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### The effectiveness of youth crime prevention

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# 5.

## **A Randomized Controlled Trial of the Effectiveness of the Youth Crime Prevention Program ‘New Perspectives’ (NP): Post-treatment Changes and Moderator Effects<sup>4</sup>**

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4 De Vries, L. A., Hoeve, M., Wibbelink, C. J. M., Asscher, J. J., & Stams, G. J. J. M. (in revision). A Randomized Controlled Trial of the Effectiveness of the Youth Crime Prevention Program ‘New Perspectives’ (NP): Post-treatment Changes and Moderator Effects.

**Abstract**

*New Perspectives (NP) aims to prevent that youth at onset of a criminal career will develop a more persistent criminal behavior pattern. The study aim was to examine whether NP was effective in preventing and reducing (persistent) delinquency. Moreover, we examined improvements in secondary outcomes (e.g., peer and parent relationships and cognitive distortions) and other outcomes (e.g., substance use and self-esteem). At-risk youth (N = 101) aged 12 to 19 years were randomly assigned to the intervention group (NP, n = 47) or control group ('care as usual', n = 54). The effects of the NP intensive phase (3 months after program start) and aftercare phase (6 months after program start) were analysed. NP and care as usual did not differ on any of the outcome measures at both post-test occasions. Age moderated the effects of NP on prosocial behavior: the behavior of older NP-adolescents improved during the NP intensive program phase, whereas older adolescents in the control group showed a deterioration. Opposite effects were found for the aftercare phase. The overall null-effects are discussed, including implications for further research, policy, and practice.*

## 5.1 Introduction

Juvenile delinquency is a serious problem given its negative consequences for victims, society, and juvenile offenders. In the Netherlands approximately one third (38%) of the adolescents between 12 and 17 years of age have reported a crime at any moment in their life (Van der Laan & Blom, 2011). Of those juveniles, about 36% recidivate (Wartna, Blom, & Tollenaar, 2011). The Dutch prevalence rates are comparable to self-reported juvenile delinquency in the United States, but are relatively high compared to other European countries (Enzmann et al., 2010).

The fact that many youngsters with disruptive behaviors develop personality disorders (Rey, Morris-Yates, Singh, Andrews, & Stewart, 1995) and a persistent criminal trajectory (Loeber, Burke, & Pardini, 2009) underscores the need to intervene at an early stage in adolescents' lives. It is therefore very important to establish the effectiveness of programs that aim to prevent persistent juvenile delinquency. This article reports on the effects of the prevention program New Perspectives (NP), an intensive ambulant program designed to help divert adolescents in early stages of delinquency from committing future offenses (Elling & Melissen, 2007).

## 5.2 Previous Research on Programs Preventing Delinquency

An expanding amount of research on preventive and curative interventions exist that target youth at risk for chronic antisocial and criminal behavior. Meta-analytic reviews have shown positive effects of these programs aimed at preventing and reducing juvenile reoffending (e.g., Andrews, Bonta, & Hoge, 1990a; Koehler, Lösel, Akoensi, & Humphreys, 2013; Lipsey, 1992; 2009). However, treatment outcomes have been shown to be modest. For example, Deković et al. (2011) concluded that prevention programs during early and middle childhood showed no convincing evidence in reducing delinquent behavior in adulthood. Findings of a recent meta-analytic study (De Vries, Hovee, Assink, Asscher, & Stams, 2015a) revealed more positive effects of prevention programs for adolescents at the onset of a criminal career. However, the effects were small in magnitude, showing an offending reduction of only 13%. It is therefore important to continue evaluating promising theory-driven prevention programs.

Andrews and Bonta (2010) stated that interventions based on the RNR-model principles of *Risk* (proportionality between program intensity and risk of reoffending), *Need* (targeting criminogenic needs), and *Responsivity* (match between program style/mode and person's characteristics) have shown to reduce offender recidivism up to 35%. Findings of a meta-analytic study on the effectiveness of preventive interventions for youth at risk for persistent delinquent behavior concluded that family-based and individual programs, including (cognitive) behavioral-oriented techniques (training parenting skills), are most effective in preventing a persistent criminal career (De Vries et al., 2015a). Group-based and highly intensive programs proved to be counterproductive. Thus, we expect that preventive interventions that are designed according to the RNR model and general principles of

effectiveness derived from the meta-analysis by De Vries et al. yield positive effects in preventing a persistent criminal trajectory.

### **5.3 New Perspectives**

The NP-program is based on the theoretical framework of the RNR model (Andrews et al., 1990a). First, NP adheres to the *risk principle* by providing modules (NP Prevention and NP Plus) that differ in treatment intensity in order to adjust to the offender's risk of recidivism. Second, the multisystemic approach of NP enables treatment of multiple factors related to delinquency and recidivism, such as cognitive distortions, poor parenting behavior and associations with deviant peers (*needs principle*). Third, NP is based on the *responsivity principle* by adjusting treatment to the client's motivation level. Techniques of motivational interviewing and individual coaching are used to influence motivation levels of adolescents. Additionally, the NP program is carried out in a multimodal format by incorporating a variety of effective cognitive social learning strategies (incl. problem-solving skills and cognitive restructuring methods). NP attempts to modify cognitive distortions by using *cognitive restructuring* techniques (Elling & Melissen, 2007). Finally, NP aims to achieve high levels of program integrity by linking program aims to the methods being used, providing well-trained staff, and implementing monitoring methods to evaluate activities of the care workers (DeVries et al., 2014a; Van den Braak & Konijn, 2006). Given that the program has a strong theoretical framework (RNR model), monitoring methods (for program integrity), behavioral-oriented techniques, and a multimodal format, NP is considered to be a promising intervention in preventing persistent delinquency.

Previous uncontrolled evaluation studies of NP have shown reductions in delinquency and improvements in the different life domains, such as family, school, and peers (Buysse, Van Andel, & Van Dijk, 2008; Geldorp, Groen, Hilhorst, Burmann, & Rietveld, 2004; Noorda & Veenbaas, 1997). For example, Noorda and Veenbaas (1997) concluded that 72% of 300 youngsters showed a decrease in delinquent behavior and long-term (after 9 months) improvements in multiple life areas. Improvements were found in family bonds, leisure time, and peer affiliations (Geldorp et al., 2004; Noorda & Veenbaas, 1997). Finally, De Vries, Hoeve, Asscher, and Stams (2014a) and Van den Braak and Konijn (2006) found moderate to high levels of adherence to prescribed treatment procedures and components of the intensive (NP) program phase. However, previous evaluation studies lacked use of a control group and, consequently, it is questionable if the positive results can be attributed to the intervention. Using a randomized controlled trial is the most rigorous way to evaluate treatment effects (Clingempeel & Henggeler, 2002).

### **5.4 The Present Study**

The present study uses a randomized controlled trial to examine the short-term effects (after 3 and 6 months after start of program) of NP. First, we examined whether NP is effective in decreasing delinquent behavior, the primary program goal. Second, we examined individual

and social factors, which are considered to be the secondary program goals of NP, including parenting behavior, social bonds with parents (adolescent-parent attachment), peer affiliations, and cognitive distortions, and are assumed to be related to delinquency (Andrews & Bonta, 2010; Elling & Melissen, 2007). Also, other individual factors that have been found to be associated with delinquency were assessed, such as substance use (D'Amico et al., 2008), and low self-esteem (Donnellan et al., 2005). Finally, we examined program outcomes related to depression and anxiety (internalizing behavior problems), because these problems often co-occur with externalizing problems (Barker, Oliver, & Maughan, 2010). The present study is one of the first outside the USA to examine the effectiveness of a prevention program targeting adolescents (in pre-, mid- and late adolescence) at risk for persistent delinquency by using a randomized controlled trial.

