Interactions between Parental Alcohol-Specific Rules and Risk Personalities in the Prediction of Adolescent Alcohol Use

Tim Janssen1,*, Helle Larsen1,2, Margot Peeters3, Thomas Pronk1, Wilma A.M. Vollebergh3 and Reinout W. Wiers1,2

1University of Amsterdam, Weesperplein 4, Amsterdam 1018 XA, The Netherlands, 2Research Priority Area Yield, University of Amsterdam, Amsterdam, The Netherlands and 3Utrecht University, Heidelberglaan 1, Utrecht 3508 TC, The Netherlands

*Corresponding author: Department of Developmental Psychology, University of Amsterdam, Weesperplein 4, Amsterdam 1018 XA, The Netherlands.
Tel.: +31-20-525-6729; Fax: +31-20-525-6971; E-mail: t.janssen@uva.nl

(Received 12 February 2014; first review notified 17 April 2014; in revised form 25 May 2014; accepted 27 May 2014)

Abstract — Aims: To examine the impact of an important context variable (alcohol-specific parental rules) and an important person variable (risky personality traits) and their interaction on prospective adolescent drinking. Methods: Participants were 252 adolescents, 67.9% female, between 13 and 16 years old. Data were collected via online assessments during 2 years with four time points of assessments. We examined membership of alcohol use trajectories as a function of parental alcohol-specific rules, moderated by risk-associated personality traits. Results: Permissive parental rules predicted early onset and trajectories of heavy drinking. High scores on Sensation Seeking and Hopelessness also predicted early onset and heavy drinking, but there was no evidence for moderation. Conclusion: The influence of parental rule setting and risk personality was confirmed, but no evidence was found that the impact of risk personality on adolescent drinking is moderated by parental rules. Implications of these findings, and limitations of the study, are discussed.

INTRODUCTION

Across the Western world, adolescence is a period in which many adolescents experiment with addictive substances for the first time. In the Netherlands, 57% of boys and 50% of girls have consumed alcohol at the age of 13 according to a recent survey (Van Laar et al., 2011). Two important factors predicting underage drinking are a context variable: parental alcohol-specific rule setting (Yu, 2003; Van Der Vorst et al., 2005, 2006, 2007; Koning et al., 2011; Mares et al., 2012) and a person variable: high-risk personality traits (Stewart et al., 2005; Woicik et al., 2009; Krank et al., 2011). It has been hypothesized that high-risk personality traits may moderate the prediction of alcohol use by parental rules (Van der Vorst et al., 2007). The present study is the first to examine whether parental rule setting indeed interacts with risk personality in the longitudinal prediction of emerging patterns of alcohol use.

On the context side, it has been shown that strict parental rule setting regarding alcohol use is the most effective form of alcohol-specific parenting in the prevention of adolescent alcohol use (Yu, 2003; Van Der Vorst et al., 2005; Van Zundert et al., 2006; Van Den Eijnden et al., 2011). Restrictive alcohol-specific rules from parents have been found to prevent early use and escalation of adolescent alcohol use (Barnes et al., 2000; Van Der Vorst et al., 2005, 2006; Van Zundert et al., 2006; Koning et al., 2011; Van Den Eijnden et al., 2011). Alcohol-specific parenting can be communicating norms on alcohol use or setting house rules regarding the use of alcohol (Koning et al., 2011). Associations between alcohol-specific parenting and adolescent alcohol use have been demonstrated both in older and in younger adolescents (Van Der Vorst et al., 2005), and there are indications that their influence endures after high school graduation (Wood et al., 2004).

