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Can at-risk young adolescents be popular and anti-social? Sociometric status groups, anti-social behaviour, gender and ethnic background

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A B S T R A C T

This study aimed to extend the understanding of anti-social behaviour and its association with popularity and sociometric status in a sample of at-risk adolescents from diverse ethnic backgrounds ($n = 1491$, average age 14.7 years). Both overt and covert types of anti-social behaviour were used to distinguish subgroups. These subgroups were created on the basis of anti-social behaviour profile scores, using Latent Class Analysis. Moderator effects of gender and ethnic background were investigated using a log-linear analysis. The main finding was that each sociometric status group consisted of subgroups that differed in terms of prevalence of self-reported anti-social behaviour. At-risk young adolescents who reported involvement in anti-social behaviour appeared in every status group, including the popular group. Implications for school prevention programmes for anti-social behaviour are discussed.

Many studies have examined the association between peer group status and anti-social behaviour (Adler, Kless, & Adler, 1992; Cillessen & Mayeux, 2004; Cillessen & Rose, 2005; De Bruyn & Cillessen, 2006; Estell, Farmer, Pearl, Van Acker, & Rodkin, 2003; LaFontana & Cillessen, 2002; Newcomb, Bukowski, & Pattee, 1993; Parkhurst & Hopmeyer, 1998; Rodkin, Farmer, Pearl, & Van Acker, 2000, 2006; Rose-Krasnor, 1997; Rose, Swenson, & Waller, 2004; Xie, Cairns, & Cairns, 1999; Xie, Swift, Cairns, & Cairns, 2002). However, most of these studies focused on children of middle to high socioeconomic status, young adolescents, or highly educated young adults (e.g. LaFontana & Cillessen, 2002). Furthermore, previous work focused almost exclusively on boys (e.g. Rodkin et al., 2000) and on overt aggressive acts such as physical aggression (e.g. De Bruyn & Cillessen, 2006). Consequently, these studies cannot differentiate between gender-specific anti-social behaviour. Moreover, there was little examination of distinctions between different ethnic groups.

Our study investigated the association between popularity and anti-social behaviour in a large sample of young adolescents from preparatory vocational schools (VMBO) in the Netherlands. In this setting, young adolescents are at increased risk of becoming (more) anti-social. The structure of the Dutch educational system after primary school is rather unique in distinguishing between various educational levels, a distinction which is based on pupils' cognitive abilities VMBO schools aim to provide pupils with basic qualifications for the labour market. Their pupil population consists of young adolescents from a low socioeconomic background, with a large proportion of ethnic minority groups, and a low level of moral development (Høst, Brugman, Tavecchio, & Beem, 1998). Moreover, this type of education has been described as having a harsher school climate compared to other school types (Høst et al., 1998). Our study aimed to enlarge the understanding of anti-social behaviour and its association with popularity in such an at-risk sample.

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At-risk young adolescents

The association between anti-social behaviour and popularity is not necessarily the same for pupils in lower-level education as for those in higher-level education. Young adolescents may be at risk of becoming (more) anti-social in preparatory vocational schools for various reasons. First, previous research has shown that anti-social behaviour is more prevalent and diverse among adolescents in these schools (Mooij, 2005). There is also an indication that there is a higher rate of anti-social behaviour and an increased chance of interaction with anti-social peers, which is a strong predictor of anti-social behaviour. Moreover, as was suggested by Leenders and Brugman (2005), anti-social behaviour is more common among pupils in these schools, and might therefore be perceived as more acceptable among these adolescents.

Second, previous studies (e.g. Høst et al., 1998) have indicated that in preparatory vocational schools, the overall level of moral development among young adolescents lags behind in comparison to their peers in higher-level educational settings. Consequently, popular adolescents in lower-level education who serve as a role model may act differently from popular adolescents at a higher level. Allen, Porter, McFarland, Marsh, and McElhaney (2005, p. 747) stated that "popular adolescents are likely to increase behaviours that receive approval in the peer group (e.g. minor levels of drug use and delinquency) and decrease behaviours unlikely to be well received by peers (e.g. hostile behaviour with peers)". Thus, the type of behaviour that is approved of depends on the peer group and within different educational levels different types of behaviour may be "approved" of.

