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The downside up? A study of factors associated with a successful course of treatment for adolescents in secure residential care

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CHAPTER 2

RISKY OR NEEDY? CHARACTERISTICS OF ADOLESCENTS IN SECURE RESIDENTIAL YOUTH CARE

“Het is de crème de la crème van de moeilijke jeugdigen in Nederland”
[“It is the crème de la crème of difficult young people in the Netherlands”]
(A teacher in secure residential care about the target group)

“...een variëteit aan stuiterkippen...” [“...a variety of bouncing chickens...”]
(A group care worker about adolescents at the secure residential group)

“Het hele rijtje van ambulante hulpverlening heeft hij gehad”
[“He has received the whole list of ambulant care”]
(A mother about her 20-year old son in secure residential care)

Abstract

Adolescents in secure residential care often show multiple problems and multiple risks in different domains. Aim of the present study is to examine relevant risk factors in a sample of 164 Dutch adolescents in secure residential care. Results show that many of these adolescents report multiple dynamic risk factors in both an individual and contextual domain, but that there are also adolescents with relatively few risk factors. Both substance abuse and delinquent friends were among the five most prevalent risk factors and predicted the seriousness of the adolescents' delinquent behavior prior to admission. The four groups that were found by cluster analysis could be distinguished by the seriousness and type of problems. The findings indicate that treatment for some adolescents should be mainly focused on their individual needs, while other adolescents need intensive, multimodal treatment focusing on both risks in the individual, family and peer domain.

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2.1 Introduction

Many studies show that young people in secure residential care (i.e., residential care in a secured environment, such as juvenile correctional centers) often show serious emotional and behavioral problems, with antisocial and oppositional problems generally being prominent (Boendermaker, 1999; Bullock et al., 1998; Vreugdenhil et al., 2004). The problems of young people in these facilities are complex and have often started at an early age, causing youth to often have a long history of care (Boendermaker, 1999). Research on the development of antisocial behavior problems, which are often an important reason for admission to secure residential care, consistently shows that antisocial problems have a developmental course that begins with relatively minor offences and, in some cases, progresses to more serious violent crimes (e.g., Farrington, 2005).

The development and persistence of behavior problems can be explained by multiple factors related to the domain of the child, his or her parenting system and/or the social context (Dodge & Pettit, 2003; Lahey, Waldman, & McBurnett, 1999). The different factors can have a negative or positive influence on a child's development and have a risk increasing or protective function respectively. Research shows that the larger the number of risk factors and the lower the number of protective factors, the higher the chance that young people will show problematic behavior (Farrington, 1997; Pollard & Hawkins, 1999; Rutter et al., 1998; Steinberg & Avenevoli, 2000). Furthermore, risk factors in different domains are often linked together (Van der Laan et al., 2009). Factors in the individual and family domain play an important role in childhood (Osofsky & Marshall, 2000), while peers, school and neighborhood become more important in adolescence (Loeber et al., 2006).

Since youth in secure residential care often show behavioral problems, multiple problems and co-morbidity in psychopathology (Hussey et al., 2008; Rogers, Pumariega, Atkins, & Cuffe, 2006), they also belong to a group that often shows many risk factors in different domains and few protective factors (cf. Lodewijks, De Rooter, & Doreleijers, 2010). Therefore, it is not surprising that secure residential care often has limited results in terms of recidivism (cf. Abrams, 2006).

Research on the care process indicates that often a similar set of services is provided to all young people in residential care, regardless of their problems (Libby et al., 2005), which is also described as a "one size fits all approach" (Connor, Doerfler, Toscano, Volungis, & Steingard, 2004). At the same time research shows that specific training, aimed at social-cognitive and social-emotional skills of young people, can generate a significant strengthening of treatment outcomes (Knorth et al., 2008). These findings point to the importance of accounting for the specific problems and needs that young people in (secure) residential care have. It corresponds to the "criminogenic needs", "responsivity" and "treatment modality" principles of effective

programs for reducing recidivism. These principles imply that interventions should be focused on those client factors that constitute the basis of the problem behavior, that there should be an appropriate matching between styles of workers and styles of clients, and that interventions should be aimed at different aspects of the clients' problems (multimodal) and therefore apply different methods respectively (MacGuire, 1999).

A starting point for the improvement of secure care outcomes is constituted by *dynamic* (changeable) risk and protective factors, because these factors can be influenced by treatment and can function as guidelines for treatment (DeMatteo & Marczyk, 2005). Static (non changeable) factors on the other hand, such as demographic characteristics and a history of delinquency, can not be influenced by intervention (Cottle, Lee, & Heilbrun, 2001; Heilbrun et al., 2000; Van der Laan & Blom, 2006a). Therefore, interventions that have the purpose to reduce the problem behavior of young people, such as secure residential care, should aim at relevant dynamic risk- and protective factors (Lipsey & Derzon, 1998; Van der Laan et al., 2009).

