. They blow themselves up, let the anger come out and are extremely strong.

The children in this profile score considerably low on the DBD questionnaire compared to the children in Profile 3. Just 25% of the children score in the clinical range as regards attention problems; 50% as regards hyperactivity problems and ODD; and 40% as regards CD. Mean age in this profile was 10.37 years (standard deviation 1.07).

5. Domination (bullying). My victim makes a minor mistake towards me; I use that as a trigger to bully him or her (aggressive action). That's fun.
Joost tells a story about another boy who throws a chair at him. In response he grabs the boy and hits his head against the wall. 'If he hurts me, I'll give it back to him ten times more. Why? Because I like it….'.

Profile 5 includes 11% of all the children in our study. These children differ considerably from the other children. They act aggressively, mainly because they enjoy dominating or hurting other children. They feel happy and proud of what they do, but also angry because of the minor provocation made by their opponent. In contrast to the children in the other profiles, these children do not feel ashamed, guilty or confused. At the same time, they think their opponents are afraid of them and feel confused by the situation. Most children freely release their anger. Finally, most of these children do not seek support, because they know they are in the wrong.

The children in Profile 5 score highest on the DBD questionnaire compared to the children in the other profiles. Within the clinical range are 71% of the children as regards attention problems and CD, 86% as regards hyperactivity problems, and all the children score in the clinical range as regards ODD. The mean age of the children in this profile was 10.00 years (standard deviation 0.82).

5.4.3 Reactive Versus Proactive Aggression?

We hypothesized that we would find additional profiles of inner logic besides the two profiles of reactive and proactive aggression (Crick & Dodge, 1996; Orobio de Castro, 2004). Only 28% of the children meet all five criteria of reactive aggressive behaviour; these are the children of our Profile 3 'escape/revenge and

inner conflict'. These children perceive the situation as threatening; their actions are impulsive and hot blooded or due to loss of control; their main goal is protection; and they are angry. However, our study suggests that the children of Profile 3 have inner conflicts that stem from diverse problems. According to these children, their 'reactive aggression' is related to: 'brain problems'; being teased and bullied frequently; the ineffectiveness of non-aggressive behaviour when trying to stop their opponent.

None of the children meet all five criteria of proactive aggression. Only when we restrict ourselves to one criterion - anticipating a certain reward – we have found two very different profiles that meet this criterion. These are the narratives of Profile 1, using aggression to get understanding and settle a peer conflict; and Profile 5, using aggression both to overpower the opponent and for the pleasure of bullying children.

Finally, the children with narratives of Profile 4, 'revenge', have characteristics of both reactive and proactive aggression. They use aggression in an instrumental way, but not cold-blooded; they are angry. They aim at both protection and domination, but especially at settling the power balance, which is not mentioned in either reactive or proactive aggression.

In conclusion, we are able to confirm our hypothesis that we would find more profiles of inner logic than the two profiles consistent with reactive and proactive aggression. We actually found five different profiles of inner logic of children with aggressive behaviour.

5.5 Conclusions

Most children say that they are victimized or bullied (81%). The narratives of the children make very clear that from the children's perspective aggression and bullying happens on a daily basis in schools. Most children report they react aggressively in conflict situations (74%). Most children freely express their anger. They use aggression to escape (protection; 42%); to get revenge (settling power balance; 35%); to dominate (bullying; 12%); or to get understanding (7%). Some children (5%) were not able to report a goal, and reported losing control and acting impulsively.

5.5.1 Profiles of Inner Logic

We hypothesized that we would find more profiles of inner logic than the two profiles consistent with the distinction between reactive and proactive aggression (Crick & Dodge, 1996; Orobio de Castro, 2004). On the one hand we found similarities between the reactive-proactive dichotomy and our data. On the other hand we found a more diverse picture with five profiles of inner logic, consistent with the critiques on the reactive-proactive dichotomy (Bushman & Anderson, 2001).

5.5.2 Relation with Teachers' Perspective and Children's Age

In order to confront the children's perspective with their teachers' perspective, we used the children's scores on the DBD rating scale. This scale examines whether behavioural disorders ADHD, ODD, and CD are present in a child according to the teacher.

The children who mentioned a neutral situation as a starting point (Profile 1) and non-aggressive actions (Profile 2) should score lowest on the DBD rating scale. However, the children in these profiles showed a highly differentiated picture; some children scored in the normal range, but a significant number of children scored in the clinical range. The teachers see more behavioural problems related to aggression than is to be expected from these children's narratives. It may very well be that the children in Profile 1 and 2 actually have more conflicts than they report, and with more aggression actions.

Consistent with the severity of their narratives, the children in Profile 5, the bullies, scored mostly in the clinical range on all four behavioural disorders, which means that the teachers see them as the most problematic with regard to their behaviour. After that, the children in Profile 3 (inner conflict) scored mostly in the clinical range, which is consistent with the severity of their narratives as well because they report clinical problems (for example loss of control).

No difference was found between the profiles with respect to the age of the children.

5.6 Discussion

Before we discuss the meaning of our results we will point to some limitations of our study. Firstly, we have to bear in mind that our study is based on narratives of children in special education, which means that the children were, to

some extent, behaviourally and/or emotionally disturbed. In order to be able to generalise conclusions about children's inner logic related to aggression to broader groups of children, one needs to study the inner logic in other groups as well. Secondly, our study relies on the children's own accounts of a conflict. It is very well possible that the children emphasised their opponent's role in order to put themselves in a more positive light. Thirdly, our analysis relies on one account of a conflict. If we would ask children to reflect on several other conflicts, they might report conflicts with other inner logic profiles as well. The relations between children's narratives and the conflicts they actually have, needs to be studied in future research to get deeper insight into the conflict dynamics of schoolchildren.

The narratives of the children in our study make clear that, from their perspective, aggression and bullying is part of the peer culture at their schools. The children report many aggressive incidents, such as being pushed into the bushes, being kicked and hit, being thrown to the ground etc. Therefore we might have to be careful with the assumption that children react aggressively due to distorted cognitions (social information processing theory, Crick & Dodge, 1996). The children might very well perceive the situation accurately. In a culture of mutual aggressive behaviour to settle the power balance, children might need aggressive behaviour to stop and impress their opponent. Our finding that the children do not often mention non-aggressive tools to solve peer conflicts, might be related to an actual lack of non-aggressive skills, but could also be related to the children's experience that non-aggressive behaviour is ineffective and weakens their status in the peer group.

Some parts in eclectic intervention programmes may be counterproductive for certain children in special education, for instance the exercises meant to develop the children's ability in perspective taking. During these exercises, the children are invited to open up and tell about their fear, anger or sadness. But bullies are aware of their victims' fear, confusion and anger; they enjoy that. So inviting the children to open up can be very dangerous for victimized children during group sessions.

We have to be careful with children having problems regulating their emotions. They may be impulsive because of brain damage; or traumatized by repeated victimization by peers; or suffer from inner conflicts related to their aggressive behaviour (Profile 3). Some methods to stop impulsive behaviour could even intensify aggressive behaviour in specific children, as in the case of Kevin. He has already developed a method to make himself invincible by using the 'think-time'

of the Stop-Think-Do method to blow himself up and explode, instead of using it to cool down. These children probably need individual help and cannot be helped in group sessions.

In short, the proactive - reactive dichotomy seems inadequate when it comes to understanding aggressive behaviour of children in the school context. From the perspective of the children, aggressive behaviour is normal behaviour in order to settle conflicts and the balance of power. This requires an approach at the level of the school system and group dynamics, and a focus on moral learning and social skills. Besides, we need an approach that focuses on cognitive-affective dynamics at the level of the individual child. Some children have very specific problems needing an individualized approach.

Chapter 6 The Impact of Context on the Development of Aggressive Behavior in Special Elementary School Children[29]

6.1 Introduction and Theory

Inspired by a variety of systems theories, many scholars in the field of developmental psychopathology emphasize the importance of context in the study of child development and problem behavior (Dishion & Stormshak, 2007; Granic & Hollenstein, 2003). In this study we observed the differences found in the behavioral trajectories of aggressive children in different intervention contexts and different classroom contexts.

It is often assumed that peer contagion accounts for aggressive group dynamics in intervention groups. The term 'peer contagion' describes the phenomenon in which the aggregation of aggressive peers increases the aggressive behavior of the individuals in the group. (Warren, Schoppelrey, Moberg & McDonald, 2005). The mechanisms that account for peer contagion effects are social-learning mechanisms such as imitation, synchronization and contagiousness of (aggressive) behavior. The mechanism of mutual positive reinforcement of antisocial behavior among peers is especially well documented. This mechanism is also known as deviancy training (see for example Dishion, Spracklen, Andrews & Patterson, 1996). Intervention groups provide an appropriate context for studying the influence of peer group dynamics on children's aggressive behavior. They make it possible to manipulate the context in which the intervention is given and thus to control for effects of peer group dynamics (Van Lier, Vitaro & Eisner, 2007).

Another appropriate context for studying the effects of peer group dynamics is the classroom context in regular versus special education. In special education classrooms, negative peer group effects consist not only of peer contagion, but also of aggression as a means of reaching personal or social goals. A study on children's

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In footnote 11 we explained that in the present chapter the analysis of the influence of intervention group composition on program outcomes from Chapter 3 is repeated. However, the outcomes of the analyses are slightly different in the two chapters. The analyses of the studies in Chapter 3 were repeated some time after publication of the article presented in this chapter. At that time, an improved method of performing permutation tests was available, which resulted in the somewhat different outcomes (together with a slightly different sample as well).

Furthermore, in the original article some text is displayed as web material in order to reduce the size of the article. In this chapter these web materials are described in appendices.

motives for acting aggressively revealed various goals (Visser, Singer, van Geert & Kunnen, 2009). Children reported using aggression: 1) to escape from the conflict situation, 2) to get revenge, 3) to dominate the other child, and 4) to get understanding for their situation. The research on bullying, viewed as the most common form of violence in schools, also provides evidence for functional roles of aggression. Bullies are often assumed to have social skills deficits; they use aggression because they have no behavior alternatives. However, a distinction should be made between different types of bullies (Sutton, Smith & Swettenham, 1999). A subgroup of bullies, the ringleader bullies, may actually possess well-developed social skills. The assumption is that they use aggression strategically to obtain power and/ or a position in the group (see Arsenio & Lemerise, 2001 for a discussion; Nation, Vieno, Perkins & Santinello, 2008). Classrooms provide an environment where the effects of both peer contagion and functional mechanisms of aggression on children's behavior can be studied in real-life.

6.1.1 Effects of Intervention Group Composition on Aggressive Behavior

Dishion, McCord and Poulin (1999) were among the first to report about the possible negative influence of placing antisocial youth together in an intervention context. Since then, several studies have been conducted on peer contagion effects in intervention groups. All of these intervention studies support the deviancy training hypothesis; there was peer reinforcement of inappropriate behavior during intervention sessions. There is also evidence for positive peer contagion in an intervention context. An effect study by Van Lier, Vuijk and Crijnen (2005) on the Good Behavior Game (a universal intervention with a focus on stimulation of social skills in all children) revealed that highly aggressive children showed a reduction in aggressive behavior together with an increase in contact with typically developing children.

Although it is clear that peer contagion effects are likely to occur in intervention settings, unequivocal empirical evidence is lacking for the conditions in which those peer contagion effects occur (Mager, Milich, Harris and Howard (2005). Ang and Hughes (2001) for example concluded that negative peer contagion was more effective in homogeneous aggressive groups than in mixed groups or individual treatment, while Mager, Milich, Harris and Howard (2005) found that it were the mixed groups in which negative peer contagion was more effective compared to homogeneous aggressive groups. Van Lier, Vitaro and Eisner (2007) argued that

negative peer contagion is likely to occur in both homogeneous aggressive and mixed intervention groups.

We need to learn more about the factors and processes that may mediate negative effects of grouping antisocial children (Arnold & Hughes, 1999; Van Lier, Vitaro & Eisner, 2007). For example, it is still uncertain to which children and under which circumstances negative peer contagion effects are most harmful. Also, more research publications on the negative influences of peer contagion effects are strongly needed (Hartup, 2005), yet they are still rare. This is partly because there is a tendency to refrain from publishing studies showing null or harmful effects of aggression reduction programs (Gifford-Smith, Dodge, Dishion & McCord, 2005). The present study aims to contribute to this field of research. We focus on the effect of intervention group composition in elementary school children by comparing the effects of a group-based social skills program (aggressive children only) with the effects of the same program in an individual setting.

6.1.2 Effects of Classroom Composition on Aggressive Behavior

Research suggests a link between the development of aggressive behavior and the school environment (Barth, Dunlap, Dane, Lochman & Wells, 2004; Warren, Schoppelrey, Moberg & McDonald, 2005). Classrooms with high rates of aggressive behavior promote aggression in individual children (Barth, Dunlap, Dane, Lochman & Wells, 2004) and these effects are relatively permanent (Kellam, Ling, Merisca, Brown & Ialongo, 1998; Thomas, Bierman & The Conduct Problems Prevention Research Group, 2006; Warren, Schoppelrey, Moberg & McDonald, 2005).

The influence of classroom aggression is particularly evident in special education, since children with special educational needs (SEN) generally show higher levels of aggression. The grouping of these children implies a higher possibility of a negative influence of peers and an absence of well-adjusted role models (Gifford-Smith, Dodge, Dishion & McCord, 2005). Several studies (Baker, Wang & Walberg, 1995; Peetsma, Vergeer, Roeleveld & Karsten, 2001) confirmed that SEN students in regular education do better academically and socially than comparable students in special education. However, a study by Daniel and King (2001) on inclusion of SEN students in regular education showed that teachers and parents of those children reported more behavioral problems in comparison to SEN students in special education classrooms. Because of these conflicting findings, more research is needed

on the negative effects of grouping antisocial children together in special education. The present study contributes to this need by studying how the behavioral trajectories of aggressive children change when they transfer from special to regular education.

6.2 The Present Study

6.2.1 Assumptions

Inspired by dynamic systems thinking (Van Geert, 2003; 2008), we make the following assumptions. A social skills intervention context is a manipulated, temporary context and, in dynamic systems terms, amounts to a temporary and transient perturbation of the child-peer system. The classroom setting, on the other hand, is a relatively permanent context, constituting a persistent structural feature of the child-peer system. Our assumptions apply to the widely used social skills intervention programs in schools that have a limited number of meetings (varying from 8 to 30) and that are implemented in indicated groups.

We assume that the influence of the social skills intervention context on the children's aggressive behavior is weaker than the influence of the classroom context. A child spends more time in the classroom than in the intervention group and the classroom is also a more familiar, structural element of the child's environment than the intervention context. Therefore, a moderately aggressive child, for example, might be strongly and positively influenced by a classroom consisting of many prosocial peers. Moreover, a moderately aggressive child in a social skills intervention group consisting of many aggressive peers may actually become more aggressive due to peer contagion. In this sense the impact of a social skills intervention group, which consists of only highly aggressive peers, might in fact be only slightly positive (or even negative) compared to the positive impact of a normal classroom environment.

6.2.2 Hypotheses

We considered the effects of a social skills intervention program aimed at reducing aggressive behavior in elementary special education. The group composition was manipulated in order to study the possible negative influence of grouping aggressive children together. Children were trained either in a group or individually. Our hypothesis was that children trained in groups would benefit less from the intervention program compared to children trained individually. We based

this hypothesis on the assumption that the peer effect in the group composition (aggressive children only) would negatively influence the effect of the intervention program.

