Alcohol-specific rules, personality and adolescents’ alcohol use: a longitudinal person–environment study

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ABSTRACT

Aims To examine the bi-directional associations between providing alcohol-specific rules and adolescents’ alcohol use. Further, to explore person–environment interactions, we tested whether Big Five personality traits moderate the assumed association between providing alcohol-specific rules and adolescents’ alcohol use. Design Longitudinal data (three waves in 2 years) from 428 families, consisting of both parents and two adolescents (aged 13–16 years) were used for the analyses. Analyses were conducted on four samples: a group of older adolescents and a group of younger adolescents who already consumed alcohol, and a group of older and younger adolescents who were not drinking at baseline measurement. Findings In general, results of structural equation modelling showed that providing clear alcohol-specific rules lowers the likelihood of drinking initiation, regardless of the age of the youngsters. Once adolescents have established a drinking pattern, the impact of parental alcohol-specific rules declined or even disappeared. Finally, the Big Five personality traits did not moderate the association between providing alcohol-specific rules and adolescents’ alcohol involvement. Conclusions In sum, in particular during the initiation phase of drinking, parents could prevent the drinking of their offspring, regardless of the age or personality of their youngsters, by providing clear alcohol-specific rules.

Keywords Adolescents, alcohol-specific rules, alcohol, personality, person–environment interactions.

INTRODUCTION

Studies focusing on the influence of parents in the development of adolescents’ drinking have examined primarily the influence of parental alcohol use and general parenting practices (e.g. [1, 2]). Recent research has paid attention to the role of alcohol-specific socialization, which refers to activities parents undertake specifically to manage or prevent their children’s drinking behaviour (e.g. providing alcohol-specific rules, showing disapproval of adolescents’ drinking or talking at home about alcohol use) [3–5].

Providing alcohol-specific rules seems to be the most influential form of alcohol-specific socialization on adolescents’ drinking [3, 4, 6]. Van der Vorst et al. [4] showed strong negative associations between imposing alcohol-specific rules and adolescents’ alcohol use (βs ranging between −0.26 and −0.52). This finding was observed for older and younger adolescent children within a family and was based on the separate perceptions of family members (father, mother, adolescents) on alcohol-specific rules underscoring the consistency of this finding. Further, Van Zundert et al. [7] showed that the direct association between monitoring and adolescents’ alcohol use disappears when taking alcohol-specific rule-setting into account. This finding suggests that alcohol-specific rules are embedded in the level of behavioural control in a family, but also that the rules about alcohol in particular are related to drinking in adolescence. In addition, Yu [5] demonstrated that parents who prohibit their adolescents to drink reduce the likelihood of current adolescents’ alcohol involvement. A longitudinal study by Jackson et al. [3] showed that parents who permitted their children to drink at home were more likely to have alcohol-consuming children 2 years later (see also Wood et al. [6]).
Almost all the studies concentrating on alcohol-specific rules are cross-sectional, and therefore they do not provide insight into the direction of the effect of imposing alcohol-specific rules: does imposing alcohol-specific rules really prevent youngsters from drinking alcohol as most scholars indicate, based on theoretical assumptions concerning parent–child effects (e.g. [8]), or are parents adjusting their rules to the drinking of their offspring? That the relationship between parenting and adolescents' problem behaviour is not unidirectional—the direction estimated in most empirical studies—but that adolescents are also influencing their parents' behaviour, so-called bi-directionality, has been demonstrated in several studies (e.g. [9,10]). With respect to alcohol, parental strict control prevents early adolescents' drinking, but early adolescents' drinking also leads to a decline in the degree to which parents provide strict control [11]. In other words, parents are responding to their children's alcohol involvement by loosening their control. Thus, a longitudinal research design measuring the bi-directional association between providing alcohol-specific rules and adolescents' drinking will reveal insight into the direction of effects. To develop effective alcohol prevention programmes focusing on parents, it is essential to establish the direction of the association between alcohol-specific rules and adolescents' alcohol use over time.

To understand the development of alcohol consumption one should consider the complexity of factors affecting adolescents' behaviours. These factors reflect the interactions between individual characteristics, such as personality, and environmental factors, such as alcohol-specific socialization [12,13]. Behaviour, in this case drinking, is always an outcome of ongoing processes between the person and the environment [14], and therefore person–environment interactions could be defined as a set of processes that are based on a similar set of experiences having different consequences, depending on the characteristics of an individual [15].

With regard to drinking, we assume that adolescents could react differently when parents impose alcohol-specific rules simply because they differ in their personality. For instance, impulsive adolescents might find it more difficult to obey the alcohol-specific rules of their parents than other adolescents, probably due also to their vulnerability for alcohol consumption [16]. On the contrary, imposing strict rules about drinking might even result in abstaining from alcohol for conscientious youngsters, as they are more likely to obey their parents and are already less prone to drink alcohol [17,18].