Next to the overall program effectiveness, it is important to examine which youngsters benefit most from the intervention (Kazdin & Weisz, 1998). The NP target group is very diverse regarding ethnic background, gender, and age. In this respect it is important to examine possible differential effects of NP for boys and girls, and adolescents from different cultural backgrounds and ages. In social work research and practice, there is little consensus about whether treatment should be tailored to youth background characteristics, ethnicity and gender in particular. For example, although several studies have demonstrated that female juvenile offending is associated with specific risk factors (Hipwell & Loeber, 2006), gender-non-specific programs were found to be equally effective in reducing recidivism for boys and girls (Zahn, Day, Mihalic, & Tichavsky, 2009). Also, different risk factors have been found in non-indigenous groups, including migration stress factors, such as loss of family and friends, poor integration, and feelings of alienation and discrimination (Stevens & Vollebergh, 2008). Despite these specific risk factors, mainstream service programs were found to be equally effective for minority and white majority juvenile delinquents in the United States (Wilson, Lipsey, & Soydan, 2003). Finally, it is well-known that the extent and impact of risk factors change with age. For example, the influence of peers in the adolescent's behavior increases with age, whereas the impact of parental supervision decreases with age (Loeber, Slot, & Stouthamer-Loeber, 2006; Van der Put et al., 2011). As a consequence, examination of differential effects of prevention programs for different subgroups is needed. Thus, in addition to examining the overall program effects, we investigated effects of potential moderators.

## **5.5 Method**

### **5.5.1 Participants**

A total of 160 adolescents and parents were recruited for the study at baseline and randomly assigned to the intervention NP ( $n = 81$ ) or the control group ( $n = 79$ ). Despite the efforts made, 59 adolescents (37%) and 99 parents (62%) dropped out at first assessment. Also, 10 adolescents and 22 parents did not complete the second assessment (T2) and 6 adolescents and 16 parents were lost at third assessment (T3). More details of attrition rates are presented in Appendices 5.A and 5.B.

Participants lost to post-intervention assessments (T2 and T3) did not differ significantly on demographic variables or on any of the outcome variables from those retained. Little's MCAR test indicated that data were missing completely at random for adolescents,  $\chi^2(5329) = 2210.110, p = 1.000$ , and parents,  $\chi^2(2805) = 91.275, p = 1.000$ . Therefore, all participants who completed one or more of the three assessments were included in the analyses, resulting in 101 adolescents (NP  $n = 47$ , CAU  $n = 54$ ) and 61 parents (NP  $n = 26$ , CAU  $n = 35$ ). Multiple imputation by the expectation maximization algorithm was applied to estimate missing values of adolescent and parent data on the outcome variables (Graham, 2009; Tabachnick & Fidell, 2013). Missing values on the categorical outcome measure of delinquency were not estimated.

The final sample of adolescents consisted of 68 boys and 33 girls, aged  $M = 15.58$  ( $SD = 1.53$ , range = 12.30 – 19.30). Eighty-three percent ( $n = 84$ ) of the juveniles belonged to an ethnic minority group, that is, at least one of the youth's parents was born abroad (second generation). The largest second generation groups had a Surinamese (27%,  $n = 27$ ), or a Moroccan (24%,  $n = 24$ ) background. More than half (55%) lived in a single-parent home. With regard to the education level, 40% followed lower secondary vocational education (VMBO), 41% intermediate vocational education (MBO), 12% university preparatory education (HAVO/VWO), and 8% special education. The participants were on average 15.12 years old ( $SD = 1.46$ ) when they first came into contact with the police. The sample of 61 parents were  $M = 44.48$  years of age ( $SD = 7.02$ , range = 33.03 – 63.05) and the majority of the parents were female ( $n = 53$ ). The educational level of parents ranged from elementary school (5%) to university degrees (20%). Independent sample  $t$  tests and chi-square analyses revealed no differences between treatment conditions at pre-test on demographic factors and outcome variables. Additional characteristics of adolescents are presented in Table 5.1.

**Table 5.1 Background Characteristics and Problem Severity in NP and CAU**

	NP ( $n = 47$ )		CAU ( $n = 54$ )		$t$
	$M$	$SD$	$M$	$SD$	
Mean age	15.66	1.44	15.51	1.61	-0.489
Age at first police contact	15.07	1.56	15.15	1.41	-0.220
	%	$n$	%	$n$	$\chi^2$
Older juveniles (from 16 years)	48.9	23	44.0	24	0.408
Male	63.8	30	70.4	38	0.489
Ethnic minority status	78.7	37	87.0	47	1.241
History in youth care (yes)	70.2	33	72.2	39	0.050
Meets DSM-IV criteria					
Overt aggression	52.3	23	69.8	37	3.134
Covert aggression	54.5	24	49.1	26	0.290
Substance Use	19.6	9	20.4	11	0.010
Depression	15.2	7	22.2	12	0.792

Note. NP, experimental group, CAU, control group.

### 5.5.2 Procedure

Participants were recruited at five locations of a large youth care institution in the urban area of Amsterdam between 2011 and 2013. Adolescents were mainly referred by a collaboration between professionals of the National Board of Child Protection and the Juvenile Justice Department ('Veiligheidshuis'), local child welfare agencies, elementary or secondary schools, Youth Care Agency of Amsterdam, or they were self-referred.

Adolescents were screened for participation in NP by clinical professionals based on the following criteria: (1) age 12 to 23 years, (2) experiencing problems in multiple life domains (school, family, peers, leisure time), and (3) being at risk for the development and progression of a deviant life style, such as predelinquents with antisocial behavior, first time offenders, and adolescents with mainly minor police contacts and offenses (such as shop lifting and joyriding). Exclusion criteria were an IQ below 70, severe psychiatric problems, a long history of delinquency, severe drugs- or alcohol use (dependency), absence of residence status in the Netherlands, and absence of motivation to stop committing criminal acts.

Data of adolescents and parents were collected at three points in time: prior to treatment (T1 pre-test assessment), 3 months after the pre-test assessment (T2 post-test, at termination of the intensive intervention phase), and 6 months after pre-test (T3 post-test, at termination of the aftercare phase). A more elaborate description of the randomization process can be found in the study protocol of De Vries, Hoeve, Asscher, and Stams (2014b).

### 5.5.3 Conditions

Adolescents meeting inclusion criteria for NP were randomly assigned to the experimental and control group. The experimental group received NP, a voluntary ambulant program consisting of an intensive coaching phase of 3 months followed by a 3-month aftercare phase. Youth care workers, who have low caseloads, are available 24 hours a day, 7 days per week. During the intensive coaching phase, the average contact intensity per week is 8 hours per client. The aftercare phase is characterized by a low contact intensity, ranging from a minimum of 4 hours to a maximum of 12 hours total contact intensity (in 12 weeks). Core activities of NP include motivational interviewing, individual coaching, cognitive restructuring and involving the social network (peers, parents, teachers etc.). Aspects of parenting behavior are addressed by using various techniques for parenting, such as psychoeducation and empowerment. Peer affiliations are addressed by teaching skills to resist negative peer influences, reinforcing friendships with prosocial peers and improving leisure time activities of adolescents (Tan, Brussen, Sewraj, Rijnveld, & Bontes, 2010).