Third, research has shown that academic success is not the primary goal of the majority of pupils in preparatory vocational education. According to Poulin and Dishion (2008) in lower-level educational settings pupils have limited career opportunities, which could become a demotivating factor in school performance. Luthar (1995) stated that academic achievement, a characteristic of popular adolescents in higher-level secondary educational, is not regarded as essential in lower-level samples. Maassen and Landsheer (2000) investigated a lower-level education sample, and found that there were adolescents who did not value academic success. The authors concluded that the correlations between peer-perceived social competence and various measures of academic competence were absent or even negative.

Finally, the proportion of ethnic minority pupils has been shown to be greater in preparatory vocational schools. In some of these ethnic groups, the prevalence of anti-social behaviour was shown to be much higher than in non-minority groups (Blom, Oudhof, Bijl, & Bakker, 2005; Leuw, 1997), due to cultural differences or differences in degree of cultural integration (Deković, Wissink, & Meijer, 2004). The association between anti-social behaviour and popularity is therefore not necessarily the same for all ethnic groups.

Popularity

In the conceptualisation of Coie, Dodge, and Coppotelli (1982), sociometric status was defined in terms of independent dimensions of social preference and social impact. This led to the distinction between five different sociometric status groups: popular, rejected, neglected, controversial, and average. Popularity, for example, has been traditionally operationalised as high-liking scores and low-disliking scores (Coie et al., 1982). Each sociometric status group has been characterised by distinct behavioural patterns which influence the quality of social relations (Newcomb et al., 1993). For example, peer rejection was found to be related to anti-social behaviour, whereas popular adolescents tended to be considered as well-known, attractive, athletic, and socially competent (Newcomb et al., 1993).

Several studies explored the subtypes of adolescents within a particular status group (e.g. Gifford-Smith & Brownell, 2003). Here, we will limit our discussion to subgroups within the popular status group. Recent research has indicated that at least some anti-social adolescents were perceived by their peers as 'popular' (e.g. Rodkin et al., 2000, 2006).

De Bruyn and Cillessen (2006) described a distinction between populistic versus prosocial-popular types of adolescents. The first group was regarded as popular but not necessarily well liked. The latter group was regarded as popular, well liked, and accepted. Rodkin et al., (2000, 2006) identified two similar subgroups: a popular *tough* group and a popular *model* group. Peers perceived popular *tough* adolescents as cool, athletic, sometimes even aggressive, whereas popular *model* adolescents were perceived as non-aggressive and academically competent. These studies provide support for the hypothesis that popular adolescents do not form a homogeneous category. It is, however, unclear whether these results apply to male *and* female adolescents, to at-risk adolescents, and to adolescents from different ethnic backgrounds.

Gender and anti-social behaviour

Anti-social behaviour can be defined as outward behaviour which is harmful to others, either directly or indirectly, through the violation of important moral or social norms; it may include aggressive and delinquent acts (Barriga, Morrison, Liau, & Gibbs, 2001; Liu, 2004). Covert anti-social behaviour has been characterised as a 'low-cost' way of harming others. It is aimed at damaging relationships or wrecking the sense of inclusion (Loeber, Lacourse, & Homish, 2005) and constitutes an indirect form of anti-social behaviour (Crick & Grotpeter, 1995). Overt anti-social behaviour, on the other hand, is characterised by more direct forms of aggression such as fighting, temper tantrums and verbal aggression. Loeber and Schmaling (1985) found that some adolescents showed a profile that is either mostly overt or mostly covert in nature, but there was also a group that displayed both types of behaviour.

It is important to include both aspects of anti-social behaviour, because both were found to be positively related to popularity (Rose et al., 2004). Research on the combined concerns of anti-social behaviour and popularity has primarily focused on overt anti-social acts perpetrated mostly by males (e.g. De Bruyn & Cillessen, 2006; Parkhurst & Hopmeyer, 1998; Rodkin et al., 2000, 2006). Only a few studies were concerned with covert aggressive acts, which are more typical of females (LaFontana & Cillessen, 2002; Lease, Kennedy, & Axelrod, 2002; Rose et al., 2004; Xie et al., 2002). Rose et al. showed, for example, that covert anti-social acts have an important and unique relationship with popularity. These acts were often more subtle and sophisticated than overt acts.