That personal characteristics and the social environment of an individual interact is often argued in theories of the development of problem behaviour [13,19]. Empirical studies, however, exploring personality–environment interactions are rare with regard to problem behaviour, and in particular with regard to the development of alcohol use (see for exceptions [13,20]). Engels et al. [12] demonstrated that aggressive men with less self-control were most at risk for developing problem drinking in young adulthood if they were raised in a non-structured environment. Further, Goodwin et al. [21] demonstrated that high-risk Danish boys (e.g. those with a family history of alcoholism) who experienced problems with attention and impulsiveness at the age of 19–20 years were most likely to be diagnosed with alcoholism at the age of 29–30 years. In sum, there is some empirical evidence that personality has an influence on the relation between family factors and alcohol use.

The aim of the present study was to examine the bi-directional relationships between providing alcohol-specific rules and adolescents' alcohol consumption, controlling for previous behaviour (Figs 1 and 2). We used structural equation modelling techniques to assess these hypotheses. Our main interests were the so-called cross-lagged paths which refer to the longitudinal associations between alcohol-specific rules and adolescents' drinking. In addition, the influence of parents might depend on the drinking experience of adolescents (e.g. [22]). Therefore,
we tested our hypotheses for a sample of adolescents who were already engaged in drinking at baseline measurement and for a sample of adolescents who were not drinking at baseline. Further, we examined whether each personality trait of the Big Five factor model (extraversion, conscientiousness, agreeableness, emotional stability, resourcefulness) [23,24] moderated the association between providing alcohol-specific rules and adolescents’ drinking. We used three-wave full-family data (father, mother and two adolescents of the same family), which enabled us to compare the perceptions of each family member on alcohol-specific rules and to explore possible differences between older and younger adolescents within a family.

**METHOD**

**Participants and procedure**

Data for this study were collected as part of a broader longitudinal survey (‘Family and Health’), which examined different family processes in relation to various health behaviours in adolescence (see the cross-sectional study by van der Vorst et al. [4]). A sample of Dutch families with at least two adolescent children aged 13–16 years were asked (by mail) to participate in the study. The addresses of these families were derived from the registers of 22 municipalities in the Netherlands; 885 of the families approached agreed to participate by returning the included response form. These families were then contacted by telephone to establish whether they fulfilled all the inclusion criteria; i.e. the parents had to be married or living together, and the adolescents and their parents should be biologically related. Families with twins or with adolescents who had mental or physical disabilities were excluded from the project. Because an equal division of education and an equal amount of sibling dyads was aimed for (i.e. boy–boy, boy–girl, girl–girl, girl–boy), a further selection was made. Finally, a total of 428 Dutch families participated in this longitudinal research. At the second and third waves, respectively, 416 and 404 families participated.

The families were interviewed three times with an interval of 1 year at home in the presence of a trained interviewer. An extensive questionnaire had to be completed by each family member individually. This took about 2 hours. The family members were not permitted to discuss the questions or answers with each other. Each family received €30 after the four family members had completed the questionnaire. At the end of the third wave five holiday cheques of €1000 were raffled between the families who participated in all three waves of the study.

Each family consisted of both parents and two adolescent children: 95% of the participants were of Dutch origin, and most of the remainder was born in another West European country or in Indonesia. The mean age of the older siblings was 15.22 years at time 1 (T1: SD = 0.60; range 14–17 years), and that of the younger siblings was 13.36 years at T1 (SD = 0.50; range 13–15 years). Fathers’ mean age was 46 years (SD = 4.00) and mothers’ was 44 years (SD = 3.57). About one-third of both siblings followed special or low education, one-third followed an intermediate general education and the remainder followed the highest level of secondary school in the Netherlands (i.e. preparatory college and university education). A total of 52.8% of the older adolescents and 47.7% of the younger adolescents were boys.

**Measures**

**Alcohol consumption**

The adolescents were asked about the intensity and frequency of their drinking. Intensity of drinking was measured by asking the number of glasses of alcohol the adolescents had been drinking during the previous week during weekdays and at weekends in contexts at home and outside the home [25]. These divisions were made to allow the adolescents to recall more accurately what they
had consumed that week. The scores on these four questions were summed to obtain an indication of the total amount of alcohol consumption the adolescents drank during a week. Frequency of drinking was assessed by asking the adolescents how many times they drank alcohol during the past 4 weeks. They had to respond on a six-point scale: (1) ‘have not been drinking’; (2) ‘1–3 days a month’; (3) 1–2 days a week’; (4), ‘3–4 days a week’; (5) ‘5–6 days a week’; and (6) ‘every day’ [26].