We also considered the impact of change in classroom environment by studying the behavioral trajectories of children who transferred from special Cluster 4 education[30] to regular education[31]. This transfer occurred after the social skills intervention program was finished. Because Cluster 4 education classrooms are comprised of mostly aggressive or at least behaviorally disturbed children, negative peer group effects are more likely to occur within the Cluster 4 classrooms than in classrooms in regular education. Our hypothesis was that children who transferred from Cluster 4 to regular education would show a decrease in aggressive behavior after they transferred, relative to what would be expected from their individual trajectory in aggressive behavior during the Cluster 4 period.

Finally, consistent with our view on intervention as a temporary perturbation in an otherwise stable system, we expected that if any (differential) effects of the social skills program occurred, these effects would disappear six to nine months after the program had ended.

6.3 Method

6.3.1 Participants

Participants were 71 Dutch children in four special education schools for children with behavioral and/or psychiatric problems (Cluster 4 schools) in the north of The Netherlands. These children either had a psychiatric disorder, showed severe socio-emotional or behavioral problems at school and at home and/or suffered academically. In the present sample, 38% of the children changed school. Of that 38%, 52% transferred to a regular school and 48% transferred to another Cluster 4 school.

Children were assigned to our study if the teacher felt incapable of handling the child's aggressive behavior. A consequence of this selection method is that the children might vary more in their levels of aggressive behavior than in intervention studies that use norm-based aggressive behavior scores to select children.

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[30] Cluster 4 education in the Netherlands is education for children with behavioral and/or psychiatric problems.
[31] With regular education we also mean education organized for children who need extra attention due to learning and behavioral problems.

All parents of the children provided written informed consent. Relevant characteristics of the participants are shown in Table 1.

Table 1

Characteristics of the participants (N=71)

Variable	N	%
Sex		
Girls	4	6
Boys	67	94
Age		
< 8 years	1	1
8 - 12 years	64	90
> 12 years	6	9
Ethnicity		
Native	55	78
Mixed	10	14
Foreign	2	3
Missing	4	5
Intelligence Quotient		
< 80	6	8
80 – 100	29	41
> 100 – 120	17	24
> 120	2	3
Missing	17	24
Diagnosis		
ADHD or symptoms of ADHD	13	18
PDD-NOS or symptoms of PDD-NOS	13	18
Combination of above	14	20
ADHD or symptoms combined with another diagnosis	3	4
Rest	5	7
No diagnosis	21	30
Missing	2	3
Family composition		
Two-parent family	31	44
Single-parent family	23	32
Two-parent family with one stepparent	11	15
Foster or adoption family	4	6
Missing	2	3

Table 1 continue

Variable	N	%
Education father / mother		
Elementary / lower vocational	18	26
Secondary, lower general/intermediate vocational	23	32
Secondary, higher general/pre-university	9	12
Higher professional / university	16	22
Missing	5	8

6.3.2 The Intervention Program

The children in this study participated in the social skills program TRAffic 8-12 (TRA = Training for the Reduction of Aggression), which is based on social-cognitive and social-learning principles. The children followed 14 one-hour sessions either in groups of six children with two trainers (Group-Trained: GT) or individually with one trainer (Individually-trained: IT). We were not able to fully randomize the assignment of children to the group- or individual- condition because of practical reasons such as availability of trainers and teacher-preference. There were no significant differences in aggressive behavior between the GT and IT children at baseline T0 (p=0.21 for the total score on the Aggressive Behavior Checklist).

The program is designed for children with psychiatric disorders such as Attention Deficit Hyperactive Disorder (ADHD) and Pervasive Developmental Disorder-not otherwise specified (PDD-nos). For further information on TRAffic 8-12, see Appendix 6A.

6.3.3 Design

The design of this study and additional information is presented in Figure 1. We collected data at five different time points over a period of two-and-a-half years (T0, T1, T2, T3 and T4). Between T0 and T1 the first half of the participants followed the TRAffic 8-12 program, between T1 and T2 the other half of the participants followed the program. At T3 and T4 subgroups of children transferred to other Cluster 4 schools or to regular schools (see Figure 1 for details and percentages). At T3 and T4 there was a considerable reduction in the number of child assessments, which probably reflected the reduced commitment to the study by new teachers and schools (many children transferred to new schools). Other reasons for the reduction of assessments were sickness, replacement and refusal of teachers

to participate in the later stages of the study. Because of the arbitrary nature of these issues, we have no reason to believe that the reduction was biased.
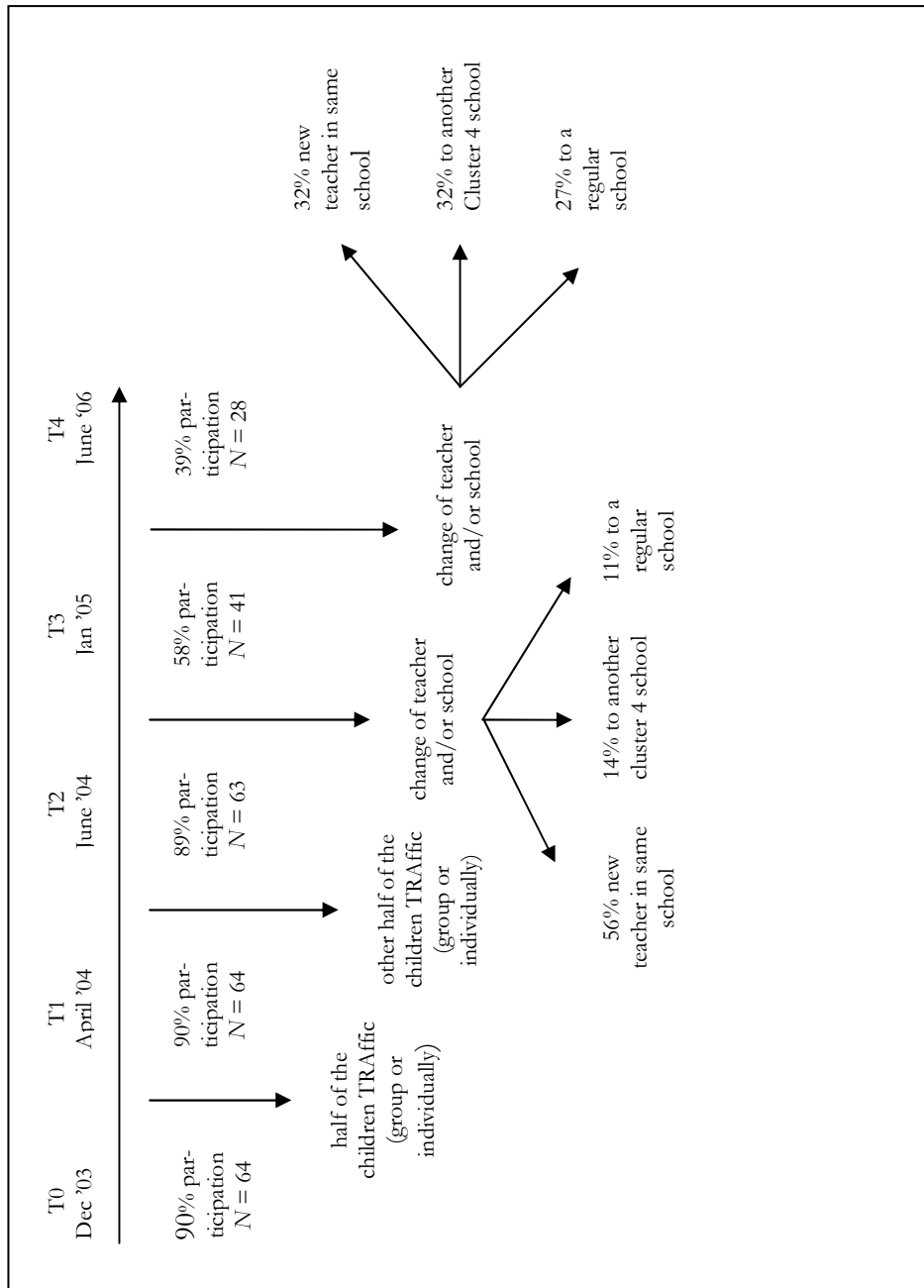

Figure 1. Design of and attrition in the study.

6.3.4 Measures

Aggressive behavior was assessed using the *Agressievragenlijst* (Aggressive Behavior Checklist) completed by the teachers (Krol, 1998). The checklist contains 26 items and is divided in four subscales: Physical Aggression, Verbal Aggression, Indirect Aggression, and Negativism Ratings are given on a 5-point Likert-scale: Cronbach's α's for the subscales are ≥ .84. See Appendix 6B for further information.

6.3.5 Analysis

The statistical analysis was carried out by means of random permutation techniques. Random permutation tests are very flexible, making it possible to work with samples like ours which are small, dependent and contain missing data (see for example Boosman, van der Meulen, van Geert & Jackson, 2002; Toddman & Dugard, 2001; for further information about our statistical procedures, see Appendix 6C).

Intervention Group Composition. The short-term effects of TRAffic 8-12 were determined by using T0 (T_{before}) and T1 (T_{after}) for the session 1 children and T1 (T_{before}) and T2 (T_{after}) for the session 2 children. The time between T_{before} and T_{after} was three months. GT and IT children were compared with respect to their change scores (T_{after} minus T_{before}). In order to determine the long-term results of TRAffic 8-12, T_{before} and T3 (13 months later, $T_{longterm}$) were used. We excluded children who transferred to a regular school at T3 or T4 in order to avoid confusion between effects of the intervention program and of the change in classroom environment. Furthermore, TRAffic effects were analyzed within groups, comparing the children before and after the program with themselves.

We also calculated the effect sizes (Cohen, 1988) because in small intervention groups large difference scores are sometimes not found to be significant, while in fact there might be an effect in terms of improvement of targeted behavior. Finally, we also checked the possible differential effects of TRAffic 8-12 due to the psychiatric diagnoses of the children (ADHD and PDD-nos) as well as their IQ (see Appendix 6D for details).

Classroom Composition. We investigated whether the individual trends in aggressive behavior changed when children transferred to 1) a school of regular education or 2) another Cluster 4 school. Option 2 was included in the analysis to check whether any observed changes were due to the school transition itself or in particular to the transition to a school of regular education. The long-term

assessments were carried out later in the school year in order to make sure that the children's behavior was not temporarily adjusted behavior.

We wanted to test whether the trajectory of aggressive behavior, calculated for the period before school transition in Cluster 4 education, changed after a school transition. It is important to note that such trajectories can show considerable individual differences: some children may show a downward change, others an upward change and still others are likely to be constant. Thus, our test focused on the effect of the school transition on the direction and magnitude of the trajectory. For instance, if before the transition to a regular school a child showed an upward trajectory, then we expected to find a *decrease* in the upward trajectory, if not a complete change in the trajectory direction. In a child with a downward trajectory, we expected to find an even stronger downward trajectory than before. These expectations were statistically tested by means of random permutation methods and statistical simulation. We finally checked for possible differences between the groups due to the psychiatric diagnoses of the children (ADHD and PDD-nos) and their IQ (see Appendix 6E for details).

6.4 Results

6.4.1 Intervention Group Composition

There were 65 children who participated in the intervention program. We started the analysis by exploring the averages and standard deviations of the group-trained (GT) and the individually-trained (IT) children. Our central question was whether TRAffic 8-12 would have differential effects for GT and IT children. The random permutation test revealed that GT and IT children did not differ in their change in aggressive behavior after the program compared to before (comparison between groups, see Table 2). This result also applied to the children's long-term changes six to nine months after the program had ended, i.e. no difference in change between GT and IT children. IT children thus did not profit more (or less) from the intervention program than GT children.

Table 2

Change scores of GT and IT children with p-values, before-after and before-six to nine months after, compared between groups

Aggressive behavior	Change$_{\text{Mbefore-Mafter}}$ of all trained children			Change$_{\text{Mbefore-Mlongterm}}$ of children who stayed in Cluster 4 education		
	Group N=33	Individual N=32	p	Group N=12	Individual N=10	p
Physical	-1.92	-5.04	0.33	-4.58	-3.30	0.81
Verbal	-0.49	-2.22	0.64	1.60	-4.40	0.37
Indirect	0.41	-2.61	0.23	2.18	-3.30	0.38
Negativism	-0.54	-3.26	0.46	-0.46	-6.60	0.36
Total	-2.55	-13.12	0.40	-1.26	-17.60	0.48

We also compared the aggressive behavior of GT and IT children before the program with their behavior after the program. On most measures GT and IT children did not show a statistically significant decrease in aggressive behavior directly after the program (comparison within groups, see Table 3). Only the IT children showed a significant decrease in physical aggression directly after the program compared to before (p=0.04). The effect size however was small (ES=-0.34), which means that the improvement in behavior was minimal.

Table 3

Averages and standard deviations of GT and IT children with p-values and effect sizes, before and after, compared within groups

Aggressive behavior	Group (N=33)				Individual (N=32)			
	M_{before} (s)	M_{after} (s)	p	ES	M_{before} (s)	M_{after} (s)	p	ES
Physical	15.26	13.33	0.39	-0.16	15.13	10.08	0.04*	-0.34
	(9.42)	(8.32)			(8.69)	(8.68)		
Verbal	26.49	26.00	0.83	0.01	22.23	20.01	0.43	-0.23
	(10.05)	(8.82)			(10.50)	(10.30)		
Indirect	16.59	17,00	0.41	0.10	13.49	10.89	0.27	-0.17
	(11.03)	(9.54)			(9.06)	(8.21)		
Negativism	24.94	24.39	0.83	0.03	21.72	18.46	0.23	-0.19
	(10.60)	(8.78)			(10.15)	(9.27)		
Total	83.28	80.73	0.77	0.00	72.57	59.44	0.14	-0.26
	(36.17)	(29.72)			(33.19)	(30.97)		

* Significant at p<0.05

Six to nine months later no significant decreases in aggressive behavior were found for either the GT or the IT children (see Table 4). This means that the significant decrease in physical aggression of IT children dissolved six to nine months after the program had ended, at least for the children who stayed in cluster 4 education. In two cases (IT children: Negativism scale and Total scale score) the size of the effect was mid-high, but we did not interpret these effect sizes since the differences between the two measurement points were not significant.

Table 4

Averages and standard deviations of GT and IT children who stayed in Cluster 4 education with p-values and effect sizes, before and six to nine months after, compared within groups

Aggressive behavior	Group (N=12)				Individual (N=10)			
	M_{before} (s)	$M_{longterm}$ (s)	p	ES	M_{before} (s)	$M_{longterm}$ (s)	p	ES
Physical	15.77	11.18	0.20	-0.54*	15.18	11.88	0.44	-0.39
	(9.83)	(6.53)			(10.29)	(8.05)		
Verbal	26.13	27.73	0.74	0.16	22.18	17.78	0.29	-0.43
	(12.73)	(9.78)			(6.94)	(11.34)		
Indirect	16.27	18.45	0.67	0.22	12.38	9.08	0.39	-0.34
	(11.81)	(11.50)			(8.33)	(6.74)		
Negativism	25.08	24.63	0.93	-0.04	23.10	16.50	0.12	-0.63*
	(13.64)	(10.48)			(7.14)	(10.56)		
Total	83.25	81.99	0.94	-0.04	72.84	55.24	0.20	-0.50*
	(44.82)	(35.87)			(26.94)	(33.40)		

* Mid-high effect

To conclude, the hypothesis that GT children benefit less from the intervention program than IT children must be rejected. Overall, no consistent differences were found between GT and IT children in how they profited from the program. Also, GT and IT children separately did not show decreases in aggressive behavior after the program compared to before. Furthermore, the short-term effect that was found disappeared six to nine months after the program had ended. The absence of long-term effects is congruent with our hypothesis that if we would find any effects of TRAffic 8-12, these effects would have disappeared six to nine months after the program had ended.