The eight most relevant risk factors for (the persistence of) delinquent behavior are identified by Andrews, Bonta and Wormith (2006) in summarizing current findings regarding risk and/or need factors. These most important risk factors, called the "central eight", first include three factors related to antisocial behavior, namely a history of antisocial behavior, an antisocial personality pattern (e.g., weak self-control, aggressiveness), and antisocial cognition (e.g., beliefs supportive of crime, cognitive emotional state of anger, resentment, and defiance). Three other important risk factors at the individual domain are a poor performance at school and/or work, poor involvement in anticriminal leisure activities, and substance abuse. Important risk factors in the contextual domain are close associations with criminal others and poor nurturance and/or caring, and monitoring and/or supervision by parents or family (Andrews et al., 2006).

A dynamic factor which seems to be part of the antisocial cognition risk factor described by Andrews et al. (2006) and might play a crucial role in the process of secure residential youth care is compliance with or motivation for treatment. Adolescents in secure residential care are often unaware of their problems, show oppositional problems and a poor motivation for change (Englebrecht, Peterson, Scherer, & Naccarato, 2008; Van Binsbergen, 2003). Also substance abuse is a relevant dynamic factor within the domain of the child, because it is a quite common problem for these adolescents (Feldstein & Ginsburg, 2006; Vreugdenhil et al., 2004). A poor performance at school and/or work, and involvement in antisocial leisure activities are also relevant risk factors for adolescents in secure residential care (Boendermaker, 1999; Foley, 2001), and in line with this, poor competence skills of the adolescents (Slot & Spanjaard, 1999).

In the contextual domain, both risk factors mentioned by Andrews et al. (2006) are relevant for adolescents in secure residential care: negative family characteristics in terms of poor parenting styles and supervision (Boendermaker, 1999; Chambers, Power, Loucks, & Swanson, 2001) and the presence of delinquent friends (Fergusson, Vitaro, Wanner, & Brendgen, 2007; Van der Ploeg & Scholte, 2003). For example, Hoeve and colleagues (2008) found that neglectful parenting was more frequent in more serious delinquents than in non- or minor delinquents, suggesting that parenting styles differentiate non- or minor delinquents from more serious delinquents. Furthermore, adolescents who are more deeply embedded in deviant peer relations seem to be more resistant to developing a relationship with staff during secure residential care (Florsheim, Shotorbani, Guest-Warnick, Barratt, & Hwang, 2000).

It is important to increase the knowledge regarding the specific risks and needs of young people in secure residential care so that effective interventions can be designed and implemented. The central aim of this article is, therefore, to examine important and relevant risk factors in a sample of adolescents in secure residential care. Specifically, we address the following research questions:

- What is the prevalence of risk factors for adolescents in secure residential care?
- Do more and less problematic adolescents differ on the number and type of risk factors?
- Are there subgroups that show specific combinations of risk factors?

Considering the findings in previous studies, we expect that most of the adolescents show multiple risks factors in both the individual and contextual domain. Our second hypothesis is that adolescents with a high accumulation of risk factors will show more problematic behavior than adolescents with few risk factors. Third, we expect that there are subgroups of adolescents showing specific combinations of risk factors.

2.2 Method

The present study is part of a research project which focuses on adolescents staying in *Het Poortje*, which is a secure residential center that is located on two sites in the north of the Netherlands. Adolescents from 12 to 23 years old are placed in the center by either a civil or penal measure. The principal reason for admission is either intolerably disruptive and antisocial behavior or behavior presenting a danger to the young person him or herself or to the general public.

The social competency model is considered to be the primary, underlying methodology of the care and treatment in the secure center (Durrant, 1993; Slot & Spanjaard, 1999). An important component of care and treatment in the center are the

activities at the (mostly secured) residential group. Besides the residential group, the adolescents spent much time in special education classes of eight to ten adolescents at the internal school, where they receive training by teachers.

The total research project consisted of a longitudinal design with a measurement at admission (T_1), eight weeks after admission (T_2), at departure (T_3) and one year after departure (T_4). For the present study, information from the measurement of admission (T_1) was used. A group of 194 adolescents that stayed for a minimum period of eight weeks in the center was eligible for inclusion in the present study.

2.2.1 Procedure

At admission, both information from treatment documents and interviews and questionnaires administered with the adolescents and group care workers was used.

The adolescents were informed about the research project by the project leader shortly after admission during a private conversation and by an information flyer. To promote their participation in the project, it was emphasized that participation in the project was confidential and that it was a common part of their stay in the center. The adolescents were interviewed by students of the University of Groningen using (semi-) structured interviews. To guarantee a correct administration, the students received training before conducting the interviews. Directly after the interview, the adolescents also received questionnaires to complete in their own time. A group of 164 adolescents (85%) was interviewed on average 4.4 weeks after their admission. Of the 30 adolescents that did not participate, 22 refused to participate and eight adolescents did not participate due to practical problems (e.g., short stay in the center). Of the interviewed adolescents, 101 adolescents (62%) also filled in questionnaires on average 2.9 weeks after their admission.

