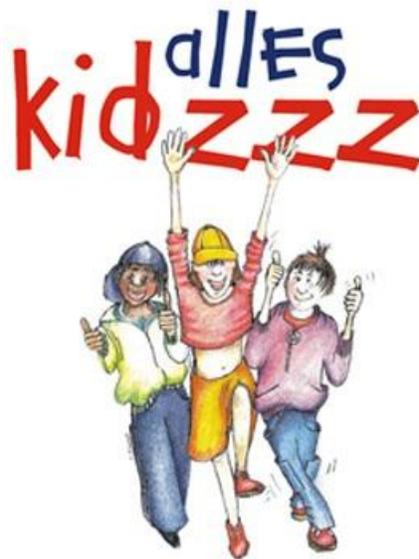




**Universiteit Utrecht**

## **Self-esteem, personality and the effect of the Stay Cool Kids intervention**



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## Acknowledgements

Before you lays the end product of the masters research I conducted regarding self-esteem, personality and aggression in connection with the effect of the Stay Cool Kids intervention (Alles Kidzzz) on aggression reduction. The results I present in this thesis are part of a larger-scale project regarding the efficacy of this intervention, that multiple students and employees of the University of Utrecht have taken part in, as well as the institutions ReinieR and Indigo.

During my masters, I got the chance to experience real world research and theory applied to practice at the same time. Practicing the intervention at my internship and conducting complex statistical analyses simultaneously has at times left me puzzled, but in the end has deepened my understanding of both practice and theory. This year has proven to be a learning experience on multiple levels.

The road towards concluding this article has not been a paved one and it is no exaggeration to state that sweat and tears went into the completion of my research. At this final stage of my contribution to the project, I would like to thank a number of people who contributed to the fulfillment of my research. First of all, I would like to thank my parents for accommodating my education. Without their support, I would not have been able to be where I am today. Secondly, thanks go out to my boyfriend Paul who greatly supported me throughout my academic journey. And although she stated that formal acknowledgement would not be necessary, I would like to thank my thesis supervisor, Monique van Londen-Barentsen, who challenged me to approach the complex subject head on and who has gone above and beyond to aid in bringing the project, and my thesis specifically, to a successful conclusion, for her input and insights into (among other things) the statistical analyses throughout my research. Not to mention, she was available for feedback at every hour of the day (and night). Also, I would like to thank Sabine Stoltz for making the data from her research available and for guiding me through the practicalities of my research, and wish her the best of luck in the final stages of her PhD on the Stay Cool Kids intervention. Finally, writing this thesis would not have been possible without the cooperation of the children who participated in the research, as well as their parents and teachers.

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## Self-esteem, personality and the effect of the Stay Cool Kids intervention in highly aggressive boys

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### Abstract

**Objective:** The aim of this multi-site RCT study was to explore self-esteem and personality in an intervention setting with highly aggressive boys. This study focused on the effectiveness on aggression reduction of Stay Cool Kids, an individualized indicated preventive intervention for highly aggressive 9 year old boys and explored the influences of self-esteem and personality. **Methods:** On a sample of 193 boys selected by their teachers for extreme externalizing behavior, teachers and parents reported on aggression and personality and children themselves on aggression and self-esteem. Before and after intervention and at 6 months follow-up assessments of aggression by all informants in the experimental and control group were compared. **Results:** In the intervention group, teachers reported a significant reduction in aggression after intervention but not at follow-up, whereas parents only reported intervention effects at follow-up measurement, and children did not report any progress. The most influential personality characteristics with regard to aggressive behavior appears to be Agreeableness, since the influence of this traits on aggression reduction over time is supported by teacher reports. Self-report measures indicated an association between self-esteem and aggression, but no significant effect of the intervention or of self-esteem on aggression reduction. **Conclusion:** There is a relationship between self-esteem and aggression, and between personality and aggression, but not according to all respondents. Results suggest that the associations between personality and aggression in our sample of highly aggressive boys are comparable those found in general populations. These findings provide relevant knowledge that future research and the aggression prevention practice can build upon.

**Keywords;** intervention, aggression, self-esteem, personality, boys.

### Samenvatting

**Doel:** Het doel van deze multi-site RCT studie was om zelfbeeld en persoonlijkheid exploratief te onderzoeken in een interventiesetting met hoog-agressieve jongens. Deze studie richtte zich op de effectiviteit op aggressiereductie van Alles Kidzzz, een geïndividualiseerde geïndiceerde preventieve interventie voor hoog-agressieve 9-jarige jongens, op agressie, daarnaast werden de invloed van zelfbeeld en persoonlijkheid exploratief onderzocht. **Methoden:** Ouders en leerkrachten rapporteerden over agressie en persoonlijkheid, en de jongens rapporteerden over hun agressie en zelfbeeld, over een steekproef van 193 jongens die door hun leerkracht geselecteerd zijn op basis van hun extreem externaliserende gedrag. Zowel voor als na de interventie en bij een nameting na 6 maanden werden de rapportages van de verschillende respondenten in de experimentele en controlegroep vergeleken. **Resultaten:** In de experimentele groep rapporteerden leerkrachten een significante reductie in agressie na de interventie maar niet bij de nameting, terwijl ouders alleen interventie-effecten rapporteerden op de follow-up meting, en kinderen geen verbetering rapporteerden. Het belangrijkste persoonlijkheidskenmerk met betrekking tot agressief gedrag lijkt Welwillendheid te zijn, aangezien de invloed van dit kenmerken door ouderrapportage wordt aangetoond. Zelfrapportages gaven een associatie aan tussen zelfbeeld en agressie, maar leverden geen significant effect op van de interventie of van zelfbeeld op de reductie van agressie. **Conclusie:** Er is een relatie tussen zelfbeeld en agressie, en tussen persoonlijkheid en agrssie, maar niet volgens alle respondenten. Resultaten suggereren dat persoonlijkheid en agressie in onze steekproef van hoog-agressieve jongens op vergelijkbare wijze samenhangen als in non-interventie populaties. Deze bevindingen leveren relevante kennis op waar toekomstig onderzoek en de praktijk van agressiepreventie op voort kunnen bouwen.

**Steekwoorden;** interventie, agressie, zelfbeeld, persoonlijkheid, jongens.

## **Self-esteem, personality and the effect of the Stay Cool Kids intervention in highly aggressive boys.**

Aggressive behavior has been a focus of research and media exposure in recent years. The personal and societal costs of the consequences of aggressive behavior during childhood are considerable. This research paper will focus on the self-esteem and personality traits of boys with highly aggressive behavior, in relation to an individual preventive intervention. The research question is *How do self-esteem and personality moderate the effect of the Stay Cool Kids intervention in highly aggressive boys?* This question is investigated using longitudinal data from control and intervention groups in The Netherlands. The strengths of the design are significant; there is a relatively large research population, the random assignment of control and experimental condition is applied, and the data is based on information from multiple respondents. Questionnaires are filled out by the boys, their parents and teachers during a data collection period of nine months.

This research provides a closer look at the interplay between personality, self-esteem and aggressive behaviors of 9 year old boys in a school setting receiving either no intervention or a targeted/ indicated preventive intervention that aims to reduce aggressive behavior in highly aggressive children. This study can contribute to the (currently limited) body of knowledge about the development of personality in highly aggressive children, more specifically the relationship between Emotional Stability, Agreeableness and aggression. Moreover, it explores the relationship between self-esteem and aggression in this specific group of highly aggressive children. Finally, this study can contribute to intervention efficacy by indicating which children can benefit most from the intervention.