Substantial gender differences have been found to exist in both the overall prevalence of anti-social behaviour (Perkins & Borden, 2003) and in the different types of anti-social behaviour (Underwood, 2004). In general, boys have been found to be more anti-social than girls (e.g. Vaillancourt, 2005). Moreover, boys have been found to be more overtly anti-social than girls and if girls were anti-social, they have been found to be more likely to be covertly than overtly anti-social (Gorman-Smith & Loeber, 2005). Previous studies that tried to establish gender differences in anti-social behaviour without including covert anti-social acts may have failed to locate *tough* girls for this reason.

Studies linking popularity and anti-social behaviour in higher-level secondary education samples, which also included gender, led to mixed results. For *overt* anti-social behaviour, Parkhurst and Hopmeyer (1998) found a stronger correlation with popularity among boys than among girls. Lease et al. (2002) concluded the opposite, whereas LaFontana and Cillessen (2002) and Rose et al. (2004) found no gender-related differences. Regarding *covert* anti-social behaviour and popularity, LaFontana and Cillessen (2002) found similar correlations for boys and girls. Rose et al. (2004) found a stronger correlation with popularity for girls than for boys. With respect to *model* and *tough* popular youngsters, De Bruyn and Cillessen (2006) showed that *tough* boys are more verbally aggressive, more physically aggressive, and more threatening than *tough* girls. Similar differences were found in the *model* popular group. These findings suggest that *tough* girls display more covert types of anti-social behaviour whereas *tough* boys display more overt types of anti-social behaviour. It is however unclear whether this holds in an at-risk sample and for different ethnic groups.

Hypotheses

This study investigated whether there were subgroups in terms of self-reported anti-social behaviour within each sociometric status group. We used a large at-risk sample of young adolescents and investigated whether an association existed between subgroup and anti-social behaviour which was moderated by gender and ethnic background.

Our first hypothesis was that in all sociometric status groups, subgroups could be identified based on anti-social tendencies, and that, at least in an at-risk sample, the popular status group contains an (anti)social group (e.g. Rose et al., 2004). Although it is likely that ethnicity will moderate the relationship between sociometric status and (anti)social subgroups we have as yet no basis for a definite hypothesis regarding the direction of this moderating effect since hardly any research has been done on these subgroups so far. With regard to gender we expected that in the popular status groups only a small group of *tough* girls and a larger group of *tough* boys would be present.

In order to identify *tough* girls we used both overt and covert types of anti-social behaviour, since they are believed to score higher on covert anti-social behaviour items. A major advantage of this study is that we based our search for the (anti)social subgroups on profile scores rather than on more arbitrary cut-off criteria such as mean scores. Finally, a social desirability scale was included to check for socially desirable response patterns.

Method

Participants

Eighty pre-vocational secondary schools in the Netherlands were approached by letter to participate. Nine schools were willing to participate in accordance with the research requirements. The reason most schools were not willing to participate was due to logistical problems as data were gathered in the context of an intensive prevention study (Van der Velden, Brugman, Boom, & Koops, 2009). The schools are located in cities in the middle and highly urban Western part of the Netherlands.

Participants were 1491 Dutch (male = 55.5%) young adolescents with ages ranging from 13 to 18 years ($M = 14.7$; $SD = .64$). All participants attended preparatory vocational schools (VMBO). Dutch origin represented 40.6% of the sample, Moroccan origin 10.8%, Turkish origin 14.8%, Surinamese origin 12.5%, origin from the Dutch Antilles 3.2%, and other origins 18.1%.

Measures

Sociometric status

To determine sociometric status, the rating method of Maassen, Akkermans, and van der Linden (1996) was used. Rating methods allow young adolescents to evaluate each and every member of their class and provide information about to what extent this person is liked or disliked. The program SSrat v2 (Sociometric Status rating; Maassen & Landsheer, 2005) was used to classify young adolescents in five status groups. The reliability or stability of the two-dimensional rating scale method as

compared to that of the nominations method was studied by Maassen and Verschueren (2005) and Maassen, van Boxtel, and Goossens (2005). The theory underlying the program SSrat is described in Maassen et al. (1996; see for an introduction Maassen, van der Linden, Goossens, & Bokhorst, 2000). We used an alpha level of 5% in SSrat.

Social desirability

To assess social desirability, 10 statements were used (such as: 'I am always honest') based on the Marlowe-Crowne questionnaire (Crowne & Marlowe, 1960). Contrary to the original 2-point scale, participants in this study responded along a 6-point Likert scale from 'agree strongly' to 'disagree strongly' (alpha = .75).