For each adolescent we contacted the *coach*, who is one of the group care workers of the residential group to whom each adolescent is assigned. This assignment to group care workers is unsystematic and mainly based on the order of placement. The coach is responsible for observing the adolescents and involved in the adolescents' individual treatment planning. The coaches only filled in questionnaires. They were approached six to eight weeks after the adolescent's admission by e-mail with a short explication about its purpose and the questionnaires in an attachment, which they could fill in digitally or manually and reply by (e-)mail. Before approaching coaches individually, they were also informed about the research project by the project leader during several group meetings. For the group of 164 adolescents that was interviewed at admission, we received a response from 95 coaches (58%).

2.2.2 Instruments

Motivation for treatment

To evaluate the adolescents' problem perception and motivation for treatment, the Motivation for Treatment questionnaire (MTQ, Van Binsbergen, 2003) was completed by the adolescents. Aim of the instrument is to assess the first three stages of treatment motivation (i.e., precontemplation, contemplation and preparation) that are distinguished by Prochaska and DiClemente (1984). The original version of the MTQ consisted of 81 items, but for the present study we only used a short 17-item version of the questionnaire based on outcomes of factor-analysis conducted by Van Binsbergen (2003). The items of the MTQ contain a 3-point rating scale ranging from 0 (not true) to 2 (true). For the present study, we calculated a total motivation score by weighing the scores on the stages of motivation as one, two and three respectively, resulting in a range of scores from 0 (not motivated) to 12 (motivated). We will use the total median score of 6,5 as a cut-off score to distinguish between adolescents being motivated ($\geq 6,5$) or not motivated ($< 6,5$) for treatment. The reliability of the MTQ for the present sample was satisfactory ($\alpha = .63 - .77$).

Substance abuse and school performance

The Scientific Research and Documentation Centre (SRDC) interview (Van der Laan & Blom, 2006b) was used to assess self-reported substance use and school performance of the adolescents. Substance abuse was measured using several items of the SRDC interview concerning the frequency of alcohol, soft drugs and hard drugs use during the last twelve months. Adolescents were classified as having substance abuse problems if they reported to use alcohol or soft drugs for at least four days a week, or if they used hard drugs for more than two days a week. School performance was assessed by a self-report item of the SRDC with a 5-point rating scale ranging from 1 (very unsatisfactory) to 5 (very satisfactory). For the present study, we applied the median score 3 as a cut-off score to distinguish between adolescents with a good (≥ 3) versus a poor performance (< 3).

Leisure activities

We used one item of the Dutch version of the Lancashire Quality of Life Profile (LQoLP, Van Nieuwenhuizen, Schene, & Koeter, 1998) to assess the main daily activities of the adolescents prior to admission. The Quality of Life Profile was part of the interview conducted with the adolescents at admission. The used item consisted of several categories of activities, ranging from school/ work to unstructured activities. For the present study, we calculated a dichotomous variable that distinguishes

between unstructured activities, such as going out with friends and dealing drugs, and structured activities, such as school and work.

Competence skills

For the evaluation of the adolescents' competencies, the Adolescents' Tasks and Skills Questionnaire (TASQ) was completed by the coaches. The TASQ was developed within the scope of a PhD project in a Dutch secure residential child and youth care setting (Van der Knaap, 2003). Aim of the instrument is to assess the degree to which a youngster's functioning is adaptive or effective in relation to salient developmental tasks (i.e., normative demands and expectations), as judged by a group care worker. The TASQ consists of 137 items concerning the adolescents' skills which contain a 5-point Likert scale ranging from 1 (totally not applicable) to 5 (totally applicable). The questionnaire consists of 29 subscales and six dimensions of competence containing 25 of the 29 subscales. The six broad dimensions include: 1) peer relationships (29 items); 2) autonomy and self-management (24 items); 3) academic competence; 4) job competence; 5) sexuality and relationships; and 6) personal hygiene and well-being. A mean score can be calculated for each dimension. For the present study, we calculated a mean total competence score based on these six dimensions. A mean total score that is equal or higher than the median of 3 is perceived as sufficient competency. The internal consistency of the TASQ for the present sample was good ($\alpha = .86 - .98$).

Family functioning

The functioning of the family was measured in terms of the supervision behavior of parents regarding the adolescents' leisure time activities by using the SRDC interview. For the present study, we only used the mothers' scores, because mothers were more often seen as the primary caregiver by the adolescents. Sum scores of the SRDC interview subscales parental control (5 items, ranging from 1 [never] to 5 [almost] always), and passive monitoring (5 items, ranging from 1 [nothing] to 3 [much]) were used to measure the mothers' supervision behavior. Parental control refers to the extent in which mothers are informed about the leisure time activities of the adolescents. Passive monitoring is the extent to which mothers are informed about the daily activities of the adolescents. These parenting scales were sufficiently reliable: $\alpha = 0.80$ and $\alpha = 0.70$ respectively. Median scores of 15 and 10 were applied as cut-off scores to distinguish between a low and high supervision rate in terms of control and monitoring respectively.

