PSYCHO-SOCIAL ASPECTS SUPPLEMENT

Abstract — Aims: The overall aim was to study patterns of delinquent behaviour in relation to adolescent alcohol use. The more specific aims were to examine whether alcohol use varied between groups of adolescents with different patterns of delinquent behaviour, and to explore whether the association between delinquent behaviour patterns and alcohol use was similar for males and females. Methods: The participants were male (n = 406) and female (n = 532) adolescents in the eighth grade (age 14 years) in a medium-sized city of Sweden. We used information about self-rated alcohol use and different types of delinquent behaviour. Results: The results revealed that the occurrence of excessive alcohol use and drunkenness varied between groups of adolescents with different delinquency patterns, and that the associations between alcohol use and patterns of delinquent behaviours were relatively similar for males and females. Adolescents with patterns characterized by more serious non-violent delinquency or by violent delinquency reported the highest occurrence of alcohol use and frequency of drunkenness. Adolescents with well-adjusted behaviour or occasional minor delinquency were less likely to report drinking large amounts of alcohol or to the point of feeling drunk. Conclusions: The present results further emphasize the importance of distinguishing between different offender groups when examining the relationship between delinquent behaviour and associated problems, such as excessive alcohol use.

INTRODUCTION

An association between alcohol use and criminal behaviour, especially violent criminality, repeatedly emerges in the literature (Virkkunen and Linnoila, 1993; Caspi et al., 1997; Nash Parker and Auerhan, 1998; White et al., 1999; Richardson and Budd, 2003). It has been shown that the national trends of alcohol consumption correspond strongly with homicide and assault trends (Norstrom, 1998; von Hofer, 2003) and that a considerable proportion of violent crime is committed by individuals with an alcohol or drug use disorder (Grann and Fazel, 2004). However, does the demonstrated association between alcohol use and antisocial behaviour apply to antisocial behaviour in general or only in some subgroups of offenders? The present paper examines whether alcohol use varies between groups with different delinquent behaviour patterns in a sample of male and female adolescents.

Occurrence of antisocial behaviour and antisocial behaviour patterns

An increasing number of individuals engage in antisocial behaviour during adolescence (Moffitt, 1993). Since the majority of individuals displaying antisocial behaviour during adolescence do not proceed to adult offending, there has been a distinction between adolescence-limited and persistent antisocial behaviour (Moffitt, 1993). Even though studies support this distinction (Statin and Magnusson, 1991; Patterson et al., 1998; Fergusson et al., 2000; White et al., 2001a; Eklund and af Klinteberg, 2006), other research indicates that a distinction between additional offending groups is needed (Nagin and Land, 1993; Loebber and Stouthamer-Loebber, 1998; Fergusson et al., 2000). It has particularly been argued that there is a need to distinguish between aggressive and non-aggressive antisocial behaviour (Loebber and Stouthamer-Loebber, 1998). For example, adolescents with both aggressive and non-aggressive antisocial behaviour have been shown to display a more severe pattern of antisocial behaviour compared with adolescents having only non-aggressive antisocial behaviour (Loebber and Schmaling, 1985). Similarly, research has shown that violent offenders often have frequent and persistent antisocial behaviour (Farrington and Loebber, 2000). Thus, further research on offending subgroups is needed.

Sex differences in antisocial behaviour

Concerning sex differences, a male preponderance in antisocial behaviour has been demonstrated (Moffitt, 2001b, 2001c; Gorman-Smith and Loebber, 2005), both with respect to property offences and violent offences (Windle, 1990). Nevertheless, the sex difference in antisocial behaviour appears to be reduced during adolescence (Moffitt, 2001b, 2001c). Furthermore, although aggressive and violent behaviour is more frequently reported among males than females (Moffitt, 2001a), there is research indicating that it may be manifested differently in males and females. The tendency for males to be more aggressive appears to be more pronounced for physical aggression than for other types, such as relational aggression (Eagly and Steffen, 1986; Moffitt, 2001a). Other findings have shown that males display more overt aggression—in terms of physical and verbal forms without distinguishing between them—than females (Bjorkqvist et al., 1992; Crick and Grootpete, 1995; Crick et al., 1997). Girls, on the other hand, are more relationally aggressive than males (Crick and Grootpete, 1995; Crick et al., 1997). Using a distinction between physical and verbal aggression, Bjorkqvist and colleagues (1992) found that adolescent males displayed more physical aggression, while there was no significant difference between males and females with respect to verbal aggression.