Anti-social behaviour

The Anti-social Behaviour Questionnaire (Høst et al., 1998; Leenders & Brugman, 2005) consisted of five categories of delinquent behaviour (a total of 12 items): vandalism, physical aggression, relational aggression, minor theft and serious theft. Each item (for example: 'stealing money at home') consisted of the question: 'did you conduct this behaviour' and could be scored on a 4-point scale (no, once, sometimes, often). Three questions were changed compared to the previous version, in order to include covert types of aggression (for example: 'gossiping about others').

Our main analyses are based on the profile scores, therefore all 12 items were used as separate entries for these analyses. For descriptive analyses, however, we aggregated the information into two subscales, a *covert* scale (Cronbach's alpha = .65) with, for example, lying, and an *overt* scale (Cronbach's alpha = .72), with, for example, physical aggression. All 12 items were included as many categorical variables in a confirmatory factor analysis (CFA) using Mplus 4.1 (Muthén & Muthén, 2005). In addition to the loadings of items on their designated factor (see Table 1), the correlations between the three factors was estimated (overt–covert: $r = .57$; covert–social desirability: $r = -.46$; overt–social desirability: $r = -.72$). Fit indices indicated a good fit of the model (*CFI* = .90; *TLI* = .93; *RMSEA* = .05).

Furthermore, the translated version of the externalising behaviour subscales aggression (alpha = .95) and delinquency (alpha = .75) of the Teacher's Report Form (TRF, Achenbach, 1991) was used. The Dutch version of the TRF (Verhulst, van der Ende, & Koot, 1997) has been shown to have a good reliability and validity (alpha for the delinquency scale = .70 and .61 for boys and girls, respectively; alpha for the aggressive scale = .94 and .93 for boys and girls, respectively, see Verhulst, van der Ende, & Koot, 1997). Fit indices indicated a reasonably good fit of our CFA model (*CFI* = .87; *TLI* = .97; *RMSEA* = .11).

Procedure

After a brief verbal instruction, participants completed the self-report measures within classroom settings in classes of approximately 20 pupils. Participation was granted by means of passive consent and confidentiality was guaranteed. Anti-social behaviour was reported by the mentor who met the pupils on a regular base. During data collection, about 2% of the participants were not present.

Sociometric status information was gathered within the classroom setting where privacy was ensured by separating classroom desks and by the verbal instruction to refrain from discussing ratings. All pupils received a full list of classmate names, to be sure that all pupils in the class room would receive a rating. This way, sociometric status information was also available for pupils who were not present on the day of data collection.

Strategy for analyses

To deal with missing data, we used multiple imputations using the MICE-package (Van Buuren & Oudshoorn, 1999, 2005) in 'R' (R Development Core Team., 2006). This method uses conditional distributions for the missing data. For each incomplete variable, MICE assumes that a multivariate distribution exists from which conditional distributions can be derived using an

Table 1
Factor loadings for the CFA with the Anti-social Behaviour Questionnaire.

Subscale	Item	Standardized factor loading
Covert		
	Stealing money at home	.62
	Excluding someone	.63
	Gossiping	.68
	Lying	.72
Overt		
	Damaging property	.73
	Stealing from supermarket with small value	.74
	Robbing someone	.59
	Stealing from supermarket with large value	.72
	Graffiti	.45
	Aggressive violence	.60
	Fight/argue with strangers	.70
	Starting a fire	.62

iterative Gibbs sampling from the conditionals. Five imputed datasets were generated and the analyses were conducted for each data set. Because all analyses resulted in similar results, and pooling the estimates is rather complicated for our types of analyses, only the statistics for the first dataset are reported.

The hypothesis about the existence of subgroups was evaluated using latent class analysis (LCA; McCutcheon, 1987). The main goal of an LCA is to determine groups of persons with similar item responses (Vermunt & Magidson, 2004). In this analysis, categorical latent variables represent subpopulations, where population membership is not known but is inferred from the data. We used the items of the questionnaires as categorical variables in the analyses. Results of the LCA are class size, posterior class probabilities, the probability per individual to be in one of the latent classes, and a profile per group per item. To select the best model, we used the Bayesian Information Criterion (BIC; Schwarz, 1978), which is a comparative index that favours parsimonious models with lower values indicating a better fit. Also entropy values (Vermunt & Magidson, 2004) were used, with higher values indicating a better classification solution.