Adolescents in the control group received care as usual (CAU). These services included child welfare services, such as individual and/or family counseling, individual and academic service coaching, and social skills training. Notably, 35% of the juveniles ( $n = 19$ ) did not receive an intervention (see also Figure 1 for an overview of the flow of participants through the study).



### 5.5.4 Measures

The primary outcome was delinquent behavior and the secondary outcomes were parenting behavior (monitoring, support, authoritative and restrictive control), adolescent-parent attachment (communication, trust, and alienation), peer affiliations (contact intensity, prosocial and deviant peer friendships) and cognitive distortions (self-centered attitude, blaming others, mislabeling, and assuming the worst). Other outcomes included prosocial behavior, self-esteem, aggressive behavior (overt and covert aggression), substance use, externalizing behavior problems (attention deficit, hyperactivity, impulsivity and social behavioral problems), and internalizing problems (depression and anxiety). Potential moderators were gender, age, and ethnicity.

*Delinquent Behavior.* The primary outcome measure was the presence of delinquent behavior among adolescents. The prevalence of offending was assessed by the 'Self-report Delinquency Scale' (SRD) of the Research and Documentation Centre (WODC; Van der Laan & Blom, 2006; Van der Laan, Blom, & Kleemans, 2009). Adolescents reported if they ever participated in diverse delinquent acts, based on seven subscales (vandalism, property crime, violent acts, weapon possession, drugs possession and dealing, and cybercrime). Three subscales of the SRD scale were used for examination of the program effectiveness: *violent crime* (7 items), *vandalism* (4 items), and *property crime* (6 items). The acts ranged from minor offenses to more severe offenses. First, for the 17 types of offending activities, participants were asked if they had been engaged in each of these acts. Examples of items are: "Have you ever wounded anyone with a knife or other weapon?" and "Have you ever covered walls, buses, or entryways with graffiti?" Next, for each of the acts, where respondents answered with "yes", they were then asked how often they participated in diverse delinquent acts during the past 3 months. In the present study, sum scores were used, indicating how often the participant showed delinquent activities in the previous three months. Cronbach's alpha's for delinquent behavior were T1  $\alpha = .80$ ; T2  $\alpha = .62$ ; and T3  $\alpha = .88$ .

*Parenting Behavior.* In particular parental support (10 items: *warmth* and *responsiveness*), authoritative control (10 items: *explaining* and *autonomy*), and restrictive control (10 items: *strictness* and *discipline*), were assessed with the 'Parenting Behaviour Questionnaire' (PBQ, Wissink, Deković, & Meijer, 2006). All items were measured using a 5-point Likert scale (1 = never to 5 = very often). Examples of items are: "How often do your parents give you a compliment (support)?", "How often do your parents explain why something is forbidden for you (authoritative)?", and "How often do your parents punish you severely (restrictive)?" In the present study, reliability analyses resulted in the following Cronbach's alpha's: .90 (T1), .92 (T2), and .93 (T3) for parental support; .81 (T1), .81 (T2), and .85 (T3) for authoritative control; and .85 (T1), .85 (T2), and .82 (T3) for restrictive control. This questionnaire was also used for reports of parents. Items are adapted to the perspective of the parent, for example: "How often do you give your child a compliment?" Reliability analyses of parent reports resulted in .78 (T1), .73 (T2), and .80 (T3) for parental support; .59 (T1), .63 (T2), and .70 (T3) for authoritative control; and .62 (T1), .65 (T2), and .64 (T3) for restrictive control.

*Parental knowledge* about adolescent's whereabouts was measured by the 'Vragenlijst Toezicht Houden' (VTH), the Dutch version of the parental monitoring scale of Brown, Mounts, Lamborn, and Steinberg (1993). On 6 items adolescents filled out how much their parents knew about who their friends are; how they spent their money; where they were after school; which place they went when they left home; what they did in their leisure time; and what grades they received at school. Cronbach's alpha's were .83 (T1), .82 (T2), and .81 (T3). Also parents filled out how much they know about their children's whereabouts (6 items). Cronbach's alpha's of the parent assessments were .73 (T1), .83 (T2), and .88 (T3).

*Adolescent-Parent Attachment.* The quality of adolescent-parent relationships was assessed by using the short Dutch validated version of the 'Inventory of Parent and Peer Attachments' (IPPA; Armsden & Greenberg, 1987; Gullone & Robinson, 2005). This instrument consists of 12 items assessed on a 4-point Likert scale (1 = almost never to 4 = almost always). The IPPA is based on three subscales: the adolescents' *trust* in availability and sensitivity of the attachment figure, the quality of *communication* and the extent of *anger and alienation* in the relationship with the attachment figure. Examples of items for each scale are: "If my parent knows something is bothering me, he/she asks me" (communication); "My parent respects my feelings" (trust); "I don't get much attention from my parent" (alienation). Cronbach's alpha's for the communication, trust and alienation scales were .73 (T1), .77 (T2), and .83 (T3), .74 (T1), .77 (T2), and .79 (T3), and .63 (T1), .62 (T2), and .66 (T3), respectively. For all scales (PBQ, IPPA, and VTH) of parenting behavior, total mean scores were used for the analyses.

*Peer affiliations.* Adolescents' perceptions of peer affiliations were measured by the Dutch version of the 'Friends' scale (Deković et al., 2004), which is part of the 'Family, Friends & Self Scale' (FFS, Simpson & McBride, 1992). The FFS consists of 17 items assessed on a 5-point Likert scale (1 = none of my friends to 5 = almost all of my friends), divided in two subscales. Adolescents rated on 10 items how many of their friends participated in a variety of deviant behaviors (10 items, e.g., "How many of your friends have damaged other peoples' property on purpose?"). Affiliation with prosocial peers was measured by 7 items of the FFS concerning prosocial activities (e.g. "How many of your friends like to play sports?"). Cronbach's alpha's were .92 (T1), .92 (T2), and .93 (T3) for deviant peers; .71 (T1), .78 (T2), and .85 (T3) for prosocial peers. *The intensity of contact with peers* was measured by a subscale of the 'Basic Peer Questionnaire' (BVL, Weerman & Smeenk, 2005). Adolescents reported on 5 items how often they spend time with their peers during the week and weekends. The two frequency items were rated through a 3-point scale (1 = never to 3 = 3 or more days or on Saturday and Sunday). The two duration items were also rated on a 3-point scale (1 = less than one hour to 3 = all day). The fifth item is a 4-point scale (1 = never to 4 = 5 times a week) and examines how often respondents go to parties with their friends. Cronbach's alpha's were .72 (T1), .66 (T2), and .76 (T3). For all questionnaires of peer affiliations, total mean scores were used for the analyses.