We also tested whether TRAffic 8-12 resulted in differential effects due to the children's psychiatric diagnoses and IQ. Both analyses (diagnosis and IQ) were performed by means of random permutation testing (see appendix 6D for details). All children diagnosed with ADHD, PDD-nos or a combination of both did not

differ significantly in their change in aggressive behavior from children with no diagnosis. As for IQ, no significant correlation was found with change in aggressive behavior.

6.4.2 Classroom Composition

Changes in behavioral trajectories of aggressive behavior were considered in relation to changes in classroom environment for 59 children. This was accomplished by studying the children who transferred from Cluster 4 to regular education. The children who stayed in Cluster 4 education (*Stayers, N=32)* were compared with the children who transferred to a regular school (*Regulars, N=14*) and with the children who transferred to another Cluster 4 school (*Changers, N=13)*. It is important to note that the Regulars undergo the greatest change. They change schools, as the Changers do, but they also transfer to a different type of school. Preliminary control tests revealed that the Stayers did not show significantly different trajectories and levels of aggression prior to school transfer compared to the Regulars and the Changers (see Appendix 6E).

The central question was: Did the children who transferred to a regular school show a change towards less aggression after their transition, more than would be expected from the individual trajectory that started during the Cluster 4 period? For the Regulars, our statistical tests indicated a systematic decrease in aggression after the school transition relative to the child's expected aggression on the basis of its observed trend line during the Cluster 4 period (residuals are -25.32, $p=0.01$ and 0.009 for both tests). The group of Changers however did not show a change towards less aggressive behavior relative to the expected levels based on the children's trajectories (average of residuals = -2.68, $p=0.46$ and $p=0.46$).

Final statistical tests revealed that the Regulars and the Changers appeared to have as many psychiatric diagnoses as the Stayers. As for IQ, the random permutation test revealed that the Regulars had a significantly higher IQ than the Stayers and the Changers. The potential effect of IQ will be addressed in the discussion. The Stayers and the Changers did not differ significantly in their IQ. See Appendix 6E for details of all the analyses.

6.5 Discussion

With the present study we wanted to provide more insight into the influence of context on aggressive behavior in children from special education. Therefore we

observed the influence of the context in which a social skills intervention program is given and the influence of a change in school context from special to regular education.

Our study showed that being trained in a group with only aggressive children did not result in an increase in aggressive behavior in the children. However, being trained in a group did not result in considerable decreases in aggressive behavior either. Individually-trained children showed a temporary decrease in only one aggressive behavior measure. The psychiatric diagnoses and IQ of the children did not play a role in the effects of TRAffic 8-12. Our findings are consistent with many other studies in the sense that long-term advantages of the social skills intervention program TRAffic 8-12 were absent (see for example Beelmann, Pfingsten & Losel, 1994; Schneider, 1992). However, contrary to some studies that we discussed in this paper, we did not find negative effects of grouping aggressive children together in an intervention group. A reason might be the fact that the TRAffic 8-12 program was only a short during program. In 14 meetings, during one hour per week, the children were grouped together or trained individually. The length of time the children were grouped might be too short for grouping to have a negative effect. The role of length-of-intervention is one of the factors that need to be addressed in future studies on iatrogenic effects of grouping aggressive children in intervention contexts.

Our study also demonstrated that children who transferred to a regular school showed a change towards less aggression relative to their individual trajectory of aggressive behavior during the special education period. This was not the case for the children who transferred to another Cluster 4 school. This latter finding makes it less plausible that a mere change-of-climate causes a change towards less aggression. The most likely explanation of the change is the observation that regular schools are characterized by a considerably less aggressive school climate than special education schools. This conclusion is consistent with the assumption that classroom aggression depends on peer contagion and/or on the functional role of aggression in classrooms. The few studies on this topic also showed the influence of classroom aggression on aggression in individual children. An alternative explanation is that the children who transferred to a regular school were simply more intelligent than the others (which was indeed so) and that intelligence helps children profit from beneficial environments such as regular schools, as far as reduction of aggression is concerned. However, this explanation is contradicted by the finding that intelligence

did not help the children profit from the earlier beneficial effects of intervention, or special education in general. There is no reason to believe that their intelligence began to intervene in their aggressive behavior as soon as they entered regular school, and not earlier. However, we cannot rule out the possibility of an IQ-context interaction, i.e. that IQ eventually benefits other skills or attitudes in regular education but not in special education. This possibility needs to be verified in future research. In this study we did not have the opportunity to look for joint effects of transition and IQ on the children's trajectories of aggressive behavior because the method of analysis was unsuitable for that purpose.

Although the study showed that the children who transferred to another Cluster 4 school showed no change towards less aggression, the question remains whether the change to a regular school itself caused an improvement in the children's behavior and not the fact that regular school climates are characterized by less aggression compared to Cluster 4 schools. If moving the children to regular education is enough to reduce aggression, why were these children moved from regular education to special education in the first place? We can only speculate about this question, because we do not know the history of the children in detail. An important point is that most children have been in special education for several years, which implies that the younger children in our sample may never have been in regular education, and that the older ones were much younger at the time of transfer. Peer influence increases with age and it is likely that (peer affected) aggressive behavior was not that important at the time of transfer to special education. Hence, for most of the children coming from special education, the current context of regular education was a relatively new context for them, which had a beneficial effect on the reduction of their aggressive behavior. In addition, there are many reasons for moving children to special education other than aggressive behavior, such as hyperactivity, concentration problems or pervasive disorders. During the time they spent in special education, aggression might have considerably increased, in comparison to the level of aggression shown at the time they transferred to the special education setting. These uncertainties reveal how little we still know about the long-term individual trajectories of children with behavioral problems. Longitudinal studies into these trajectories are badly needed.

Hypothesis 3 was confirmed as well. Our study showed that the social skills intervention program did not have a long-term effect on the aggressive behavior of the children, whereas a change in educational context did have the expected result.

Obviously, children spend much more time in the classroom than in a temporary intervention group. We can ask ourselves whether it is realistic to expect structural changes in children's aggressive behavior from intervention programs that are not being implemented in the classroom on a long-term basis. As Framer and Xie (2007) stated, it is unlikely for interventions to have a lasting impact on children's aggression if the context in which children operate daily supports the problematic behavior. One can imagine that the effects of an intervention program such as TRAffic 8-12 would disappear easily when a child returns to his or her classroom in which aggression is the norm and the best way to defend oneself.

One point of critique could be that our present measure relies on teacher observations. Differences in reference frameworks between the Cluster 4 and regular teachers could have caused the differences in observed behavior, in that the observations concern subjective teacher-dependent differences in interpretation and evaluation and not real difference. If this were the case, we would expect the difference which we found to be in the opposite direction. Regular teachers are likely to be less used to aggressive behavior and could be expected to classify the same behavior as more extreme than their Cluster 4 colleagues.

6.6 Conclusion

The statement that context can have an impact on aggressive behavior in elementary school children is likely to meet very little disagreement. However, children function in diverse and changing contexts and these contexts are partly determined by the children's behaviors and characteristics (e.g. the trivial fact that they are in the context of special education is a consequence of their problematic behavior, which, in turn, is affected by this particular context). Our study investigated the effect of contexts on aggressive behavior. The temporary and manipulated context of a traditional social skills intervention program such as TRAffic 8-12 had little if any impact on the children's aggressive behavior. The natural and permanent context of the classroom however markedly affected the trajectory of aggressive behavior. Transferring to a new school with less aggressive pupils was accompanied by a significant drop in the aggressive behavior of the children. The most plausible explanation for this effect of context on aggression is that contexts differ in terms of group composition, and that group composition relates to particular types of group dynamics. The group dynamics result in more or

less aggression, and aggression is transferred to individuals in different ways, either through contagion or because it is functional in the group.

Aggressive behavior forms part of a child's action repertoire that helps the child realize his or her goals or interests in particular contexts. Attempts towards changing the child's behavior must not focus on the child alone, but must address the fit, or misfit, between a child and the contexts in which the child functions (Vermeer, 2007). Changing the context and explicitly reckoning with how certain contexts work for the child must be an essential part of any intervention that aims to permanently change behavior. The type of intervention programs that we studied, namely brief interventions focusing on teaching social skills, are still widely used. Our results have shown that their effects must be interpreted against the backdrop of the particular group composition and social context that they provide. Long-term programs that feature in the curricula of children are likely to be more effective, in particular if they succeed in changing the child's daily context of social functioning.

Chapter 7 Summary, Conclusions and Discussion

The aim of this thesis was twofold. First, in part I of the thesis we investigated the effectiveness of the Dutch school-based social skills intervention program TRAffic 8-12 on 74 children in Cluster 4 education. The program aims to reduce anger and aggression in 8-12-year-old-children. We studied the moderating effect of children's motivation and intervention group composition on program outcomes. A focus on outcome alone, however, reveals only very little (if anything) about why and how the children's behavior changed or did not change. Therefore, in part II of this thesis our second aim was to look beyond the program outcomes. We considered three issues that could help explain the results of the TRAffic 8-12 program: 1) the implementation and sustainability of the program by the trainers and the children's teachers, 2) the children's motives for behaving aggressively, and 3) the impact of the classroom context on the children's aggressive behavior.

In section 7.1 we summarize the findings and conclusions of the different studies[32]. The implications of our results for practice and for further research are discussed in section 7.2. In section 7.3 a teacher-focused aggression reduction intervention program that has been developed in reply to the findings of the present thesis is described. The chapter concludes with a final remark in section 7.4.

7.1 Summary of Findings and Conclusions
7.1.1 Part I The Tip of the Iceberg: The Effects of the TRAffic 8-12 Program

In part I of this thesis we considered the effects of the TRAffic 8-12 program. This effect study contributes to the need for more research into the effectiveness of Dutch school-based programs (Junger-Tas, 2002; Van Overveld & Louwe, 2005). Dutch intervention studies lag behind international research, especially with respect to follow-up research. Therefore, children's behavior was rated not only directly after the program had finished, but also six months and two years later.

We were skeptical about a lasting positive impact of the TRAffic 8-12 program. Inspired by dynamic systems thinking (e.g. Lichtwarck-Aschoff & van Geert, 2004; Steenbeek & van Geert, 2005; Van Geert, 2003), we presented an alternative view of the effectiveness and implementation of an intervention program

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[32] This section can be considered the English summary of the present thesis. A Dutch summary is provided at the end of the thesis.

such as TRAffic 8-12. In a dynamic systems view, the influence of an intervention on children's aggressive behavior is considered to be a process that is shaped by all the elements of the system (e.g. the child, peers in the classroom, peers in the intervention group, the program trainer, the teacher, and also the school), which mutually influence each other. Contrary to a static approach to behavior, the dynamic systems approach does justice to the complexity of real life in which the development of children's behavior during an intervention cannot be considered independent of other elements of the child's system. We wondered whether the impact of a temporary intervention program such as TRAffic 8-12 would outweigh the relatively permanent, and possibly negative, impact of the other, mostly behaviorally disturbed, children in the Cluster 4 education classrooms. We hypothesized that the TRAffic 8-12 program would only show small effects directly after the program had ended and that these effects would disappear in the long term.

The results of the effect study indicated that, according to the children's teachers and parents, participation in the TRAffic 8-12 program did not result in decreases in children's aggressive behavior and behavioral problems, neither in the short term nor in the long term. We compared the changes in trained children with the changes in untrained children and we compared the levels of children's behavior after the program with the levels before the program. In some cases we found significant differences between children's behavior before and after the program, but the clinical relevance of these differences was (very) small. We also studied whether children with higher IQ's and children without a psychiatric diagnosis would profit more from the program than children with lower IQ's and children with a psychiatric diagnosis. Teachers' and parents' ratings of children's behavior did not reveal a relation between these factors and program outcomes. Finally, we found a significant difference in the parents' ratings of behavioral problems between children who had qualified for transfer to a regular school some time after the program had ended and children who stayed in Cluster 4 education. Although the effect size of the difference between these two groups was the largest of all our results, the effect size was still small. These results did not provide sufficient evidence from which to conclude that there was a clinically relevant difference between the two groups, especially as we took into account the probability of the presence of a positive observer bias (the raters knew that their ratings occurred before and after the program).

An important goal of the effect study was to gain insight into the moderating effect of children's motivation and intervention group composition on

program outcomes. This search for moderators in our study fits with the current line of intervention research that is less focused on how effective programs are in general and which programs are most effective, and more focused on which programs work best for whom and under what conditions (Kazdin, 2000).

The influence of children's motivation on program outcomes is hardly discussed in literature (Bijstra & Nienhuis, 2003). Motivation is, however, considered an important common factor (Van Yperen, van der Steege, Addink & Boendermaker, 2010) or moderator (La Greca, Silverman & Lochman, 2009) of treatment effects. We hypothesized that motivated children would profit more from the TRAffic 8-12 program than unmotivated children. The children were assigned to the motivated group if their answers to several interview questions indicated that they wanted to learn more prosocial skills (otherwise the children were assigned to the unmotivated group). Although the results showed that the changes in the motivated and the unmotivated children were in the expected direction (i.e. the motivated children showed more of a decrease in problem behavior after the program than the unmotivated children), the teachers' and the parents' ratings of children's aggressive behavior and behavioral problems indicated that the differences between the two groups were not significant, with very little clinical relevance.

Contrary to motivation, the influence of intervention group composition on program outcomes has been studied fairly extensively. Several studies (e.g. Ang & Hughes, 2001; Arnold & Hughes, 1999; Dishion, McCord & Poulin, 1999) have documented the harmful effects of grouping aggressive adolescents in intervention programs. Other studies (e.g. Ang & Hughes, 2001; Mager, Milich, Harris & Howard, 2005) have documented more ambiguous results. We explored whether iatrogenic effects would occur in groups of aggressive children of elementary school age. The children in our study were trained either in a group of six children or individually. The assumption was that the individually-trained children would benefit more from the TRAffic 8-12 program than the group-trained children, because the individually-trained children would not be negatively influenced by the aggressive behavior of group members. In a similar manner to the results of the motivated and the unmotivated children, the results were in the expected direction (i.e. individually-trained children showed more of a decrease in problem behavior after the program than the group-trained children). However, the teachers' and the parents' ratings of children's aggressive behavior and behavioral problems indicated that, again, the differences between the two groups were not significant.

In Chapter 3 we listed several explanations for the fact that we did not find unambiguous short-term or long-term effects of the TRAffic 8-12 program, and that we did not find differential effects for motivated versus unmotivated children and for individually-trained versus group-trained children. We do not have reason to believe that the TRAffic 8-12 program is a poorly developed program. Theoretically speaking, the program should be effective in reducing aggressive behavior, as the theories on which the training techniques are based have been proven to have scientific value. How, then, did we not find (long-term) effects of the program? The studies that are described in part II of this thesis can be considered a search for answers to this question.

7.1.2 Part II Beyond the Tip of the Iceberg: Considering Program Implementation and Sustainability, Children's Motives and Impact of Classroom Context

In part II of the thesis we looked beyond the program outcomes (the 'tip of the iceberg'). We focused on three issues that could help explain the absence of TRAffic 8-12 effects: 1) the implementation of the program, the sustainability of the training techniques and the influence of school contextual processes, 2) the children's motives for behaving aggressively, and 3) the impact of the classroom context on the children's aggressive behavior. The choice for these three issues was motivated by an alternative conceptualization of intervention and behavior change. In Chapter 1 we explained that the traditional approach, namely that of intervention as a medical model that cures static problems such as aggressive behavior, is problematic. This approach does not do justice to the complexity of behavior change, which is by nature a process that unfolds in a complex interplay between person (i.e. the child) and context (Lichtwarck-Aschoff & van Geert, 2004). Therefore, we adopted a contextual model of intervention (Wampold & Bhati, 2004) and a dynamic systems approach to behavior change (Lichtwarck-Aschoff & van Geert, 2004).