### **Aggression**

In order to measure the reduction in aggressive behavior after intervention, it is necessary to define aggression clearly. The distinction Achenbach and Rescorla (2001) made between aggressive and rule-breaking behavior within the broader externalizing syndrome is supported by a large body of research. The aggressive behaviors are: arguing a lot, being defiant or mean to others, demanding attention, destroying own things, destroying others' things, being disobedient at home or at school, getting in fights, attacking people, screaming a lot, being explosive, being easily frustrated, being stubborn, being sullen, displaying mood changes, sulking, being

suspicious, teasing a lot, having a temper, threatening others and being loud. Many of these behaviors are (to a certain extent) considered acceptable for young children, but most children show a decline of this type of behavior as they reach early adolescence (e.g., Wicks-Nelson & Israel, 2009). Most children grow up to become well-functioning adolescents and adults, but not all do. There are many different ways to measure aggression; however the most straightforward way is by using the DSM-IV criteria for diagnosing the different disruptive behavioral disorders (American Psychiatric Association, 2000). Conduct disorders are among the most prevalent difficulties experienced by children and adolescents. Because definitions and methods are not universal across the world and are subject to change, it is hard to pinpoint a definite number for the prevalence of conduct disorders (Wicks-Nelson & Israel, 2009). For both oppositional defiant disorder (ODD) and conduct disorder (CD) the median estimate is around 3%, whereas prevalence studies report percentages ranging from 1 to 16%, while all report a higher prevalence amongst boys than amongst girls (Wicks-Nelson & Israel, 2009). Although the percentage drops between the ages of 4 and 9, a small group (between 5 and 10%) remains stable in displaying high rates of aggressive behavior throughout their childhood (Prinzle, Onghena, & Hellinckx, 2005). A large group of researchers has found that an early age of onset is related to more serious and persistent antisocial behavior later in life (e.g., Loeber & Farrington, 2000).

*Consequences of aggressive behavior in childhood.* Children with the highest scores with regard to aggression generally experience relations with family and friends more negatively, perceive more parental rejection, perceive their teacher to be less fair to them, experience other children saying mean things to them and experience other children to be bullying them. Again, these effects are stronger in boys than in girls (Sprott & Doob, 2000). Aggressive children are often rejected from their peer group (Bierman, 2004; Boivin & Begin, 1989; French, 1988), often maintain this rejected status and have an increased risk of developing serious adjustment problems later in life (Asher & Coie, 1990; Kupersmidt & Coie, 1990). The negative long-term effects include higher rates of delinquency, adult criminality, educational failure and adult psychological maladjustment (Moffitt & Caspi, 2001). Antisocial behavior at the age of 10 is a powerful predictor of the total cost of public services used by age 28. Individuals with conduct problems, as rated by the teacher, cost over three times as much and individuals with a conduct disorder cost 10 times as much as those without such problem behaviors (Scott, Knapp,

Henderson, & Maughan, 2001).

Amongst boys there is continuity in problem behavior from childhood to adolescence and such continuity is especially acute when early problem behavior takes the form of physical aggression. Physical aggression during childhood is the most consistent predictor of the occurrence of both violent and nonviolent offences in adolescence. Moffitt (2006) claims that roughly 5% of all delinquents are life-course-persistent delinquents, who are already displaying highly maladaptive behavior in the externalizing category at a preschool age. In concurrence with these findings, Pepler, Jiang, Craig, and Connolly (2010) found a small group of only boys who reported high initial levels of delinquency that increased over time. They reported higher levels of destructive, aggressive and theft behavior than boys in any other group. In mid adolescence, these boys had developed higher internalizing problems and more difficulties in their relationships with parents and peers than boys in the groups with lower delinquency rates (Pepler et al., 2010). When the aim is to prevent physical violence and when resources are limited, children with chronic physical aggression and / or serious conduct problems should be the primary targets of intervention (Broidy et al., 2003).

Huessman, Dubow, and Boxer (2009) found moderate levels of continuity of aggression from age 8 to 48 both for both males and females. Life-course-persistent high aggressives had consistently poorer outcomes across domains of life success, criminal behavior and psychosocial functioning at the age of 48 (e.g., arrests, traffic violations, aggression toward spouse, divorces, depression, health, occupational and educational attainment) than life-course-persistent low aggressives. In contrast, adolescence-limited and child-limited aggressives did not differ from life-course-persistent low aggressives on the outcomes at age 48 (Huessman et al., 2009). This study underlines the importance of regulating the excessively aggressive behavior of children. This study also finds that outbreaks of aggressive behavior that are limited to middle childhood or that are limited to adolescence (but not both) were shown to have few long-term negative consequences. In other words, if children who are highly aggressive are able to move out of this tendency, they could lead much more successful, happier and healthier lives. There are many different types of interventions that are aimed at reducing or preventing aggressive and / or criminal behavior, and a substantial group of researchers has investigated the efficacy of these interventions on this type of behavior.

*Aggression and intervention.* In a large meta-analysis of programs aimed at preventing criminal behavior, high risk children and those with a lower SES tend to benefit more from these prevention programs by the time they reach adulthood. High risk in this study is defined as living in inner-city areas and / or high-crime neighborhoods. Shorter but more intensive programs, with a focus on social and behavioral skills, tend to produce the largest effects in terms of preventing criminal behavior (Deković et al., 2011).

In a recent meta-analysis, McCart, Priester, Davies, and Azen (2006) found an average effect size (ES) of .23 for child training based on the principles of cognitive behavioral therapy. This suggests that this type of intervention can be effective for treating aggressive behavior problems in youth.

Wilson and Lipsey (2007) found that targeted interventions for selected or indicated children are generally effective in reducing short term aggressive and / or disruptive behavior. Samples were selected as at risk for aggressive behavior on the basis of individual characteristics, such as activity level or environmental characteristics such as poverty or residing in a high-crime neighborhood. Effects are larger for better-implemented programs and those involving students at risk for aggressive behavior. The mean effect size of 0.29 that they found for selected / indicated programs, represents a decrease in aggressive / disruptive behavior that is not only statistically significant but likely to be of practical significance to schools as well (Wilson & Lipsey, 2007). In the current study we will explore first how the level of self-esteem of highly aggressive boys interacts with their aggression level and the intervention effects.

### **Self-esteem**

Much has been published on the relationship between self-esteem and aggression. Some research suggests that low self-esteem during adolescence predicts criminal behavior (Broidy et al., 2003) and aggression (Robins, Donnellan, Widaman, & Conger, 2010) during adolescence. On the basis of self-report, teachers' and parents' ratings, 11-year olds with low self-esteem tend to increase aggressive behavior by the age of 13 (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005). Other research indicates that people with high self-esteem are usually less aggressive than people with low self-esteem (Spratt & Doob, 2000). Sandstrom and Jordan (2008) looked into the relationship between self-esteem and aggression while making a distinction between explicit self-esteem, that is "reflecting an individual's conscious, deliberative,

and assessable view of self”, which can be measured through self-report measures, and implicit self-esteem, that is “reflecting a more automatic and reflexive appraisal that may not be voluntarily accessible”, which cannot easily be tapped into while using these self-report measures. They found a positive empirical relationship between explicit self-esteem and aggression when levels of implicit self-esteem are low, but not when levels of implicit self-esteem are high. In this line of thought, it is posed that since a more negative view of self makes the consequences of peer aggression worse, higher self-esteem could reduce aggressive and delinquent behavior in adolescents who are victimized (Ybrandt & Armelius, 2010).