Contact with mothers was assessed in terms of the parental rearing styles by using the Dutch version of the EMBU-C questionnaire which was completed by the adolescents (Markus, Lindhout, Boer, Hoogendijk, & Arrindell, 2003). The EMBU

consists of 52 items with a 4-point Likert scale ranging from 1 (never) to 4 (always). For the present study, we used the subscales emotional warmth (19 items) and rejection (17 items). Emotional warmth reflects perceived parental warmth in interaction with their child and rejection refers to perceived parental rejection. An emotional warmth score of ≥ 57 and a rejection score of ≤ 34 are perceived as sufficient, because minimum scores of 3 and maximum scores of 2 for each item were considered to be necessary for a sufficient score on these scales respectively. These scales showed good internal consistency ($\alpha = .92 - .96$).

Delinquency of friends

The amount of delinquent friends reported by the young people was assessed by a subscale of the SRDC interview concerning the delinquent behavior of friends, which contains 6 items ranging from 0 (none delinquent) to 3 (all delinquent) and showed good reliability ($\alpha = .84$). We calculated the scores on the subscale into one delinquent friends score ranging from 0 (no delinquent friend) to a maximum score of 18 (only delinquent friends). Because a score of 1 for each item indicated that the adolescents had some friends that showed delinquent behavior, we applied a cut-off score of 6 to distinguish between adolescents with relatively few (< 6) and many (≥ 6) delinquent friends.

Delinquent behavior

The SRDC interview (Van der Laan & Blom, 2006b) was also used to assess self-reported delinquency of the adolescents. The interview was administered mainly as an interview, except for the delinquent behavior scale (36 delinquent behavior items) which was applied as a questionnaire. This scale showed good reliability ($\alpha = .88$). The frequency and seriousness of self-reported delinquency over the last twelve months were combined into one delinquency score on the basis of the frequency and seriousness of the offences as is applied by Van der Laan and Blom (2006a, p. 280).

2.2.3 Participants

Main background data, based on information from the center's administration department and treatment documents, for the group of 164 adolescents that participated in the interview at admission are shown in Table 2.1.

Table 2.1
Sample characteristics of the participating adolescents at admission

Characteristics	Interviewed adolescents (N = 164)		
	M	SD	range
Age at admission	16.1	1.46	11.6 - 20.0
	N	%	
Sex (male)	111	67.7	
Ethnicity (Dutch origin)	104	63.4	
Measure of placement (civil)	120	73.2	
Place of origin (regional; close by the center) ^a	77	49.0	
Living arrangement prior to admission ^b			
At home with (one of the) parents	83	51.9	
Residential setting (including secure care)	53	33.1	
Living with (foster) family	17	10.6	
Independent	5	3.1	
Instable/ homeless	2	1.3	
Care history before admission ^b	148	92.5	
Externalising behavior problems ^c	139	85.3	
Internalising behavior problems ^c	58	35.6	
Delinquent behavior ^d	111	72.1	

^an = 157. ^bn = 160. ^cn = 163. ^dn = 154.

To examine possible attrition bias regarding the information on questionnaires from both adolescents (N = 101) and group care workers (N = 95), we compared the response groups with the non-response groups of the adolescents' and group care workers' questionnaires on the background characteristics in Table 2.1 and adolescents' self-reported delinquent behavior. We found that adolescents for whom there was information of group care workers were significantly more often placed in the center by a civil measure than adolescents in the non-response group, $\chi^2(1) = 11.5$, $p = .001$. This response group was also significantly more likely to have shown delinquent behavior prior to admission than the non-response group, $\chi^2(1) = 5.3$, $p = .028$. Overall, these results indicate that there is no attrition bias regarding information on adolescents' questionnaires, but that the group for whom there is information of group care workers might be somewhat more delinquent than the group for whom this information is missing.

For a subgroup of 57 adolescents, there was information on all the risk factors. To examine possible attrition bias regarding this information, we conducted the same analyses as described above in comparing the response and non-response group. These analyses showed that adolescents in this response group were significantly more often placed by a civil measure, $\chi^2(1) = 7.3$, $p = .009$, and less likely to have a mother with poor passive monitoring behavior, $\chi^2(1) = 7.1$, $p = .009$, than adolescents in the non-response group. These results indicate that the subgroup of 57 adolescents might be somewhat less problematic than the group for whom this information is missing.

2.2.4 Data analysis

To determine whether more problematic adolescents differ from less problematic adolescents regarding risk factors, we conducted univariate analyses by using the Mann-Whitney test and the Spearman's correlation coefficient to test for significant associations between risk factors and self-reported delinquency. The threshold for significance in these analyses was set at $\alpha \leq .05$. Adolescents' background characteristics and risk factors that were significantly associated with delinquency at a threshold of $\alpha \leq .05$, were included in a hierarchical multiple regression analysis to explain which predictors account for delinquency and to look for interaction-effects between risk factors (Field, 2009).