Rules about alcohol

We developed a 10-item scale to measure the degree to which parents permit their children to consume alcohol in various situations, such as ‘in the absence of parents at home’ or ‘at a friends’ party’ [4]. Thus, we asked each family member what rules the parents had or what they prohibited concerning alcohol. Respondents had to answer to what degree these rules were applicable at their home. Response categories ranged from (1) ‘completely applicable’ to (5) ‘not applicable at all’. Higher scores indicate having stricter rules about alcohol consumption. We have some preliminary psychometric features of the rules concerning alcohol scale. The scale seems to have a good content validity, as explorative factor analysis revealed one factor (items loaded between 0.56 and 0.93), but also content validity, as explorative factor analysis revealed concerning alcohol scale. The scale seems to have a good have some preliminary psychometric features of the rules about alcohol consumption. We have some preliminary psychometric features of the rules concerning alcohol scale. The scale seems to have a good content validity, as explorative factor analysis revealed one factor (items loaded between 0.56 and 0.93), but also the reliability was high with Cronbach’s α between 0.80 and 0.93 across reporters and waves. Further, divergent validity seem to be satisfactory. Alcohol-specific rules was namely moderately correlated (varying between 0.34 and 0.50 depending on the perspective of the respondents) with alcohol-specific monitoring (parents knowing when their adolescent child is drinking, where and with whom). Finally, predictive validity is shown by the results of this study.

Personality

We used the short version of the Big Five questionnaire [24]. Five personality dimensions were assessed on the basis of the five-factor personality model [23]. For 30 traits, the adolescents were asked to what degree they possessed each trait. We used the items of the short version of the Big Five questionnaire, assessed at T1. Response categories ranged from (1) ‘absolutely disagree’ to (7) ‘absolutely agree’. The dimension ‘extraversion’ was measured with (recodes of) items such as quiet, withdrawn and shy (older adolescents (O): α = 0.86; younger adolescents (Y): α = 0.79). The dimension ‘agreeableness’ was assessed with items such as kind, likeable and cooperative (O: α = 0.77; Y: α = 0.78). The dimension ‘conscientiousness’ was measured with items such as organized, orderly and efficient (O: α = 0.85; Y: α = 0.84). The dimension ‘emotional stability’ was assessed with (recodes of) items such as nervous, fearful and sensitive (O: α = 0.73; Y: α = 0.74), and ‘resourcefulness’ with items such as creative, artistic and versatile (O: α = 0.68; Y: α = 0.63) (see [23] for more information about the psychometric properties of the short version of the Big Five questionnaire).

Analyses strategy

We selected a sample including adolescents who participated at all three waves (n = 401) for both adolescents. Thus, all missing data on the basis of non-participation were omitted from the analyses. Next, we divided both samples of the younger and older adolescents into two groups: adolescents who were not drinking alcohol at baseline measurement (n_older = 111; n_younger = 229) and adolescents who reported that they had been drinking at baseline (n_older = 290; n_younger = 172). We conducted all analyses on these four samples.

First, descriptive analyses were conducted to calculate the means and standard deviations of adolescents’ intensity and frequency of drinking in each group. Secondly, paired t-tests were used to compare the responses of the four family members on the scale on alcohol-specific rules at all three waves in each group. This will gain insight into possible differences in alcohol-specific rules towards older and younger adolescents in a family, into possible differences in experiences of parents and adolescents, but also into the stability of alcohol-specific rules over time. Thirdly, to test our longitudinal models, we applied structural equation modelling using version 4.2 of the Mplus statistical package [27]. We tested three models for the older adolescents (mother, father and adolescent reports on alcohol-specific rules) as well as for the younger adolescents in each group (thus a total of 12 models). [The correlations between alcohol-specific rules based on the reports of the mothers and alcohol-specific rules based on the reports of the fathers were not high, varying between 0.33 and 0.55. This indicates that they are separate constructs. In line with this, we have tried to make a latent ‘parental rules’ construct of the fathers’ and mothers’ reports. However, the variables do not seem to load together. The factor loadings of the fathers are too low (around 0.40), which is another indication that fathers’ and mothers’ perspectives should be measured separately.] In each model, assessments of alcohol use were based on self-reports of the particular adolescents (older or younger adolescents). The distributions of the intensity of drinking variables were very skewed. Therefore, the number of glasses of alcohol was divided into six classes for the structural equation models: 1 (no glasses), 2 (one to five glasses), 3 (six to 10 glasses), 4 (11–20 glasses), 5 (21–30 glasses) and 6 (> 30 glasses a week).

In the first model parental rules about alcohol use were based on the reports of the adolescents, in the second model parental rules about alcohol use were based
on the reports of the mothers and in the third model on the reports of the fathers (see Fig. 1 for the conceptual model for adolescents who reported to consume alcohol at T1). The models of the non-drinking groups were the same as the models of the drinking groups, except that the alcohol use variable of the adolescents at T1 was omitted due to lack of variance (all adolescents were non-drinkers at T1; Fig. 2). [Correlation tables of the model variables can be obtained from the first author of this paper.]