The opposite argument is also made by a group of researchers, who found that high (and not low) self-esteem is associated with aggressive behavior, for example because high self-esteem leads children to rationalize antisocial conduct, so aggressive children with high self-esteem increasingly value the rewards that aggression offers over time (Menon et al., 2007). Threatened egotism occurs when highly favorable views of self are threatened by some person or circumstance, which leads to violent aggression. Once a person becomes familiar with the emotional distress of losing self-esteem, he or she may become watchful for potential or incipient threats and may react strongly to what observers would regard as slight or trivial offenses (Baumeister, Smart & Boden, 1996). However, the picture does not appear to be so clear-cut, since there are also indications that a U-shaped relation exists between self-esteem and aggression (Ostrowsky, 2010). Thomaes, Reijntjes, Orobio de Castro, and Bushman (2009) found that inflated self-views (unrealistically high views of self) increased (rather than decreased) emotional distress of children following threatening feedback and the same held true for deflated self-views. No such effect occurred following non-threatening feedback. Distorted views of self are thus emotionally vulnerable and realistic self-views are emotionally resilient.

To complicate matters even more, Webster (2007) found that aggression is highest in children with medium levels of self-esteem and lower in those with low and high levels of self-esteem, indicating a reversed U-shaped relation between self-esteem and aggression. The mixed nature of these findings stresses the need to have a closer look at the development of aggression in children and adolescents. Whereas self-esteem is a theoretical construct that represents the child’s view of self, there are also ways of measuring how other people experience and view the personality of the child.

## **Personality**

An abundance of research on temperament and problem behavior of children is available, but it is only in recent years that a substantial effort has been made to map the development of personality in children and adolescents. Research suggests that personality traits are much more stable over the years than specific problem behavior symptoms (De Haan, Prinzie, & Deković, 2010; McCrae et al., 2000). The most commonly used personality classification distinguishes five broad characteristics, which are referred to as the Big Five personality traits (McCrae et al., 2000).

The Big Five personality traits are; Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness (Mervielde & De Fruyt, 1999). Agreeableness, which is usually referred to as Benevolence in children, describes an empathic consideration of other people's needs and emotions. Conscientiousness entails the ability to sustain attention, control impulses and carry out plans and tasks. Emotional Stability (which is transposed with Neuroticism) describes self-reliance and emotional balance. Openness (Imagination) entails an interest and the willingness to try or consider new activities, ideas and beliefs (Caspi, Roberts, & Shiner, 2005; Mervielde & De Fruyt, 1999).

All of the five higher-order personality traits that were previously described are important in predicting social competence in children. Agreeable and Extraverted children are generally more socially competent and remain more socially competent than their less Agreeable and Extraverted peers. Children with relatively low Emotional Stability or Conscientiousness tend to experience a variety of social difficulties, thus suggesting a potential interaction between these traits that might be particularly problematic for social functioning (Caspi et al., 2005).

Research indicates that various specific externalizing behaviors, such as ADHD symptoms are associated with low Conscientiousness, low Emotional Stability (Martel, Nikolas, Jernigan, Friderici, & Nigg, 2010) and low Agreeableness. More specifically, aggression is found to be highly related to low Agreeableness in many empirical studies regarding adolescents (e.g., DeYoung, Peterson, Se'guin, & Tremblay, 2008; Gleason, Jensen-Campbell, and South Richardson, 2004). Of the Big Five personality traits, low Agreeableness and Emotional Stability are the most important predictors of aggression in adolescents. Additionally, physical aggression appears to have a negative relationship with Conscientiousness in adults (Grumm & von Collani, 2009) and with Agreeableness in adolescents (Klimstra et al., 2010).

Research on the relationship between the Big Five personality traits and behavior problems in childhood suggests that children with low scores on the scale Openness to Experience tend to exhibit problems in social behavior and more specifically, low scores on this trait are related to conduct problems (Ehrler, 1999). On the other hand, there is also research indicating a positive relationship between Openness to Experience and aggression (Prinzle et al., 2004).

Children's Extraversion and Imagination are positively related to their externalizing problem behaviors, whereas Benevolence and Conscientiousness are negatively related to externalizing problem behaviors (Prinzle et al., 2004). Externalizing problems negatively predict Agreeableness and Emotional Stability. Klimstra et al. (2010) found a negative relationship between aggression and Agreeableness and also between aggression and Conscientiousness in adolescents.

In a large cohort-study using Flemish data, De Haan et al. (2010) found that Extraverted children, who are energetic and not shy, showed higher levels of delinquency at the age of six. Benevolent children, who are compliant and non-irritable, showed lower levels of aggression and delinquency at the age of 6 and Emotionally Stable children showed lower levels of aggression at the age of six. Conscientious children, who have more self-control, showed a decrease in delinquency over time. Their research suggests that Extraversion and Conscientiousness may matter more for delinquency than for aggression, that Emotional Stability matters more for aggression than for delinquency and that Benevolence matters for both types of behavior.

Using data from the same non-clinical population, Prinzle, Onghena, and Hellinckx (2005) found that Benevolence in children is negatively related to initial levels of problem behavior. Higher scores on Emotional Stability correspond to larger reductions of problem behavior over time in children. These findings suggest that children with high Emotional Stability might also display larger reductions of problem behavior after intervention.

To sum up, there is some evidence suggesting that preventive interventions might assist in reducing aggression and other negative outcomes in the long run though this evidence is not very compelling as of yet. The current study looks into individual characteristics of highly aggressive boys that may influence the effects of the Stay Cool Kids intervention, with a focus on self-esteem and personality traits. Self-esteem and personality were selected as characteristics of interest because research suggests that both of these characteristics mediate the development of

aggressive behavior.

### **The current study**

In the current study, we examined the effect of a preventive intervention for highly aggressive boys using a sample of 193 nonclinical elementary school-aged boys. The focus was on self-esteem and personality, both of which are associated with aggressive or externalizing behavior (Donnellan et al., 2005; Prinzie et al., 2004).

Since literature on the role of children's personality in interventions for highly aggressive children is not available to our knowledge, or at least highly limited, our expectations can only draw on research in non-intervention settings, more specifically on research investigating samples that have not been selected on the basis of their extreme externalizing behavior. Moreover, our sample consists of only boys, whereas most other studies include girls as well. Despite these limitations, we can tentatively state the following hypotheses with regard to personality and intervention.

We expect to find discrepancies between parental and teacher ratings of children's behavior (Achenbach, McConaughy, & Howell, 1987). We expect to find associations between self-esteem and aggression and also between personality and aggression in our sample of highly aggressive children. We expect to find a positive correlation between Extraversion and aggression (De Haan et al., 2010), between Agreeableness and aggression (Prinzie, Onghena, and Hellincks, 2005), and between Conscientiousness and aggression (Grumm & von Collani, 2009). We expect Emotional Stability to be negatively related to initial levels of aggression (Prinzie, Onghena, & Hellinckx, 2005), and with regard to Openness to Experience we did not formulate a directional hypothesis; we will explore curiously what the results from our sample of highly aggressive boys will suggest. Based on recent research (Klimstra et al., 2010), we expect that Agreeableness and Emotional Stability will have the strongest associations with aggression.

In addition, we expect that the main effect of the Stay Cool Kids intervention will be moderated by the level of self-esteem and the personality traits of the child. Based on meta-analyses by McCart et al. (2006) and by Wilson and Lipsey (2007) we expect to find significant intervention effects on aggression reduction.

We tentatively expect Extraversion to be correlated to a smaller aggression reduction based on influential studies linking Extraversion to high aggression (Prinzie et al., 2004) and high

delinquency (De Haan et al., 2010). Based on the strong associations between Conscientiousness and aggression (Grumm & von Collani, 2009; Klimstra et al, 2010; Prinzie et al., 2004) we tentatively expect a larger reduction in aggressive behavior in children who are highly Conscientious. Since higher scores on Emotional Stability correspond to larger reductions of problem behavior over time in children (Prinzie, Onghena, and Hellinckx, 2005), we expect to find a larger reduction in aggression scores over time, and potentially also after intervention. Children who score high on Benevolence are children who are generally considerate, friendly and helpful. Possibly these children are also more Benevolent in the intervention setting and therefore benefit more in terms of reducing aggressive behavior. Due to the mixed nature of findings regarding Openness to Experience in relation to aggression, we did not formulate a hypothesis on the potential effect this trait might have on the aggression reduction in our sample of highly aggressive boys.