*Cognitive Distortions.* Distortions in adolescents' cognition were assessed with the Dutch validated version (HID, Nas, Brugman, & Koops, 2005) of the 'How I Think Questionnaire' (Gibbs, Barriga, & Potter, 2001). The HIT contains 54 items: 39 items represent self-serving cognitive distortions, 8 items are used to screen suspect responding, and 7 items are positive fillers. The 39 items refer to the four-category typology of self-serving cognitive distortions: *self-centered attitude*, *blaming others*, *minimizing-mislabeling* (consequences of) *behavior*, and *assuming the worst*. All items were assessed, using a 6-point Likert scale (1 = disagree strongly to 6 = agree strongly). Examples of items are: "I make mistakes because I am with the wrong people", and "You have to hurt people, before they hurt you." In the present study total mean scores of the four self-serving cognitive distortions scales were used. Cronbach's alpha's of the self-centered scale were: .72 (T1), .68 (T2), and .78 (T3); blaming others: .75 (T1), .71 (T2), and .75 (T3); mislabeling: .76 (T1), .78 (T2), and .80 (T3); and assuming the worst: .73 (T1), .64 (T2), and .82 (T3).

*Prosocial behavior.* The 'Prosocial Behaviour Questionnaire' (PBQ; Weir & Duveen, 1981) was used to assess positive aspects of behavior. This self-report questionnaire consists of 20 items to be answered on a 4-point scale (1 = never to 4 = always). An item example is: "If there is an argument, I try to do something about it." A total mean score was used for the analyses. Cronbach's alpha's were .87 (T1), .91 (T2) and .91 (T3).

*Self-esteem.* Feelings of worth and satisfaction with oneself were measured by using the Dutch version (Treffers et al., 2002) of the global self-worth 5-item subscale from the 'Self-Perception Profile for Adolescents' (CBSA, Harter, 1988). Adolescents first chose which of two descriptions described them better (e.g., "Some youngsters are often disappointed in themselves"; "Other youngsters are almost never disappointed in themselves"), then they reported whether that description was a 'little true' or 'totally true' for them (4-point scale). A total mean score was used for the analyses. Results of the reliability analyses were:  $\alpha = .67$  (T1);  $\alpha = .76$  (T2); and  $\alpha = .80$  (T3).

*Aggressive behavior.* Aggression was measured by the Dutch self-report validated version of the 'Buss-Durkee Hostility Inventory' (BDHI-D, Lange, Dehghani, & Beurs, 1994). The BDHI (Buss & Durkee, 1957) consists of two subscales 'Overt Aggression' (measuring the tendency to express verbal or physical aggression) and 'Covert Aggression' (determining the emotional and cognitive components: hostility, irritability, suspicion, and anger). Examples of items are: "If someone hits me first, I let him have it (overt aggression)", and "I sometimes show my anger by banging on the table (covert aggression)". The questionnaire contains 35 items to be answered on a 2-point scale, 1 = not true and 2 = true. Total mean scores for the covert and overt aggression scales were used for the analyses. Results of the reliability analyses of overt aggression were:  $\alpha = .77$  (T1);  $\alpha = .70$  (T2); and  $\alpha = .71$  (T3) and for covert aggression:  $\alpha = .79$  (T1);  $\alpha = .85$  (T2); and  $\alpha = .83$  (T3).

*Substance Use.* Abuse and *dependency of alcohol and drugs among* adolescents was measured by the CRAFFT Substance Abuse Screening Test (Knight, Sherritt, Shier, Harris, & Chang, 2002). The CRAFFT is based on 6 items. Examples of items are: "Do you ever forget

things you did while using alcohol or drugs?" and "Have you ever gotten into trouble while you were using alcohol or drugs?" Participants answered these questions with 'yes' or 'no'. Total mean scores were used for the analyses,  $\alpha = .84$  (T1);  $\alpha = .83$  (T2); and  $\alpha = .86$  (T3).

*Externalizing Behavior Problems.* The socio-emotional development of adolescents was measured by the Dutch 72-item questionnaire 'Sociaal-Emotionele Vragenlijst' (SEV; Scholte & Van der Ploeg, 2007). Parents were asked to report on externalizing behavior of their child. Items had to be answered on a 5-point scale (1 = never to 5 = very often). The SEV measures three dimensions: externalizing behavior, autism, and internalizing behavior. Externalizing behavior was based on 44 items, divided in two subscales: attention deficit, hyperactivity and impulsivity (18 items, T1  $\alpha = .93$ ; T2  $\alpha = .90$ ; T3  $\alpha = .92$ ) and social behavioral problems (26 items: oppositional defiant behavior, aggression, and antisocial behavior, T1  $\alpha = .94$ ; T2  $\alpha = .95$ ; T3  $\alpha = .94$ ). Examples of items are: "Your child is easily distracted" and "Your child is easily involved in fights". For the analyses, we used subscales of attention deficit, hyperactivity and impulsivity and social behavioral problems (externalizing behavior).

*Internalizing problems.* Cognitive, affective, and behavioral symptoms of depression were measured by the 'Child Depression Inventory-2' (CDI-2, Breat & Timbremont, 2002), a revision of the CDI (Kovacs, 1985) and based on DSM-IV. Adolescents reported how they felt in the past two weeks on 3-point scale (1 = sometimes to 3 = always). Examples of items are: "All bad things are my fault", and "I am tired all the time". The CDI-2 consists of 27 items. Total sum scores were used for the analyses,  $\alpha = .83$  (T1);  $\alpha = .84$  (T2); and  $\alpha = .84$  (T3). Symptoms of anxiety were assessed by use of the 'Spence Children's Anxiety Scale' (SCAS, Spence, 1998). The SCAS is based on the DSM-IV and measures the following symptoms of anxiety: *generalized anxiety, separation anxiety, social phobia, panic disorder, agoraphobia, obsessive-compulsive disorder, and physical injury fears* (Scholing, Nauta, & Spence, 1999). The SCAS is based on 45 items, to be answered on a 4-point scale (1 = never to 4 = always). Examples of items are: "I worry about things (generalized)", "I would feel afraid of being on my own at home (separation)", "I worry what other people think of me (social)", "All of the sudden I feel really scared for no reason (panic/agoraphobia)", "I get bothered by bad or silly thoughts or pictures in my mind (obsessive)", and "I am scared of dogs (physical injury)". Total sum scores were used for the analyses,  $\alpha = .88$  (T1);  $\alpha = .91$  (T2); and  $\alpha = .93$  (T3).

Adolescents' internalizing behavior was also assessed by using parent reports on three subscales of the questionnaire 'Sociaal-Emotionele Vragenlijst' (SEV; Scholte & Van der Ploeg, 2007): general anxiety, social anxiety, and depressive behavior (18 items). An item example is: "Your child is anxious without a clear reason". Cronbach's alpha's were .88 for all three assessments of internalizing behavior.

*Demographic factors.* In order to assess the influence of age on program effectiveness, the group was divided into a group of adolescents younger than 16 years of age ( $n = 54$ ) and a group of adolescents that were 16 years or older ( $n = 47$ ). The division in age group was based on age criteria of NP, consisting of two different modalities for younger (NPP/NP Plus) and older adolescents (NP). The influence of ethnicity was assessed by dividing adolescents

into two groups: native Dutch adolescents ( $n = 17$ ), and second generation adolescents from ethnic minority groups ( $n = 84$ ).