On the person side, four major personality traits have been found to strongly predict substance use (Woicik et al., 2009): impulsivity, Sensation Seeking, Anxiety Sensitivity and Hopelessness. Impulsivity is defined as the propensity for rash action, specifically the inability to inhibit behavior in the face of reward or punishment. Sensation Seeking is defined as the desire for intense and novel experiences. Anxiety Sensitivity is defined as a fear of, and desire to relieve, anxiety symptoms. Hopelessness is defined as showing propensity for depression, a negative outlook on life and low regard of self (Conrod et al., 2008). Woicik and colleagues (Woicik et al., 2009) designed the Substance Use Risk Profile (SURPS) questionnaire by evaluating the psychometric properties of questions measuring these scales, leading to the selection of these specific risk-implicated traits. Although a large volume of literature linked these personality traits to substance use (Conrod et al., 2000; Woicik et al., 2009; Castellanos-Ryan et al., 2013), evidence of their relation to the development of alcohol use has been mixed. While Krank and colleagues (Krank et al., 2011) confirmed the predictive validity of Impulsivity and Sensation Seeking in adolescents, a Dutch study by Malmberg and colleagues (Malmberg et al., 2010) found that only Sensation Seeking, but not Impulsivity, predicted the early onset of alcohol use in a Dutch sample of adolescents, whereas Anxiety Sensitivity predicted delayed onset.

While there is ample evidence for the separate impact of alcohol-specific rules and risk-associated personality factors in adolescent samples, researchers have commented on the lack of studies investigating the role of person–environment interactions in this domain (Rutter et al., 1997; Zucker, 2008). A few such interactions have been found in previous studies. For example, in one recent study, youth with a ‘risk gene’ increased alcohol use only when parents were not strict (Pieters et al., 2012a). In another study, the interaction between personality traits and parental rules was examined in the prediction of alcohol use (Van Der Vorst et al., 2007), using the Big Five (Dubas et al., 2002). This study found that for adolescents low on Agreeableness, permissive parental rules predicted higher levels of alcohol use. However, this prediction was limited to currently active drinkers and to weekly alcohol use as a single outcome variable.

Most studies to date have focused on predicting a specific aspect of alcohol use, whereas the development of alcohol use can occur in distinct patterns (Van Der Vorst et al., 2009). For example, while some adolescents remain abstinent, others...
engage in heavy episodic drinking, while yet others drink regular yet limited quantities. Therefore, we use a longitudinal design with multiple alcohol use indicators to establish developmental trajectories. The advantage of using multi-dimensional alcohol trajectories is that it allows us to investigate whether interactions between parental alcohol-specific rules and risk personality are specific to the amount of alcohol use among active drinkers or whether it also predicts the onset of regular drinking behavior. Individual trajectory membership is predicted by parental alcohol-specific rules, risk-associated personality factors and their interactions. Based on earlier research, we hypothesize: (1) lower odds of drinking, especially heavy drinking, in adolescents with strict alcohol-specific parenting, (2) higher odds of drinking, especially heavier drinking in adolescents with high scores on high-risk personality profiles, especially sensation seeking (cf. Conrod et al., 2008; Malmberg et al., 2012) and (3) an interaction effect indicating that parental rules moderate the effect of high-risk personality profiles, such that high scores on risk profiles are more predictive of alcohol use among those who report permissive parental rules at home (as in Pieters and colleagues (Pieters et al., 2012b), with risk-associated cognitive processes).

METHOD

Participants
Participants were recruited with flyers distributed at the Dutch 2009 edition of the international Health Behaviors in School-aged Children-survey (Van Dorsselaer et al., 2009). Interested pupils could leave their e-mail addresses and phone numbers. A total of 5734 flyers were added to the surveys. We invited 2200 pupils to participate in the current study. E-mails inviting pupils indicated that the current study was an additional, high-intensity project that required continued participation to complete and was not related to the original survey. Parents of 37 children did not consent to their children’s participation.