As far as we can tell the effects of children's self-esteem and personality in aggression interventions have not been studied before. This study seeks to explore the associations between aggression and self-esteem and between aggression and personality in highly aggressive boys by (i) examining the effect of children's level of self-esteem and personality characteristics on their aggression reduction after intervention; (ii) using data from multiple informants (children, parents and teachers); (iii) using a relatively large randomly assigned control and intervention group of school-aged boys from two regions in The Netherlands.

## **Method**

### **Research design**

Because this research focuses on the influence of personality and self-esteem on the reduction of aggression after intervention, we decided to pursue a multi-site RCT study. In this study, 48 primary schools in the regions Den Bosch and Utrecht (The Netherlands) were randomly assigned to one out of three groups where fourth grade classes participated. By randomizing the treatment condition in this manner, every school provided boys for the intervention as well as the control condition group during three consecutive years. In this way it was ensured that intervention effects could not be due to school factors. Because schools were assured of receiving two years of training, this enhanced their motivation to participate in the control condition. The three assessment periods were prior to the beginning of the intervention (at

T1), at intervention termination after 11 weeks (at T2) and after six months (at T3). The Dutch Central Committee on Research Involving Human Subjects approved this study.

### **Participants**

The sample held 193 boys, consisting of 126 children who were in the intervention group and 67 who were in the control condition group and did not receive any intervention or received care as usual in their school. The mean age of the boys was 10.03 years ( $SD = .55$ ). In total, 63.7% of the participants were from Dutch cultural background, whereas 36.3% of the participants had an immigrant cultural background (mostly Moroccan and Turkish, which are the largest immigrant groups in the general Dutch population (CBS, 2009)). Children in the intervention and control group did not differ significantly in terms of age and cultural background at baseline.

### **Procedure**

The first step of the research procedure involved the parents of all fourth graders receiving a letter with general information about the study as well as a consent form to give their permission for teachers to fill out the Teacher Report Form (TRF age 6-18, Achenbach, 1991) about their child. Secondly, teachers rated the top 30% children of their classes on their level of externalizing behavior by filling out the 32-item externalizing scale of the TRF. After that, the researchers selected children on the basis of their T-scores. Only boys with a T-score  $> 60$  were indicated, because this (sub) clinical level of externalizing problem behavior poses a potential risk to their development. The parents of the selected children were contacted and asked for their permission to take part in this study. The baseline measurement (at T1) was conducted after parental consent was provided. This measurement was carried out by trained research assistants in the child's school. Parent's questionnaires were sent to them by mail, or distributed during school meetings, with the request to return them within a week. After the last session of the intervention, the T2-assessment took place with parents, children and teachers. In the control condition this measurement took place after roughly 11 weeks from the baseline measurement. The T3-assessment took place roughly six months after finishing the intervention. Parents and teachers were thanked for their cooperation by a small financial reward, whereas children received a small gift.

At T2, 100% ( $n = 193$ ) of the children had completed the intervention as 97.9% of the children filled out the questionnaires at T2 ( $n = 189$ ) and 93.3% at T3 ( $n = 180$ ). At T1 151 parents filled out the questionnaires and at T2 and T3 respectively  $n = 126$  and  $n = 103$ . At baseline (at T1) 10 parents (all of whom were immigrants) did not fill out the Hierarchical Personality Inventory for Children (HIPIC) due to language problems. For the teachers  $n = 169$  reported at baseline, at T2  $n = 169$  and at T3  $n = 135$ . All 169 teachers who filled out questionnaires at baseline included the HIPIC in their reports.

In order to ensure that as much of the data as possible was included in the analyses we analyzed reports within each informant. For the parents, we created parental mean scores for each variable.

## Measures

The outcome measure of the effect of the intervention that is used for the analyses in the current research is aggressive behavior. The predicting variables are self-esteem and the Big Five personality traits.

*Aggressive behavior.* Aggressive behavior is measured firstly through the aggression subscales of the Child Behavioral Checklist (CBCL age 6-18, Achenbach, 1991) ( $\alpha = .95$ ) and the TRF ( $\alpha = .92$ ), each consisting of 18 identical items. The CBCL is filled out by the parents of the child and the TRF by the teacher of the child at that time. The TRF ratings are also used for the initial screening of the participants. Example items from the aggression scale are ‘argues a lot’ and ‘cruelty, bullying or meanness to others’. The respondent selects one out of three options for each item; (0) not true (as far as you know), (1) somewhat or sometimes true and (2) very true or often true (Achenbach & Rescorla, 2001). In addition to the CBCL and TRF, aggressive behavior is measured through the REPRO, which operationalizes aggression into reactive and proactive aggression and is filled out by the child, parent and teacher at T1 (child  $\alpha = .69$ , parent  $\alpha = .85$ , teacher  $\alpha = .83$ ), T2 (child  $\alpha = .70$ , parent  $\alpha = .88$ , teacher  $\alpha = .86$ ) and T3 (child  $\alpha = .69$ , parent  $\alpha = .87$ , teacher  $\alpha = .90$ ). Sample items are ‘when I am threatened or teased, I react angrily’ (reactive scale) and ‘I tease and threaten other children to get my way’ (proactive scale). The respondents choose an answer from five categories, ranging from 1 = not true, 2 = seldom true, 3 = sometimes true, 4 = usually true and 5 = almost always true (Orobio de Castro, Merk,

Koops, Veerman, & Bosch, 2005).

Because our main interest was in the reduction in aggression scores, these scores were standardized in order to compare them between the different respondents. In this study we opted to use multiple instruments to measure the child's aggression on the basis of different respondent's reports. With regard to the parental reports, the CBCL aggression scale and the REPRO were combined into a standardized aggression score (T1 correlation between CBCL and REPRO;  $r = .67, p < .01$ ; T2  $r = .74, p < .01$ , T3  $r = .76, p < .01$ ). Additionally, when both parents filled out the questionnaires about their child, their data were combined into one parental score per child. For the teachers, the TRF and REPRO scales were also combined into one standardized aggression score (T1  $r = .64, p < .01$ , T2  $r = .75, p < .01$ , T3  $r = .77, p < .01$ ). The previously described steps were all aimed at drawing a clear-cut picture of the interplay between complicated concepts.

*Self-esteem.* Self-esteem is measured through 18 statements originating from three subscales of the Competentie Belevingsschaal Kinderen (CBSK), which is completed by the child at T1, T2 and T3. The scales are social acceptance (T1  $\alpha = .70$ , T2  $\alpha = .72$ , T3  $\alpha = .73$ ), behavioral attitude (T1  $\alpha = .70$ , T2  $\alpha = .72$ , T3  $\alpha = .79$ ) and feeling of self-worth (T1  $\alpha = .77$ , T2  $\alpha = .73$ , T3  $\alpha = .79$ ). Sample items are 'some children are satisfied with the way their life is going – other children are not satisfied with the way their life is going' and 'some children are loved by their peers – other children are not that loved by their peers' and the child chooses one out of two statements and decides whether this statement applies completely or partially to their personal experience. The most competent answer receives four points, whereas the least competent answer receives only one point (Veerman, Straathof, van den Berg, Treffers, & ten Brinkt, 1997).