The association between antisocial behaviour and alcohol use

In addition to the increase in antisocial behaviour during adolescence, a large proportion of adolescents begin using alcohol at this age (Hellandsjo Bu et al., 2002). It has been shown that adolescents who display antisocial or violent behaviour are more likely than other adolescents to have problematic alcohol use and frequency of drunkenness.
use (Farrington and Loeber, 2000; White et al., 2001b), excessive alcohol use or drunkenness (Eklund and af Klinteberg, 2005). Correspondingly, it has been demonstrated that adolescents and young adults who have an early alcohol debut or who misuse alcohol have higher rates of antisocial or violent behaviours (Fergusson et al., 1996; Chassin et al., 2002; Richardson and Budd, 2003). Males and females who binge drink are also at higher risk for engaging in disorderly behaviour or criminality while under alcohol’s influence (Richardson and Budd, 2003).

**Aims**

With the above-mentioned research as a starting point, the main aim of the present study was to investigate delinquent behaviour patterns in relation to adolescent alcohol use. Firstly, we wanted to examine whether it is possible to categorize adolescents into subgroups based on the type of delinquent behaviour in which they engaged, and secondly, to test whether these subgroups of adolescents differ with respect to alcohol use. The more specific questions addressed in the study were:

1. How common are different types of self-rated delinquent behaviours and alcohol use (drunkenness and/or excessive alcohol use) in adolescence? What are the similarities and dissimilarities between males and females?
2. Is it possible to identify subgroups of adolescents with relatively similar delinquent behaviour patterns, based on the type of the delinquent behaviours? Are the obtained delinquency patterns similar for males and females?
3. Does alcohol use vary between groups of adolescents with different delinquency patterns? Is the association between alcohol use and delinquency patterns similar for males and females?

According to previous research, we hypothesized that the patterns of delinquent behaviour would be relatively similar in male and female adolescents, although there would be fewer females engaging in these behaviours. Further, we hypothesized that an increasing seriousness of delinquency patterns would be associated with higher alcohol use.

**METHODS**

**Participants**

The participants were eighth grade male and female adolescents in a medium-sized city in Sweden (Stattin and Kerr, 2001). All adolescents attending the eighth grade in the city schools were invited to participate in the study (n = 1279). Adolescents were told that participation was voluntary. They participated in the study unless they chose not to do so or unless their parents returned a form stating that they did not want their child to participate. A number of parents did not want their child to participate in the study (n = 12) (Kerr and Stattin, 2000). In total, 1186 of the 1279 adolescents were present on the day of the data collection and completed questionnaires during school hours (Andershed et al., 2002). Thus, 93% of the target sample was included in the study. The mean age in the group was 14.4 years. All adolescents with complete information on the variables used for identifying subgroups were included (n = 938; of whom 406 were males and 532 females).

**Measures**

Information about delinquent behaviour, drunkenness and excessive alcohol use was obtained from self-rating questionnaires administered to participants by researchers during school hours. The questions referred to the frequency of behaviours taking place during the last year and were rated on five-point scales (1 = no, that had not happened; 2 = 1 time; 3 = 2–3 times; 4 = 4–10 times; 5 = more than 10 times). One item concerning excessive alcohol consumption was obtained from another questionnaire and was rated on a dichotomous scale (1 = yes; 2 = no). Different types of delinquent behaviours were grouped and formed five delinquency scales. Three scales included non-violent delinquency (minor offences, damage to property, burglary/theft) and two scales included violent delinquency (threat/force, physical violence).