First, in Chapter 4, we performed a qualitative study of the program trainers' implementation of the TRAffic 8-12 program and the teachers' implementation and sustainability of the TRAffic 8-12 training techniques outside and after the program meetings. The quality of program implementation has been proven to have an important impact on program outcomes (Domitrovich & Greenberg, 2000; Durlak & DuPre, 2008). Also, a degree of sustainability is essential in achieving long-term results of intervention programs. Furthermore, we considered the underlying

processes that occurred in the schools and that affected program implementation and sustainability. We argued that these processes need to be captured because program implementation and sustainability are influenced by interactions within the school context (i.e. children's teachers, peers in the classroom, available resources) (Cartwright, 2009; Lichtwarck-Aschoff & van Geert, 2004). We introduced the phenomenon of the 'context-dependency of causality', explaining that intervention program elements are only effective with, or via, factors external to the intervention program itself.

We registered the implementation and sustainability process by keeping a journal with personal observations and by interviewing the program trainers and the teachers. The study showed that the program trainers' implementation of the TRAffic 8-12 program was hampered by difficulties in managing the behavior of the children trained in groups and by reduced motivation of the trainers to carry out the program. Several factors in the school context appeared to be responsible for these findings. The children's behavior in the group sessions proved to be dependent on the presence or active involvement of the children's teachers, who are an essential part of the child's natural context. Furthermore, the limited availability of the required resources (time, substitution of teachers, and space) in the school context influenced the program trainers' motivation to carry out the program. With respect to the sustainability of the TRAffic 8-12 training techniques, the study showed that the teachers were not motivated and not capable enough to implement and sustain the techniques outside and after the program meetings. Instead of the techniques themselves, individual processes within the teacher appeared to play a crucial role. The teachers expected to see immediate improvements in the behavior of the children who participated in the TRAffic 8-12 program, and they were disappointed when this was not the case. In Chapter 4 we discussed how teachers view their own role with respect to the development of children's behavior at school, and we concluded that several conditions need to be met in order to convince and motivate teachers to invest in children's social-emotional development. In sum, the results of the implementation and sustainability study all pointed to one conclusion: In Cluster 4 education the children's teachers are crucial. In the TRAffic 8-12 project, much more effort should have been made to involve teachers in the choice for the program and in the implementation of the program, to support teachers in finding ways to integrate the TRAffic 8-12 training techniques into their existing classroom

practices, and to provide feedback on teachers' efforts to improve the children's behavior.

Second, in Chapter 5 we studied the children's perspective on their own aggressive behavior. We wanted to gain more insight into the children's motives for behaving aggressively. The children were interviewed with an inner logic interview instrument (Singer, Doornenbal & Okma, 2002). The inner logic of children refers to how they view the situation in which they are acting; what they do in social situations (social actions and emotion regulation); what their goals, concerns and emotions are; how they regulate their emotions and how they view the emotions and concerns of their opponents.

Contrary to the much-used dichotomy of reactive and proactive aggression (Crick & Dodge, 1996; Merk, 2005; Orobio de Castro, 2004), we found a more differentiated picture of five profiles of inner logic. Children reported using aggression to create understanding for their situation, to escape from the conflict situation, because of inner conflicts, for revenge, and for the fun of bullying. These results indicate that children can have different motives for behaving aggressively, requiring different approaches in terms of intervention instead of one general approach such as the TRAffic 8-12 program. A striking example of possible counterproductive effects of the TRAffic 8-12 training techniques is Kevin. He reported using aggression for revenge and to settle the power balance. Kevin did not use the 'think-time' of the Stop sign technique to think of alternatives to aggression, but instead used it to build up anger and 'explode'. This is an example of how there can be a serious mismatch between a child's motives and the techniques of an intervention program. We suggested that children like Kevin probably need individual support and cannot be helped in group sessions of programs such as TRAffic 8-12.

Third, in Chapter 6 we considered the impact of the children's classroom context and confronted this impact with the effects of the TRAffic 8-12 program that were studied in Chapter 3. We hypothesized that the children who transferred from special to regular education would show a change towards less aggression. This was hypothesized because of the relatively fewer accounts of negative peer group effects in regular education. We also assumed that the influence of the social skills intervention context on the children's aggressive behavior would be weaker than the influence of the classroom context. A child spends more time in the classroom than

in the intervention group and the classroom is also a more familiar and structural element of the child's environment than the intervention context.

As we already concluded in Chapter 3, the social skills intervention program TRAffic 8-12 did not have differential effects for group-trained versus individually-trained children. Also, there were no long-term results of the program for the children who stayed in Cluster 4 education. However, a change toward less aggression was found in children who transferred from special to regular education. Based on these results we discussed the importance of addressing the fit, or misfit, between a child and the contexts in which the child functions (Vermeer, 2007). Attempts toward changing the child's behavior must therefore not focus on the child alone, as in the case of the TRAffic 8-12 program. Instead, changing the context and explicitly taking into account how certain contexts work for the child must be an essential part of any intervention program that aims to permanently change behavior.

7.2 Discussion of Practical and Research Implications

7.2.1 Implications for School Practice Settings and Intervention Program Development

Because we looked 'beyond the tip of the iceberg' in this thesis, we gained essential insights into possible reasons for the absence of TRAffic 8-12 effects. We still believe that the TRAffic 8-12 program can be effective for a subgroup of children with aggressive behavioral problems. To achieve this, our studies showed that several conditions need to be met or must be considered in order to successfully implement a school-based social skills intervention program such as TRAffic 8-12.

First, school practice settings that wish to implement an intervention program need to be made aware of the efforts that are necessary to secure a successful implementation of the program and sustainability of the program elements (Domitrovich & Greenberg, 2000), and they need to be supported in achieving this as well (Han & Weiss, 2005). Schools are not primarily organized to facilitate the implementation of intervention programs. This fact is often overlooked, which results in an implementation of the program that is not optimal and in disappointing results. The institution that releases an intervention program and trains teachers to implement the program should provide a type of 'support program'. In this support program the following issues should be addressed: 1) Screening of compatibility between the essentials of the program and the problems that the school and the teacher want to target, 2) support and feedback for teachers on how they apply the training techniques and what the effects of their efforts are on the

children's behavior, and 3) continued support for teachers after the program on how to integrate the training techniques with their existing classroom practices.

Second, individual differences between children should be taken into account in the development of child-focused intervention programs (Nangle, Erdley, Carpenter & Newman, 2002). The study of children's narratives, for example, showed that children use aggression for different reasons, requiring different approaches. Certain training techniques are not effective for all children. The effective Zippy's Friends program (see for example Clarke & Barry, 2010; Van den Berg-de Ruiter, Roovers & Panis, 2009), which is focused on teaching children coping skills, is a program that does not teach children exactly how to act in certain (difficult) situations. Instead, children are supported in finding the right coping methods that work for them specifically. This is a good example of the way in which intervention programs can be adapted to individual differences between children.

Third, in the development of school-based programs such as TRAffic 8-12 the influence of the school context in which children operate daily should be considered (Clarke, O'Sullivan & Barry, 2010; Cohen, Hsueh, Russell & Ray, 2006; Farmer & Xie, 2007; Ringeisen, Henderson & Hoagwood, 2003). From the dynamic systems perspective that we adopted in this thesis, we repeatedly stated that children's behavior is not only the product of certain mechanisms in the child (e.g. lack of social skills, poor emotion regulation), but also the product of a reciprocal interaction between the child and the daily context of the child. So, in school-based intervention programs children's problematic behavior should not be considered to stand 'on its own'. Their behavior is, for example, co-determined by the behavior of the (other) children in the classroom (Barth, Dunlap, Dane, Lochman & Wells, 2004; Kellam, Ling, Merisca, Brown & Ialongo, 1998; Thomas, Bierman & The Conduct Problems Prevention Research Group, 2006). Certain children might always react aggressively because other children know exactly how to provoke these children out of the teacher's sight. Therefore, an intervention program should not just target the problematic behavior of particular children (e.g. focusing on how to control anger), but also the behavior of the other children in the classroom (e.g. focusing on teaching rules about how to interact with each other).

The teaching style of the teacher is another important 'component' of the school context that co-determines children's behavior. In general, teachers who experience difficulties with the behavior of certain children in the classroom look for solutions 'outside themselves', for example in the form of a social skills intervention

program. The program is assumed to be the method for solving the problem with the particular children that show problematic behavior. The role of the teacher is thereby overlooked. From the implementation and sustainability study described in Chapter 4 we concluded that children's teachers are crucial for the achievement of long-term effects in an intervention program. They need ongoing and intensive support to integrate a program's training techniques into their classroom practices in a sustainable way. The point we want to make here is that, in addition to attention to the integration of particular training techniques in a teacher's classroom practice, considering the teaching style of the teacher in general also contributes to the improvement of children's behavior. In school, teachers are the children's central change agents (Louwe & van Overveld, 2008). Their pedagogical thinking and actions have a big influence on children's behavior. Louwe and Van Overveld (2008) point to the many television programs about child-rearing problems in families that show the importance of educators' pedagogical thinking and acting when influencing children's behavior. In school, teachers are crucial in teaching children how to interact with each other, for example by behaving as a role model or by setting rules and ensuring that children keep to these rules in a consequent manner with the use of a well-thought-out reward system. This seems to be stating the obvious, but the set-up of most social skills intervention programs fails to underline the role of the teachers (Louwe & van Overveld, 2008). Instead, the focus is on teaching children new skills. In reply to the findings of the studies presented in this thesis, we developed a teacher-focused, web-based program that is aimed at providing teachers with tools to improve children's problematic behavior via their own pedagogical action repertoire. In section 7.3 this program is described.

Finally, we would like to stress the importance of more attention for the socio-emotional development of children in schools. Elias, Zins, Graczyk and Weissberg (2003) point to the fact that "the focus of schools on test scores in reading and math has clouded an understanding of the interrelationship between academic and social-emotional learning". Schools are primarily focused on the academic development of children (Massey, Armstrong, Boroughs, Henson & McCash, 2005). There are several arguments that plea for a stronger focus on children's socio-emotional development as well. Teaching children socio-emotional skills and improving their well-being is as important as teaching academic skills, because both skills are needed for being successful in life. As Elias, Zins, Graczyk and Weissburg (2003) state: "There is a growing international recognition that

education must …… refocus to prepare children for the tests of life, not for a life of tests". Also, academic skills and socio-emotional skills are intertwined. Children's academic performance in school is dependent on their socio-emotional well-being and vice versa (Elias, Zins, Graczyk & Weissburg, 2003). This intertwining of 'components' (i.e. skills, capabilities, development areas) within a child's system is typical for the dynamic systems approach (see for example Van Geert, 1998). In this approach, the relationship between a system's components is described as either supportive (growth in one component supports growth in another one), competitive (growth in one component is related to decline in another one), or neutral. In this case, the relationship between children's academic performance and their socio-emotional skills can be described as mutually supportive. Thus, children's academic performance will benefit from investments in their socio-emotional development (and vice versa). Wilson, Gottfredson and Najaka's (2001) meta-analysis of the effects of school-based intervention programs supports this notion: The programs that focused on socio-emotional learning resulted in improved outcomes of factors related to school success. Finally, the recent developments in the Netherlands towards more inclusive education for children with disabilities ask for higher investments in preparing teachers in regular education to cope with these children. Regular school teachers perceive the children with behavioral and psychiatric problems as the hardest group to deal with.

7.2.2 Implications for Research

In effectiveness research the dominant method is the Randomized Controlled Trial (RCT). It is a quantitative method in which large groups of children who receive a particular treatment are compared with a control group of children who do not receive the treatment. Simply stated, if the treatment group shows an improvement in the targeted behavior and the control group does not, then the treatment program receives the label 'evidence-based'. The label implies that the program works; it 'cures' the problem that is targeted. This type of research is also called 'evidence-based practice' (Van Yperen, 2005). Politicians, organisations that subsidize intervention research, intervention researchers and clinicians are all 'on the hunt' for evidence-based intervention programs.

A problem with the evidence-based approach is that very large samples are needed in order to make sound conclusions about the effects of the intervention. Only large samples can outweigh the variability within the sample. In most evidence-

based studies the researcher does not have such large samples. Furthermore, the evidence-based approach reveals little about how an intervention program works in different practice settings and for individual children (see, for example, Cartwright 2009; 2010). Contrary to the quantitative and evidence-based practice approach is a more qualitative and practice-based evidence approach, which allows for the complexity of developmental phenomena such as (changes in) children's behavior (Granic & Hollenstein, 2003). In the latter approach, for example, mechanisms of change in small groups of children who participate in an intervention program are monitored closely and extensively by using observation or interviews, or program trainers keep diaries of the treatment process. This type of research method is typical for the dynamic systems approach. It gives essential insights into change processes, and it can provide answers to the often differential effects of intervention programs. Our studies of the implementation and sustainability of the TRAffic 8-12 program and of the children's narratives of aggressive behavior are examples of that approach.

In sum, we believe that the value of RCT's needs more nuance. Understandably, certain groups, such as policy makers, need to know whether a certain program is beneficial for a large group of children in order to make their policies. However, RCT's do not give insight into how and why intervention programs work for whom, and under what circumstances. Therefore, more qualitative reports are also needed.

The quantitative - evidence-based practice versus qualitative - practice-based evidence dichotomy derives from a static versus a dynamic approach of behavior (change) (Lichtwarck-Aschoff, 2008). Evidence-based practice with its quantitative methods implies a static approach, as the outcome variable (i.e. aggressive behavior) is associated with the independent variable (i.e. the aggression reduction intervention program). If we want to capture the nature of the change processes that occur as the result of the implementation of an intervention program, then we need to adopt a dynamic approach (Granic & Hollenstein, 2003). This approach allows us to study how, in time (e.g. during an aggression reduction program), the state of a system (e.g. a child with high levels of aggressive behavior) evolves to another state (e.g. a child with lower levels of aggressive behavior). This approach gives insight into the mechanisms that account for change in individual children who participate in intervention programs.

A growing number of researchers in developmental and clinical psychology have started to adopt the dynamic systems approach (see, for example, Carriere,

2009; De Weerth & van Geert, 2002; Fogel, 2001; Gottman, Swanson & Murray, 1999; Granic, Hollenstein, Dishion & Patterson, 2003; Kunnen & Bosma, 2000; Lichtwarck-Aschoff, Kunnen & van Geert, 2009; Steenbeek & van Geert, 2007; Van Geert & van Dijk, 2002; Van Geert & Fischer, 2009). These researchers build dynamic models with which they try to explain how changes in behavior occur. In the field of (childhood) aggression research, dynamic systems methods have been applied to studies of antisocial development in children and the role of coercion (Granic & Patterson, 2006), the joint influence of children's impulsivity and relationships with peers on growth in behavioral problems (Snyder, Prichard, Schrepferman, Patrick & Stoolmiller, 2004), the influence of friendship on antisocial behavior from childhood into adulthood (Dishion, Nelson, Winter & Bullock, 2004), and the relationship between rigidity and development of problem behavior (Hollenstein, Granic, Stoolmiller & Snyder, 2004). Dynamic systems methods are also increasingly being applied in the field of intervention research, for example in studies of change in cognitive therapy for depression (Hayes & Strauss, 1998), clinical case formulation (Schiepek, 2003), and how parent-child interaction changes with intervention (Granic, O'Hara, Pepler & Lewis, 2007). In the present research project we also began building a dynamic model. In section 7.2.3 a preview of the preliminary work that has been done so far on building a dynamic model of aggressive interaction between two elementary school children is presented.