*Personality.* The personality traits are measured through the HIPIC, a questionnaire consisting of 144 questions, divided into the subscales Extraversion, Agreeableness, Conscientiousness, Emotional stability and Openness, which is filled out by the parents and teacher of the child (Mervielde & De Fruyt, 1999). Fathers and mothers are comparable informants of childhood behavior with regard to the personality inventory (De Fruyt & Völlrath, 2003); therefore it was opted to combine the parental scores on the HIPIC to enable the comparison between as many children as possible. Table 1 demonstrates the high internal

consistency of the subscales of the HIPIC based on both parental and teacher reports.

Table 1

*Alpha coefficients for the subscales of the HIPIC (combined parental scores and teacher scores)*

	Extraversion	Agreeableness	Conscientiousness	Emotional Stability	Openness
Parents	.76	.97	.99	.72	.77
Teachers	.82	.79	.83	.76	.78

## Intervention

The Stay Cool Kids intervention is a social cognitive intervention which focuses on the relations between cognitions, emotions and behavior of the child. The aim of the intervention is to reduce aggressive behavior in primary school children who display high levels of aggression. In the long run, the intervention aims to prevent the development of externalizing behavior disorders in these children. Intervention children received a 45 minute session per week throughout an 8 week period, from January until March. All sessions took place within the school setting. There were meetings between the trainer, parents and teachers of the child before the training commenced, during mid-term evaluation and after the training was finished.

The dual-phased training focused firstly on determining the child's individual competences and needs. In the first session, all children received a general introduction. For the second and third session, trainers could choose two out of six possible exercises. They conducted an analysis of the child's competences after session three, which was discussed with the parents and teachers and resulted in an intervention plan. Here, trainers could choose five of the nine available exercises from the manual. The trainer and child signed a contract regarding the training goals and program for the second phase (session 4-8). The focus of exercises was on realistic, positive self-perception, accurate social cognitions, anger management and reducing aggressive behavior. The involvement of parents and teachers was enhanced by providing them with information about the contents of each training session.

## Results

*Preliminary analysis.* We conducted a paired-samples t-test to compare the parental and teacher reports on the TRF ( $M = .77$   $SD = .36$ ) / CBCL ( $M = .50$   $SD = .32$ ) and on the REPRO

(teachers  $M = 3.09$   $SD = .79$ , parents  $M = 2.23$   $SD = .54$ ) at T1. The teacher scores are significantly higher on aggressive behaviour on the TRF/ CBCL ( $t(201) = 8.18$ ,  $p < .01$ ) and on the REPRO ( $t(257) = 15.30$ ,  $p < .01$ ). As was described previously, the CBCL aggression scale and the REPRO correlated strongly (T1  $r = .67$ ,  $p < .01$ ; T2  $r = .74$ ,  $p < .01$ , T3  $r = .76$ ,  $p < .01$ ), which justified combining them into a standardized parental aggression score. For the teachers, the TRF and REPRO scales correlated to a strong degree (T1  $r = .64$ ,  $p < .01$ , T2  $r = .75$ ,  $p < .01$ , T3  $r = .77$ ,  $p < .01$ ), justifying the creation of a standardized aggression score for the teacher reports.

Analyses focused on participants' standardized aggression scores at T1, after intervention (at T2) and at 6 month follow up (at T3). Table 2 shows the mean scores on aggression of the child, based on teachers', parents' and self-report at baseline measurement (at T1), after the intervention (at T2) and after six months (at T3). The parental and teacher scores are standardized, combined scores from the CBCL or TRF and REPRO and the child scores are standardized means on the REPRO.

Table 2

*Mean Scores on Aggression*

	Experimental condition			Control condition		
	T1 M (SD)	T2 M (SD)	T3 M (SD)	T1 M (SD)	T2 M (SD)	T3 M (SD)
Aggression based on self-report	-.06 (1)	-.07 (.94)	.01 (1.05)	.13 (.98)	.15 (1.11)	-.00 (.91)
Aggression based on teacher report	.05 (.9)	-.08 (.93)	-.07 (.97)	-.12 (.91)	.2 (.94)	.18 (.84)
Aggression based on parental report	.07 (.92)	-.01 (.94)	-.07 (.97)	-.12 (.91)	.2 (.94)	.18 (.84)

*Equivalence of sample at baseline on the dependent variables.* Independent-samples t-tests were conducted to compare the aggression level at baseline measurement (at T1) for the control and experimental groups. At baseline measurement, there was no significant difference between the experimental ( $M = .05$ ,  $SD = .9$ ) and control group ( $M = -.12$ ,  $SD = .91$ ) on the basis of teacher reports;  $t(167) = 1.11$ ,  $p = .27$ . There was neither a significant difference between the experimental ( $M = .07$ ,  $SD = .92$ ) and control group ( $M = -.08$ ,  $SD = .88$ ) on the basis of parental reports;  $t(147) = -1.02$ ,  $p = .31$ . Finally, children's self-report level of aggressiveness was

comparable for experimental ( $M = -.06, SD = 1$ ) and control groups ( $M = .13, SD = .98$ );  $t(186) = 1.27, p = .21$ .

Using an independent-samples t-test, no significant differences were found between the control and experimental groups for self-esteem in children's reports or for the Big Five personality traits (Agreeableness, Conscientiousness, Emotional Stability, Openness to Experience and Extraversion), in parental and teacher reports.

*Correlation between self-esteem and aggression at baseline.* Next, we expected to find a correlation between self-esteem and the level of aggression children displayed at baseline measurement (at T1). The correlation between aggression and self-esteem of the child at baseline, based on self-report by the child, is low but significant,  $r(169) = -.15, p < .01$ . This means that children who score low on self-esteem are relatively more aggressive on self-report.

*Correlations between personality traits and aggression at baseline.* We also expected to find correlations between personality traits and the level of aggression that children displayed at baseline. Table 3 shows the correlations of Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness with the standardized aggression score of the teacher and parents at the baseline measurement (at T1). Our results indicate that the Big Five personality traits correlate significantly with the level of aggression in our sample of highly aggressive children.

The table shows that the correlation between Extraversion and aggression was weak on the basis of teacher reports, whereas based on parental reports the correlation it was not significant. The correlations between Agreeableness and aggression were quite strong based on both parental and teacher reports, thus supporting our hypothesis that Agreeableness would correlate with aggression. Additionally, a weak correlation was found between Conscientiousness and aggression, and this is a moderate correlation based on parental reports. Teacher reports provide a weaker (but still significant) correlation between Conscientiousness and aggression. We also expected that Emotional Stability would correlate with aggression, but this is only the case on the basis of parental reports and the correlation is rather weak; our hypothesis in this regard is not completely supported by the results. Furthermore, weak correlations are reported between Extraversion and aggression on the basis of teacher reports, but based on parental reports the

correlation is not significant. Lastly, Openness correlates weakly with aggression on the basis of both teacher and parental reports.

Table 3

*Correlations between Measures Reported by Teachers and Parents at Baseline*

	Aggression according to teacher (N = 169)	Aggression according to parents (N = 141)
Extraversion	-.17*	-.06
Agreeableness	-.40**	-.61**
Conscientiousness	-.18*	-.43**
Emotional Stability	-.13	-.19*
Openness	-.15*	-.28**

*Note.* \* =  $p < .05$ , \*\* =  $p < .01$ .

### **Intervention effects**

The analysis plan for examining intervention effects involved ANCOVAs on the aggression outcomes combined with the aggression score at baseline (at T1). Next, we conducted ANCOVAs which included the other variables within the predictor domains; these analyses included the condition (intervention or control), the aggression score at baseline (at T1), the level of self-esteem at baseline (at T1) and personality at baseline (at T1). The analyses were carried out with the T2 measurement (immediately after intervention termination) as well as with the T3 (six months follow up) measurement.