Specific subgroups within the sample regarding combinations of risk factors were identified by cluster analysis (Norušis, 2010). We first included both the original, standardized continuous and categorical risk variables in the analysis by using the two-step procedure (Norušis, 2010), but this resulted in a two-cluster solution with a poor cluster quality. Therefore, we dichotomously rated all risk factors and conducted hierarchical clustering by using the Ward's method (Norušis, 2010). By applying visual methods (e.g., inspection of the dendrogram, icicle plot and agglomeration schedule), we concluded that four, five, nine or fifteen clusters could be optimal solutions. However, because the 9 and 15 cluster models resulted in very small subgroups ($n < 5$) due to the relatively small sample overall, we decided to apply confirmatory analysis on the 4 and 5 cluster model by conducting *K*-means clustering and to compare the resulting cluster solutions to that from the hierarchical cluster analysis (Mandara, 2003). These comparisons resulted in a mean kappa of .08 [95% $CI_{\kappa} = -0.06, 0.22$] for the 4 cluster and -.18 [95% $CI_{\kappa} = -0.25, -0.11$] for the 5 cluster model. Because we found somewhat better agreement for the 4 cluster model than the 5 cluster model (Viera & Garrett, 2005), we chose the 4 cluster model as the most optimal.

To determine whether the four cluster groups significantly differed in terms of risk factors, problems and background characteristics, we applied Kruskal-Wallis tests and chi-square tests. Because of the small sample size, we applied $\alpha \leq .10$ as a threshold for significance. Post-hoc analyses for the four groups were conducted by using a Bonferroni correction ($\alpha \leq .017$).

2.3 Results

2.3.1 Prevalence of risk factors

The prevalence of the different risk factors is shown in Table 2.2.

Table 2.2
Prevalence of risk factors for adolescents at the moment of admission

Type and number of risk factors		<i>N</i>	<i>%</i>
<i>Individual domain</i>		<i>139</i>	<i>84.8</i>
1.	Poor motivation for treatment (<i>N</i> = 101)	64	63.4
2.	Substance abuse (<i>N</i> = 153)	84	54.9
3.	Unstructured daily activities (<i>N</i> = 158)	77	48.7
4.	Poor competence skills (<i>N</i> = 95)	35	36.8
5.	Poor school performance (<i>N</i> = 156)	31	19.9
<i>Contextual domain</i>		<i>136</i>	<i>78.7</i>
6.	Poor parental control by mother (<i>N</i> = 151)	77	51.0
7.	Mainly delinquent friends (<i>N</i> = 158)	71	44.9
8.	Poor emotional warmth from mother (<i>N</i> = 101)	44	43.6
9.	Poor passive monitoring by mother (<i>N</i> = 151)	37	24.5
10.	Rejection by mother (<i>N</i> = 101)	13	12.9

Note. Risk factors are ordered by prevalence and domain.

The total group of 164 adolescents showed a mean number of 3,3 risk factors ($SD = 1.82$), ranging from zero to eight, with 1,8 individual ($SD = 1.15$) and 1,7 contextual ($SD = 1.17$) risk factors on average. Most of the adolescents (70%) showed a combination of risk factors in both the individual and contextual domain.

Of all the 164 adolescents that were interviewed at admission, there was information on all the risk factors for a group of 57 adolescents (35%). These adolescents showed 3,7 out of 10 risk factors on average ($SD = 1.93$), ranging from zero to eight risk factors, including 2,1 ($SD = 1.24$) individual and 1,6 contextual ($SD = 1.12$) risk factors on average. For 72% of these 57 adolescents there was a combination of risk factors in the individual and contextual domain. Risk factors in the individual domain of the child were slightly more prevalent (88%) than risk factors in the contextual domain (81%). This subgroup had the same order of prevalence of the separate risk factors as is shown in Table 2.2.

2.3.2 Risk factors and delinquency

The number of risk factors showed a significant positive association with the seriousness and frequency of delinquent behavior in the last twelve months prior to admission, $r_s = .34$, $p = .000$, which can be considered as a medium to large effect. So,

the higher the number of risk factors, the higher the chance for adolescents to show serious delinquent behavior.

The results for the associations between separate risk factors and delinquency based on the available information for the 164 interviewed adolescents are shown in Table 2.3.