The variables in the models as depicted in Figs 1 and 2 are treated as latent variables. The alcohol-specific rules were measured by 10 items. To overcome the problem of estimating too many parameters in relation to the sample size, the 10 items were split up into two equivalent parts (parcels) according to the recommendations of Bandalos & Finney [28] and Nasser & Wisenbaker [29]. The indicators for adolescents’ alcohol use were the two alcohol variables intensity and frequency, both measured with six ordered categories. The factor loadings of the 12 models were mainly above 0.80. The lowest loading was 0.65. The conclusion is that the parcels/indicators represent adequately the underlying latent variables.

Because the alcohol indicators are non-normal and more ordered categorical (ordinal) than metric, the most suited estimator available in Mplus is the weighted least-square estimator with mean- and variance-adjusted \( \chi^2 \)-statistic (WLSMV-estimator). However, if the data are ordinal with at least five categories and moderately non-normal (skewness < 2 and kurtosis < 7) an adequate alternative is the maximum likelihood (ML) estimator [30]. The skewness and kurtosis was < 2 for all alcohol variables, while there were six categories. For these reasons and because multiple group testing (see below) is somewhat complicated using the WLSMV-estimator, we decided to use the ML-estimator for all our analyses. Moreover, we tested the 12 models with both estimators resulting in identical results. The low percentage of missing data (< 2%) was treated with the help of the full-information maximum likelihood (FIML) approach: estimation of parameters using all the available information in the data case by case, maximizing the likelihood of the observed data [31] with the help of the expectation maximization (EM) algorithm via maximum likelihood [32].

To assess the moderating effects of the Big Five personality traits on the associations between providing alcohol-specific rules and adolescents’ alcohol consumption, we tested all models in relation to each personality trait under two conditions: low and high on the particular personality trait [33]. The median split method was used to divide the sample, for instance, into a high extraversion group and a low extraversion group (for additional details on the procedures to test moderating effects, see van der Vorst et al. [11]). Because the number of respondents was reduced as a consequence of the median split method, our aim was to be very economical with the free parameters of the baseline model. The structural parameters were kept free (10 \( \beta \)s and three disturbance correlations for the model shown in Fig. 1 and seven \( \beta \)s with two disturbance correlations for the model shown in Fig. 2). All the other parameters were fixed at the values resulting from the 12 model estimates. A baseline \( \chi^2 \) was computed with no equality constraints between the structural parameters of the two groups (unconstrained model). Next, all the \( \beta \)s were constrained to be equal for both groups. The \( \chi^2 \) of this constrained model was compared with the \( \chi^2 \) of the unconstrained model. If \( \chi^2 \) increases significantly one or more \( \beta \)s would be significantly different across groups. To observe which \( \beta \)s were different between two groups, additional difference tests for each individual \( \beta \) were conducted. These analyses were performed for each of the Big Five personality traits for all 12 groups. The fit of the models was assessed by the following global fit indexes: \( \chi^2 \), comparative fit index (CFI), root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) [34].

RESULTS

Descriptives

The older adolescents within the subsample of drinkers consumed on average 5.4 glasses of alcohol a week at T1 (Table 1). The amount of alcohol consumed increased significantly to 8.1 glasses a week per year later, and to 10.1 glasses a week 2 years later. The older adolescents in the non-drinking sample at T1 consistently drank less than the older adolescents of the drinking sample, namely an average 2.2 glasses of alcohol a week at T2 and 4.9 glasses a week at T3. The increase of intensity of drinking for the non-drinking older adolescents was also significant. The younger adolescents in the drinking sample consumed 2.0 glasses of alcohol a week at T1. 3.8 at T2 and 6.9 at T3. The younger adolescents in the non-drinking sample also drank less than the adolescents of the younger drinking sample. They drank on average 1.3 glasses of alcohol a week at T2 and 3.2 glasses 1 year later. The increase in intensity of alcohol use for both groups of the younger adolescents was significant. The older adolescents in both groups increased their frequency of drinking significantly from T2 to T3. We also found an increase in frequency of drinking for the younger adolescents in the non-drinking group, although they generally drank less often than the older adolescents. However, the younger adolescents for the drinking group did not increase significantly the frequency of their drinking.
Perceptions of alcohol-specific rules
Comparisons of responses of the adolescents and parents of the drinking samples as well as the non-drinking samples showed a consistent pattern. We found for each sample strong significant differences in perceptions of providing alcohol-specific rules at all three measurements (Table 2). Both parents reported that they imposed stricter rules than both youngsters reported them to do at all three measurements. However, the rules on alcohol imposed by parents declined significantly during the 2 years according to the four family members. Further, although the parents treated their offspring differently (they were stricter with the younger adolescents than with the older ones at all three waves) fathers and mothers were, on average, similar in their rule-setting to their older adolescent and also to their younger adolescent. Finally, when the younger adolescents reached the age of the older adolescents at the first measurement (15 years), parents of drinking as well as of non-drinking adolescents appeared to be less strict towards the 15-year-old younger adolescents than towards the older adolescents at that age.