*Effect of the intervention.* Based on self-report, a significant effect ( $F(1,181) = 65.59$ ;  $p < .001$ ) of children's aggression level at baseline (at T1) on their aggression level at T2 is found. We did not find a significant intervention effect. This indicates that highly aggressive children are likely to be highly aggressive after intervention (at T2), regardless of their being in the experimental or in the control group.

ANCOVAs based on self-report including the aggression level at T3 yielded similar

results; we found a significant effect ( $F(1,173) = 62.89; p < .001$ ) of children's aggression level at baseline (at T1) on their aggression level at T3. Again, we did not find a significant intervention effect on the basis of children's self-report. This indicates that highly aggressive children are likely to be highly aggressive at follow-up measurement (at T3), regardless of their being in the experimental or in the control group.

On the basis of parental reports, a significant effect of the aggression score at baseline is found on the aggression score at T2;  $F(1,122) = 203.16; p < .001$ . We did not find a significant effect of the intervention. This suggests, again, that highly aggressive children are likely to be highly aggressive after intervention (at T2), regardless of their being in the experimental or in the control group.

At T3, however, we did find a significant reduction in aggression level according to parental reports,  $F(1,103) = 10.43; p < .01$ . In addition, we found a significant effect of the aggression score at baseline (at T1) on the aggression score at T3;  $F(1,103) = 128.99; p < .001$ . These results indicate that although the aggression score at baseline has a considerable effect on the aggression score after intervention, the intervention also has significantly reduces the aggression score according to parents. In other words, the parents noticed and reported a significant decrease in the level of aggressive behavior of the boys who were assigned to the intervention group.

On the basis of teacher reports, we also found a significant effect ( $F(1,166) = 58.12; p < .001$ ) of the aggression level of the child at baseline (at T1) on their aggression level at T2. We also found a significant effect of the intervention on the aggression level of the child at T2 ( $F(21,166) = 7.25; p < .01$ ). These results indicate that although the aggression score at baseline has a considerable effect on the aggression score after intervention, the intervention also has a significant effect according to the teacher. In other words, the teachers noticed and reported a significant decrease in the level of aggressive behavior of the boys who were assigned to the intervention group.

At T3, we still found a significant effect ( $F(1,132) = 11.33; p < .01$ ) of the aggression level of the child at baseline (at T1) on their aggression level at T2 on the basis of teacher reports. This suggests, once again, that highly aggressive children are likely to be highly aggressive after at T3, regardless of their being in the experimental or in the control group. These analyses did not indicate a significant reduction in aggressive behavior at T3; these results suggest that the

reduction in aggressive behavior that teachers observe immediately after intervention (at T2), are no longer observed at T3.

*Effect of self-esteem.* Based on self-report of the child, no significant effect of the intervention is found on their aggression scores after intervention (at T2) and at follow-up measurement (at T3), no significant effect of their self-esteem is found on their aggression scores after intervention (at T2) and at follow-up measurement (at T3) and no significant interaction effect between condition and self-esteem is found at T2 or T3. These results indicate that the highly aggressive boys who were included in this study generally did not report a significant reduction in their level of aggression after taking part in the intervention.

*Effects of personality for parental reports.* In order to examine the effect of the Big Five personality traits on the aggression level of the child after intervention, we conducted ANCOVAs in the previously described manner. In all analyses that were conducted with the parental reports, significant main effects (variances between  $F(1,21) = 31.42, p < .01$  and  $F(1,21) = 19.10, p < .01$ ) of the aggression score at baseline were found. These results indicate that the tendency of highly aggressive children to be highly aggressive after intervention (at T2), regardless of their being in the experimental or in the control group still holds when the different personality traits are included in the analyses.

The analyses were conducted with each personality trait included separately as a covariate and revealed no significant effects of condition, Agreeableness, Conscientiousness, Emotional Stability, Openness to Experience, or Extraversion on the child's aggression immediately after the intervention (at T2). These results indicate that the parents generally did not report a significant reduction in the level of aggression of their child after intervention, nor do they point towards significant effects of the different personality traits on the aggression level after intervention (at T2).

An ANCOVA including the T3 aggression outcome and the trait Agreeableness yielded a significant intervention effect,  $F(1,15) = 8.14; p < .05$ . The intervention significantly reduces the aggression outcome at T3 on the basis of parental reports. No significant main effect of Agreeableness on aggression level was found and also no significant interaction term between aggression and Agreeableness was found. These results indicate that (based on parental reports)

the intervention significantly reduces the aggression outcome at T3. In this ANCOVA, with the personality trait Agreeableness included as a covariate, the intervention significantly reduces the level of aggression at T3. However, no main effect or interaction effect of Agreeableness on the aggression level at T3 was found. In other words, there is no moderating effect of the personality trait Agreeableness on the reduction in aggressive behavior after intervention.

When we conducted an ANCOVA with the T3 aggression outcome and the characteristic Emotional Stability, we also found a significant main effect of the intervention;  $F(1,38) = 7.70$ ;  $p < .01$ . In other words, although parents generally did not report a significant reduction of children's aggression immediately after intervention (at T2), they did report one at follow-up measurement (at T3). No significant main effect of Emotional Stability on aggression level was found and also no significant interaction term between aggression and Emotional stability was found. These results indicate that (based on parental reports) the intervention significantly reduces the aggression outcome at T3. In this ANCOVA, with the personality trait Emotional Stability included as a covariate, the intervention significantly reduces the level of aggression at T3. However, no main effect or interaction effect of Emotional Stability on the aggression level at T3 was found. Put differently, there is no moderating effect of the personality trait Emotional Stability on the reduction of aggressive behavior after intervention.

The ANCOVAs based on parental reports that included the remaining traits (Conscientiousness, Openness to Experience and Extraversion) did not produce results indicating an intervention effect or an effect of these individual traits on the aggression level at follow-up measurement (at T3).

*Effects of personality for teacher reports* When we performed an ANCOVA with the T2 aggression outcome and the characteristic Agreeableness, we found a significant effect of the intervention ( $F(1,55) = 4.03$ ;  $p < .05$ ), a significant main effect of the characteristic Agreeableness ( $F(92,55) = 2.96$ ;  $p < .01$ ), but no interaction effect between condition and Agreeableness. In other words, teachers report a significant reduction in aggression level after intervention. Moreover, children who are high on Agreeableness, regardless of their being in the experimental or in the control group, showed a larger decrease in aggressive behavior at the T2 measurement than children who are low on Agreeableness.

ANCOVA with the trait Emotional Stability provided significant findings as well. The

intervention seems to have a significant effect ( $F(1,79) = 7.70, p < .05$ ) on the aggression outcome after intervention (at T2). No significant main effect of Emotional Stability on aggression level at T2 was found and also no significant interaction term between aggression and Emotional stability was found. These results indicate that (based on teacher reports) the intervention significantly reduces the aggression outcome at T2. In this ANCOVA, with the personality trait Emotional Stability included as a covariate, the intervention significantly reduces the level of aggression at T2. However, no main effect or interaction effect of Emotional Stability on the aggression level at T2 was found. In other words, there is no moderating effect of the personality trait Emotional Stability on the reduction of aggressive behavior.

When we performed an ANCOVA with the T2 aggression outcome and the characteristic Extraversion on the basis of teacher reports, we found a significant effect of the intervention ( $F(1,53) = 5.72; p < .05$ ) as well as a significant effect of aggression at baseline,  $F(1,53) = 19.85; p < .05$  on the aggression level after intervention (at T2). These results indicate that although the aggression score at baseline has a considerable effect on the aggression score after intervention, the intervention significantly reduces aggressive behavior in highly aggressive boys according to the teacher.