Analytical sample
Of the 397 recruited adolescents, 134 (35.4%) were boys and 245 (64.6%) were girls. Average age at inclusion was 14.9 years (SD = 1.29, range: 12–18). In order to achieve a more homogeneous sample in terms of age, we limited the analyses for this paper to those between the ages of 13 and 16 (excluding 12-, 17- and 18-year-olds: 48 out of 397 participants). Additionally, many participants completed assessments at the first time point, but not at the following time points (see Table 1). Therefore, we limited our final sample to participants between the ages of 13 and 16 who had provided alcohol-related data during at least two time points, excluding 113 out of 397 participants. The final analytical sample consisted of 252 participants, of whom 81 (32.1%) were male and 171 (67.9%) were female. Average age at baseline for the final sample was 14.6 years (SD = 1.04). Descriptive statistics of alcohol-related variables for the analytical sample are listed in Table 1.

Dropout
We examined the associations of study-relevant measures with dropout at time points 2, 3 and 4 in the final sample by testing the relation of these measures to dichotomous variables indicating absence or presence of alcohol-related data at each time point. The only significant relations to missingness are for heavy episodic drinking at time points 1 and 2, and weekly drinking at time point 1. These relations are to missing data at time point 4. The default estimator for mixture models, used in our analyses, is maximum likelihood with robust standard errors (Muthén and Muthén, 2010), which is an appropriate method in the event that outcomes are indicators of missing values (Muthén et al., 2003).

Procedure
Passive parental consent was obtained through a letter sent to the home address, detailing the procedure and online nature of the study. Ethical permission for the study was obtained from the Ethical Committee of the University of Amsterdam. The study commenced by sending the participants an e-mail message with links to the survey website, where data were collected at 6-month intervals at four time points in 2010 and 2011. Before measurements began, participants were reminded that they were free to terminate their participation at any point in the study. Earlier studies have shown that online self-assessment tends to be reliable and in many cases preferred by participants (Miller et al., 2002; Kypri et al., 2004). To further encourage honest responding, participants
were assured that their data would be inaccessible to their parents and school authorities. All assessments were conducted online, and the participants could complete the questionnaires on a computer at home, school or any other location. Participations were rewarded with 5 EUR at each assessment. Additionally, participants who completed all measurements were eligible for prizes in a supervised lottery.

**Measures**

**Alcohol use**

Regular weekly alcohol use was measured through a self-report questionnaire (cf. Wiers et al., 1997) based on the timeline follow-back method (Sobell and Sobell, 1992). The questionnaire required participants to indicate for each day of the week, how many alcoholic units they would typically drink. A single alcoholic unit contains 10 g or 12.7 ml of alcohol. The sum of units consumed at each day of the week was calculated as the participants’ score on Weekly Alcoholic Units. Additionally, Monthly Heavy Drinking Episodes were assessed by asking participants to indicate how many times they had been involved in a heavy drinking episode during the past month (Boys: five or more drinks on one occasion; Girls: four or more drinks on one occasion, cf. Wiers et al., 1997).

First alcoholic drink was assessed by asking participants to indicate at what age they first consumed alcohol (i.e. not just a single sip). We dichotomized this question to reflect whether the participants’ first drink had come before a cut-off that was regarded as putting them at-risk. This cut-off is set between ages 11 and 12 years, to reflect occasions where participants first consumed alcohol prior to leaving Dutch elementary school, a previously indicated risk factor in Dutch culture (Van Dorsselaer et al., 2009).

**Risk personality traits**

The SURPS (Woicik et al., 2009) consists of 23 items assessing participants’ scores on personality traits associated with alcohol use. These traits were Impulsivity, Sensation Seeking, Hopelessness and Anxiety Sensitivity. Items in the SURPS took the form of statements (e.g. ‘I tend not to think before speaking’), about which participants were asked to indicate whether they strongly disagreed, disagreed, agreed or strongly agreed on a four-point Likert scale. The current study used a translated version of the original SURPS (cf. Malmberg et al., 2010). Cronbach’s Alpha for reliability of each scale of the SURPS in the current study is 0.61, 0.70, 0.86 and 0.58, for Impulsivity, Sensation Seeking, Hopelessness and Anxiety Sensitivity scales, respectively, which is in line with internal consistencies previously found in studies by Woicik and colleagues (0.64, 0.70, 0.86 and 0.61 in equal order; Woicik et al., 2009) and Malmberg and colleagues (0.63–0.72, 0.68–0.72 and 0.83–0.88 for Impulsivity, Sensation Seeking and Hopelessness scales; Malmberg et al., 2010), which are deemed satisfactory for short scales (Loewenthal, 1996). Scores for each trait were computed as the mean score for the items of the matching scale (cf. Malmberg et al., 2013).