To examine the hypothesis whether subgroups of anti-social young adolescents are prevalent within the popular status group, taking into account gender and ethnic background, a log-linear analysis was performed (Agresti, 1996). The purpose of log-linear analysis is to discover associations among categorical variables, in order to determine the best model that will account for observed frequencies (Tabachnick & Fidell, 2001). The goal is to find a model with the smallest number of associations that still provides a good fit, indicated by a non-significant likelihood ratio Chi-square. The selected model must not be significantly worse than the next more complicated model, indicated by a significant change in Chi-square.

Using all five sociometric status categories, all ethnic backgrounds, and the gender group in one log-linear analysis, resulted in too many cells with frequencies less than 5. To avoid violation of this statistical assumption (Tabachnick & Fidell, 2001), we used two separate log-linear analyses. We first tested the hypothesis that the ratio of anti-social subgroups is the same in every sociometric status group. A second hypothesis was tested to investigate whether gender and ethnicity moderated the ratio of anti-social subgroups in the popular status group. We used a variable denoting whether or not the adolescent was popular and a variable denoting whether or not an adolescent had a Dutch ethnic background.

Results

Missing data analysis

Of the data, 62.8% were fully observed; 22.9% of the participants had only one or two missing scale items on one of the questionnaires. In 12.3% of the cases one of the questionnaires was missing completely, due to a time limitation. In general, no statistical and/or substantial differences were found between complete and incomplete cases, neither on background variables such as gender ($\chi^2 = .46$, $p = .49$), age ($F_{(1,1411)} = 17.81$, $p < .001$, *partial* $\eta^2 = .01$), and ethnicity ($\chi^2 = .57$, $p = .45$), nor on the research variables sociometric status, ($\chi^2 = 5.84$, $p = .21$), covert anti-social behaviour ($F_{(1,1489)} = .48$, $p = .38$), overt anti-social behaviour ($F_{(1,1489)} = 1.23$, $p = .06$), social desirability ($F_{(1,1489)} = .13$, $p = .46$), teacher reported aggression ($F_{(1,1489)} = 3.04$, $p = .02$, *partial* $\eta^2 = .004$), and teacher reported delinquency ($F_{(1,1489)} = 5.53$, $p = .002$, *partial* $\eta^2 = .006$). Note that we consider the three significant results as being not relevant, due to the very small effect size.

Descriptive analysis

The prevalence of the five status groups in our study is in line with previous research findings of traditional nomination procedures (e.g., Coie et al., 1982): popular ($n = 215$; 14.4%), rejected ($n = 205$; 13.7%), neglected ($n = 88$; 5.9%), controversial ($n = 29$; 1.9%) and average ($n = 954$; 64.0%). More girls were prevalent in the controversial status group than boys (62.1% vs. 37.9%), whereas boys were more often rejected (69.6% vs. 30.4%) and neglected (67.0% vs. 33.0%) than girls ($\chi^2 = 32.12$; $p < .001$; $\varphi = .15$).

A social desirability effect was found for ethnicity, with participants with an ethnic minority background reporting significantly and substantially more social desirable answers than Dutch participants ($F_{(1,1227)} = 25.97$; $p < .001$; partial $\eta^2 = .08$), but not for gender ($F_{(1,1227)} = 2.08$; $p = .14$; partial $\eta^2 = .002$) nor for sociometric status groups ($F_{(4,1227)} = 1.50$; $p = .19$; partial $\eta^2 = .005$).

To evaluate whether mean levels of overt and covert anti-social behaviour differ for the five sociometric status groups, for gender, or for ethnic background, after controlling for social desirability, a multivariate analysis of variance (MAN(C)OVA) was performed. Significant multivariate main effects were found for anti-social behaviour of sociometric status groups ($F_{(8,2450)} = 2.98$; $p = .002$; partial $\eta^2 = .009$), for gender ($F_{(2,1225)} = 67.65$; $p < .001$; partial $\eta^2 = .10$) and for ethnicity ($F_{(2,1225)} = 7.05$; $p < .001$; partial $\eta^2 = .01$). Social desirability was a significant covariate ($F_{(2,1225)} = 1681$; $p < .001$, partial $\eta^2 = .73$). No interaction effects were found.