The ANCOVAs based on teacher reports that included the remaining traits (Conscientiousness and Openness to Experience) did not produce results indicating an intervention effect or an effect of these individual traits on the aggression level after intervention (at T2).

ANCOVA at T3 did not yield any significant results of the intervention or of personality traits on the basis of teacher reports. These results indicate that the significant reduction in level of aggression that teachers report at T2 is not found at the follow-up measurement (at T3).

*Summary of findings.* Based on self-report, the level of self-esteem does not significantly predict the level of aggression after intervention, nor does the Stay Cool Kids intervention significantly reduce the aggression level after intervention. There is, however, a significant effect of the level of self-reported aggression at baseline on the aggression outcome after intervention; highly aggressive boys are likely to remain highly aggressive at T2.

Based on parental reports, the strongest effect that is found using ANCOVA is that of aggression at baseline measurement on aggression after intervention (at T2) and at follow-up

measurement (at T3). Immediately after intervention, the analyses based on parental reports do not indicate significant intervention or personality effects on the level of aggression. At follow-up measurement (at T3), on the other hand, intervention effects appear in the analyses that included the personality characteristics Emotional Stability and Agreeableness. Parents notice a significant reduction in aggressive behavior at the follow-up measurement after six months (at T3), but not immediately after intervention termination (at T2).

The analyses that are based on teacher reports also indicate that the aggression level at baseline measurement (at T1) strongly influences the aggression level after intervention. Moreover, the outcomes from the analyses involving the characteristics Agreeableness, Emotional Stability and Extraversion indicate significant intervention effects; the teachers report a significant decrease in children's aggression level after intervention (at T2). At follow-up measurement (at T3), the ANCOVAs based on teachers report do not indicate any significant effects of the intervention on the aggression level, nor do they indicate significant results of personality traits on the aggression level of the child.

### **Discussion**

*Preliminary analysis.* The aim of this study was to explore the effect of self-esteem and personality on the reduction in aggression after intervention in highly aggressive children. As outlined previously, there were three plausible possibilities regarding the relationship between self-esteem and aggression in highly aggressive children: there could be a positive relationship between self-esteem and aggression (Menon et al., 2007), a negative relationship (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005) or a U-shaped relationship (Ostrowsky, 2010). The results lent some support for the conclusion that a negative relationship between self-esteem and aggression could exist based on self-report, but the correlation is low, therefore the evidence is not very compelling. Since the literature on this topic is not unanimous and because research has indicated the relatively low internal consistency of self-report by children (Tani, Greenman, Schneider, & Fregoso, 2003), we cannot draw conclusions from these exploratory results and further research is necessary to investigate the relationship between self-esteem and aggression in a preventive intervention setting.

With regard to the Big Five personality traits, our hypothesis that there would be a positive correlation between Extraversion and aggression (De Haan et al., 2010) is only supported

partially; weak correlations were reported between Extraversion and aggression based on teacher reports, but based on parental reports the correlation is not significant. It is not unusual for teachers to report differently on children's externalizing behaviors, for the most part because they experience the child under different circumstances (Achenbach, McConaughy, & Howell, 1987), which might at least partially explain the limited correlations that were found.

Our hypothesis that Agreeableness and aggression would correlate negatively is supported by quite strong correlations based on parental, as well as on teacher reports. Children who were more Agreeable (or Benevolent) displayed lower rates of aggressive behavior as reported by their parents and teachers in our sample, as is the case in the sample of Prinzie, Onghena, and Hellinckx (2005). Apparently, this tendency not only holds for a general population, but also for our sample of highly aggressive boys.

Since research on adult populations indicates a negative relationship between Conscientiousness and aggression (Grumm & von Collani, 2009), we expected to find a negative relationship in our sample as well. Our results support this hypothesis; a (weak) correlation was found between Conscientiousness and aggression, and this is a moderate correlation based on parental reports. Teacher reports provide an even weaker (but still significant) correlation between Conscientiousness and aggression. Since Conscientiousness in adults is a trait that is related to task-related behaviours (Caspi, Roberts, & Shiner, 2005) it is possible that maturational processes play a role here and this trait has not fully developed in the children that were included in our sample. Since personality was included in our study as a static measure at baseline measurement and was not followed up with longitudinal assessments we are unable to draw causal conclusions on this matter.

Furthermore, we expected Emotional Stability to be negatively related to initial levels of aggression (Prinzie, Onghena, & Hellinckx, 2005) and this hypothesis is only supported by parental reports (and not by teacher reports) and the correlation is weak. This finding suggests that in highly aggressive children, their level of Emotional Stability has less of an impact on their aggression level (or vice versa). This finding could be explained by the fact that the current study focuses on a specific group of highly aggressive boys, whereas the hypothesis was based on research on a general population sample.

Our results indicate a weak correlation between Openness and aggression on the basis of both teacher and parental reports, thus suggesting that the more open a child is to trying new

things, the higher the rate of aggressive behavior of the child is going to be. Since Openness entails a willingness to try or consider new activities, ideas and beliefs (Caspi, Roberts, & Shiner, 2005; Mervielde & De Fruyt, 1999), it is possible that children high on Openness are also more open to (aggressive) suggestions of other children. Moreover, Openness is associated with sensation seeking, which in turn significantly predicts antisocial behavior (Prinzle et al., 2004). However, it is important to keep in mind the mixed nature of findings from recent studies regarding the trait Openness to Experience and aggression (e.g., Ehrler, 1999; Prinzle et al., 2004), and thus to be careful in interpreting the results.

*Intervention effects.* Intervention effects for the total group at post-assessment (at T2) were not found for parents or children's self-report. The fact that only the teacher reports yield results that indicate a reduction in aggression after the intervention is not surprising; parents generally report fewer problem behaviors than professionals do (Kroes, Veerman, & De Bruyn, 2005), which would lead them to see less of a difference after intervention. In addition, it is known from research that there is generally only modest agreement between the ratings of a child's functioning from multiple informants (Achenbach, McConaughy, & Howell, 1987). In the current study there was a discrepancy between the parental and teacher reports on the level of aggressive behavior; the teacher scores on aggressive behavior at baseline (at T1) were significantly higher than the parental ones, as was described previously. Research indicates that there are usually low correlations between the reports of problem behavior between parents and teachers; the average correlation is .28. According to Achenbach, McConaughy & Howell (1987) these discrepancies are mainly due to situational differences in children's behavior. Parents and teachers do not only experience children in different settings in which their behavior might differ significantly, their expectations can also vary, thus leading them to provide different reports in children's behavior.

*Intervention effects at follow up.* Interestingly, the results with regard to intervention effects at follow-up measurement (at T3) differ from those at T2. Self-report at follow-up measurement (at T3) did not indicate significant intervention effects, in accordance with the self-report after intervention (at T2). Six months after intervention termination (at T3), parents report a significant reduction in aggressive behaviour of their child. This may be due to a potential

“sleeper effect” discovered with respect to behavioural observations (Carpenter & Nangle, 2002). Whereas teachers report a significant decrease in aggression level after intervention termination (at T2), they fail to do so at the follow-up measurement (at T3), which may be due to the fact that at six months after the intervention, children have moved on to the next grade and often get a new teacher. Their new teacher is unable to compare the classroom behavior of the child to the behavior before the intervention, because the teacher did not have the child in his or her class at that point in time. This may explain why the significant decrease in aggression level that was reported at T2 no longer appears in the reports at T3. This result does not necessarily imply that children’s behavior has deteriorated from how it was at T2, especially since parents do report a reduction in aggressive behavior at this point in time.

*Effects of self-esteem and personality.* Although further research is required to gain a more complete understanding of the interplay between self-esteem, personality and aggression in highly aggressive children, our findings suggest that the development of aggressive behavior is influenced by the level of self-esteem and by certain personality characteristics of children.