Structural equation modelling
Drinking samples
The fit of the three models of the older adolescents and of the three models of the younger adolescents was satisfactory (Table 3).

Models of the older adolescents
All cross-sectional associations between alcohol-specific rules and older adolescents’ alcohol use were significant for the three models (Table 3), with the exception of correlation of the model of the mothers at T2 and of the model of the adolescents at T3. It is noteworthy that correlations between cross-sectional latent variables are

Table 1 Means and standard deviations of frequency and intensity of drinking.

<table>
<thead>
<tr>
<th></th>
<th>Drinking adolescents at T1</th>
<th>Non-drinking adolescents at T1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Older</td>
<td>Younger</td>
</tr>
<tr>
<td>Frequency T1</td>
<td>M 2.6* SD 0.70</td>
<td>M 2.3* SD 0.59</td>
</tr>
<tr>
<td>Frequency T2</td>
<td>M 2.6* SD 0.84</td>
<td>M 2.3* SD 0.80</td>
</tr>
<tr>
<td>Frequency T3</td>
<td>M 2.7* SD 0.85</td>
<td>M 2.4* SD 0.83</td>
</tr>
<tr>
<td>Intensity T1</td>
<td>M 5.4* SD 5.43</td>
<td>M 2.0* SD 2.08</td>
</tr>
<tr>
<td>Intensity T2</td>
<td>M 8.1* SD 7.93</td>
<td>M 3.8* SD 4.35</td>
</tr>
<tr>
<td>Intensity T3</td>
<td>M 10.1* SD 10.19</td>
<td>M 6.9* SD 7.05</td>
</tr>
</tbody>
</table>

Comparisons are made over time for both adolescents for both groups. The results should be read vertically in a column. a,b,cMeans that do not share superscripts are significantly different (P < 0.05).

Table 2 Means and standard deviations of alcohol-specific rules.

<table>
<thead>
<tr>
<th></th>
<th>O 2.97* SD 0.80</th>
<th>MO 3.98* SD 0.65</th>
<th>FO 3.99* SD 0.68</th>
<th>Y 3.69* SD 0.76</th>
<th>MY 4.51* SD 0.50</th>
<th>FY 4.50* SD 0.60</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M 2.52* SD 0.72</td>
<td>M 3.52* SD 0.70</td>
<td>M 3.50* SD 0.75</td>
<td>M 3.23* SD 0.76</td>
<td>M 4.12* SD 0.69</td>
<td>M 4.13* SD 0.68</td>
</tr>
<tr>
<td></td>
<td>M 2.88* SD 0.67</td>
<td>M 3.13* SD 0.72</td>
<td>M 3.11* SD 0.76</td>
<td>M 2.82* SD 0.76</td>
<td>M 3.71* SD 0.73</td>
<td>M 3.73* SD 0.77</td>
</tr>
</tbody>
</table>

Comparisons are made between reports of older adolescents, fathers and mothers at each wave. The same holds for the younger adolescents. The results should be read horizontally. a,b,cMeans that do not share superscripts are significantly different (P < 0.05).

Perceptions of alcohol-specific rules
Comparisons of responses of the adolescents and parents of the drinking samples as well as the non-drinking samples showed a consistent pattern. We found for each sample strong significant differences in perceptions of providing alcohol-specific rules at all three measurements (Table 2). Both parents reported that they imposed stricter rules than both youngsters reported them to do at all three measurements. However, the rules on alcohol imposed by parents declined significantly during the 2 years according to the four family members. Further, although the parents treated their offspring differently (they were stricter with the younger adolescents than with the older ones at all three waves) fathers and mothers were, on average, similar in their rule-setting to their older adolescent and also to their younger adolescent. Finally, when the younger adolescents reached the age of the older adolescents at the first measurement (15 years), parents of drinking as well as of non-drinking adolescents appeared to be less strict towards the 15-year-old younger adolescents than towards the older adolescents at that age.

Structural equation modelling
Drinking samples
The fit of the three models of the older adolescents and of the three models of the younger adolescents was satisfactory (Table 3).

Models of the older adolescents
All cross-sectional associations between alcohol-specific rules and older adolescents’ alcohol use were significant for the three models (Table 3), with the exception of correlation of the model of the mothers at T2 and of the model of the adolescents at T3. It is noteworthy that correlations between cross-sectional latent variables are
decreasing over time, as these correlations are controlled for previous influences and must be interpreted as partial correlations. Further, rules about alcohol and adolescents' alcohol use showed strong stability over time in all models. More importantly, all cross-lagged associations were not significant, which implies that providing alcohol-specific rules does not prevent older adolescents' drinking and that parents do not become more permissive as their offspring consume more alcohol.