Sociometric status groups differed significantly in *overt* anti-social behaviour ($F_{(4,1226)} = 4.42$; $p = .001$; partial $\eta^2 = .01$). Post-hoc analyses using confidence intervals of mean differences revealed several differences, see Table 2. Moreover, general comparisons of status groups of *covert* anti-social behaviour ($F_{(4,1226)} = 1.99$; $p = .09$) did not reach significance.

An LCA was performed on all items of the anti-social behaviour scales to create subgroups of young adolescents. It appeared that using higher order latent variable models (i.e. items loading on a latent variable per questionnaire, loading on a second order latent variable) did not result in stable models, due to computational and convergence problems. Therefore the LCA was performed on the items as independent predictors of the latent class indicator.

Table 2
Standardized means and 95% confidence intervals of the sociometric status groups, ethnic background and gender on the variables overt and covert anti-social behaviour ($n = 1491$).

	Covert			Overt		
	Mean	95% C.I.		Mean	95% C.I.	
		Lower bound	Upper bound		Lower bound	Upper bound
Sociometric status group						
Popular	.05	.01	.09	.02	−.03	.09
Rejected	.01	−.04	.07	-0.01_{a}	−.12	.08
Neglected	−.02	−.08	.03	-0.10_{bc}	−.24	.02
Controversial	.00	−.09	.11	0.18_{ab}	.00	.37
Average	.01	.00	.03	0.04_{c}	.01	.07
Ethnic background						
Dutch	0.03_{d}	.01	.06	.01	−.05	.08
Non-Dutch	-0.01_{d}	−.04	.01	.03	−.03	.10
Gender						
Boys	-0.02_{e}	−.05	.00	0.10_{f}	.05	.16
Girls	0.05_{e}	.01	.10	-0.05_{f}	−.13	.02

Note: Reported means are factor scores. Means that share the same subscripts differ significantly ($p < .05$). Means in the model are evaluated for the covariate Social Desirability. C.I. = Confidence Interval.

In Table 3, fit results and subgroup prevalence are provided for models with 1 through 5 latent classes; models with more than 5 classes resulted in even higher BIC-values. A 3-class solution was preferred, because it fits the data best, group sizes are substantial, and item profiles (not shown) are clearly different. Three groups can be distinguished: one small group (C; 16%) may be interpreted as a group with anti-social behaviour, willing to use *covert* and *overt* anti-social behaviour. Participants within this group responded to all items with at least 'sometimes' and for many items they reported 'often.' The remainder can be divided into two evenly large groups. One group (A; 42%) reported a fairly low prevalence of anti-social behaviour. Participants in this group reported no involvement in any anti-social behaviour at all, responding 'no' to all items with some rare exceptions of 'once.' The other group (B; 41%) reported involvement in *covert* and *overt* forms of anti-social behaviour 'sometimes.'

Popular anti-social subgroups

The main question concerned whether subgroups of anti-social young adolescents are also prevalent within popular status groups and whether gender and ethnic background moderate this association. Two log-linear models were computed using SPSS HILOGLINEAR. The first hypothesis states that for every sociometric status group, the ratio of anti-social subgroups is the same.

There appeared to be no K-way effect on the association between anti-social subgroups and the five sociometric status groups ($\chi^2_{(2)} = 1.34$, $p = .51$), indicating that the proportion of anti-social subgroups is the same in every sociometric status group, see Table 4.

The second hypothesis was concerned with moderation effects of gender and ethnicity. A four-way log-linear analysis was performed to develop a hierarchical model on the associations between (anti)social subgroups, being popular or not, gender, and having a Dutch ethnic background or not. Inspection of the residuals did not result in outliers and higher order effects did not reach significance ($p < .05$). Stepwise selection by backward deletion of effects produced a model that included all main effects and two two-way interaction effects (see Table 5). The final model (step 4) indicated a good fit between the observed frequencies and expected frequencies generated by the model. Also, deleting another association from the model in step 5 resulted in a significant change of the chi-square ($p = .045$). A summary of the model with results of the significance tests (partial likelihood ratio χ^2) is depicted in Table 5.

The most important finding is that there was no association between anti-social subgroups and being popular or not. Furthermore, it appeared that gender has no association with being popular or not. The ratio of anti-social subgroups for boys (47.5% : 44.6% : 7.9%; group A : B : C, respectively) was not significantly different for girls (44.7% : 43.9% : 11.4%), $\chi^2_{(2)} = .76$, $p = .68$.