Parental alcohol-specific rules

Indication of perceived parental rules on alcohol use consisted of a 10-item questionnaire (Van Der Vorst et al., 2005) including items such as ‘I am allowed to consume alcohol when my parents are at home with me’. Participants answered on a 5-point Likert scale consisting of the following categories, here translated from Dutch: (1) ‘not applicable to my situation at all’, (2) ‘hardly applicable to my situation’, (3) ‘somewhat applicable to my situation’, (4) ‘applicable to my situation’ and (5) ‘definitely applicable to my situation’. Lower scores reflect an overall higher strictness of parental alcohol-specific rules. Cronbach’s Alpha for this scale is 0.94 in the current sample, which is slightly above previous reports (Van Der Vorst et al., 2007). Analysis revealed that 55.7% of parents indicated absolute strictness in their alcohol policy. Therefore, the sum score on this questionnaire was dichotomized so that a score of 0 indicated absolute strictness and a score of 1 indicated flexibility in alcohol rules.

**Analysis strategy**

Our goal was to estimate alcohol trajectories, by applying mixture model analysis and latent transition analysis (LTA; Collins and Lanza, 2010). Mixture model analyses were used to identify latent classes, or subgroups of participants, in response patterns from different indicators. In our mixture model analyses, classes represented patterns of drinking behavior estimated via the three selected indicators, Weekly Alcohol Units, Monthly Heavy Drinking Episodes and Early First Drink. Each participant received a most probable class membership at each time point, given her or his score on the indicators at that time point. Given that Weekly Alcohol Units and Monthly Heavy Drinking Episodes are count-based variables and Early First Drink is a dichotomous variable, means were estimated per class for the first two whereas a proportion is estimated for the latter. We constrained the mixture models so that the estimated means on Weekly Alcohol Units and Monthly Heavy Drinking Episodes were always fixed at 0 for the first class (representing a class with no current drinking behavior) while being estimated freely on other classes, with solutions for different amounts of classes being estimated. The optimal amount of classes was established by determining the lowest scores for the Bayesian Information Criterion (BIC), the adjusted Bayesian Information Criterion and Akaike’s Information Criterion (Nylund et al., 2007). The optimal classification was achieved when participants’ values matched the estimated means and proportions for those classes closely.

Using the optimal amount of classes and the estimated means and proportions from the mixture model analyses, we conducted LTA to estimate most likely class memberships based on estimated transitions between classes over time. LTA offers a probabilistic estimation of the likelihood of transitioning from one class to the other, given individual scores on indicators at those time points (Collins and Lanza, 2010). For example: going from no drinking to some weekly drinking and heavy episodic drinking between time points changes the most likely class membership of an individual from the non-drinking class to a drinking class best fitting this individual’s drinking behavior. Most likely class memberships were exported to SPSS Statistics for Windows 20 (IBM Corporation, 2011).

Alcohol trajectories were determined by examining most likely class memberships and transitions between those classes over time. Trajectories are defined as common patterns of transitions between classes over time. We identify common patterns of interest based on the following rules: *Non-Drinkers* are defined as those who at each of the four time points are...
members of the non-drinking class. The Onsetters trajectory is defined as those who are members of the non-drinking class at the first time point, but transition to another class during the study period. The Heavy Drinkers trajectory is defined as those who are members of the heavy drinking class (and thereby display extraordinary drinking for their age) during at least two time points within the study period. Finally, the Stable Light Drinkers trajectory is defined as those who were a member of the light drinking class during the first time point but did not transition to two or more occasions of heavy drinking during the study period.