Models of the younger adolescents

Alcohol-specific rules was cross-sectionally significantly related only to younger adolescents' alcohol use in the model of the younger adolescents themselves (T1, T2) and in the model of the mothers at T1. Alcohol-specific rules predict rules over time, and previous drinking predicts drinking later on. According to mothers, rules about alcohol at T1 were related negatively to adolescents' alcohol use at T2. This indicates that rules about alcohol prevent younger adolescents' alcohol involvement later on. The other cross-lagged paths from alcohol specific rules to alcohol use of younger adolescents in the three models we tested were not significant. The same holds for the cross-lagged paths from adolescents' drinking to providing alcohol-specific rules.

Non-drinking sample

The fit of the six models was satisfactory (Table 4).

Models of the older adolescents

According to the older adolescents themselves, as well as the mothers and fathers, alcohol-specific rules (T1) were strongly negatively related to older adolescents' drinking (T2; Table 4). This implies that imposing strict rules about alcohol prevents 15-year-olds who do not yet drink alcohol to start consuming alcohol intensively and frequently. This longitudinal effect was also found a year later (from T2 to T3) in the model with adolescent reports. Alcohol use of the older adolescents (T2) was not associated significantly with alcohol-specific rules over time (T3).

Models of the younger adolescents

The preventive effect of providing alcohol-specific rules (T1) on adolescents' drinking behaviour (T2) appeared to
be significant in the model of the fathers. In the model based on information of the mothers, this significant association was observed a year later (T2 to T3). Thus, parents who provided strict rules on alcohol consumption are less likely to have a drinking younger adolescent later on than permissive parents.

**Multi-group analyses**

To establish whether adolescents scoring low or high on each of the five personality traits (extraversion, conscientiousness, agreeableness, emotional stability, resourcefulness) differ in their reaction on alcohol-specific rules setting, we conducted multi-group analyses in every model based on drinking adolescents and non-drinking adolescents (five multi-group analyses per model for a total of 12 models). Here, only differences between cross-lagged effects are discussed, because these effects are our main interest.

**Drinking adolescents**

We found one significant different cross-lagged path for the drinking groups, namely in the model of older adolescents (paternal reports) concerning the personality trait ‘agreeableness’. For older adolescents scoring high on agreeableness, alcohol-specific rules were related negatively significantly to adolescents’ drinking, and for adolescents scoring low on agreeableness, alcohol-specific rules were not related to alcohol use (T2–T3: $\Delta \chi^2 \ (10) = 21.129$, $P < 0.01$: $\beta_{\text{high}} = -0.23$, $P < 0.01$: $\beta_{\text{low}} = -0.06$, $P > 0.05$). In all other models no differences between the group scoring low on a trait and the group scoring high on a specific personality trait were observed. This indicates that personality does not moderate the association between providing alcohol-specific rules and adolescents’ alcohol use in the case that adolescents already drink alcohol at T1.

**Non-drinking adolescents**

All cross-lagged associations were not significantly different between the group scoring low on a trait and the group scoring high on a trait for the non-drinking samples.

Further, it should be stressed that despite the large number of multi-group analyses (60 models were tested in total), we found a difference in paths for only one multi-group analysis in the drinking group of older adolescents.

**DISCUSSION**

The aim of the present study was to determine the bi-directional associations between providing alcohol-specific rules and personality. We found one significant different cross-lagged path for the drinking groups, namely in the model of older adolescents (paternal reports) concerning the personality trait ‘agreeableness’. For older adolescents scoring high on agreeableness, alcohol-specific rules were related negatively significantly to adolescents’ drinking, and for adolescents scoring low on agreeableness, alcohol-specific rules were not related to alcohol use (T2–T3: $\Delta \chi^2 \ (10) = 21.129$, $P < 0.01$: $\beta_{\text{high}} = -0.23$, $P < 0.01$: $\beta_{\text{low}} = -0.06$, $P > 0.05$). In all other models no differences between the group scoring low on a trait and the group scoring high on a specific personality trait were observed. This indicates that personality does not moderate the association between providing alcohol-specific rules and adolescents’ alcohol use in the case that adolescents already drink alcohol at T1.

**Table 4** Standardized estimates and fit measures for models of non-drinking adolescents at T1 tested for reports by adolescents, fathers and mothers.