Table 2.3
Associations between risk factors and self-reported delinquency at admission

Risk factor	$r_{(s)}$	95% CI
<i>Individual domain</i>		
Motivation for treatment ($N = 101$)	.12	[-.07, .31]
Substance abuse ($N = 153$)	.41***	[.27, .53]
Unstructured daily activities ($N = 158$)	-.17*	[-.32, -.02]
Competence skills ($N = 95$)	-.06	[-.26, .14]
School performance ($N = 156$)	-.19*	[-.34, -.04]
<i>Contextual domain</i>		
Parental control mother ($N = 151$)	-.08	[-.23, .09]
Delinquent friends ($N = 158$)	.65***	[.55, .73]
Emotional warmth mother ($N = 101$)	.02	[-.18, .21]
Passive monitoring mother ($N = 151$)	-.25**	[-.39, -.09]
Rejection mother ($N = 101$)	.01	[-.18, .21]

Note. CI = Confidence Interval. Associates have been tested by using Spearman's correlation, except for the association of unstructured daily activities with delinquency, for which the Mann-Whitney test was used.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Within the individual domain, a higher delinquent behavior score was most strongly associated with substance abuse (medium to large effect), followed by poor school performance, and unstructured daily activities (both a small to medium effect). Having delinquent friends (large effect) and poor passive monitoring behavior of the mother (small to medium effect) were associated with a higher delinquent behavior score in the contextual domain.

Besides these risk factors, also adolescents being male, $U = 2201.5$, $z = -2.61$, $r = .20$, of Dutch origin, $U = 2539.0$, $z = -1.99$, $r = .16$, that were placed by a penal measure, $U = 2095.0$, $z = -2.03$, $r = .16$, and showed externalizing behavior problems prior to admission, $U = 1172.0$, $z = -2.33$, $r = .18$, were significantly ($p \leq .05$) more likely to show a higher delinquent behavior score. Therefore, these background characteristics were initially included in the regression analysis, but excluded in the final model because these variables did not significantly contribute to the prediction of the outcome. The final regression model is shown in Table 2.4.

Table 2.4
Hierarchical regression model for risk factors and delinquent behavior (N = 151)

Predictor	B	SE B	β	95% CI B
Constant	1.15	2.80		
Substance abuse	6.20	2.16	.20***	[2.34, 4.13]
Delinquent friends	3.24	0.45	.50**	[1.94, 10.5]

Note. SE = Standard Error. CI = Confidence Interval. R² = .37, p < .001.

** p ≤ .01. *** p ≤ .001.

The model shows that both having delinquent friends and substance abuse significantly predicted 37% of the variance in the delinquency score. The confidence interval for delinquent friends is wider than that for substance abuse, which indicates that the parameter for delinquent friends is less representative for the true population values than substance abuse. Although the model appears to be accurate for the sample, there are indications that the model might have violated the assumption of homoscedasticity. Therefore, these results cannot be generalized beyond this sample.

2.3.3 Subgroups based on combinations of risk factors

The four groups that were found by the hierarchical cluster analysis based on a combination of all ten risk factors for a subgroup of 57 adolescents are shown in Table 2.5.

Table 2.5
Prevalence of risk factors and seriousness of delinquency for 57 adolescents in four subgroups

Type of risk factor	1) Low risk (n = 12)		2) Individual risk (n = 13)		3) Individual/family risk (n = 15)		4) High risk (n = 17)	
	N	%	N	%	N	%	N	%
<i>Individual domain</i>								
Poor treatment motivation**a	4	33.3	12	92.3	4	26.7	13	76.5
Substance abuse***b	0	0	2	15.4	8	53.3	16	94.1
Unstructured daily activities**c	1	8.3	2	15.4	13	86.7	11	64.7
Poor competence skills***d	0	0	13	100.0	3	20.0	8	47.1
Poor school performance*e	0	0	2	15.4	1	6.7	6	35.3
<i>Contextual domain</i>								
Poor parental control mother*f	1	8.3	7	53.8	10	66.7	10	58.8
Mainly delinquent friends***g	1	8.3	3	23.1	3	20.0	17	100.0
Poor emotional warmth mother	5	41.7	6	46.2	6	40.0	5	29.4
Poor passive monitoring mother	0	0	1	7.7	4	26.7	5	29.4
Rejection by mother	0	0	1	7.7	4	26.7	0	0

Table 2.5 (continued)

	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Number of risk factors*** ^h	1.08	0.67	3.85	1.07	3.73	1.34	5.35	1.50
Individual domain*** ⁱ	0.50	0.52	2.46	0.52	1.93	1.03	3.18	0.88
Family domain* ^j	0.50	0.52	1.15	0.80	1.60	0.99	1.18	1.02
Self-reported delinquency*** ^k	5.00	4.49	8.23	9.39	9.73	10.46	31.9	25.2

Note. The two highest frequencies of risk factors are reported in bold for each group. Significant differences ($p \leq .017$) shown by post hoc analyses between the groups are shown below for each risk factor (> indicates a higher risk).