Mixture model analyses were conducted separately for each gender. National trend findings reveal that heavy drinking behavior for girls may equate to merely average or mildly heavy drinking behavior for boys (Van Laar et al., 2011). We ensure that individuals are assigned to classes with values appropriate for their gender. Furthermore, we did not constrain means and probabilities for the indicators over time to a single value to account for participants’ increasing age and associated increases in drinking. Estimated means and proportions for the indicators per class are listed in Table 2.

We used multinomial logistic regression analysis to predict membership of alcohol trajectories. This analysis identifies unique relations of predictors to multiple classes relative to a contrast group. We tested two models for the multinomial logistic regression. In the first model, the main effects of the alcohol-specific rules and risk personality factors were included. In the second model, interaction terms for each factor with the alcohol-specific rules were included. We corrected for gender where significant. Mixture model analyses and LTAs were conducted in Mplus 7.0 (Muthén and Muthén, 2010). Syntax examples for the final LTA model and SPSS trajectory predictions are available upon request.

RESULTS

Latent class and transition analyses

The optimal number of classes is reflected by the lowest score for the model fit indices (Nylund et al., 2007). The three-class model had the lowest value for BIC, Akaike’s Information Criterion and adjusted BIC for both genders and at each time point. Table 2 contains the estimated means and proportions for the three-class solution, as well as the final amount of participants most likely allocated to that class in the LTA.

Alcohol trajectories

Alcohol use indicators were observed at four time points, and three classes existed at each time point in the LTA. Thus, there were 3^4, or 81 possible class-by-time combinations in the individual patterns, of which 23 were present in the current sample. Three out of 252 participants were not classified according to the above rules due to implausible trajectory changes and were discarded (see supplementary materials for details). Means and standard deviations for risk personality and alcohol-specific rule indications for these trajectories are listed in Table 3.

Multinomial logistic regression

Results from the regression analyses for alcohol trajectories are displayed in Table 4 where odds ratios (OR) indicate an increased likelihood of membership to each specific trajectory given a one-point increase in the predictor, relative to the contrast category (Non-Drinkers).

In Model 1, higher scores on baseline Sensation Seeking predicted membership of the Onsetters (OR = 1.49, 95% CI: 1.04–2.13) and membership of the Heavy Drinkers (OR = 1.61, 95% CI: 1.07–2.42) trajectories. Higher scores on Hopelessness predicted membership of the Onsetters trajectory (OR = 1.67, 95% CI: 1.12–2.51). As expected, alcohol-specific rules were a significant negative predictor of Onsetters (OR = 0.53, 95% CI: 0.36–0.78) and Heavy Drinkers (OR = 0.32, 95% CI: 0.21–0.49) trajectory membership.

In Model 2, there were no significant relations between the added interaction terms and trajectory membership, indicating that the data failed to support the hypothesized interaction between risk personality and parental rules. Chi-squared tests of significance indicate that these interactions did not significantly add to the prediction of alcohol trajectory compared with Model 1 ($\chi^2_{\text{Rules } \times \text{Impulsivity}} = 3.92$, $P = 0.418$, $\chi^2_{\text{Rules } \times \text{Sensation Seeking}} = 0.103$, $P = 0.999$, $\chi^2_{\text{Rules } \times \text{Anxiety Sensitivity}} = 1.01$, $P = 0.908$, $\chi^2_{\text{Rules } \times \text{Hopelessness}} = 1.43$, $P = 0.839$).