### **5.5.5 Analytic Strategy**

An intention-to-treat analysis was applied following the principle of Montori and Guyatt (2001): all participants were included in the analysis regardless of the level of participation (attendance to the assigned intervention) in the intervention and drop-out from the study (at post-test assessments). This method was used to exclude confounding effects of treatment motivation (or offending propensity) that may occur when cases are analyzed based on the treatment actually delivered.

Given that we found no differences between the treatment conditions at pre-test (T1), we did not account for pre-test scores in the analyses. Independent samples  $t$  tests were conducted to examine the main intervention effects immediately after the intensive program phase (T2) and aftercare phase (T3). In addition, repeated measures multivariate analyses (MANOVA) and repeated measures univariate analyses (ANOVA) were conducted to assess intervention effects and changes in scores on all outcome variables. A repeated measures design of MANOVA was applied, because we examined more than one dependent variable (taking into account correlations between variables) and different dimensions based on an overall theoretical construct. Additionally, using multivariate tests increases the power to detect group differences and reduces the probability of making Type I errors (Tabachnick & Fidell, 2013). The reported  $F$ -values for intervention outcomes reflected the condition (experimental or control, the between-subject factor) by time (within-subject factor) interaction effect. In all analyses, the significance level was set to .05.

In order to investigate effects of moderators, we applied three-way interactions in the repeated measures ANOVA'S and MANOVA's. The reported  $F$ -values in the moderator analyses represented the three-way interaction term composed by condition, time, and the relevant moderator. Effect sizes were computed as Cohen's  $d$ , based on means and standard deviations (of  $t$  tests). Partial eta squared was used to represent the impact of between-groups and within-group effects (of repeated measures).

## **5.6 Results**

### **5.6.1 Delinquency and Psychopathology Rates**

Of the adolescents in the sample, 80% reported having ever committed one or more of the delinquent acts at the first assessment. Risk assessments revealed that 28% of the NP-group showed a very low risk of reoffending, 43% low to moderate risk, and 11% a high to very high risk (18% unknown). Rates of behavioral and emotional problems were as follows; 20% of the adolescents showed problematic substance use, 60% showed (severe) overt aggression, 50% showed (severe) covert aggressive behavior disorders, 19% of the adolescents showed disorders related to depression. No differences between NP and CAU were found in behavioral and emotional problems.

Over 40% (43% in the NP group; 41% of the controls) had committed an offense (vandalism, property or violent acts) in the three months before the pre-test took place. Three months after pre-test, 26% in the NP group and 32% in the control group had committed an offense. At post-intervention assessment (6 months after pre-test), 19% of the youths in the NP group and 22% in the control group had committed an offense.

### 5.6.2 Intervention Effects

*Primary outcome.* Independent samples *t* tests on T2 and T3 showed no significant differences between the NP and CAU on delinquent behavior. Six months after pre-test (T3), NP- participants reported lower delinquency levels ( $M = .30, SD = .67$ ) than CAU ( $M = .75, SD = 1.53$ ). This difference was marginally significant  $t(93) = 1.78, p = .079, d = .37$ . Results of repeated measures univariate analyses showed no significant condition X time interaction. Also, a significant main effect of time on delinquency,  $F(2, 88) = 7.451, p = .001, \eta^2 = .08$  was found. Levels of delinquency decreased over time for NP-adolescents and CAU (see Table 5.2).

**Table 5.2 Means, standard deviations and intervention effects of NP ( $n = 47$ ) vs. CAU ( $n = 54$ ), primary outcome**

	Pre-test		Post-test (3 months)			Post-test (6 months)			<i>F</i> time x group <sup>a</sup>	$\eta^2$	
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>			<i>t</i>
Delinquency			0.964			0.455			1.778	0.857	0.010
NP	0.830	1.291		0.600	1.033		0.302	0.674			
CAU	1.130	1.760		0.706	1.154		0.750	1.532			

*Note.* NP, experimental group, CAU, control group. *F* test statistics are based on univariate tests of the repeated measures. Due to missing values on self-reported delinquent behavior: NP ( $n = 40, T2; n = 43, T3$ ); CAU ( $n = 51, T2; n = 52, T3$ ).

*Secondary outcomes.* Results based on adolescent and parent reports showed no significant differences between NP and CAU on the secondary outcomes after the intensive phase and aftercare phase (based on *t* tests). Results of repeated measures univariate and multivariate analyses showed no significant condition X time interactions with regard to parental behavior, attachment, peers, and cognitive distortions. A significant main effect of time was found for parenting behavior,  $F(8, 92) = 2.730, p = .010, \eta^2 = .19$ , and attachment,  $F(6, 94) = 12.830, p = .000, \eta^2 = .45$ . Both groups showed improvements over time (see Tables 5.3 and 5.4).

*Other outcomes.* Results of adolescent and parent reports (*t* tests) showed no significant differences between the NP and CAU on the remaining outcomes (prosocial behavior, self-esteem, externalizing and internalizing behavior). Again, no significant condition X time interactions were found. We found a significant main effect of time on self-esteem,  $F(2, 98) = 3.714, p = .026, \eta^2 = .04$ , indicating an increase of self-esteem in both groups. Moreover, a significant main effect of time was found on adolescents' externalizing behavior,

$F(4, 56) = 3.39, p = .015, \eta^2 = .20$ . Both groups showed reductions in problem behavior (see Tables 5.5 and 5.6).

### **5.6.3 Moderators of Effectiveness**

The influence of moderators (gender, age, ethnicity, treatment status) on the program effects was analyzed by including these variables in the repeated measures univariate and multivariate analyses as a between-subject factor. These analyses were only based on reports of adolescents, while the sample of parents ( $N = 61$ ) was too small to detect program effects (power 0.52, assuming an alpha of 0.05, small effect size, based on power calculations).

*Gender.* Gender did not significantly influence program outcomes, indicating that NP was equally effective for boys and girls regarding primary, secondary and other outcomes.

*Age.* Program effects of prosocial behavior were significantly affected by age,  $F(2, 96) = 3.91, p = .022, \eta^2 = .04$ . The intervention effects just failed to reach significance for older adolescents,  $F(2, 90) = 7.73, p = .071, \eta^2 = .06$ . Older adolescents in the NP group showed an increase in prosocial behavior during the NP intensive phase, whereas older adolescents in CAU showed a decrease in prosocial behavior. However, prosocial behavior of older NP-adolescents decreased during the aftercare phase, whereas the behavior of older adolescents in CAU improved. No significant differences were found for the younger adolescents. Age did not significantly influence other program outcomes.

*Ethnic minority status.* No significant moderator  $\times$  intervention effects were found, indicating that there is no difference in program effectiveness between native Dutch adolescents and adolescents from ethnic minority groups.