No moderating effect of self-esteem on the level of aggression was found based on self-report. It is known from research that the internal consistency of highly aggressive children’s self-report tends to be low, especially when compared to parental and teacher reports (Tani, 2003). Moreover, aggressive children have the tendency to make themselves appear more socially competent on self-report scales than they actually are (Patterson et al., 1990). These tendencies may have caused the self-report measures to be less useful for interpretation.

The most important predictor of the level of aggression after intervention (at T2) is the level of aggression at baseline (at T1). This holds true for all respondents and this finding is in accordance with a large body of research indicating that externalizing behaviors can be quite stable over time, especially in highly aggressive boys (Loeber & Farrington, 2000; Prinzie, Onghena, & Hellinckx, 2005). Even when the intervention is effective in reducing aggression scores, extremely aggressive boys like the ones from our sample will still display relatively high rates of aggression.

We tentatively expected Extraversion to be correlated to a smaller aggression reduction based on influential studies linking Extraversion to high aggression (Prinzie et al., 2004) and high delinquency (De Haan et al., 2010). Our results based on parental and teacher reports do not

indicate an effect of Extraversion on the aggression reduction in our sample of highly aggressive boys.

As hypothesized, children who are high on Agreeableness, regardless of their being in the experimental or in the control group, showed a larger decrease in aggressive behavior at the T2 measurement based on teacher reports than children who are low on Agreeableness. This finding based on teacher reports is in concurrence with a large body of research indicating a negative relationship between aggression and Agreeableness (e.g., Caspi et al., 2005; DeYoung et al., 2008; Gleason et al., 2004), but this is not reported by parents in the current study. Although moderating effects were not substantiated in our exploratory study, this finding does suggest that highly Agreeable children might benefit more from the intervention than children who are low on Agreeableness (or Benevolence, as it is oftentimes referred to in children). Further research is needed in order to gain more insight into the effects of Agreeableness on highly aggressive boys in an intervention setting.

Although we tentatively expected a positive association between Conscientiousness and aggression reduction since Conscientiousness has proven to be negatively related to aggression levels in different studies (Grumm & von Collani, 2009; Klimstra et al., 2010; Prinzie et al., 2004), our results based on parental and teacher reports do not support this hypothesis. Research by De Haan et al. (2010) suggested that Conscientiousness may matter more for delinquency than for aggression, and since our research focused purely on aggression and not on delinquency, this might explain our results. Future research could include measures of delinquency to explore whether this would produce stronger associations with Conscientiousness.

With regard to Emotional Stability we suggested that children with high Emotional Stability might display larger reductions of problem behavior after intervention; in accordance with research from Prinzie, Onghena, and Hellincks (2005) indicating higher scores on Emotional Stability correlate to larger reductions of problem behavior over time in children. However, we did not find a moderating effect of Emotional Stability, nor did we find a main effect of Emotional Stability on the aggression reduction based on parental and teacher reports.

Due to the mixed nature of research findings regarding the trait Openness to Experience and aggression, suggesting a positive (Prinzie et al., 2004) as well as a negative association (Ehrler, 1999) between Openness to Experience and problem behavior and the lack of evidence connecting Openness to Experience and aggression in an intervention setting, we were unable to

formulate clear expectations on this matter. The results do not support an effect of Openness to Experience on the aggression reduction after intervention or without intervention.

*Effects of self-esteem and personality at follow-up.* The most important predictor of the level of aggression at the follow-up measurement (at T3) is the level of aggression at baseline (at T1) and this is true for all three respondents, just as it is at T2. As was mentioned previously, this is in accordance with a large body of research indicating that externalizing behaviors can be quite stable over time, especially in highly aggressive boys (Loeber & Farrington, 2000; Prinzie, Onghena, & Hellinckx, 2005).

No moderating effect of self-esteem on the level of aggression was found based on self-report at the follow-up measurement. As was described previously, the generally low internal consistency of highly aggressive children's self-report (Tani, 2003) or the tendency aggressive children have to make themselves appear more socially competent on self-report scales than they actually are (Patterson et al., 1990) might play a role in this finding. In any case, we are unable to draw conclusions about the effects that the level of self-esteem might have on the aggression reduction after or without intervention in highly aggressive children.

Although parents report a significant intervention effect on the aggression reduction at the follow-up measurement (at T3), their reports do not indicate any main or interaction effects of the Big Five personality traits.

As was mentioned previously, the follow-up measurement (T3) based on teacher reports did not indicate any significant effects of the intervention or of the Big Five personality traits on the aggression reduction. Although the difference between the results from the measurement at intervention termination (at T2) and follow-up measurement (at T3) may seem surprising, it can be explained at least partially by the fact that the follow-up teacher report is provided by a different teacher from the first two assessments.

*Strengths and limitations.* Longitudinal investigation of the personality development of children is a recent development in the field (e.g., Prinzie, Onghena, & Hellinckx, 2005) but including intervention effects has (at least to our knowledge) not been done before. Investigating personality and self-esteem of aggressive boys in an intervention study is innovative and the results of this study can contribute to the (currently limited) body of knowledge about the

development of personality in highly aggressive children, more specifically the relationship between Emotional Stability, Agreeableness and aggression.

Moreover, it explores the relationship between self-esteem and aggression in this specific group of highly aggressive children. Finally, this study can contribute to intervention efficacy by indicating which children can benefit most from the intervention.

Furthermore, the strengths of the design are significant; there is a relatively large research population, the random assignment of control and experimental condition is applied, and the data is based on information from multiple respondents.

In addition to these strengths, several limitations of the study should be noted as well. First, whereas 18.2% of the immigrant parents did not fill out the HIPIC, the information on their children's personalities is limited. Also, we allowed the parents to fill out the HIPIC after the intervention, to ensure that parents would not drop out at baseline because of the (already) long questionnaires. Teachers filled out this questionnaire at baseline. Although research indicates that personality traits are fairly stable (De Haan et al., 2010; McCrae et al., 2000), it is not unthinkable that a change in behavior after the intervention might lead parents to report in a slightly different way on their children's personality. For theoretical and scientific reasons, it would have been preferable to obtain this information prior to the intervention.

A second limitation due to practical and financial reasons related to the sample size is the sole reliance on questionnaire measures. This increases the likelihood of method bias or confound amongst the measures. Self-reports on behavior were found to correlate only modestly with reports from multiple respondents (Achenbach, McConaughy, & Howell, 1987). Therefore, a multimethod measurement strategy (for example by including observational measures) may more accurately assess children's behavior and thus provide more reliable results. Including observational measures could also offer a solution to the issue with the teacher reports (children having a different teacher at the time of the follow-up measurement).

A third limitation lies in the complex design of this study. Because self-esteem, personality and aggression were all measured concurrently (at baseline), it is not possible to make statements about directionality. Future longitudinal research is needed to enable the study of changes over time in childhood behavior and personality development in relation to interventions such as the Stay Cool Kids program.

Finally, this exploratory research focused on comparing reports within informants. Conducting an SEM analysis, thus comparing the reports between the different respondents could gain more insight into the relationships between self-esteem and aggression and between personality and aggression with regard to the Stay Cool Kids intervention.

Taking into consideration the seriousness of the consequences of persistent aggression in children for their own development, as well as for society, it is of great importance that intervention efficacy is enhanced, especially of preventive interventions such as the Stay Cool Kids program. The exploratory findings on the relationship between self-esteem, personality and aggression in the light of this intervention should be further investigated in order to select those children who could benefit the most from the intervention. Lastly, further longitudinal research is important to delineate the development of self-esteem, personality and aggression.

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