Table 2. Estimated means and proportions of class indicators

<table>
<thead>
<tr>
<th>Weekly Alcohol Units</th>
<th>Binges/month</th>
<th>Early First Drink</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (Class 1)</td>
<td>M (Class 2)</td>
<td>M (Class 3)</td>
</tr>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>0</td>
<td>1.25</td>
<td>8.09</td>
</tr>
<tr>
<td>T2</td>
<td>0</td>
<td>1.23</td>
<td>8.36</td>
</tr>
<tr>
<td>T3</td>
<td>0</td>
<td>1.85</td>
<td>10.98</td>
</tr>
<tr>
<td>T4</td>
<td>0</td>
<td>1.63</td>
<td>10.73</td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>0</td>
<td>1.81</td>
<td>7.28</td>
</tr>
<tr>
<td>T2</td>
<td>0</td>
<td>0.68</td>
<td>6.13</td>
</tr>
<tr>
<td>T3</td>
<td>0</td>
<td>0.79</td>
<td>4.98</td>
</tr>
<tr>
<td>T4</td>
<td>0</td>
<td>2.68</td>
<td>11.63</td>
</tr>
</tbody>
</table>

T1–T4 represent the four time points of data collection. Means of Weekly Alcohol Uses and Monthly Heavy Drinking Episodes for Class 1 were fixed at 0. Early First Drink represents the percentage of group members that had drunk their first drink before the age of 12.
Based on earlier findings of the effect of strict alcohol-specific rules, that this change is a consequence of national policy changes. It is possible that this is reflected in higher scores on rules since this study in 2006. Government policy in the Netherlands is to encourage parents to apply strict alcohol-specific rules, which is also reflected in a higher minimum alcohol age since 2014 (18 instead of 16 years). The present study shows that even though alcohol-specific parenting has become stricter, it still predicts later trajectories of alcohol use.

The findings regarding the risk personality factors measured by the SURPS, from the current study, are in line with previous results in Dutch samples (Malmberg et al., 2010, 2012). Internationally, results regarding risk personality factors are not in line with findings on the prediction of onset by Impulsivity (Krank et al., 2011; Castellanos-Ryan et al., 2013). Since the lack of predictive power of the Impulsivity scale matched findings from Malmberg and colleagues (Malmberg et al., 2010, 2012), it is possible that this lack of predictive power is a cultural phenomenon. Specifically, we believe that the standing of alcohol use in Dutch adolescents compared with adolescents from non-Dutch countries is more socially normative (Van Laar et al., 2011), potentially explaining the lack of relation to individual difference factors. Unfortunately, the current study does not allow us to test this assertion. One could also speculate that the overlap between Impulsivity and Sensation Seeking, or the relatively low reliability of these scales, may reduce predictive power. However, the scales were constructed to minimize overlap and reliabilities matched those of earlier studies.
studies with significant prediction using the Impulsivity scale. Corresponding with the minimization of overlap, in the present sample, the correlation between Sensation Seeking and Impulsivity scales was low ($r = 0.131, P = 0.03$).

The lack of significant interactions between parental rules and risk-associated personality factors indicate no individual differences in the associations between alcohol-specific rules and alcohol trajectories based on personality. This may indicate that parental rules and personality both have a broad, simple effect on drinking behavior that is present regardless of personality. However, given previous findings of interactions between parental rules and specific genes and cognitive risk-factors (Pieters et al., 2012a, b), there may be specific cognitive reward-related processes that are mediated by parental rules, such as those governing alcohol-related cognitions. Additionally, this is the first person–environment study with a broad trajectory-based outcome. More specific outcomes such as weekly drinking or heavy episodic drinking may still be significantly predicted by moderation effects. Nevertheless, such outcomes may misrepresent the patterns of alcohol use development at the general population level. Furthermore, we note that in the study sample, most parents demonstrated restrictive alcohol-specific rules. We dichotomized the alcohol-specific rules because we found that many participants indicated absolute strictness with regard to alcohol consumption.