Finally, another and well-discussed dichotomy in the field of intervention research is the debate on specific factors (i.e. the medical model) versus common factors (i.e. the contextual model) (Van Yperen, van der Steege, Addink & Boendermaker, 2010). From the dynamic systems perspective this distinction does not seem very useful, for both the specific training techniques and common factors such as the relationship between the trainer and the child are considered part of the intervention system and cannot be considered separately. For example, the training technique of the Stop-Think-Do method may only become effective for a child if the teacher is able to explain the method to the child in a correct and adaptive (to the child's developmental level and the child's perception) way and if the teacher supports the child in using the method in real life situations.

Until now, many researchers and practitioners believed that only the specific factors of an intervention program (i.e. the particular training techniques, the contents of the program) lead to changes. A growing body of evidence (e.g. Duncan, Miller, Wampold & Hubble, 2009; Wampold, Ahn & Coleman, 2001)

shows that more common factors, such as the personality of the therapist and the relationship between the therapist and the client, also determine the outcomes of an intervention program. The results of the studies described in part II of this thesis support the theory of the presence of common factors that co-determine the outcomes of the TRAffic 8-12 program. The implementation study showed that for the children in Cluster 4 education the presence or active involvement of their teachers was very important for a successful implementation of the program. This finding corresponds with the significance that is ascribed to the person of the therapist in the contextual model (Wampold, Ahn & Coleman, 2001). The study of children's inner logic showed that children have different motives underlying their aggressive behavior. Although we did not test whether different motives of children resulted in different outcomes of the program, one can imagine that children who like to bully other children might benefit less from the TRAffic 8-12 program (as they have less motivation to change) than children who use aggression to defend themselves, but feel guilty about it. Again, the findings from this study correspond with a common factor in the contextual model, namely the fit between the rationale of the treatment and the problems that the client experiences.

In the Netherlands, the issue of the importance of the specific versus the common factors is hotly debated. However, based on a dynamic systems approach to intervention and on the growing body of evidence that both specific and common factors are relevant to intervention outcomes, it must be concluded that both factors are important (Van Yperen, van der Steege, Addink & Boendermaker, 2010). In the Netherlands most practitioners and intervention researchers still focus too much on the (effects of the) specific intervention program that is meant to solve the problem. What is needed is a better understanding in practice settings of the *interplay* between both the common and the specific factors of an intervention program.

7.2.3 Dynamic Modeling as a Research Tool: A Dynamic Model of Aggressive Interaction

In this section we present our first steps in building a dynamic model of aggressive interaction between two children. With the model we aim to provide insight into how the (aggressive) behavior of a child unfolds in real time, step by step, in interaction with other elements in the system such as peers or adults. Knowledge of the mechanisms of real time development of aggressive behavior in children can make a significant contribution to the development of aggression

reduction intervention programs. Before we explain the model, we will first introduce the concept of dynamic modeling.

A dynamic systems model is defined as a set of interacting elements (e.g. two children and their context, each with particular characteristics) that influence each other mutually over time. The state of a system at one moment in time is determined by the characteristics of those elements (i.e. the values of certain variables). The state of the system at a next moment in time is a function of (the elements of) the system in the previous moment. The first step in building a dynamic model is to describe the process in the form of a conceptual model. This means that the relevant variables of that process and how they influence each other mutually must be determined. The next step consists of translating the conceptual model into a mathematical model that is able to produce an output (i.e. types of change processes or trajectories) that corresponds with the theory of the conceptual model. Finally, the conceptual model must be empirically tested.

The development of aggressive behavior in children can be modeled in different ways, depending on the particular phenomenon that is to be studied. A developmental phenomenon can, for example, be modeled across different time scales, varying from years, to months, to days, to seconds (Lichtwarck-Aschoff, 2008). At the so-called macro level long-term developmental changes and trajectories are modeled, while at the micro level short-term actions and interactions are modeled. Obviously, the two time levels are related, meaning that changes in, for example, short-term interactions between a child and its environment will result in changes in the long-term development of the child. Thus, in a fully developed dynamic model the two time levels are related to each other. In our model we first focus on how the (aggressive) behavior of two children unfolds during a short-term interaction, with the intention of modeling how an aggressive interaction starts, unfolds, and finally how the aggressive interaction stops. For that purpose, we chose to use an agent model that models the interactions between real agents (i.e. people) and their environment (Steenbeek, 2006). In our model the agents are two children and the environment is the school context consisting of the children's classmates, the teacher, et cetera. These are the elements of the dynamic system. Changes in the system are the result of interactions between relevant characteristics of the two children and their school context. These characteristics (which include, for example, the degree of impulsivity of the children or the degree of aggression in the environment) form the variables of the dynamic system. Dependent on the values of

those variables, the system is in a certain (stable) state. Aggression develops through spontaneous interactions between the system's elements.

In Figure 1 we display how the behavior of two interacting children and their school context influence each other mutually in two time steps. The behavior of child 1 at time t influences the behavior of child 2 at time t and vice versa. Both children's behavior at time t is also influenced by the school context at time t, and they influence the school context as well through their behavior. At time $t+1$ the behavior of child 1 and child 2 is influenced by their own behavior at time t, by the behavior of the other child at time t and by the school context at time t. The school context at time $t+1$ is also influenced by both the school context, the behavior of child 1 and the behavior of child 2 at time t.
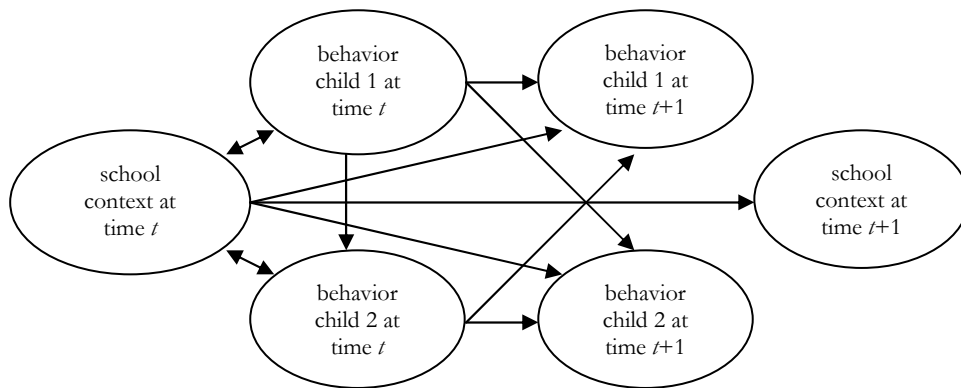
Figure 1. Diagram of an agent model with two time steps.

On the basis of existing theories on aggressive behavior in children and our own empirical findings, we began the conceptualization of our dynamic model. We chose the variables that seemed most relevant to the phenomenon we wanted to model (i.e. the beginning, the course and the end of an aggressive interaction between two children in the school context), and we began by determining how these variables interact with each other.

With respect to the child's behavior we chose the following variables. First, each child has a certain *behavioral repertoire* that is formed by previous experiences (for

example, aggression produces positive results), family influences (e.g. deviant parenting), and the number of aggressive role models. This is the behavioral part that is determined by social-learning mechanisms (Bandura, 1978). The chance that a child will (re)act aggressively towards another child during an interaction is higher if the child possesses a highly aggressive behavioral repertoire, consisting mostly of aggressive strategies and almost no prosocial strategies, than if the child possesses a behavioral repertoire with mostly prosocial strategies.

Second, each child has a certain *level of impulsivity*. Impulsivity has been proven to be related to aggression, in particular to reactive aggression (Dodge, Lochman, Harnish, Bates & Petitt, 1997). Children who are highly impulsive will be quicker with an aggressive (re)action than children who are low in impulsivity.

Third, children's aggressive behavior is determined by the way that they regulate their *emotions*. Children who are less skilled in regulating their emotions show more reactive aggressive behavior (Little, Jones, Henrich & Hawley, 2003). Additionally, children with a strong temperament and children who are easily frustrated show more aggression (Berkowitz, 1989; Crick & Dodge, 1996).

Fourth, the child's *perception of the situation* determines the aggressiveness of the (re)action of the child. Children differ with respect to when they interpret the behavior of the other child as a trigger to aggress. Some children, such as those with distorted cognitions (e.g. the hostile attribution bias; Crick & Dodge, 1996), easily interpret the behavior of others as a trigger to aggress, which makes them negatively biased with respect to their reaction. They react with more aggression to the behavior initiative of another child than children with a 'correct' perception of the situation. Other children, such as those with a disorder on the autism spectrum, might interpret an aggressive behavior initiative of another child as less aggressive than it actually is, which makes them positively biased in their reaction.

Finally, children's *concerns* are important drivers of behavior (Frijda, 1986; Visser, Singer, van Geert & Kunnen, 2009). Children have different personal and social concerns or motivations underlying their behavior. A child who wants to avoid conflicts reacts with less aggression to an aggressive behavior initiative of another child (positive bias) than a child who wants to dominate the other child, making him or her react with more aggression (negative bias). Children's concerns are determined by previous experiences, but they are also dependent on the specific context (in this case the school context) the child is in. In an interaction a child evaluates what his or

her reaction will mean with respect to the balance between 'gain'[33] and 'loss'[34] in the specific context. For example, in a classroom a child will have less motivation to aggress because, contrary to a situation on the playground, there is also a greater risk to be caught and be punished by the teacher (i.e. there is more loss than gain). Another example might be that a child perceives the behavior initiative of the other child as aggressive, but because the child is afraid of the other child (i.e. there is more loss than gain) the child decides, in this particular situation with this particular child, in favor of an appeasement strategy (i.e. reaction with a positive bias).

Above we listed the variables within the child that, at time t, determine the probability that both child 1 and child 2[35] will show an aggressive action. Factors in the school context also influence this probability. First, many (aggression provoking) *cues* in the context result in higher chances of aggression. The number of cues in general influences the arousal of a child – the more cues, the higher the arousal, and the sooner a child will (re)act aggressively (Zillman, 1988; 1994). Video observations that were made of one classroom of boys who participated in the studies of this thesis[36] confirm this notion. In school situations with a limited number of cues (e.g. doing work in the classroom) there were considerably fewer aggressive interactions compared to situations with many cues (e.g. free play time on the playground). Not just the number of cues in general, but also the type of cue influences the chance of aggression. In Chapter 6 of this thesis we showed that contexts high in aggression (i.e. many classmates who show aggressive behavior) have a potentially negative influence on the behavior of individual children (i.e. more aggressive behavior).

Second, the children's *teacher* is an important variable in the school context that influences the aggressive behavior of the children. Some teachers tolerate more disturbing behavior than others. Also, some teachers are less attentive than others with respect to how children interact with each other. In children with these types of teachers the chance of aggressive (re)actions is higher. The influence of the teacher also depends on the specific school situation. In a classroom the teacher has more opportunity to control children's behavior than on the playground, where children have more freedom and where there is a higher chance of them being out of the teacher's sight.

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[33] Gain: if the child reaches its goal, which can be variable (domination, fun, revenge, escape).
[34] Loss: if the child gets further away of reaching its goal.
[35] From the diagram in Figure 1.
[36] These observations are not presented in the thesis.

The variables listed above form so-called parameters; they are adjustable, dependent on the type of interaction you want to model (i.e. the type of children and the type of context). The model will *start* with an interaction initiative of one child, determined by the factors within the child (the child variables), the behavior of the other child, and the specific school context at that moment, and applies only to the first behavior of an interaction series. It represents, for example, a child who: 1) hits another child on the head while passing the child in the classroom, or 2) kicks another child on the playground, or 3) asks another child to play with him, or 4) pulls a child to the playground to encourage him to play along.

The *course* of the interaction between the two children is determined as follows. The basic property of the reaction is that it is, in principle, symmetrical (e.g. you hit me – I hit you; you hit me hard – I hit you hard) (Cairns, Santoyo & Holly, 1994; Chermack, Berman & Taylor, 1997). Individuals can differ in terms of biased symmetry, with a positive bias (you hit me hard – I hit you less hard) or a negative bias (e.g. you hit me hard – I hit you harder). The first bias leads to appeasement, and the second leads to escalation (in principle). Thus, there are three possibilities with respect to the reaction of one child to the behavior initiative of the other child: A 'correct' reaction (the reaction is of the same kind/intensity/form), a positively biased reaction (the reaction is less aggressive), and a negatively biased reaction (the reaction is more strongly aggressive). Whether or not the reaction is biased depends on the factors within the reacting child (the child variables) and on the school context. For example, with a child with an aggressive behavioral repertoire and who is easily frustrated there is a high chance of a negatively biased reaction to a neutral tap on the shoulder from another child while playing soccer on the playground.

The *end* of the interaction between the two children is determined in two ways. First, as we observed in our videos, in many cases the aggressive interaction simply stops, after, for example, five (re)actions between the two children. It seems that there is some sort of saturation within (one of) the children, probably driven by the fact that their concerns are secured. Second, the teacher might interfere and stop the aggressive interaction. The probability of interference of the teacher is determined by parameters representing the teacher's personality traits (aggression toleration and attentiveness), the specific school situation (i.e. in the classroom the probability of a teacher's interference is higher than on the playground) and the duration of the interaction of the two children (the longer the interaction, the higher the probability that the teacher notices the children and interferes).

In this section we have presented a preview of the development of our dynamic model of aggressive interaction between two children in a school context. With this model we aim to determine which mechanisms account for the occurrence, course and the end of aggressive interactions. Dynamic modeling gives us the opportunity to test our assumptions about the interplay between the child and the school context in the development of aggressive behavior (e.g. the interplay between children's concerns and the specific situation). With the conceptual model (that still needs further development) we have only described the process. With a mathematical model we must be able to generate a plausible output, given the input of the model. This will be a first, internal validation of the model. After that, the model must be validated externally by comparing the output of the model simulations with empirical data.

7.3 A Teacher-Focused Aggression Reduction Program: Grip op Gedrag

7.3.1 Motivation for Development of the Program

The findings of the present thesis inspired us to develop a new type of aggression reduction intervention program[37], called *Grip op Gedrag* (Grip on Behavior). The program is focused on strengthening the teacher's skills in dealing with children's behavioral problems at school. The program's training techniques are based on general principles of basic communication and they are derived from existing aggression reduction intervention programs. This means that the techniques themselves are not new. In our opinion, many potentially effective methods and techniques have been developed in recent years. They are embedded in accepted developmental theories. Given this theoretical and empirical support, the techniques should be effective in reducing children's behavioral problems. However, as we concluded in the present thesis, a review of all the school-based intervention programs reveals highly ambiguous results.

The results of the studies in this thesis give insight into what is needed to accomplish positive results with existing training techniques. An important aspect is that we need to focus more on elements of the interaction between child and context, instead of on children's skills alone. All children's behavior is provoked and maintained by interactions between the child and the environment (see, for example, Fogel, 1993; Sameroff & Chandler, 1975; Van Geert, 1998). In Figure 2 we present

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[37] The development of the program is made possible with a grant from ZonMw.

our analysis of the problems with existing aggression reduction programs together with the assumptions that meet these problems and that form the basis for the development of the new program. We believe that if we implement existing training techniques that have been proven to be effective in such a way that they match with the specific child, teacher and context, they will be more effective than they are now.

7.3.2 Development and Contents of the Program

The program *Grip op Gedrag* has been developed by the University of Groningen and the University of Applied Sciences Inholland, in co-operation with an education support centre in Groningen (*ABCG*) and five teachers from three different elementary schools. It is a web-based program, which means that it will be (freely) available on the internet (via the web server of the University of Groningen) as soon as the development of the program is finished completely. We developed the basics of the program with the five teachers. Key elements of the program are the expansion of teachers' action repertoire, a focus on solutions, goal-orientation, and inclusion of children's motivations.