**Minor offences**

Six items concerning minor offences formed the index ‘minor offences’: (1) Have you taken items from a mall, store or newsstand without paying? (2) At home, have you taken money that did not belong to you? (3) Have you stolen anything from someone’s pocket or bag? (4) Have you bought or sold something that you knew or suspected had been stolen? (5) Have you without permission taken a bike? (6) Have you purposely left a café, movie theatre, bus or anywhere else without paying? (adjusted minimum–maximum values = 0–24).

**Damage to property**

Two items formed the index ‘damage to property’: (1) Have you purposely vandaled or taken part in vandalizing things such as windows, street lamps, telephone booths, benches or gardens? (2) Have you been involved in illicitly vandalizing with graffiti or writing something in ink or paint somewhere, e.g. on a wall? (adjusted minimum–maximum values = 0–8).

**Burglary/theft**

Four items concerning more severe forms of non-violent delinquent behaviour were grouped to form the index ‘burglary/theft’: (1) Have you been involved in breaking into a house, store, newsstand, storage or any other building with the purpose of stealing something? (2) Have you been involved in taking a car without permission? (3) Have you been involved in taking a moped, motorcycle or scooter without permission? (4) Have you been involved in stealing something from a car? (adjusted minimum–maximum values = 0–16).

**Threat/force**

Two items concerning violent delinquency were used to form the index ‘threat/force’: (1) Have you threatened or forced someone to give you money, cigarettes or something else? (2) Have you been involved in threatening or forcing someone to do things that he/she did not want to do? (adjusted minimum–maximum values = 0–8).

**Physical violence**

Three items concerning violent delinquency formed the index ‘physical violence’: (1) Have you been involved in a physical fight in the city? (2) Have you been involved in hitting someone so severely that you believe or know that he/she needed medical care? (3) Have you on purpose attacked someone with a
Table 1. The frequency (and proportion) of male and female adolescents reporting different types of delinquent behaviour (left-hand side) and the degree of seriousness in the affected adolescents (right-hand side)

<table>
<thead>
<tr>
<th></th>
<th>Total group</th>
<th>Risk subjects</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>Minor offences (0–24)</td>
<td>258 (63.5)</td>
<td>292 (54.9)</td>
</tr>
<tr>
<td>Damage to property (0–8)</td>
<td>154 (37.9)</td>
<td>109 (20.5)</td>
</tr>
<tr>
<td>Burglary/theft (0–16)</td>
<td>33 (8.1)</td>
<td>13 (2.4)</td>
</tr>
<tr>
<td>Violence—threat/force (0–8)</td>
<td>47 (11.6)</td>
<td>49 (9.2)</td>
</tr>
<tr>
<td>Violence—physical (0–12)</td>
<td>73 (18.0)</td>
<td>29 (5.5)</td>
</tr>
<tr>
<td></td>
<td>4.07</td>
<td>3.38</td>
</tr>
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*Equal variances not assumed.

Note: * p < .05, ** p < .01, *** p < .001.

The study was approved by the Social Science Ethics Committee, Örebro University, Sweden (Dnr CF 529-2003).

RESULTS

Occurrence and seriousness of different types of delinquent behaviours

The majority of adolescents reported that they had been involved in some kind of delinquent behaviour. In total, 285 of the 406 males (70.2%) had committed at least one delinquent act, as compared to 315 of the 532 females (59.2%) (χ² = 12.06, P < 0.001). The frequency and proportion of adolescents reporting the various types of delinquent behaviours are presented in the left-hand side of Table 1. Minor offences, damage to property and burglary/theft were more frequently reported among males than females. The most common type of delinquent behaviour was minor offences, reported by over half of the adolescents, followed by damage to property. Burglary and theft was the least frequent type of delinquent behaviour among both males and females. Males engaged in physical violence to a greater extent than females, whereas there was no significant sex difference related to threatening or forcing someone. Among males, physical violence was more common than threatening or forcing someone, with the opposite pattern among females.