A strength of the present study is that it demonstrates the unique and shared prediction by risk-associated personality traits and parental alcohol-specific rules and does so in a trajectory-based longitudinal format. Previous studies have been limited to demonstrating either separate prediction of personality traits and rules with alcohol trajectories as the outcome variable (Van Der Vorst et al., 2009; Malmberg et al., 2012), or prediction of personality rule setting interactions on singular outcome measures (Van Der Vorst et al., 2007) among active users. Despite this strength of our study, some limitations should be mentioned. First, though we gathered participants from a nationally representative sample, attrition analysis shows that the current sample is predominantly female, younger, has a greater predominance of Dutch ethnicity and a lower lifetime prevalence rate of alcohol use. The current results are limited to a relatively small (compared with other longitudinal studies in the field; see Warner et al., 2007; Danielsson et al., 2010) sample of low-risk individuals in regular secondary education. For findings regarding risk personality in a high-risk population, we refer to a concurrent study by Peeters et al. (2014). This study found similar significant prediction by risk personality when comparing abstainers with on-setters and persistent alcohol users, within a 374-participant high-risk sample enrolled in Dutch special education schools. The sample for this study is also described in Peeters et al. (2013). Second, dropout in the current sample was relatively high and related significantly to earlier scores on Monthly Heavy Drinking Episodes, indicating that participants scoring high on Monthly Heavy Drinking Episodes were more likely to drop out. To account for this, we used maximum likelihood with robust standard errors (Muthén and Muthén, 2010). Third, findings related to risk personality influences are limited to personality traits measured by the SURPS, meaning that the potential influence of other personality traits, such as extraversion, cannot be tested in the current study. Finally, it is possible that other environmental factors such as peer influence, which have a strong demonstrated predictive effect on alcohol use (Larsen et al., 2009), may demonstrate interactions with personality where parental rules did not.

Present results expand on previous findings by predicting trajectory membership, an outcome that is sensitive to the complexities of adolescent alcohol use development. Significant prediction of alcohol trajectory membership by Sensation Seeking and Hopelessness appears to validate use of personality-challenge approaches to delaying onset of alcohol use in adolescents. Such approaches have been used by Conrod and colleagues (Conrod et al., 2008, 2010) and can be generalized to different countries and cultural contexts (Stewart et al., 2005). Results of the present study indicate that, regardless of personality, it is relevant to inform parents to apply strict rules regarding alcohol use, and indeed, teaching this has been proven to be effective (Koning et al., 2011). The present study demonstrates that strict alcohol-specific rules and individual differences in personality are both important in the longitudinal prediction of the development of adolescent alcohol use. However, risk personality did not moderate the relation between parental rules and alcohol use in the current study. Our understanding of the joint and unique influence of risk personality and rules may be enhanced by future studies examining other age ranges and specific at-risk populations. Possibly, older adolescents or young adults may respond to parental rules differently, or the role of parental rules and risk personality may change as a consequence of prolonged alcohol use throughout adolescence.

SUPPLEMENTARY MATERIAL

Supplementary material is available at Alcohol and Alcoholism online.

Acknowledgements — We acknowledge Dr. Rens van der Schoot, for invaluable statistical assistance.

Funding — This work was supported by the Netherlands Organization for Scientific Research [grant number 453-08-001], awarded to the senior author.

Conflict of interest statement. None declared.

REFERENCES


Conrod PJ, Castellanos-Ryan N, Strang J. (2010) Brief, personality-targeted coping skills interventions and survival as a non-drug
user over a 2-year period during adolescence. Arch Gen Psychiatry 67:85–93.


Pieters S, Van Der Zwaluw CS, Van Der Vorst H et al. (2012a) The moderating effect of alcohol-specific parental rule-setting on the relation between the dopamine D2 receptor gene (DRD2), the mu-opioid receptor gene (OPRM1) and alcohol use in young adolescents. Alcohol Alcohol 47:663–70.