Problems in existing programs	**Assumptions for the new program**
1. A homogeneous approach does not match with differences between children in behavior, cognitions, and concerns.	1. The program must provide a tailor-made solution for children's problems that meets their concerns.
2. Specific techniques are only effective for particular children in particular situations.	2. The techniques must fit with the specific problems of the children.
3. Children's motives and concerns have a great influence on their problematic behavior, but they are overlooked in the development of intervention programs.	3. Children's concerns must be taken into account.
4. There is no transfer of learned skills to daily situations.	4. The program must be appropriate for direct application in the classroom.
5. Problems with program implementation in schools can lead to reduced motivation with the program implementers.	5. The application of the program should be based on the specific goals of the teachers.
6. Programs are solely focused on changing children's behavior, while the school environment as a whole must be taken into account.	6. The program must not just focus on the child, but also on elements in the school environment that contribute to the problematic behavior of the children (e.g. other children, non-effective teaching procedures).

Figure 2. Analysis of problems with existing aggression reduction programs and assumptions for the development of the new program.

The program consists of interview questions and observation methods for the teacher that clarify the problem, the goals, the needs and concerns of both teacher and child(ren), and the possibilities concerning working on the problem. Based on the information that the teachers fill in on the website forms, advice follows for the teacher focused on improving the behavior of the child. Directions with respect to implementation of the techniques in the classroom are also provided. Additionally, in the program teachers are asked to monitor the behavior of the child(ren) in order to be able to examine whether the advice is effective in improving the child(ren)'s behavior. Finally, the teacher completes an evaluation.

As we said before, the contents of the advice that the program produces is not new. It is based on existing techniques, used in intervention programs or methods that have been proven (partly) effective. The program is novel in the sense that it provides instructions for *the teacher* on how to *implement* the techniques in *daily situations* and with *different children*. The advice consists of a general section in which the teacher is provided with very concrete techniques to improve his or her general interaction, didactic and classroom management skills (e.g. being sensitive and responsive, focusing on desired behavior, being supportive, providing structure). Teachers who posses these skills are able to provide a safe classroom environment, which is important for the academic and socio-emotional development of all children at school. For children with behavioral problems such an environment can be considered an essential and basic condition needed for them to function in a classroom. The techniques are derived from methods such as Video Home Training, which is focused on parents' basic communication skills and strengths that already exist in the family.

The advice in the program also consists of a specific section that matches with the goal that the teacher has formulated in the program. This means that the program is primarily focused on the teacher's goal with respect to improving the behavior of a child. This makes the program distinguishable from other aggression reduction intervention programs that mainly focus on changing children's behavior without considering the teacher's role. The techniques in this section of the advice are based on methods frequently used in existing intervention programs aimed at improving children's behavior (e.g. *Zelfcontrole, Equip, Minder boos en opstandig, Programma Alternatieve Denkstrategieeen, Taakspel, Leefstijl*[38]). Examples of the techniques

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[38] Most of these programs are described shortly in Chapter 1, section 1.3.3.

are: Modelling positive behavior, reinforcement of desired behavior and the Stop-Think-Do method for the control of impulsive behavior. These methods have been proven effective for subgroups of children, under the condition that they are optimally implemented. Again, the program provides concrete advice on how to implement the techniques with specific children. Additionally, the effective No Blame method, focused on reducing bullying behavior, is included in the program.

7.3.3 First Results of the Program

The five teachers who co-developed the program also implemented the core elements of the program with one or more children in their classroom. We evaluated the first version of the program with them.

Most teachers thought that there was a good fit between the problems they experienced with one or more of the children and the advice given by the program. In most cases the implementation of the advice resulted in a reduction of the children's behavioral problems. The focus on strengthening the teacher's pedagogical action repertoire instead of the children's skills was evaluated positively. The following elements were mentioned by the teachers as being most effective: A positive approach to the children's behavior, focus on the children's desired behavior, being consequent in applying the rules and active involvement of children in the solution of the problem. All teachers indicated that they were already familiar with the techniques of the program, but that the systematic way in which the advice was described and the fit between the problems and the advice was a surplus. Additionally, they were better able to implement the techniques of this program in a sustainable way in their classrooms than the techniques of intervention programs that they had implemented before. According to the teachers, the fact that the techniques of the *Grip op Gedrag* program were described in such a way that they were easily and directly applicable in the classroom played a role in this. Finally, the teachers evaluated the positive formulation of goals (i.e. directed at the behavior that is wanted) as very useful. It made them aware of the impact that their 'mindset' (focus on the positive versus focus on the negative) has on the children's behavior.

The implementation of the program with the five teachers revealed two preconditions for implementation success. First, the support of an internal supervisor of the school is considered very important. Such a colleague can function as a sound board, give feedback, make observations, and motivate the teacher. Second, the teacher has to believe in the rationale of the program, namely that the

teacher can have a positive impact on the children's behavior by reconsidering his or her pedagogical action repertoire.

7.4 Final Remark

The research project that forms the basis of this thesis started off as an intervention study with a classical approach. Our aim was to improve the understanding of the effectiveness of the social skills intervention program TRAffic 8-12. The effect study showed that the program was not effective in reducing the aggressive behavior and behavioral problems of the participating children. This finding has led us to broaden our look and to focus not only on the program itself. Three different studies have shown the importance of the context in which a program is implemented and in which children operate daily, and of children's concerns that play a crucial role in the behavior that we want to change in intervention programs. The findings from these studies provided us with some important implications with respect to future intervention program implementation and development. Additionally, our look 'beyond the tip of the iceberg', which comes down to a more qualitative and system-oriented approach, showed the need for more extensive research designs than the RCT's that are currently the dominant research method in effectiveness research. Finally, we used the knowledge gathered in this research project to develop a new aggression reduction program, in which the teacher has a central role as 'change agent' of children's problematic behavior.

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Appendices Chapter 6

Appendix 6A. The Intervention Program

TRAffic 8-12 is a Dutch intervention program for 8 to 12 year old children who experience anger and conflicts on a daily basis. It is a typical social skills program such as is often being used in schools and therapeutic settings on a daily basis. The curriculum of TRAffic 8-12 is based on social-cognitive and social-learning principles. With the use of traffic signs such as the stop sign and the rotary section children learn how to control their anger and solve conflicts in a prosocial way. Imitation, reinforcement and transfer to daily life are important components of the program. Children follow 14 one-hour sessions either in groups of six children with two trainers (Group Trained: GT) or individually with one trainer (Individually-trained: IT). We were not fully able to randomly assign children to the group or individual condition because of practical reasons such as availability of trainers and preference of teachers. However, this did not result in significant differences in aggressive behavior between the GT and IT children at baseline T0 for the whole group (p=0,21 for the total score on the Aggressive Behavior Checklist).

The program is designed for children with the psychiatric disorders Attention Deficit Hyperactive Disorder (ADHD) and Pervasive Developmental Disorder-not otherwise specified (PDD-nos). In most social skill programs ADHD and PDD-nos are considered as contraindications. Children with ADHD are assumed to disturb the proper functioning of the intervention group because of their impulsive and hyperactive behavior (Van Manen, 2001). Children with PDD-nos are assumed to experience too much unsafety in an unfamiliar group to be able to learn anything, because of their difficulties with social situations. However, also these children may show aggressive behavior and might benefit from a social skills program. TRAffic 8-12 explicitly pays attention to the problems these children have with encoding and interpreting social information. The use of visual tools plays a very important role in TRAffic 8-12, which is especially important for children with PDD-nos. There are for example 'real' stop signs and rotary sections, an anger thermometer and a DVD with examples of how and how not to react in different situations. TRAffic 8-12 trainers were therapists, teachers, and psychology trainees. They followed a three-day training in which they were taught the theory and basics of TRAffic 8-12.

Appendix 6B. Measures

Aggressive behavior was assessed using the *Agressievragenlijst* (Aggressive Behavior Checklist) completed by the teachers (Krol, 1998). It is a Dutch checklist that measures the frequency of aggressive behavior in a school setting. It contains 26 items and is divided in four subscales: Physical Aggression (5 items; e.g. The child kicks or hits other children), Verbal Aggression (6 items; e.g. The child calls names to other children), Indirect Aggression (4 items; e.g. The child gossips about other children) and Negativism (11 items; e.g. The child annoys other children on purpose). Ratings are given on a 5-point Likert-scale: (almost) never = score 0, once per month = score 1, once per week = score 2, once per one or two days = score 3 and more than once per day = score 4. Scores are determined by summing up the scores per item within each subscale. Because the number and the degree of detail of the items differ considerably among subscales, we used weighted scores (subscale scores are weighted and then summed). Cronbach's α is .84 for Physical Aggression, .89 for Verbal Aggression, .84 for Indirect Aggression and .95 for Negativism.

Appendix 6C. Analysis, Statistical Procedure

For several reasons we decided to use random permutation techniques in our statistical analysis. First of all, some children in certain intervention groups were from the same classroom, making the sample partly dependent. Second, at each assessment we were confronted with missing data and at T3 and T4 the number of assessments became quite small. Third, variations in the sample groups were quite large. All of these constraints make it very difficult if not impossible to use conventional statistical techniques. Random permutation tests are much more flexible, making it possible to work with small and dependent samples with missing data (see for example Toddman & Dugard, 2001; Boosman, van der Meulen, van Geert & Jackson, 2002). A limitation of random permutation tests is the fact that it is a relatively laborious and unfamiliar technique, which is particularly used if the data set is 'messy'. However, the requirements of conventional techniques are hardly met in real developmental studies.

In a random permutation test, the empirical distribution is compared with a random distribution that is determined by randomly reshuffling the empirical data, in accordance with the null hypothesis. This reshuffling is carried out a great number of times (e.g. 10000 times). The resulting random distribution is a close approximation of the 'exact' null hypothesis distribution of the current dataset, given all its

peculiarities, such as small sample size. In the next step of the analysis, the empirical distribution is compared with the random distribution (null hypothesis). If both distributions differ significantly from one another, we can conclude that the empirical distribution is likely to differ from the distribution expected on the basis of the null hypothesis and that the differences between the groups that were compared are meaningful.

Appendix 6D. Analysis of the Study on Intervention Group Composition

The short-term effects of TRAffic 8-12 were determined by using T0 and T1 for the session 1 children and T1 and T2 for the session 2 children (from now on called T_{before} and T_{after} which covers a period of three months). Group-trained (GT) and individually-trained (IT) children were compared with respect to their change scores (T_{after} minus T_{before}). The null hypothesis predicted no difference between GT and IT children in the way they profit from the program, or, to put it differently, no dependence of the child's change scores on the group to which the child belongs (both groups are in fact drawn from the same underlying distribution). In order to determine the long-term results of TRAffic 8-12 T_{before} and T3 (13 months) were used. Here, we only included the children who did not transfer to a regular school at T3 in order to avoid confusion between effects of the intervention program and of the change in classroom environment. Furthermore, TRAffic 8-12 effects were analyzed within groups, comparing the children before and after the program with themselves. The null hypothesis was that the program has no effect and, consequently, that it does not matter whether we measure a child's behavior before or after the program.

We also calculated the effect sizes (Cohen, 1988) because in small intervention groups large difference scores are often not significant, while in fact there might be an effect in terms of improvement of targeted behavior. We calculated the effect size (ES) for the GT and IT children as follows. For each child the aggression score before the intervention was subtracted from the aggression score after the intervention. This difference score was then divided by the pooled standard deviation (weighted average standard deviation based on aggression scores before and after the program of all trained children). The average of these outcomes

per child for the GT and IT children gave us an idea of how the proportion of a standard deviation these two groups changed during the intervention program[39].

The results of the analyses described above are discussed in Chapter 6.

Effects of Psychiatric Diagnosis and IQ

We checked the possible differential effects of TRAffic 8-12 due to the psychiatric diagnoses of the children (ADHD and PDD-nos). First, we determined the change scores of the children by subtracting the total aggression score after TRAffic 8-12 from the total aggression score before TRAffic 8-12. By means of random permutation techniques, the difference between the observed change scores of children with ADHD, PDD-nos or a combination and the same scores of children with no diagnosis was compared with the distribution of change scores. The null hypothesis is that both groups (diagnosis versus no diagnosis) have similar change scores. The results are shown in Table 1. Both children with ADHD (M=-7.83) and children with PDD-nos (M=-11.42) did not differ significantly from children without a psychiatric diagnosis (M=1.52) with respect to their change scores (p=0.48 and 0.43 respectively).

We did not further test the significance of the difference in change scores between children with a combination of ADHD and PDD-nos and children without a diagnosis, because the difference was negligible. To conclude, children with ADHD, PDD-nos or a combination of both did not profit more or less from TRAffic 8-12 than children who do not have these psychiatric problems.

Table 1
Change scores of children with ADHD, PDD-nos and no diagnosis, with p-values, before - after

			change of children without a psychiatric diagnosis (*s*) (*N*=19)	*p*
change of children with a psychiatric diagnosis (*s*)	ADHD (*N*=12)	-7.83 (17.82)		0.48
	PDD-nos (*N* = 8)	-11.42 (25.78)	1.52 (41.67)	0.43

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[39] In recent years one has come to an understanding of the meaning of the level of effect sizes (ES). Generally, an ES smaller than 0.20 is considered negligible, an ES between 0.20 and 0.49 is called small, between 0.50 and 0.79 an ES is called mid-high, and an ES above 0.80 is considered high.

By means of calculating correlations, we also tested for differential effects of TRAffic 8-12 due to the IQ of the children. A high IQ might make children benefit more from TRAffic 8-12 than children with a low IQ. The correlation between change scores (after – before TRAffic 8-12) for the whole intervention group and IQ was -0.11. For group-trained and individually-trained children separately the correlation was -0.11 and -0.10 respectively. This means that there is no relation between IQ and change in aggressive behavior; a higher IQ is not accompanied by a higher reduction in aggressive behavior.

Appendix 6E. Analysis of the Study on Classroom Composition

We investigated whether the individual trends of development of aggressive behavior change when children transferred to 1) a school of regular education or 2) another Cluster 4 school. Option 2 was included in the analysis to check whether the observed changes are due to the school transition itself (irrespective of which type of school the child was referred to), or in particular to the transition to a school of regular education. The long-term assessments were carried out later in the school year in order to make sure that the behavior the children were showing was not temporarily adjusted behavior. In our analysis we used the total score on the Aggressive Behavior Checklist. Only if results were questionable, subscales were included in the analysis.

We wanted to test whether the trend of change in aggressive behavior, calculated for the period before school transition in Cluster 4 education, showed a downward direction after a school transition. It is important to note that such trends can show considerable individual differences: some children may show a downward trend, others an upward trend and still others are likely to be constant. Thus, our test focused on the effect of the school transition on the direction and magnitude of the trend. For instance, in a child with an upward trend (before the school transition) we expected to find at least a *decrease* in the upward trend. In a child with an already downward trend, we expected to find at least an *increase* in the downward trend. In order to check the changes in observed trend before the school transition, we proceeded as follows.