On the basis of these results showing that a larger group of males than females participated in the different types of delinquent behaviours, except using threat and force, we wanted to examine the seriousness (delinquency scale scores) of the behaviours in the subgroups that reported these behaviours. For each of the delinquent behaviour indices, we therefore separately compared males and females who reported at least one act of the specific type of behaviour in question. The results are presented in Table 1. As is shown in the table, the degree of seriousness among adolescents that participated in minor offences was higher in males than in females. This was also the case concerning damage to property and physical violence. However, there were no significant sex differences with respect to burglary and theft or with respect to violence manifested as using threats or force.

Occurrence and frequency of alcohol use

There was a significant sex difference in self-rated alcohol use, with 31.9% of the males and 23.1% of the females reporting that they had been drinking large amounts of alcohol or to the point of feeling drunk (χ² = 8.9, P < 0.01). A higher number of males (23.3%) than females (15.0%) reported drinking large amounts of alcohol (χ² = 10.4, P < 0.001), while there was no significant difference between males (25.9%) and females (21.4%) concerning drunkenness (ns).

Patterns of delinquent behaviours

In order to identify subgroups of individuals with similar patterns of delinquent behaviours, cluster analyses were performed for males and females separately. Among males and females, 24 (5.9%) and 20 (3.8%) individuals, respectively, were identified as multivariate outliers and thus excluded from further analyses.
The group of males and females that was excluded from the cluster analysis had very high levels of delinquent behaviour. For the remaining 382 males and 512 females, four-cluster solutions were chosen and the total amounts of variance explained by the cluster solutions were 59.0% and 59.4%, respectively. The largest obtained cluster for both males and females comprised adolescents with a behaviour pattern characterized by well-adjusted behaviour or occasional minor offences (denoted Cluster A; Fig. 1). The majority of adolescents, 74.3% of the males and 89.6% of the females, belonged to this cluster (homogeneity coefficients: males 0.21, females 0.55). The second largest cluster among females (5.9%) and the second smallest cluster among males (7.1%) comprised adolescents with violence manifested as threatening or forcing someone, repeated minor offences and occasional acts involving damage to property (Cluster B; homogeneity coefficients: males 2.02, females 3.10) (Fig. 2).

The second largest cluster among males (13.9%) and the second smallest cluster among females (3.5%) included adolescents with occasional acts of physical violence, repeated minor offences as well as repeated (males) or occasional acts (females) involving damage to property (Cluster C; homogeneity coefficients: males 2.62, females 4.02) (Fig. 3). In addition to the above-mentioned clusters, a small proportion of males (4.7%) and females (1.0%) had a delinquency pattern including occasional burglary or theft, repeated minor offences as well as repeated (males) or occasional acts (females) of damage to property (Cluster D; homogeneity coefficients: males 3.75, females 1.21) (Fig. 4).

A relatively larger proportion of females than males belonged to a cluster characterized by well-adjusted behaviour or occasional minor offences (sex difference not tested for). Males, to a greater extent, had a delinquency pattern characterized by physical violence than by other forms of violence, whereas among females a pattern including threatening or forcing someone was more common than one including physical violence. Although there were dissimilarities in the proportion of males and females respectively belonging to the different clusters, the behavioural patterns in the obtained clusters were relatively similar with regard to form and level (not tested for). The two exceptions were that males in the clusters characterized by physical violence and by burglary/theft respectively had a higher number of minor offences and acts involving damage to property than the corresponding cluster groups of females (not tested for).