<table>
<thead>
<tr>
<th>Adolescents</th>
<th>Mothers</th>
<th>Fathers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older</td>
<td>Younger</td>
<td>Older</td>
</tr>
<tr>
<td>n</td>
<td>111</td>
<td>229</td>
</tr>
<tr>
<td>Cross-sectional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rules T2–Alcohol T2</td>
<td>−0.24**</td>
<td>−0.41***</td>
</tr>
<tr>
<td>Rules T3–Alcohol T3</td>
<td>−0.10</td>
<td>−0.16***</td>
</tr>
<tr>
<td>Stability paths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rules T1–Rules T2</td>
<td>0.61***</td>
<td>0.62***</td>
</tr>
<tr>
<td>Rules T2–Rules T3</td>
<td>0.57***</td>
<td>0.64***</td>
</tr>
<tr>
<td>Rules T1–Rules T3</td>
<td>0.22**</td>
<td>0.13</td>
</tr>
<tr>
<td>Alcohol T2–Alcohol T3</td>
<td>0.64***</td>
<td>0.58***</td>
</tr>
<tr>
<td>Cross-lagged paths</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rules T1–Alcohol T2</td>
<td>−0.34***</td>
<td>−0.13</td>
</tr>
<tr>
<td>Rules T2–Alcohol T3</td>
<td>−0.30***</td>
<td>−0.10</td>
</tr>
<tr>
<td>Alcohol T2–Rules T3</td>
<td>−0.04</td>
<td>0.00</td>
</tr>
<tr>
<td>Fit measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d.f.</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>39.031</td>
<td>31.583</td>
</tr>
<tr>
<td>$P$</td>
<td>0.020</td>
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<tr>
<td>CFI</td>
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</tr>
<tr>
<td>RMSEA</td>
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</tr>
<tr>
<td>SRMR</td>
<td>0.042</td>
<td>0.024</td>
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</table>

*P < 0.05; **P < 0.01; ***P < 0.001. CFI: comparative fit index, RMSEA: root mean square error of approximation, SRMR: standardised root mean square residual.
specific rules and adolescents’ drinking behaviour using longitudinal data from parents and their children. In addition, we assessed whether each trait of the Big Five personality model moderates the association between alcohol-specific rules and adolescents’ alcohol consumption.

First of all, providing alcohol-specific rules was related cross-sectionally strongly negatively to the alcohol consumption of both older and younger adolescents who were already drinking and who still were in the initiation phase of drinking. These findings correspond with those of Jackson et al. [3] and Yu [5]. More importantly, providing alcohol-specific rules prevented older and younger adolescents’ alcohol use from starting to consume alcohol. The validity of this finding is illustrated by the consistent results across the different family members, and across the two children in a family, with the exception of the younger adolescents with their perspective. On the other hand, imposing alcohol-specific rules did not prevent the alcohol use of adolescents who had already started to drink. Thus, if an adolescent has established a drinking pattern, the impact of parents declines or even disappears, at least with respect to alcohol-specific rules. However, in the case that an adolescent has not started to drink regularly, no matter whether he/she is 13 or 15 years old, parents seem to be able to control their offspring drinking by providing alcohol-specific rules. This might be an interesting implication for health organizations that develop alcohol prevention programmes focusing on parental involvement. Alcohol prevention programmes should make parents aware that they play a role in preventing youth drinking by setting rules before their children have established a drinking pattern.

Further, all family members reported that parents were stricter towards the younger adolescents than towards the older ones at all three measurements, proving clearly that parents are treating their youngsters differently with concern to alcohol use. Parents seem to become more permissive towards adolescents’ alcohol use over the years. On the basis of the mean scores on alcohol-specific rules, it is quite clear that parents become less strict over time. Relatively, however, the results show that parents are fairly stable in imposing alcohol-specific rules. Moreover, it is interesting that when the younger adolescents reached the age of the older adolescents at the first measurement (15 years), parents appeared to be less strict towards the 15-year-old younger adolescents than towards the older adolescents at that age. This finding on birth order indicates that parents are influenced, at least partly, by the behaviour of their offspring. Nevertheless, this pattern was not supported by the bi-directional results of our longitudinal models. For both drinking and abstaining adolescents at the first wave, alcohol use did not affect alcohol-specific rule-setting. Thus, parents do not seem to become more permissive because they notice that their youngsters are drinking.

It is noteworthy that we do not know whether parents are consistent in providing alcohol-specific rules in the short term. Do they impose the same rules each day, or are they more permissive in some occasions than others? When parents fluctuate strongly in their alcohol-specific rule-setting in daily life, it is perhaps not a clear signal towards adolescents, leading to a higher likelihood of adolescent drinking [35]. Thus, it might be that it is not the mean level of alcohol-specific rules that is important, but the flexibility (or rigidity) of the rule-setting. On the other hand, rigidity of parents might be perceived as an indication of inflexibility to deal with youngsters’ needs (see [36]), and lead subsequently to more adolescents’ alcohol involvement. Nevertheless, it would be important to investigate the flexibility of parents in their alcohol-specific rule-setting by, for instance, observing how parents and adolescents communicate about alcohol-specific socialization.