First we determined the linear model of aggressive behavior for each child during the Cluster 4 education period. To test whether the direction changed following the transition, we calculated whether the aggression after transition was lower than what could be expected on the basis of the child's own trend of

aggression change. The null hypothesis was that the new environment did not add anything to the trend already initiated, and thus, that the data points after transition would organize randomly around the trend line calculated on the basis of the data points before transition. In Figure 1 we show an example of how (the signs of) the residuals before and after transition are determined for one child. This was done for each child in the sample, after which the average of the residuals after transition was calculated.
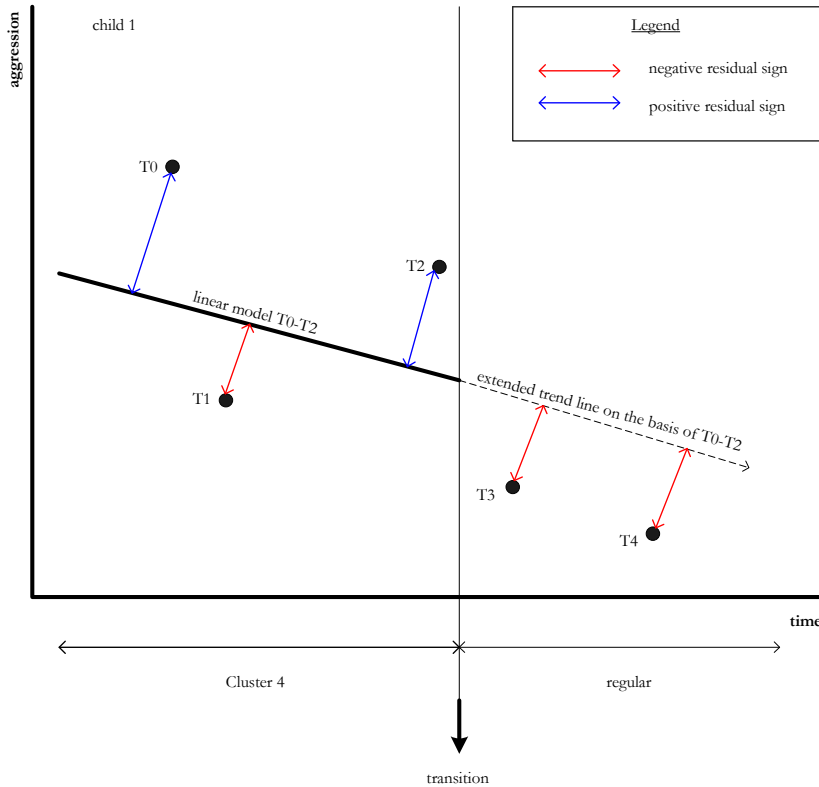

Figure 1. Graphical illustration of the method of analysis.

Null hypothesis: the data points after transition organize randomly around the trend line calculated on the basis of the data points before transition, in other words the trajectory of aggressive behavior does not change after transition to a regular school.

Alternative hypothesis: the data points after transition organize significantly more below the trend line calculated on the basis of the data points before transition compared to the data points before transition, in other words the 'trajectory' of aggressive behavior shows a significant descent after transition.

Under the assumption that there would be an equal chance of positive and negative residuals after transition compared to before, the signs of the residuals before transition were randomly permuted and each time multiplied with the absolute residuals after transition. The average of these residuals was compared with the average of the empirical distribution of residuals (after transition) with the use of random permutation tests. We repeated the analysis with an alternative null hypothesis, based on a fifty-fifty distribution of signs (there is an equal chance of a positive or a negative residual sign after school transition). We did this because the empirical distribution of signs before transition is slightly negatively biased. A fifty-fifty distribution gave us a more correct testing of the null hypothesis that the observed scores after the transition have an equal probability of falling above or below the observed trend.

The results of the analyses described above are discussed in Chapter 6.

Control Tests

Two control tests were performed using the same technique as we used in Study 1. These control tests are relevant because they may help to explain eventual changes in trends.

To control for initial differences between children who stayed in Cluster 4 education and children who transferred to a regular school, we tested whether the slopes before transition of children who transferred to a regular school differed from the slopes of children who stayed in Cluster 4 education. We justify the use of the slope as a statistical indicator of the trajectory on grounds of the fact that we had only few measurements (2 to 3) preceding the transition. With this number of measurements we must confine ourselves to describing linear regression models, which is characterized by a slope and an intercept. Instead of the intercept, we took the observed degree of aggressive behavior at baseline as an estimation of the child's initial level of aggression.

For the Stayers we calculated the slopes based on all assessments, for the Regulars and the Changers we calculated the slopes based on the assessments before transition. The random permutation test showed that the average of the slopes of the total scores on aggressive behavior did not differ significantly (p=0.23) between the Stayers (M=2.46) and the Regulars (M=-4.45). This finding implies that the children who transferred to a regular school did not show a significantly different trajectory before transition compared to the children who stayed in the same Cluster 4

education school, at least with respect to the average amount of decrease or increase in aggressive behaviors. The Changers (*M*=-4.38) also did not differ significantly from the Stayers with respect to the slope before transition (*p*=0.13).

A second control test was performed by testing whether the degree of aggressive behavior differed between the two groups at baseline T0. Combined with the information about the slopes, the second control test tells us if children who transferred to a regular school showed significantly less aggression before transition compared to children who stayed in the Cluster 4 school.

For each group we determined the average aggressive behavior score at T0 (baseline). It would have been more obvious to compare the aggressive behavior scores just before transition. However, because children transferred to other schools at different time points (T3 or T4) it was difficult to determine which values of the Stayers to compare with. The random permutation test revealed no significant difference (*p*=0.06) in aggressive behavior at T0 between the Stayers (*M*=72.42) and the Regulars (*M*=54.98). However, the result is close to significant, the Regulars obviously seemed somewhat less aggressive at baseline. The Changers (*M*=79.38) did not differ significantly from the Stayers (*p* =0.47).

It is important to note that, analytically speaking, these control tests are not necessary, because in our analysis we test whether there is a downward change after transition *relative* to the trajectory during the Cluster 4 period, irrespective of whether this trajectory is itself upward, flat or downward. On the other hand, it is still important to know if, with respect to children who transferred to regular education, we had to do with children who showed more improvement in behavior before their transition compared to children who stayed in Cluster 4 education. The results of the control tests showed that this was not the case.

Effects of Psychiatric Diagnosis and IQ

We tested whether the children who transferred to a regular school differed from the children who stayed in Cluster 4 education with respect to their psychiatric diagnoses (by means of crosstabulations) and IQ (by means of random permutation testing).

The children who transferred to a regular school did not seem to have less psychiatric diagnoses than the children who stayed in Cluster 4 education (see Table 2).

Table 2

Numbers and expected numbers of children with ADHD, PDD-nos, a combination and no diagnosis within the Stayers, Changers and Regulars groups

			Stayers	Changers	Regulars
diagnosis	ADHD	N	8	4	2
		exp N	8.2	3.3	3.4
	PDD-nos	N	6	2	3
		exp N	6.0	2.5	2.5
	combination	N	6	1	4
		exp N	6.0	2.5	2.5
	no diagnosis	N	10	6	4
		exp	10.9	4.6	4.6

χ^2 = 3.36, p=0.76

As for IQ, the random permutation test revealed that the Regulars (M=107) had a significantly higher IQ than the Stayers (M=96, p=0.06) and the Changers (M=92, p=0.04). The Stayers and the Changers did not differ significantly in their IQ (p=0.56).

To conclude, the children who transferred to regular education had a higher IQ, but the same profile of psychiatric diagnoses as the children who stayed in Cluster 4 education.

Table 2

Numbers and expected numbers of children with ADHD, PDD-nos, a combination and no diagnosis within the Stayers, Changers and Regulars groups

Nederlandse Samenvatting

In het promotieonderzoek stond de ontwikkeling van agressief gedrag bij kinderen in het speciaal onderwijs centraal. Het doel van het onderzoek was tweeledig. Enerzijds wilden we de effectiviteit bepalen van de Nederlandse sociale vaardigheidstraining TRAffic 8-12 bij 74 kinderen met agressieproblematiek in het cluster 4 onderwijs[40]. De TRAffic 8-12 training is gericht op het verminderen van agressie bij kinderen in de basisschoolleeftijd. De training is met name ontwikkeld voor kinderen met ADHD (aandachtstekort stoornis met hyperactiviteit) en PDD-nos (pervasieve ontwikkelingsstoornis, niet anderszins omschreven) problematiek. Naast de algemene effecten van het programma is het modererende effect van twee factoren onderzocht. Er is gekeken of de motivatie van kinderen om hun gedrag te verbeteren en de samenstelling van de trainingsgroepen invloed heeft op de effecten van de training. Dit effectonderzoek is beschreven in deel I van het proefschrift. Echter, een eenzijdige focus op de effecten van de training (bepaald aan de hand van vragenlijsten; het 'topje van de ijsberg') draagt weinig tot niets bij aan inzicht in hoe en waarom het (agressieve) gedrag van de kinderen wel of niet veranderde, oftewel, in wat de training wel of niet effectief maakte. Daarom was een tweede doel van het promotieonderzoek om 'verder' te kijken dan de trainingseffecten. In deel II van het proefschrift zijn drie studies beschreven die de het wel of niet effectief zijn van de training mede kunnen verklaren: 1) een studie naar de implementatie van de TRAffic 8-12 training en de continuering van de TRAffic 8-12 trainingstechnieken, 2) een studie naar de motieven van de kinderen die ten grondslag liggen aan hun agressieve gedrag en 3) een studie naar de invloed van de klassencontext op het agressieve gedrag van de kinderen. In deze samenvatting zullen we de resultaten van de verschillende studies uit deel I en II van het proefschrift beschrijven.

Deel I Het topje van de ijsberg: De effecten van de TRAffic 8-12 training

Het TRAffic 8-12 onderzoek, zoals beschreven in hoofdstuk 3 van dit proefschrift, komt tegemoet aan de behoefte aan meer onderzoek naar de effecten van Nederlandse interventieprogramma's in het algemeen (Junger-Tas, 2002; Van Overveld & Louwe, 2005). Het Nederlandse interventieonderzoek loopt achter in vergelijking met internationaal onderzoek, met name als het gaat om lange termijn

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[40] Cluster 4 onderwijs is speciaal onderwijs voor kinderen met gedragsproblemen en psychiatrische problematiek.

effectonderzoek. Daarom is in het TRAffic 8-12 onderzoek niet alleen gekeken naar de effecten (verandering in agressief gedrag) direct na afloop van de training, maar ook een half jaar en twee jaar daarna.

Theoretisch gezien is de TRAffic 8-12 training een goed ontwikkelde training. Vanuit klassiek oogpunt zouden we positieve effecten van de training kunnen verwachten. Echter, wij waren sceptisch over een blijvend positief effect van de TRAffic 8-12 training. Geïnspireerd door het dynamisch systeem denken (zie bijvoorbeeld Lichtwarck-Aschoff & van Geert, 2004; Steenbeek & van Geert, 2007; Van Geert, 2003) hebben wij een alternatieve benadering van de effectiviteit en implementatie van een interventieprogramma zoals TRAffic 8-12 geadopteerd. Vanuit het dynamisch systeem perspectief wordt de invloed van een interventie op het agressieve gedrag van kinderen gezien als een proces dat bepaald wordt door alle elementen in het systeem (bijvoorbeeld, in het geval van de TRAffic 8-12 training, door het kind zelf dat aan de training meedoet, door de kinderen in de trainingsgroep, door de kinderen in de klas van het kind, door de trainer, door de leerkracht). Al deze elementen beïnvloeden elkaar wederzijds en bepalen zo het proces van gedragsverandering. In tegenstelling tot een klassieke statische benadering van gedrag(sverandering) doet de dynamische systeem benadering recht aan de complexiteit van de ontwikkeling van gedrag van kinderen. Deze ontwikkeling vindt plaats in interactie met alle elementen in het systeem. Vanuit dit kader vroegen wij ons af of de invloed van een tijdelijk (in dit geval 14 bijeenkomsten) interventieprogramma zoals de TRAffic 8-12 training op zou kunnen wegen tegen de relatief permanente, en mogelijk negatieve, invloed van de andere, voornamelijk gedragsgestoorde, kinderen in de cluster 4 klassen. Onze hypothese was dat de TRAffic 8-12 training slechts kleine effecten zou opleveren op de korte termijn, en dat deze effecten op de lange termijn zouden verdwijnen.

Aan het onderzoek namen 74 kinderen deel. Er is een quasi-experimenteel design gebruikt, waarbij eerst de ene helft van de kinderen werd getraind en daarna de tweede helft. De leerkrachten en de ouders beoordeelden het gedrag van de kinderen aan de hand van de Agressievragenlijst (fysieke agressie, verbale agressie, indirecte agressie en negativisme) en de Vragenlijst voor Gedragsproblemen bij kinderen (gedragsproblemen gerelateerd aan aandachtstekort, hyperactiviteit, ODD (oppositioneel opstandige gedragsstoornis) en CD (antisociale gedragsstoornis). De beoordelingen vonden plaats voorafgaand aan de training, na training van de eerste groep kinderen, na training van de tweede groep kinderen, een half jaar later en twee

jaar later. In het algemeen bleek dat deelname aan de TRAffic 8-12 training niet resulteerde in een vermindering van het agressieve gedrag en de gedragsproblemen bij de kinderen, niet direct na de training en ook niet op de lange termijn. We hebben getrainde kinderen vergeleken met (nog) niet getrainde kinderen, en we hebben het gedrag van de kinderen na deelname aan de training vergeleken met het gedrag voorafgaand aan de training. In enkele gevallen vonden we een significante vermindering van het probleemgedrag van de kinderen na de training ten opzichte van daarvoor. Echter, de klinische relevantie van deze verschillen was erg klein. Er is ook gekeken naar de invloed van IQ en het hebben van een psychiatrische diagnose op het effect van de training. De gedragsbeoordelingen van zowel de leerkrachten als de ouders lieten geen relatie zien tussen deze factoren en de effecten van de training; de hoogte van het IQ vertoonde geen relatie met de mate van gedragsverandering en de kinderen zonder psychiatrische diagnose vertoonden niet meer gedragsverbetering dan de kinderen met psychiatrische diagnose. Tenslotte is onderzocht of de kinderen die later in het schooljaar vanuit het cluster 4 onderwijs in het regulier onderwijs werden geplaatst degenen waren die meer profiteerden van de training dan de groep kinderen die in het cluster 4 onderwijs bleef. De effectgrootte van het verschil tussen deze beide groepen kinderen was weliswaar het grootst van de hele studie, maar nog steeds klein te noemen. Zeker als we rekening houden met de mogelijke aanwezigheid van een positieve 'observer bias' (de leerkrachten en ouders wisten dat de beoordelingen plaats vonden voor en na de training), dan is er onvoldoende bewijs voor de conclusie dat de twee groepen kinderen klinisch van elkaar verschilden in de mate waarin zij profiteerden van de training,

Een belangrijk doel van het TRAffic 8-12 onderzoek was het verkrijgen van inzicht in het mogelijk modererende effect van de motivatie van de kinderen en van de samenstelling van de trainingsgroepen op de effecten van de training. De studie naar moderator variabelen past goed in de huidige lijn van effectonderzoek, waarbij de focus niet zozeer meer ligt op het zoeken naar algemene effecten van interventies, maar op het verkrijgen van inzicht in welke interventies het beste werken voor wie en onder welke condities (Kazdin, 2000).

De invloed van motivatie van kinderen om iets aan hun gedrag te veranderen op de effecten van een interventie komt nauwelijks aan bod in de literatuur (Bijstra & Nienhuis, 2003). Toch wordt motivatie wel beschouwd als een belangrijke algemeen werkzame factor (Van Yperen, van der Steege, Addink & Boendermaker, 2010) of moderator (La Greca, Silverman & Lochman, 2009) met

betrekking tot de effecten van een interventie. Onze hypothese was dat de kinderen die gemotiveerd waren meer zouden profiteren van de TRAffic 8-12 training dan de kinderen die niet gemotiveerd waren. Kinderen werden toegewezen aan de gemotiveerde groep als hun antwoorden op enkele interviewvragen aangaven dat zij meer sociale vaardigheden wilden leren (anders werden de kinderen toegewezen aan de ongemotiveerde groep). Ondanks dat de verschillen in gedragsverandering tussen beide groepen in de verwachte richting waren (gemotiveerde kinderen vertoonden meer vermindering van probleemgedrag dan ongemotiveerde kinderen), lieten de beoordelingen van de leerkrachten en ouders geen significante verschillen zien.