**Alcohol use and patterns of delinquent behaviours**

The frequencies and percentages of adolescents with different delinquency patterns who reported drunkenness and excessive alcohol use, as well as those who reported drunkenness and/or excessive alcohol use, are presented in Table 2. There were
There were also significant differences between the clusters in the mean frequencies of drunkenness for male and female adolescents (Table 3). The post hoc tests revealed a higher frequency of drunkenness in adolescents with a delinquency pattern characterized by physical violence compared to those with other forms of violence. Likewise, adolescents using threats or force had a higher frequency of drunkenness than adolescents with well-adjusted behaviour or occasional minor offences. Finally, the results indicated that males with repeated offences including burglary and theft reported more frequent drunkenness than males with well-adjusted behaviour or occasional minor offences.

### DISCUSSION

The present study aimed at investigating alcohol use and patterns of delinquent behaviours in male and female adolescents, and specifically examining whether alcohol use differed between adolescents with different delinquency patterns. The most important finding was that alcohol use varied between groups of adolescents displaying different patterns of delinquent behaviour, and that this applied to both females and males.

The results revealed that the majority of adolescents had participated in delinquency, which is consistent with the suggestion that antisocial behaviour is near normative rather than a rare phenomenon in adolescence (Moffitt, 1993). Furthermore, the findings support a more detailed distinction between groups with different delinquency patterns, in that four subgroups of adolescent delinquent behaviour patterns were obtained for males and females, respectively. The analyses also showed that adolescents with delinquency patterns characterized by more severe forms of non-violent delinquency or by violent delinquency had repeated minor offences and acts of damage to property, in line with other research demonstrating that severe crimes often are associated with a higher frequency and versatility of crimes (Eklund and af Klinteberg, 2006).

The findings were also in line with other research demonstrating that antisocial behaviour is more common among male adolescents (Windle, 1990). While physical violence was more common among males than females, there was no sex difference in violence manifested as threatening or forcing someone. These results are in accordance with earlier research by Bjorkqvist and colleagues (1992), which also provided support for a distinction between physical and verbal aggression. Even though fewer females displayed non-violent delinquency and physical violence, the delinquency patterns obtained in the person-oriented analyses were relatively similar in form.
for both sexes. However, while the second most common delinquency pattern among males included physical violence, it included violence manifested as threats or force in the female group. This further supports that aggressive/violent behaviour might be expressed differently in males and females (Robins, 1986; af Klinteberg, 2000).

It has been suggested that early sex differences in the socialization process affect the development of antisocial behaviour differently in males and females (Keenan and Shaw, 1997), which could partly explain the lower occurrence of delinquent behaviour in females. For example, it was proposed that early problem behaviours in females are channelled mainly into internalizing problems (Keenan and Shaw, 1997). Gorman-Smith and Loeber (2005) propose that more adverse family conditions are required for females to develop antisocial behaviour, given the social sanctions against and low approval of such behaviour in females. It has also been suggested that females require greater liability than males to manifest behaviour problems (Rhee and Waldman, 2004). The finding that females primarily tended to threaten or force someone, whereas males to a greater extent used physical violence, could be explained partly by the general sex differences in verbal ability as demonstrated with an advantage for females over males (Springer and Deutsch, 1981; Kimura, 1992).

Concerning alcohol use, drinking large amounts of alcohol was more common among males, while there was no sex difference in reported drunkenness. The lack of correspondence between these findings might partly be explained by the fact that females are more easily influenced by alcohol than males, due to size and metabolic differences (National Institute on Alcohol Abuse and Alcoholism, 1999). The cut-off score used when examining the occurrence of drunkenness and excessive alcohol use in the present study means that it was sufficient to have been drinking large amounts of alcohol or to the point of feeling drunk on some occasion. Even though alcohol use in adolescence is normative and not necessarily associated with a progression towards alcohol problems, research has shown that an early alcohol debut is related to higher subsequent alcohol consumption (Hellandsjø Bu et al., 2002), and that risky alcohol use during adolescence enhances the risk of developing early alcohol abuse (Schuckit and Smith, 1996). Furthermore, Chassin and colleagues (2002) reported that adolescents with an early debut and a high level of binge drinking in early adolescence had a high likelihood of continued heavy alcohol use.