**Table 5.3 Means, standard deviations and intervention effects of NP (n = 47) vs. CAU (n = 54), secondary outcomes, adolescent self-reports**

	Pre-test			Post-test (3 months)			Post-test (6 months)			F time x group <sup>a</sup>	$\eta^2$
	M	SD	t	M	SD	t	M	SD	t		
Parenting behavior											
Support											
NP	3.336	0.910	1.013	3.574	0.908	-0.107	3.381	0.958	0.575		
CAU	3.520	0.913		3.553	1.008		3.500	1.106			
Authoritative control											
NP	3.604	0.760	1.305	3.658	0.630	1.215	3.571	0.722	0.813		
CAU	3.782	0.610		3.810	0.631		3.689	0.738			
Authoritarian control											
NP	2.719	0.760	0.639	2.653	0.808	0.076	2.719	0.784	0.247		
CAU	2.811	0.686		2.665	0.717		2.756	0.702			
Monitoring											
NP	2.8330	0.617	0.483	2.844	0.606	0.902	2.994	0.579	0.459		
CAU	2.889	0.611		2.948	0.556		3.048	0.608			
Attachment											
Communication											
NP	2.660	0.844	0.884	2.645	0.833	1.344	2.800	0.982	-0.338		
CAU	2.809	0.846		2.871	0.851		2.737	0.901			
Trust											
NP	3.021	0.737	0.932	2.958	0.705	1.930	3.076	0.818	-0.021		
CAU	3.167	0.818		3.236	0.739		3.073	0.786			
Alienation											
NP	3.154	0.677	1.253	3.258	0.643	-0.334	3.193	0.713	1.213		
CAU	3.315	0.611		3.217	0.581		3.344	0.533			
Peers											
Deviant peers											
			-0.465			0.048			0.530	1.005	0.060



**Table 5.3 (continued)**

	Pre-test			Post-test (3 months)			Post-test (6 months)			$F_{\text{time} \times \text{group}}^a$	$\eta^2$
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>		
NP	1.696	0.803		1.682	0.791		1.546	0.702			
CAU	1.628	0.666		1.689	0.767		1.632	0.906			
Prosocial peers			-0.016			0.432					-0.324
NP	3.404	0.626		3.254	0.885		3.317	0.775			
CAU	3.402	0.716		3.322	0.686		3.260	0.963			
Contact intensity			0.513			-1.539					0.019
NP	2.243	0.449		2.305	0.423		2.181	0.517			
CAU	2.289	0.456		2.177	0.410		2.179	0.451			
Cognitive distortions											
Self-centered			-0.587			1.104					0.872
NP	2.671	0.749		2.388	0.660		2.405	0.804			-0.483
CAU	2.581	0.784		2.544	0.748		2.328	0.786			
Blaming			-0.291			0.720					0.038
NP	2.602	0.809		2.379	0.636		2.421	0.801			
CAU	2.554	0.837		2.484	0.800		2.426	0.763			
Mislabeling			-0.209			0.704					0.512
NP	2.596	0.802		2.393	0.709		2.323	0.771			
CAU	2.562	0.802		2.507	0.898		2.408	0.879			
Assuming the worst			-1.160			0.940					-0.011
NP	2.713	0.682		2.436	0.556		2.434	0.692			
CAU	2.547	0.742		2.555	0.696		2.432	0.863			

Note. NP, experimental group, CAU, control group. <sup>a</sup>*F* test statistics are based on multivariate tests of the repeated measures.

**Table 5.4 Means, standard deviations and intervention effects of NP (n = 26) vs. CAU (n = 35), secondary outcomes, parent reports**

	Pre-test			Post-test (3 months)			Post-test (3 months)			F time x group <sup>a</sup>	$\eta^2$
	M	SD	t	M	SD	t	M	SD	t		
Parenting behavior											
Support											
NP	3.676	0.652	-0.524	3.564	0.428	-0.262	3.485	0.512	0.264		
CAU	3.600	0.492		3.535	0.419		3.518	0.458			
Authoritative control											
NP	3.673	0.372	0.447	3.518	0.324	1.183	3.609	0.491	-0.305		
CAU	3.721	0.447		3.632	0.402		3.575	0.365			
Authoritarian control											
NP	3.267	0.361	-0.146	3.149	0.325	-0.163	3.303	0.426	-0.914		
CAU	3.250	0.512		3.131	0.483		3.211	0.360			
Monitoring											
NP	3.034	0.566	0.753	3.029	0.414	-0.214	3.069	0.468	-0.509		
CAU	3.132	0.456		3.006	0.405		3.005	0.497			

Note. NP, experimental group, CAU, control group. <sup>a</sup>F test statistics are based on multivariate tests of the repeated measures.

**Table 5.5 Means, standard deviations and intervention effects of NP ( $n = 47$ ) vs. CAU ( $n = 54$ ), other outcomes, adolescent self-reports**

	Pre-test			Post-test (3 months)			Post-test (6 months)			$F_{\text{time} \times \text{group}^a}$	$\eta^2$
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>M</i>	<i>SD</i>	<i>t</i>		
<i>Prosocial behavior</i>											
NP	2.697	0.499	0.504	2.669	0.558	0.241	2.712	0.492	0.211	0.044	0.000
CAU	2.742	0.395		2.694	0.503		2.734	0.554			
<i>Self-esteem</i>											
NP	3.121	0.704	-0.717	3.020	0.704	0.506	3.145	0.724	1.331	1.881	0.019
CAU	3.024	0.657		3.089	0.678		3.349	0.808			
<i>Aggression</i>											
<i>Overt aggression</i>											
NP	0.579	0.224	1.433	0.597	0.195	0.496	0.549	0.186	1.286		
CAU	0.642	0.215		0.616	0.193		0.601	0.221			
<i>Covert aggression</i>											
NP	0.430	0.205	0.810	0.450	0.274	0.166	0.411	0.249	-0.156		
CAU	0.466	0.237		0.458	0.224		0.403	0.245			
<i>Substance use</i>											
NP	0.937	1.749	-0.385	1.038	1.737	-0.717	1.191	1.877	-1.390	1.001	0.010
CAU	0.815	1.442		0.813	1.426		0.733	1.431			
<i>Internalizing problems</i>											
<i>Depression</i>											
NP	10.292	6.080	0.162	9.761	7.553	-0.988	9.039	7.351	-0.663		
CAU	10.500	6.748		8.441	5.849		8.153	6.068			
<i>Anxiety</i>											
NP	58.228	11.467	-0.732	57.539	14.962	-0.815	56.189	16.338	-0.579		
CAU	56.519	11.919		55.295	10.480		54.522	12.571			

Note. NP, experimental group, CAU, control group. <sup>a</sup>F test statistics are based on univariate and multivariate tests of the repeated measures.

**Table 5.6 Means, standard deviations and intervention effects of NP (n = 26) vs. CAU (n = 35), other outcomes, parent reports**

	Pre-test			Post-test (3 months)			Post-test (3 months)			F time x group <sup>a</sup>	$\eta^2$
	M	SD	t	M	SD	t	M	SD	t		
<i>Externalizing Problems</i>											
<i>Hyperactivity-Impulsivity<sup>b</sup></i>											
NP	20.481	13.749	0.234	15.841	6.373	-0.184	17.453	9.970	-0.951		
CAU	21.308	13.544		15.442	9.583		15.083	9.365			
<i>Social Behavior Problems<sup>c</sup></i>											
NP	21.622	14.860	0.785	19.710	7.986	-0.887	20.019	11.028	-1.211		
CAU	24.898	16.973		17.152	14.332		16.388	11.977			
<i>Internalizing Problems</i>											
<i>General Anxiety</i>											
NP	2.881	2.469	0.196	3.075	1.561	-1.259	2.341	1.863	0.046		
CAU	3.033	3.315		2.391	2.420		2.369	2.678			
<i>Social-Anxiety</i>											
NP	2.998	2.935	0.390	3.471	2.803	-0.396	3.555	2.897	-0.541		
CAU	3.325	3.436		3.173	2.985		3.126	3.172			
<i>Depression</i>											
NP	2.982	3.833	0.909	3.640	1.960	-1.187	3.262	2.353	0.043		
CAU	3.905	3.989		2.969	2.333		3.293	3.015		1.514	

Note. NP, experimental group. CAU, control group. <sup>a</sup>F test statistics are based on multivariate tests of the repeated measures.