In tegenstelling tot de factor motivatie wordt de invloed van groepssamenstelling op de effecten van interventies wel veelvuldig besproken. Verschillende studies (zie bijvoorbeeld Ang & Hughes, 2001; Arnold & Hughes, 1999; Dishion, McCord & Poulin, 1999) hebben uitgewezen dat het groeperen van agressieve kinderen in interventiegroepen nadelige effecten kan hebben in de zin dat het probleemgedrag verergert. Andere studies (zie bijvoorbeeld Ang & Hughes, 2001; Mager, Milich, Harris & Howard, 2005) laten minder eenduidigheid zien in de effecten van groepssamenstelling. In onze studie is nagegaan of de eerder genoemde nadelige effecten ook op zouden treden in groepen kinderen in de basisschoolleeftijd, aangezien de meeste studies over dit onderwerp bij adolescenten zijn uitgevoerd. Daartoe is de helft van de kinderen in groepen van zes getraind en de andere helft van de kinderen individueel. De hypothese was dat individueel getrainde kinderen meer zouden profiteren van de TRAffic 8-12 training dan groepsgetrainde kinderen, omdat de individueel getrainde kinderen niet negatief beïnvloed zouden worden door het agressieve gedrag van groepsleden. De resultaten waren in de verwachte richting (individueel getrainde kinderen vertoonden meer vermindering in probleemgedrag dan groepsgetrainde kinderen), maar de beoordelingen van de leerkrachten en ouders lieten zien dat deze verschillen niet significant waren.

In hoofdstuk 3 worden verschillende verklaringen besproken voor het uitblijven van korte en lange termijn effecten van de TRAffic 8-12 training, en voor het feit dat we geen invloed hebben gevonden van de factoren motivatie en groepssamenstelling op de effecten van TRAffic 8-12. Er lijkt niet direct een reden te zijn om aan te nemen dat de TRAffic 8-12 training een slecht ontwikkelde training is. De theorieën over agressie waar de elementen van de training op gebaseerd zijn, hebben een stevige wetenschappelijke basis. Maar hoe is dan de afwezigheid van

(lange termijn) effecten te verklaren? De studies die beschreven zijn in deel II van dit proefschrift kunnen beschouwd worden als een zoektocht naar antwoorden op deze vraag.

Deel II Onder het topje van de ijsberg: Studies naar programma implementatie en continuering, motieven van kinderen en de invloed van klassencontext

In deel II van het proefschrift zijn we 'verder' gaan kijken dan de trainingseffecten, onder het topje van de ijsberg. De volgende drie onderwerpen zijn aan bod gekomen: 1) de implementatie van de TRAffic 8-12 training en de continuering van de TRAffic 8-12 trainingstechnieken, 2) de motieven van de kinderen die ten grondslag liggen aan hun agressieve gedrag en 3) de invloed van de klassencontext op het agressieve gedrag van de kinderen. De keuze voor deze drie onderwerpen komt voort uit een alternatieve conceptualisatie van interventie en gedragsverandering. In hoofdstuk 1 is uitgelegd dat de klassieke benadering, waarbij interventie beschouwd wordt volgens een medisch model (de interventie 'geneest' een statisch probleem zoals agressie), problematisch is. Deze benadering doet geen recht aan de complexiteit van het veranderen van problematisch gedrag. Gedragsverandering is een proces dat plaatsvindt in een complexe transactie tussen persoon (in dit geval het kind) en context (in dit geval de TRAffic 8-12 training en de bredere klassen- en schoolcontext) (Lichtwarck-Aschoff & van Geert, 2004). In dit proefschrift hebben wij interventie beschouwd volgens het contextuele model (Wampold & Bhati, 2004) en gedragsverandering opgevat volgens de dynamische systeem benadering (Lichtwarck-Aschoff & van Geert, 2004).

In hoofdstuk 4 van dit proefschrift is een kwalitatieve studie beschreven naar de implementatie van de TRAffic 8-12 training door de trainers en naar de implementatie en continuering van de TRAffic 8-12 trainingstechnieken door de leerkrachten van de kinderen buiten de trainingssessies om. Het is belangrijk om deze aspecten te onderzoeken omdat verschillende studies hebben aangetoond dat de kwaliteit van implementatie samenhangt met interventieresultaten (Domitrovich & Greenberg, 2000; Durlak & DuPre, 2008). Tevens blijkt het essentieel te zijn voor het bereiken van lange termijn effecten om de trainingstechnieken te continueren na afloop van de training. Onze studie heeft zich met name ook gericht op processen in de schoolcontext die de implementatie en continuering beïnvloedden. Dit hebben we gedaan omdat de kwaliteit van implementatie en de mate van continuering

beïnvloedt worden door elementen in de schoolcontext, zoals de leerkracht, de kinderen in de klas en beschikbare middelen (Cartwright, 2009; Lichtwarck-Aschoff & van Geert, 2004). In dit kader hebben we het fenomeen van de 'contextafhankelijkheid van causaliteit' geïntroduceerd, waarmee bedoeld wordt dat de elementen van een interventie alleen effectief kunnen zijn met behulp van factoren buiten die interventie.

De processen van implementatie en continuering zijn in kaart gebracht door een dagboek bij te houden met persoonlijke observaties en door de trainers en de leerkrachten van de kinderen te interviewen. De studie toonde aan dat de implementatie van de TRAffic 8-12 training belemmerd werd doordat de trainers moeite hadden met de aanpak van het gedrag van de kinderen die in groepen getraind werden en door een verminderde motivatie om de training te geven. Verschillende factoren in de schoolcontext speelden hierbij een rol. Het gedrag van de kinderen in de groepen bleek bijvoorbeeld sterk afhankelijk van de aanwezigheid of actieve betrokkenheid van de leerkracht van de kinderen (die doorgaans niet de trainer was). Hoe meer de leerkracht actief betrokken was, hoe beter het gedrag van de kinderen te reguleren was, wat weer zorgde voor een beter verloop van de trainingssessies. Verder zorgde de beperkte aanwezigheid van benodigde middelen om de training goed uit te kunnen voeren (zoals tijd, vervanging van leerkrachten, ruimte) er voor dat de motivatie van de trainers om de training te geven verminderde. Wat betreft de continuering van de trainingstechnieken door de leerkrachten bleek uit de studie dat zij niet gemotiveerd en vaardig genoeg waren om deze technieken toe te passen buiten de trainingssessies, bijvoorbeeld in de klas of op het schoolplein. Dit lag niet aan de technieken zelf, maar aan individuele processen binnen de leerkracht. Veel leerkrachten bleken te verwachten dat het gedrag van de kinderen die deelnamen aan de TRAffic 8-12 training heel snel zou verbeteren ten gevolge van de training zelf. In hoofdstuk 4 hebben we uiteengezet hoe leerkrachten aankijken tegen hun eigen rol bij de ontwikkeling van gedrag van kinderen op school, en hebben we geconcludeerd dat er aan een aantal voorwaarden moet worden voldaan om leerkrachten te overtuigen en te motiveren om te investeren in de sociaal-emotionele ontwikkeling van kinderen. Samengevat wijzen de resultaten van deze studie op een belangrijke conclusie: in het cluster 4 onderwijs zijn de leerkrachten van de kinderen essentieel voor het functioneren van de kinderen. In het TRAffic 8-12 onderzoek had veel meer geïnvesteerd moeten worden in het betrekken van de leerkrachten bij de keuze voor en de implementatie van de training.

Tevens hadden leerkrachten meer ondersteund moeten worden bij het zoeken naar manieren om de trainingstechnieken te integreren in hun alledaagse klassenpraktijk en hadden leerkrachten feedback moeten krijgen op hun inspanningen bij het verbeteren van het gedrag van de kinderen.

In hoofdstuk 5 wordt de studie naar het perspectief van de kinderen op hun eigen agressieve gedrag beschreven. Het doel was meer inzicht te krijgen in de motieven van de kinderen die ten grondslag liggen aan hun agressie. Er werd een interviewinstrument gebruikt dat de 'innerlijke logica' van de kinderen reconstrueert (Singer, Doornenbal & Okma, 2002). De innerlijke logica van kinderen refereert aan hoe zij de situatie zien waarin zij handelen, wat zij doen in sociale situaties, wat hun doelen, belangen en emoties zijn, hoe zij hun emoties reguleren en hoe zij de emoties en belangen van hun opponenten zien.

In tegenstelling tot de veel gebruikte dichotomie van proactieve en reactieve agressie (Crick & Dodge, 1996; Merk, 2005; Orobio de Castro, 2004) vonden wij in de studie een meer gedifferentieerd beeld met vijf profielen van innerlijke logica. De kinderen gaven aan agressie te gebruiken om begrip te krijgen voor hun situatie, om te ontsnappen aan het conflict, vanwege innerlijke conflicten, om wraak te nemen of voor het 'plezier' (om te pesten). De resultaten wijzen dus op verschillende motieven die ten grondslag liggen aan agressie. Dit impliceert dat er ook verschillende benaderingen nodig zijn om deze agressie aan te pakken, en dat een eenduidige aanpak zoals de TRAffic 8-12 training onvoldoende aansluit bij de verschillen tussen kinderen. Een voorbeeld van een mogelijk zelfs schadelijk effect van TRAffic 8-12 zien we bij Kevin. Hij gaf aan agressie te gebruiken om wraak te nemen. De 'denk tijd' van de Stop-Denk-Doe methode uit de training gebruikte hij echter niet om na te denken over alternatieven voor een agressieve reactie, maar om zichzelf 'op te pompen' met boosheid en dan te exploderen. Dit voorbeeld laat zien dat de technieken van een interventie soms totaal niet aansluiten bij de motieven van een kind. Kinderen zoals Kevin hebben meer individuele begeleiding nodig en kunnen niet altijd geholpen worden in groepssessies zoals bij de TRAffic 8-12 training.

Tenslotte wordt in hoofdstuk 6 de studie naar de invloed van de klassencontext op het agressieve gedrag van kinderen beschreven. Doel van de studie was om de invloed van de trainingscontext (groep versus individueel trainen) te confronteren met de invloed van de klassencontext, en deze studie bevat daarom een gedeeltelijke herhaling van het TRAffic 8-12 onderzoek. Naast de hypothese dat individueel getrainde kinderen meer zouden profiteren van de training dan

groepsgetrainde kinderen[41], was onze hypothese dat kinderen die van het cluster 4 onderwijs naar het regulier onderwijs overgeplaatst werden een vermindering in hun agressieve gedrag zouden laten zien. Onze veronderstelling was namelijk dat in het regulier onderwijs minder negatieve effecten van agressief gedrag van leeftijdgenoten zijn op het gedrag van individuele kinderen dan in het cluster 4 onderwijs. Verder was onze hypothese dat de invloed van de trainingscontext minder groot zou zijn dan de invloed van de klassencontext, wat zich zou moeten vertalen in de afwezigheid van lange termijn effecten van de training. Deze hypothese was gebaseerd op het gegeven dat kinderen veel meer tijd spenderen in hun klas dan in een tijdelijke interventiegroep, en dat de klassencontext ook een meer bekend en structureel aanwezig element is voor een kind dan een interventiecontext.

Zoals we al geconcludeerd hadden in hoofdstuk 3, bleek dat er geen verschillen waren tussen individueel getrainde en groepsgetrainde kinderen in de mate waarin zij profiteerden van de training. We vonden echter wel een verandering in de ontwikkeling van de kinderen richting minder agressief gedrag toen zij eenmaal in het regulier onderwijs zaten. Gecombineerd met het feit dat de training niet zorgde voor een vermindering van het agressieve gedrag op de lange termijn concludeerden wij dat de klassencontext een grotere invloed had op het gedrag van de kinderen dan de interventiecontext. Op basis van deze resultaten suggereren wij dat, om gedrag van kinderen te veranderen, er niet alleen gefocust moet worden op het kind, zoals bij de TRAffic 8-12 training, maar ook op de context van het kind.

Samengevat komen de resultaten zoals beschreven in dit proefschrift op het volgende neer. Op basis van beoordelingen van leerkrachten en ouders bleek dat de TRAffic 8-12 training niet effectief was in het verminderen van agressief gedrag en gedragsproblemen bij kinderen in het cluster 4 basisonderwijs. De studies in deel II van het proefschrift hebben inzicht gegeven in mogelijke redenen voor de afwezigheid van effectiviteit. De context waarin de training geïmplementeerd en gecontinueerd wordt en die de kinderen dagelijks omringt, lijkt in belangrijke mate van invloed te zijn op de effectiviteit van de training. Zowel leerkrachten als klasgenoten van kinderen die aan een training meedoen, moeten betrokken worden bij of onderdeel zijn van de training. In het geval van de TRAffic 8-12 training was hier geen sprake van. Tevens dient een training aan te sluiten bij verschillende

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[41] Zie eerder in deze samenvatting de uitleg bij deze hypothese.

motieven van kinderen die ten grondslag liggen aan hun agressieve gedrag. Met de TRAffic 8-12 training zoals deze nu ontworpen is, is dit niet mogelijk.

Dit proefschrift heeft bijgedragen aan inzicht in wat nodig is voor de ontwikkeling van succesvolle interventies en voor succesvolle implementatie en continuering van interventies. Tevens laat onze onderzoeksaanpak, die meer kwalitatief en systeem georiënteerd is, zien dat er meer uitgebreide designs nodig zijn in effectonderzoek dan alleen de Randomized Controlled Trial. In het proefschrift wordt tenslotte een beschrijving gegeven van een nieuw type interventieprogramma. Dit programma is ontwikkeld in een vervolgproject en zodanig geen onderdeel van dit promotieonderzoek. Het programma is ontwikkeld op basis van de bevindingen in de studies van dit promotieonderzoek. In het programma heeft de leerkracht een centrale rol als 'change agent' bij de aanpak van probleemgedrag van kinderen.

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Curriculum Vitae

Marieke Visser is geboren in Groningen op 2 september 1979. Haar VWO diploma heeft zij behaald op het Praedinius Gymnasium te Groningen in 1997. Vervolgens heeft zij een half jaar in Engeland gewoond, gewerkt en de Engelse taal geleerd. In 1998 startte zij met de opleiding Orthopedagogiek aan de Rijksuniversiteit Groningen, waarvoor zij in 2002 haar bul haalde. Het promotieonderzoek ging van start in 2003 bij de faculteit Ontwikkelingspsychologie van de Rijksuniversiteit Groningen. In de promotieperiode heeft zij op een aantal internationale conferenties een poster of paper gepresenteerd (ISSBD Gent 2004, ISPA Athene 2005, ESDP Tenerife 2005). Tevens heeft zij een driedaags seminar over de toepassing van dynamische systeem theorie mede georganiseerd. In 2006 heeft zij een jaar gewerkt als docent Psychologie, waarbij zij diagnostiek- en gesprekspractica verzorgde en stagiaires begeleidde. Tenslotte was zij lid van de opleidingscommissie van onderzoeksschool ISED (Institute of the Study of Education and Human Development). In een vervolg op het promotieonderzoek heeft zij in een door ZonMw gesubsidieerd project een web-based programma ontwikkeld voor leerkrachten. Op dit moment werkt zij als onderzoeker bij het Kenniscentrum Onderwijs, Leren en Levensbeschouwing en het lectoraat Geïntegreerd Pedagogisch Handelen van Hogeschool Inholland. In deze functie doet zij praktijkonderzoek in het basisonderwijs en ondersteunt zij de opleiding voor Leraar Basisonderwijs, onder andere op het gebied van onderzoek in de opleiding.