**Person–environment interactions**

We argued that the complexity of factors affecting adolescents should be considered fully in order to understand the development of drinking, for instance by testing person–environment interactions [12,13,20]. Person–environment issues have been a topic for debate for years in the field of developmental psychopathology, but have generally been neglected in the research on alcohol use [13,19,20]. We hypothesized that the impact of providing alcohol-specific rules on adolescents’ drinking depends on adolescents’ characteristics, e.g. the Big Five personality traits of adolescents. However, no consistent significant findings were observed that could confirm our hypothesis. Again, the advantages of using multi-informant data and data on younger as well as older adolescents, in relation to the large numbers of analyses conducted, underline the robustness of our findings. Therefore, we think this finding is a meaningful contribution to the scientific debate, showing that personality and the environment are not necessarily related (as scholars have been suggesting), at least not with regard to parental socialization and adolescents’ alcohol use. Nevertheless, this might seem striking considering that the older non-drinking group of adolescents is a somewhat special group in the Netherlands: the majority of Dutch youth have already been drinking alcohol at the age of 15 [37]. In this light one might assume that personality characteristics would be a relevant explanation for the atypical behaviours of these adolescents. However, in the current study we showed that personality is not playing a role here. On the basis of this we might conclude that imposing alcohol-specific rules affect only the drinking of
adolescents who have not already established a drinking pattern, despite the adolescents’ personality.

Nevertheless, regardless of our conclusion concerning personality and providing alcohol-specific rules, it is meaningful to speculate why we found such a lack of support for our hypothesis. The general assumption is that the personality of an individual is a composite of scores on a continuum of each of the five personality traits [20]. Perhaps a certain composite makes an adolescent more sensitive to the impact of alcohol-specific rules instead of just one trait (see [23]). In the current study we tested exclusively the moderating effect of each single trait, while perhaps specific constellations of personality factors are, in particular, putting youth at risk for a lack of effect in providing alcohol-specific rules on their drinking behaviour. Secondly, it could be that other individual characteristics are of influence in the association between alcohol-specific rules and adolescents’ drinking, such as self-control or aggression. For example, the risk for problem drinking increases for young adult men who are aggressive and experience low levels of family functioning [12]. It might be that providing alcohol-specific rules has less effect on especially the drinking of aggressive male adolescents. Thirdly, the explanation is methodological. We conducted a median-split method to divide our sample. Although this is a commonly used method, it has a limitation, namely adolescents scoring in the middle of the range of each trait are also included in the analyses. Analyses conducted on adolescents with more extreme scores might show significant person–environment interactions. However, we were not able to perform this type of analysis as we would have encountered problems with statistical power. Finally, our lack of findings might be due to small samples. We also conducted multi-group analyses on the whole sample of older and younger adolescents, so combining drinkers and non-drinkers at T1. Both these samples contained 428 adolescents. We did not find significant moderating effects on alcohol-specific rules and adolescents’ drinking in these samples. In this case a lack of power could not be the reason for not finding significant results. For smaller samples it is more difficult to obtain significant effects, especially when one is testing a complex model such as ours.

Strengths, limitations and implications for future research

Although the current study has several strengths, such as its longitudinal design and the multi-informant data, it is limited by some factors. Although we selected families carefully on the basis of, for instance, educational level or the proportion of sibling dyads, the findings should not be generalized to single-parent families, to families with no biological relation between parent and child or to families with twins. Secondly, it might be that our sample does not reflect the Dutch situation accurately, as we do not have any information about the families who did not respond on our recruitment letter. Thirdly, one should be careful in generalizing our results to other countries with other drinking cultures. Dutch adolescents drink more frequently than adolescents from other European countries [38]. It is difficult to predict whether providing alcohol-specific rules would be more effective—in terms of continuation of drinking—in cultures where children start drinking at a later age, drink generally less often and intensively, or where the societal norms on youth alcohol are less permissive. Therefore, it would be important to investigate the role of alcohol-specific rules in other (drinking) cultures. Further, providing alcohol-specific rules might prevent heavy drinking or problem drinking in adolescence but also later in life. It would be interesting to find out what the long-term effects are of providing alcohol-specific rules instead of the rather short-term effects as we did. In addition, it would be important to explore how drinking peers affect the impact of alcohol-specific socialization, as the effect of a peer-drinking culture might interfere with the effect parents have on their offspring [39]. Finally, it is still unclear how parents sanction their child after he or she break the rules about alcohol. Not perceiving consequences after not following a rule might give an adolescent the impression that the alcohol-specific rules are not as strict as the adolescent thought in the first place. This might, in turn, affect future drinking. Unfortunately, we have no data on parental sanctions.

In sum, the current study is one of the first which provides insight into the impact of alcohol-specific rules on the development of adolescents’ alcohol consumption, as well as the role of the adolescents’ personality in this. The findings yield substantial evidence that imposing strict rules prevents the uptake of drinking, regardless of their personality, but in the case that adolescents are already involved in drinking, the impact of parents declines or even disappears.

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References