Our findings further support previous research reporting an association between antisocial behaviour and alcohol use or misuse in adolescents (Fergusson et al., 1996; Farrington and Loeber, 2000). In addition, our results suggest that alcohol use not only differs between adolescents with or without delinquent behaviour but also varies by their delinquency patterns. The subgroup of adolescents who displayed well-adjusted behaviour or engaged in occasional minor offences was less likely to report drinking large amounts of alcohol or to the point of feeling drunk. The highest occurrence of alcohol use and frequency of drunkenness was demonstrated in males and females with repeated delinquency including physical violence. This is in agreement with earlier findings showing that increasing severity of the criminal behaviour was associated with an increasing proportion of adolescents with alcohol use and indications of alcohol abuse (Eklund and af Klinteberg, 2006). Furthermore, our results showed that in spite of the different occurrences of delinquent behaviour and alcohol use in females and males, the association between alcohol use and delinquency patterns appeared to be fairly similar for both sexes.

Fergusson and colleagues (1996) have suggested that the relationship between alcohol use and antisocial behaviour to a great extent can be explained by shared risk factors, represented by both family and peer factors as well as individual features. For example, similar personality traits have been shown to be related to both antisocial behaviour and alcohol use (Eklund and af Klinteberg, 2005). Other researchers argue that these behaviours constitute a ‘syndrome’, which can be accounted for by a common underlying latent factor (Donovan and Jessor, 1985; Krueger et al., 2002). Based on the results of the present study, we suggest that such an underlying factor might only be relevant for subgroups with more severe antisocial behaviour and excessive alcohol use (see also af Klinteberg et al., 2004). It has been shown, for example, that persistent antisocial behaviour, as opposed to adolescence-limited antisocial behaviour, is highly influenced by genetic factors (Taylor et al., 2000; Arseneault et al., 2003) and early neuropsychological deficits (Moffitt, 1993). Furthermore, the persistent offending group is often characterized by more different types of crimes including violence in adolescence (Moffitt, 1993) and has more co-occurring problems such as substance dependence in adulthood (Moffitt et al., 2002).

Methodological considerations

The findings of the present study should be interpreted in light of some limitations. First, due to the cross-sectional design, it is not possible to infer to what extent the adolescents display temporary or more persistent delinquent behaviour. Second, the design also reduces our possibility to draw conclusions concerning the direction of the association between alcohol and the different delinquent behaviours studied. Third, the alcohol information was based on only two self-report items covering drinking habits during the last year. Further, excessive alcohol use was not defined in terms of the amount of alcohol in the questionnaire, which of course means that females and males could interpret this question in different ways. Nevertheless, there is little reason to believe that this might have caused our significant finding that a larger proportion of males than females reported drinking large amounts of alcohol. Fourth, it is likely that adolescents who were not present at school at the day of the data collection or who chose not to take part in the study might display more delinquent behaviour and alcohol use than adolescents who took part in the study. Furthermore, since the multivariate outliers excluded in the cluster analyses displayed extremely high scores on both delinquent behaviours and alcohol use, the sample used in our analyses is probably slightly better adjusted than the target sample. Nevertheless, the dropout rate of the study was small and it is reasonable to assume that including the total group of adolescents would only have strengthened our results. From this perspective, the results of the present large group of male and female adolescents might have some useful implications for antisocial prevention strategy planning in that it seems: (1) meaningful to identify groups of individuals engaged in different types of delinquent behaviour, and (2) to be of crucial importance to consider associated problems for these groups, such as excessive alcohol use.
To conclude, our results not only provide further support for an association between alcohol use and delinquent behaviour among adolescents but also indicate that alcohol use varies between adolescents with different delinquency patterns. Interestingly, despite the different occurrence of delinquent behaviour and alcohol use among males and females, the relationship between delinquent behaviour and alcohol use appears to be similar for both sexes. In a next step, we are planning to use information from a follow-up study of the present sample in order to examine behaviour development and alcohol use over time.

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