Table 3
Results of latent class analysis ($n = 1491$).

Solution	Log-likelihood	BIC	Entropy value	Subgroup prevalence (%)				
				1	2	3	4	5
1-class	−14 029	28 322	–	100				
2-classes	−13 219	26 971	.74	59	41			
3-classes	−13 014	26 832	.75	42	41	17		
4-classes	−12 894	26 862	.71	31	31	25	13	
5-classse	−12 797	26 939	.70	28	24	20	15	13

Note: BIC = Bayesian Information Criterion.

Table 4
Cross-tabulation of observed percentages for anti-social behaviour times sociometric status group for boys and girls separately ($n = 1491$).

	Subgroups					
	A		B		C	
	Boys	Girls	Boys	Girls	Boys	Girls
Sociometric status groups						
Popular	41.6% (42)	44.7% (51)	46.5% (47)	44.7% (51)	11.9% (12)	10.5% (12)
Rejected	40.8% (58)	61.9% (39)	45.8% (65)	28.6% (16)	13.4% (19)	9.5% (6)
Neglected	37.3% (22)	31.0% (9)	57.6% (34)	55.2% (16)	5.1% (3)	13.8% (4)
Controversial	54.5% (6)	50.0% (9)	36.4% (4)	22.2% (4)	9.1% (1)	27.8% (5)
Average	48.0% (247)	48.7% (214)	39.0% (201)	43.1% (189)	13.0% (67)	8.2% (36)

Note. Percentages in rows sum up to 100% for boys and girls separately. Between brackets are *n*'s.

The association between ethnicity and anti-social subgroups was significant. When comparing the overall ratio of Dutch young adolescents versus young adolescents from minority groups (45% vs. 55%), the latter group is overrepresented in the group with the least anti-social behaviour, group A (35% Dutch vs. 65% immigrant) and underrepresented in the group with moderate levels of anti-social behaviour, group B (52% vs. 48%) and the group with the highest level of anti-social behaviour, group C (54% vs. 45%).

Multiple informants

Combining self- and teacher- reported behaviour did not result in a stable measurement scale. Latent Class models for a combined set of items from the self-report scale and TRF-scale did not converge. Higher order latent variable approaches were tested, but these analyses did not result in stable models due to convergence problems. An LCA with only the TRF-items resulted in a 7-class solution, which is not very helpful. It was therefore decided not to include the TRF in the final analyses.

Discussion

The main finding of this study is that the effect of anti-social behaviour is larger within sociometric status groups than between them. In other words, in each sociometric status group there are subgroups that differ in terms of reporting anti-social behaviour. One small group reported a willingness to use *covert* and *overt* anti-social behaviour, one group reported a fairly low prevalence of anti-social behaviour, and one reported no involvement in any anti-social behaviour at all. Consequently, at-risk young adolescents who reported involvement in anti-social behaviour on a regular basis can be found in similar numbers in each and every status group.

These results imply that the popular status group does not differ from other status groups with respect to the prevalence of reporting anti-social behaviour. Thus, there are *tough* male and female popular group members who display both overt and covert anti-social behaviour, but they are not in the majority. Our findings confirm earlier findings regarding the heterogeneity of sociometric status groups in secondary education. In the environment of lower-level secondary education, it might be 'cool' to be anti-social (see also Rodkin et al., 2000, 2006). As was suggested by Rose et al. (2004, p. 379), "young adolescents may strategically behave in ways that hurt others in order to control the peer context and achieve, maintain, or display popularity".

Relying solely on self-assessment, young adolescents from a non-Dutch ethnic background reported a similar range of anti-social behaviours as Dutch adolescents. This is in contrast with previous findings, where non-Dutch groups tended to display more anti-social behaviour than young Dutch adolescents (Blom et al., 2005; Leuw, 1997). One explanation for this inconsistency may be that young adolescents from minority groups fear 'being caught' by the authorities, as suggested by Janssen et al. (2004). Consequently, they did not believe in the anonymity guaranteed by the researchers.

A second explanation may be that adolescents from a non-Dutch ethnic background are less likely to admit to anti-social behaviour than young Dutch adolescents (Junger, 1990). In some cultures (e.g. Moroccan and Turkish), adolescents will never admit to illegal acts or unlawful behaviour, especially if it has gone unnoticed (Bovens, 2003). According to Bovens, this is because public embarrassment for the actor himself or his family should be avoided at all costs. Junger (1990), therefore,

Table 5
Summary of hierarchical deletion steps involved in arriving at final model.