^a2 > 1, $r = -.48$, and 3, $r = -.56$; 4 > 3, $r = -.48$. ^b4 > 1, $r = -.44$, and 2, $r = -.63$; 3 > 1, $r = -.56$. ^c4 > 1, $\chi^2(1) = 9.2$, and 2, $\chi^2(1) = 7.3$; 3 > 1, $\chi^2(1) = 16.4$ and 2, $\chi^2(1) = 14.2$. ^d2 > 1, $r = -.85$, and 3, $r = -.71$. ^e4 > 1, $r = -.45$. ^f3 > 1, $r = -.58$. ^g4 > 1, $r = -.82$, 2, $r = -.63$, and 3, $r = -.81$. ^h4 > 1, $r = -.84$, 2, $r = -.53$, and 3, $r = -.51$; 2 > 1, $r = -.83$; 3 > 1, $r = -.83$. ⁱ4 > 1, $r = -.84$, 2, $r = -.47$, and 3, $r = -.56$; 2 > 1, $r = -.88$; 3 > 1, $r = -.68$. ^j3 > 1, $r = -.56$. ^k4 > 1, $r = -.65$, 2, $r = -.55$, and 3, $r = .51$.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

A comparison of all the groups on background characteristics (see Table 2.1) only indicated a difference in externalizing behavior problems prior to admission, Fisher's $p = .064$, but post hoc analyses did not show significant differences between the four groups. The groups showed significant differences on different types of risk factors, the number of risk factors and self-reported delinquency (see Table 2.5).

The first group of 12 adolescents (21%) could be described as the "low risk" group, with significantly less risk factors than the other three groups. The second group of 13 adolescents (23%) was mainly characterized by individual problems (i.e., a poor motivation for treatment and competence skills) and therefore called the "individual risk" group. The 15 adolescents (26%) in the third group showed a relatively high mean of risk factors in both the individual and family domain and, therefore, described as the "individual and family risks" group. The fourth group of 17 adolescents (30%) was the most problematic, because this group showed significantly more risk factors and delinquent behavior than the three other groups.

2.4 Conclusion

Most of the adolescents in the sample of the present study showed risk factors in both the individual and contextual domain, which corresponds to our expectations. The most prevalent risk factor was a poor motivation for treatment, followed by substance abuse by the adolescents and poor parental control by the adolescents' mothers. The findings show that these adolescents are often unaware or under aware of their problems and not intending to take action in the foreseeable future. This suggests, in correspondence to findings in other studies, that it is an important task for secure residential care centers to get insight into the adolescents' motivation for treatment level and to motivate adolescents during the process of care (Klomp, Kloosterman, & Kuijvenhoven, 2004; Orlando, Chan, & Morral, 2003).

Motivating the adolescents for change should be aimed at improving the awareness of their problems, specifically including substance use. The finding that substance abuse is one of the three most prevalent risk factors for the adolescents in the present study, and the finding that it is an important predictor for delinquent behavior, corresponds to findings in other studies (Feldstein & Ginsburg, 2006; Hussey et al., 2008; Kepper et al., 2009; Orlando et al., 2003; Prinz & Kerns, 2003; Robertson, Dill, Husain, & Undesser, 2004). Since research also suggests that substance problems are associated with higher treatment costs (Hussey et al., 2008), an intervention such as Motivational Interviewing seems to be very relevant and important for adolescents in secure residential care (Bartelink, 2010; Feldstein & Ginsburg, 2006; Underwood, Barretti, Storms, & Safonte-Strumolo, 2004).

Another finding that is consistent with our expectations is that adolescents with a high number of risk factors showed more (serious) delinquent behavior prior to their admission to secure residential care than adolescents showing few risk factors. This corresponds to findings of the many studies that have been carried out on this topic (Farrington, 1997; Pollard & Hawkins, 1999; Rutter et al., 1998; Steinberg & Avenevoli, 2000; Van der Laan & Blom, 2006a).

The most important predictors of delinquent behavior were the risk factors "delinquent friends" and "substance abuse" before admission to secure residential care. Although poor passive monitoring by mother, poor school performance and unstructured daily activities were also associated with delinquency, these variables did not significantly contribute to the prediction of delinquent behavior. So, instead of a "central eight" (Andrews et al., 2006) we found a "substance and friends duo" of risk factors in the present sample of Dutch adolescents in secure residential care. These results suggest that more and less problematic adolescents mainly differ on having delinquent friends and showing substance abuse. That these adolescents mainly show risks with regard to delinquent friends corresponds with the finding in other studies that peers are important during adolescence (Loeber et al., 2006), including the peers' influence on delinquency and substance use (Aseltine, 1995).

Although some negative family characteristics, especially mothers' poor parental control, were highly prevalent in our sample as was expected from findings in other studies (Boendermaker, 1999; Griffith et al., 2009), none of the family characteristics contributed significantly to delinquency. It might be that family characteristics have an indirect impact on delinquent behavior rather than a direct impact, for example by reinforcing poor school performance and the adolescent's involvement in antisocial leisure activities outside the family's home (cf. Van der Heiden-Attema & Bol, 2000). This indirect influence might especially be true for adolescents in secure residential care, because this group often consists of late adolescents and might therefore be less exposed to their parents than early adolescents (cf. Loeber et al., 2006). Other studies suggest, however, that the behavior of parents and the adolescent-parent relationship is very important in association with delinquent behavior, also during late

adolescence (Hair, Moore, Garrett, Ling, & Cleveland, 2008; Lahey, Van Hulle, D'Onofrio, Rodgers, & Waldman, 2008).