<sup>b</sup>Hyperactivity-Impulsivity consists of attention deficit disorder, hyperactivity, and impulsivity (three subscales)

<sup>c</sup>Social Behavior Problems consists of oppositional defiant behavior, aggression, and antisocial behavior (three subscales)

## 5.7 Discussion

The present study examined the short-term effects of a prevention program for adolescents at risk for a deviant life style on criminogenic and protective factors, and (persistent) delinquent behavior. Moreover, we examined which specific groups of adolescents benefited most from the NP-program. NP did not outperform CAU on the primary outcome of delinquency, secondary outcomes (parenting behavior, attachment, peers and cognitive distortions), and other outcomes that are assumed to be related to delinquency (such as substance use). Results of the present study concur with findings of experimental studies examining the effects of (preventive) interventions for delinquency and delinquency-related outcomes, but contradict findings from quasi-experimental or other less robust research designs, which show small to large and positive effects (De Vries et al., 2015a; Weisburd, Lum, & Petrosino, 2001). Additionally, we found no indications for negative effects of NP. Findings of the present study revealed that both participants in the NP-intervention and CAU displayed a reduction in delinquency and small improvements in some other relevant outcomes, including parenting behavior, attachment, externalizing behavior, and self-esteem. The improvements in delinquent behavior and other outcomes are in line with findings of prior evaluation studies of NP (Buysse et al., 2008; Geldorp et al., 2004, Noorda & Veenbaas, 1997). The present study adds to these earlier studies—that did not have a control condition—by demonstrating that NP shows equally positive changes as CAU.

A first explanation for not finding any difference between the two groups could be the use of an active control condition. The control group (CAU) was heterogeneous in that the majority received a variety of youth care programs (65%; the remaining 35% received nothing), including evidence-based programs (6% of care as usual). Although the NP program and CAU differed with respect to the program format (multimodal in NP vs. individual in CAU), and total contact intensity (higher contact intensity in NP compared to CAU), the two conditions were comparable regarding the program type, average number of involved care institutions, and type of care workers. For example, adolescents in CAU mainly received individual or family counseling or academic service coaching. These program types are generally comparable with the coaching style of the NP program. Therefore, one can expect smaller effects when comparing NP with CAU, if any at all.

Equally positive changes in the experimental and control condition suggest that CAU targeting the prevention of persistent delinquency in at-risk juveniles may also have produced positive effects. However, post-hoc analyses comparing adolescents with and without treatment (21% of the total sample never started NP or CAU) revealed comparable positive changes in primary and secondary outcomes, and no differences between the two groups, which seems to rule out positive effects of CAU or NP. This is in line with findings from a recent meta-analysis by Weisz et al. (2013), reviewing four decades of RCT's, that CAU had no effect at all on the behavioral and psychosocial development of juveniles in European intervention studies.

Another explanation for the null-effects of NP can be found in a possible mismatch between the intensity of the program and the risk levels of the clients (risk principle, Andrews et al., 1990a). A meta-analytic study of De Vries et al. (2015a) showed that the intensity of prevention programs is related to their effectiveness (see also Weisz et al. 2013). NP is considered to be a short, but intensive program. Previous studies concluded that a subgroup of adolescents with low risk for reoffending entered the NP-program (e.g., Geldorp et al., 2004). Notably, 28% of the NP adolescents in the present study showed a very low risk of re-offending. NP may be too intensive for these adolescents. At the same time, prior studies concluded that a subgroup of adolescents with a very high risk of reoffending were referred to NP (e.g., Buysse et al., 2008; Loeff, Nauta, & Abraham, 2011). In the present study, 11% of the NP-adolescents showed a high to very high risk of re-offending. In addition, a relatively large percentage of the sample (20% depression; 60% overt aggression) could be classified in the clinical range of internalizing and externalizing problems. Consequently, these higher risk adolescents may need a longer lasting and specialized intervention. In conclusion, referral of adolescents with very low or high risk of reoffending or adolescents with severe problems to the NP-program may explain the null-effects of NP.

A final explanation could be related to program integrity. Although NP showed moderate to high program integrity levels (an average of 73% adherence to program components), lower levels of treatment adherence were found for the aftercare program phase (De Vries et al., 2014a). Results of the program integrity study (De Vries et al., 2014a) revealed that in 45% of the cases ( $N = 76$ , total sample) during the aftercare phase, less than 60% of standard services were carried out. Durlak and DuPre (2008) suggested that minimum levels of program integrity of 60% are needed to reach program effectiveness. The lower levels of program integrity may be due to unclear descriptions of the aftercare program guidelines and activities (De Vries et al., 2014a; Kazdin & Weisz, 1998). To conclude, not carrying out all standard methods and components could be an additional explanation for not finding positive effects of NP (see also Lipsey, 2009).

Demographic factors did not consistently moderate effects of NP, suggesting that effects of NP are the same for boys and girls, different ages, and ethnic groups, which is in line with findings of previous meta-analytic studies (De Vries et al., 2015a; Wilson et al., 2003; Zahn et al., 2009). We only found that age moderated the effect of NP on adolescents' prosocial behavior. The NP intensive program phase proved to be effective for older adolescents, whereas prosocial behavior of older adolescents in CAU decreased. On the other hand, the NP aftercare phase proved to be ineffective for older NP-adolescents, whereas the behavior of older adolescents in CAU improved. As adolescents grow older, risk factors accumulate in multiple life domains (Loeber et al., 2009). Therefore, older adolescents (from mid adolescence) may need a more intensive approach than younger adolescents (pre-adolescence). However, given that age influenced only one of the program outcomes and the problem of multiple testing, cautious interpretation of these results is needed.

### **5.7.1 Strengths and Limitations**

The present study is one of the pioneer studies outside the USA that examined the effectiveness of prevention programs for adolescents at risk for persistent delinquency by using an RCT design. This effectiveness study is conducted in a naturalistic setting, which contributes to high levels of external validity. Other strengths of the present study include application of multiple measurements (pre-test, two post-tests), multiple informants and sources (youth and parent reports), the assessment of different types of antisocial behavior (delinquency, aggression), and measurement of various (delinquency-related) outcomes (individual and social factors). Multiple measurements of important outcomes provides a broad coverage of concepts, such as parenting behavior (Rossi, Lipsey, & Freeman, 2003). Finally, we assessed nontargeted (by NP) delinquency-related factors, such as substance use (D'Amico et al., 2008), which provides information on possible side effects of the intervention (Clingempeel & Henggeler, 2002).

Several limitations of present study must be kept in mind. First of all, only short-term effects were tested in the present study. Since sleeper effects are not uncommon (Leijten, Overbeek, & Janssens, 2012), one might expect more pronounced effects on adolescents' behaviors at follow-up. In the future, conducting follow-up assessments will shed light on the long-term (and sustainability of) effects.