Step	Model	df	χ^2	*p*	Term deleted	Δdf	$\Delta\chi^2$	Δp
1	(P × G) (C × E) (G × E) (G × C) (P × C) (P × E)	9	8.18	.51				
2	(P × G) (C × E) (G × E) (G × C) (P × C)	10	8.19	.61	(P × E)	1	.01	.92
3	(P × G) (C × E) (G × E) (G × C)	12	9.66	.64	(P × C)	2	1.47	.47
4	(P × G) (C × E) (G × E)	14	13.09	.45	(G × C)	2	3.43	.17
5	(P × G) (C × E)	15	17.10	.31	(G × E)	1	4.01	.04

Note: P = being popular or not; G = gender; C = anti-social subgroup; E = ethnicity.

considered arrest rates as more reliable measures than self-reported data for comparing crime involvement in diverse ethnic groups (see also: Loeber & Hay, 1997).

For generalizability purposes, the results of our study hold only as long as one keeps the following in mind: (1) use of self-report data; (2) drop-out rate; and (3) possible selection bias.

First, the use of self-report questionnaires might influence the reporting of anti-social behaviour. Anti-social behaviour is probably better assessed by peer perception. Moreover, our analyses with multiple informants (teacher and self-reported anti-social behaviour) did not work out as expected. This raises the question of whether multiple informants are suitable for an at-risk sample with high levels of anti-social behaviour. Sternberg, Lamb, Guterman, and Abbott (2006, p. 300) suggested that teachers have only a limited awareness of their pupils' private experiences and have fewer opportunities to learn about young adolescents' concerns. This suggests that teachers and young adolescents do not *per se* report the same behaviour, since both groups have a different perspective.

Second, generalizability is restricted to young adolescents in preparatory vocational education who attend classes regularly. It should be noted that this type of education is marked by relatively high numbers of dropouts (Loeber & Hay, 1997).

Third, there is the question of selection bias because of the nature of the schools that were willing to participate. It could be argued that participating schools were having more trouble in dealing with anti-social behaviour in their school population than average. The opposite might also be the case, however: school authorities tend to conceal anti-social behaviour in order to protect their reputation and to reduce the risk of attracting fewer pupils in the future. Still, most schools not willing or able to participate based their decision on logistical reasons. Moreover, the participating schools have different religious backgrounds and show similar levels of anti-social behaviour compared to previous studies conducted in the Netherlands (Blom et.al., 2005; Høst et al., 1998; Leenders & Brugman, 2005).

Future research is needed and should focus on multiple informants, combining self- and peer-reported anti-social behaviour, and arrest rates. There is also a need for studies including different levels of education to see whether the same models apply to different levels. When doing so, it is necessary to include items in the questionnaire that are more suitable for reporting anti-social behaviour in higher-level education, such as committing (tax) fraud. Finally, longitudinal studies are needed to investigate the causal relationship between anti-social behaviour and popularity and whether this differs for lower versus higher-level education.

The results of this study have two important implications for intervention programmes. First, intervention programmes often assume that since anti-social young adolescents experience rejection, their peer status needs to be improved by teaching them social skills (Quinn, Kavale, Mathur, Rutherford, & Forness, 1999). However, our study shows that there are young adolescents displaying anti-social behaviour who are nevertheless popular. If these young adolescents learn additional social skills, they might use these skills to increase their power and manipulate others (Mathur & Rutherford, 1996). This may explain the limited effectiveness of some social skill interventions. Popular *model* and *tough* pupils should be treated differently in these interventions or *tough* popular pupils should be excluded from the programmes to avoid unwanted results.

Second, it is important to identify *tough* young adolescents since these popular anti-social young adolescents are highly influential in class and serve as role models (Cillessen & Rose, 2005; Eder, Evans, & Parker, 1995; Estell et al., 2003). Young adolescents who associate with anti-social peers are at higher risk of engaging in anti-social behaviour themselves, due to deviancy training (e.g. Patterson, Dishion, & Yoerger, 2000). It is essential to avoid such unwanted peer associations (Dishion, McCord, & Poulin, 1999). Further research should investigate whether these *tough* popular pupils are better off than non-popular adolescents who report involvement in anti-social behaviour, and how they affect the social ecology of the classroom.

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