The results of the present study showed in correspondence with our expectation that the group of adolescents for whom there was information on all risk factors could be divided into subgroups. Somewhat more than a fifth of the adolescents could be attributed to a “low risk” group, which showed few risk factors in comparison to the other three groups. The “individual risk” group that was found, which also included somewhat more than a fifth of the adolescents, was mainly characterized by individual problems. It might be that this low risk and individual risk group mainly consist of so-called “adolescence-limited offenders” that show delinquent behavior that is mainly limited to the period of adolescence (Moffitt, 1993), but this is a hypothesis that should be tested in subsequent research.

On the other hand, the “individual and family risks” group, which was characterized by both individual and family risks, and the most problematic “high risk” group, which showed many risk factors and relatively serious delinquent behavior, may include more “life course persistent offenders” (Moffitt, 1993). Furthermore, the individual and family risk group shows similarity with the “child problems in a traumatizing family environment” profile that was found in a recently published Dutch study by Weijers, Hepping and Kampijon (2010), which focused on an adolescent group of 81 so-called delinquent “recidivists” or chronic offenders who had contact with the police on several occasions. That profile consists of youth showing behavioral problems and a family that is incapable of handling the problems that are present. The high risk group shows overlap with the “delinquent family” profile of Weijers et al. (2010). That profile consists of youth with families that consider antisocial behavior as normal. It might be that the same is true for the adolescents in the high risk group of the present study, but this is also a hypothesis that should be examined in subsequent research. Our findings also correspond with results of Gorman-Smith, Tolan, Loeber, and Henry (1998) who found that adolescents involved in serious chronic offending were more likely to have families characterized by multiple problems including disruption, conflict, and lack of parental involvement.

The four groups of adolescents that we found were mainly distinguishable by the seriousness and type of the problems that are present. So, despite similarities in their problems, i.e., antisocial and oppositional problems and the presence of multiple risk factors, the results of this study indicate that adolescents in secure residential care are characterized by different combinations of risk factors. Due to multiple problems that are often present, it is important to prioritize which problems need to be addressed first during treatment. Therefore, a clear insight into the different dynamic risk factors of each individual adolescent is needed. Results of our study suggest that the adolescent's substance abuse, contact with delinquent friends and the adolescent's poor awareness of problems should be given priority within the context of treatment

in secure residential youth care. In doing so, cognitive-behavioral methods should be applied given that these types of treatment are the most effective in decreasing recidivism of young offenders (Genovés, Morales, & Sánchez-Meca, 2006).

Our study has several limitations. In the first place, there were indications that the regression model might have violated the assumption of homoscedasticity. In addition, the relatively small sample size limited the possibilities for cluster analysis. The slight agreement that we found between the hierarchical and K-means 4 cluster model indicates that the division in four groups might not be the best estimate of the true number of clusters in the population (cf. Mandara, 2003). In line with these methodological problem is the notion that the subgroup of 57 adolescents might be somewhat less problematic than the group for whom this information is missing. Therefore, some results may not generalize to adolescents beyond the sample in the present study (Field, 2009; Kazdin, 2003).

A second limitation of this study is the way in which the risk factors are operationalized for use in the cluster analysis. The presence or absence of risk factors was defined by applying cut-off scores, because we wanted to include all the ten risk factors. Although we have tried to make the best possible decisions on the basis of the original scoring (i.e., consistently using median scores or the most relevant scores based on the item scales) to distinguish between risk and non-risk, the applied cut-off scores in the cluster analysis can be under discussion. On the other hand, we did use continuous variables in analyses whenever possible.

Despite the limitations, our findings show that many adolescents in secure residential care show multiple dynamic risk factors in both an individual and contextual domain. Considering the diverse risks and the problematic behavior of many of these adolescents, there is a high level of need to change these behaviors (cf. Griffith et al., 2009). By paying attention to dynamic risk and protective factors, it becomes clear what the needs and strengths of these adolescents are. This study showed that treatment for some adolescents in secure residential care should be mainly focused on their individual needs, while other adolescents need intensive, multimodal treatment focusing on both risks in the individual, family and peer domain.

It should be a standard procedure for secure residential care centers to draw a picture of each adolescent's risk and protective dynamic factors as soon as possible after their admission. Besides using risk assessment instruments (Gammelgård, Koivisto, Eronen, & Kaltiala-Heino, 2008; Lodewijks et al., 2010), which are often based on information from treatment documents, we recommend the standard administration of a risk interview intake protocol with each adolescent that includes questions about dynamic risk and protective factors. Such a protocol can serve as a guideline for treatment and forces staff to pay attention to the adolescents' perspective so that for example the adolescents' motivation for treatment level

becomes instantly clear. Only by assessing risk factors it becomes evident what type of conditions with regard to the persistence of problems are relevant starting points of intervention, rather than just looking at, for example, psychiatric disorders, which merely describe the symptoms present rather than the factors influencing the development and/or persistence of the problems.