Second, a possible selection bias cannot be ruled out in the present study. Despite extensive efforts to include all adolescents and parents in our study, we had relatively high drop-out rates (37% of the juveniles and 62% of the parents). Selection is considered as a common methodological problem in experimental (RCT) designs (Asscher, Deković, Manders, Van der Laan, & Prins, 2007b). Although the risk of selection cannot be entirely avoided, we found no pre-existing differences between participants and non-participants on demographic factors.

A final limitation is the relatively small sample size ( $N = 101$  adolescents). Even though the present study has sufficient power to conduct moderator analyses, a larger sample size would increase possibilities to further differentiate between the effects of NP for different types of adolescents, such as adolescents with various ethnic backgrounds. Moreover, the present study was underpowered to be able to conduct moderator analyses on the basis of parent data. Although the sample size of our study is comparable to other RCTs examining possible intervention effects on delinquency and externalizing problem behavior (e.g., Berry, Little, Axford, & Cusick, 2009; Leijten et al., 2012; Stickle, Connell, Wilson, & Gottfredson, 2008), larger samples are needed to examine mediator and moderator effects.

### **5.7.2 Conclusion and Recommendations**

Evidence-based prevention programs are crucial in order to prevent adolescents from developing persistent criminal behavior. The modest impact of prevention urges clinical practice and research to enhance the effectiveness of youth crime prevention programs. The aim of the present study was to examine whether NP was effective in preventing and

reducing (persistent) delinquency and in improving individual and social functioning of adolescents. Although the success of multimodal programs, comparable to NP, has been repeatedly proven by empirical research (e.g., Lipsey, 1992; 1995), these positive effects are not confirmed by the present study. The NP program did not outperform CAU.

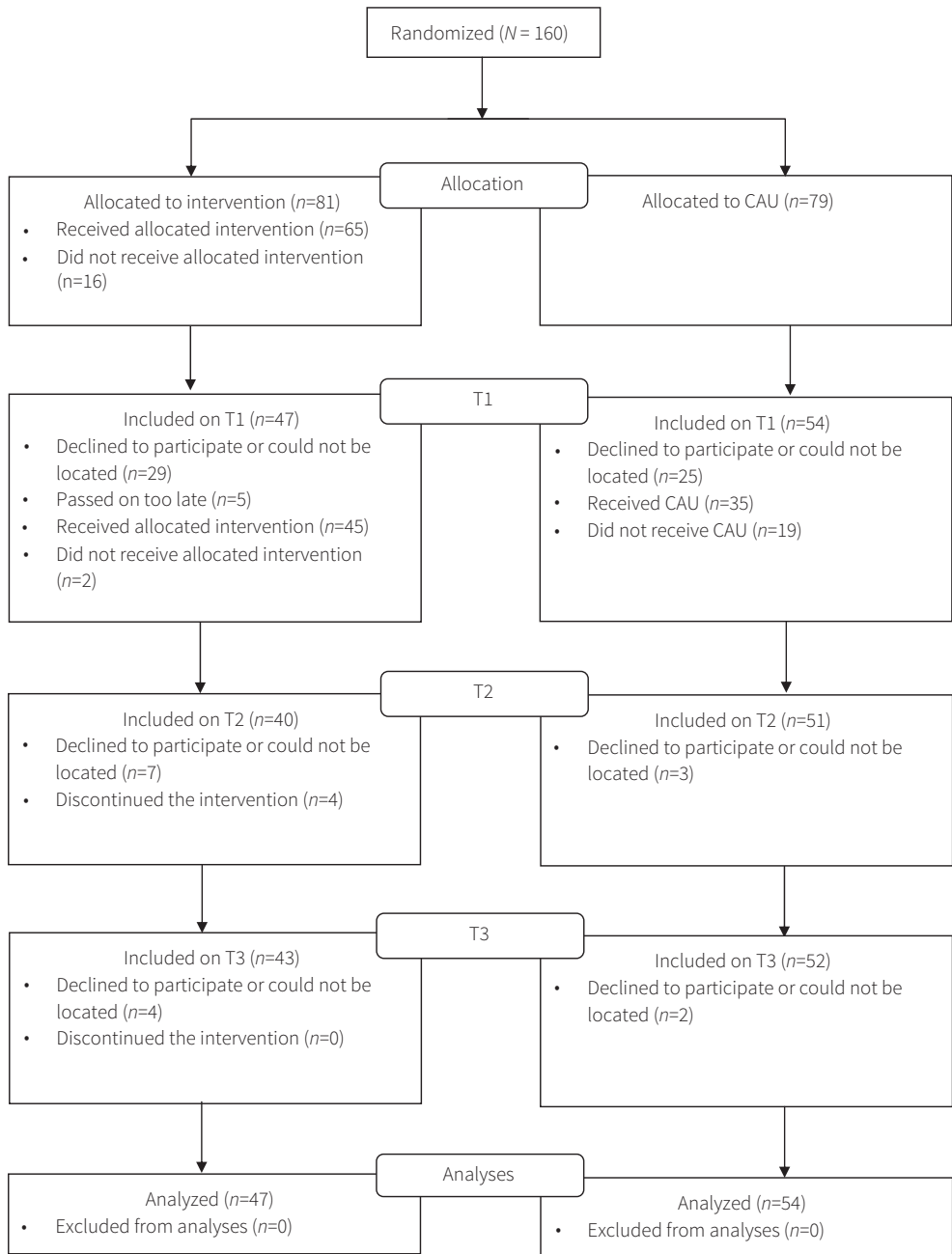
Despite the overall null-effects of NP, there are starting points for improvement on the basis of previous research. Prior evaluation studies of prevention programs targeting at risk juveniles concluded that clear descriptions of intervention techniques (Alexander and Parsons 1973) and involving the entire family, including siblings (Augimeri, Farrington, Koegl, & Day, 2007), can contribute to program effectiveness. Given that the NP program showed lower program integrity levels during the aftercare phase, a clear description of program components (incl. activities) could enhance its effectiveness. Moreover, since NP has been primarily designed as an individual program, more family involvement (including siblings) may also enhance the effects.

In addition, more specialized effective techniques may be needed to prevent and reduce a persistent criminal behavior pattern among adolescents. A meta-analytic study (De Vries et al., 2015a) demonstrated that the most effective prevention programs that target juveniles at the onset of a criminal career were family-based and included training parenting skills. These behavior-oriented programs contributed to a reduction in offending of 30% compared to care as usual or no treatment. Consequently, the effectiveness could be enhanced if prevention programs (such as NP) integrate specific effective components of behavior-oriented techniques.

Finally, establishing a careful match between program intensity and risk levels of adolescents remains important to avoid negative program effects. In order to reach an appropriate reaction to delinquent behavior of adolescents, specifically tailored risk assessment instruments are recommended to be implemented in clinical practice (see also Van der Put et al., 2011). In accordance with the risk principle (Andrews & Bonta, 2010) and conclusions of the meta-analytic study on the effectiveness of preventive interventions for juvenile delinquency (De Vries et al., 2015a), the number of treatment sessions should be kept low in programs targeting adolescents with low to medium risk levels.



**Appendix 5.A Flow Diagram Adolescents**



**Appendix 5.B Flow Diagram Parents**

