

Effects of Automatic and Explicit Parenting on Adolescents' Alcohol Use

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Disclosure of Interest

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Abstract

Background. Commonly, parenting behaviors are assessed in an explicit way, usually by means of self-reports. Yet under suboptimal conditions, it is expected that parents act more automatically. *Aims.* The aim of the present longitudinal empirical study was to investigate the influence of automatic and explicit parenting cognitions on alcohol use in adolescents and whether this relationship is dependent on adolescents' age and gender and parent gender. *Method.* A sample of 111 parent-child dyads (71.9% mothers; M age=47.4, SD=5.3) with children between 12 and 18 years old (55.2% boys; M age=14.8 years, SD=1.6) completed the Relational Responding Task (RRT) at T₁ (September 2015) and T₂ (April 2016) to assess automatic parenting prior to an online questionnaire that assessed explicit alcohol-specific parenting. *Results.* For lifetime prevalence of drinking, stricter explicit parenting cognitions predicted a lower likelihood of children ever having consumed alcohol at T₂. This effect was particularly relevant for older adolescents. Automatic parenting cognitions were not predictive of the lifetime prevalence of alcohol use. For weekly drinking, a significant protective effect of stricter automatic parenting cognitions was found only for older adolescents. *Conclusions.* This study is the first to demonstrate longitudinally that automatic parenting cognitions as measured by the RRT can be used as a predictor of the level of drinking among older adolescents, even after controlling for explicit parenting behaviors. We argue that the influence of parents is subject to change as a function of adolescents' age, with the prevailing role of automatic parenting over explicit parenting.

Keywords: automatic parenting cognitions, explicit parenting, alcohol use, developmental perspective

Introduction

Parents are important socialization agents in adolescents' lives. For a variety of adolescent behaviors, including alcohol use and other delinquent behaviors, the importance of parents, next to a variety of other factors (e.g. self-concept; Chen et al., 2020) has been established (e.g. Koning et al., 2020; Van der Vorst et al., 2005). It is believed that parents' influence tends to diminish across adolescence in favor of peer influences (Hoeve et al., 2009). Yet effective parenting remains protective when adolescents grow older (Chassin et al., 1986; Morris, et al., 2017) and may even buffer the effect of negative peer influences (Mounts and Steinberg, 1995; Trudeau et al., 2012). Commonly, parenting behaviors are assessed in an explicit and reflective way, usually by means of self-reports. These explicit parenting behaviors are often displayed when there is sufficient time, cognitive resources and motivation to reflect upon their behavior, such as a situation when a 13-year old child asks the parent if he/she can go to a party next week where alcohol is available. The parent discusses this issue at a quiet moment with his/her spouse and in a conversation with their child they explain why they don't want the child to go to that party. Yet, under suboptimal conditions and guided by a developmental perspective (i.e. adolescents' age), it is expected that parents also tend to act more quickly, in an automatic way. In this case, when a 16-year old is off to a party with friends after the parent has been at work the whole day, other kids are asking for attention and he/she overheard that alcohol is available at the party. The parent doesn't feel equipped to start a conversation and/or does it in an ineffective way (authoritative). In a previous study, we demonstrated that automatic parenting cognitions in relation to alcohol use can be assessed using an implicit measure. In fact, these automatic parenting cognitions were related more strongly to adolescents' alcohol use than explicit parenting in relation to adolescent drinking (Koning et al., 2017). However, the study by Koning et al. was a cross-sectional design and used parent reports on adolescent drinking. Therefore, in the current

study, we extend these previous findings by 1) applying a longitudinal design and 2) using parent reports on parenting and adolescent reports on alcohol use.

A vast number of empirical studies have demonstrated that the relationship between parenting and adolescent behavior changes over time, which favors dynamic developmental theories such as the age-graded theory of Sampson and Laub (2005). This theory recognizes that individual behavior is not only determined by dispositional factors, but also depends on environmental factors such as parental control that provide input for opportunity and motivation (i.e., the notion of situated action). According to Sampson and Laub (2005), deviant behavior can be explained by general processes of social control, structured activities and human agency. That is, adolescents with stronger social bonding and constraints (e.g., parental control and having an organized life) perceive and experience more consequences when involved in deviant behaviors and are therefore less motivated to do so. This indicates that, in line with a dynamic developmental perspective, the level of parental control should be attuned to adolescents' needs to foster the development of social bonding and subsequent motivation to refrain from acting defiantly. In fact, Barber et al. (2005) demonstrated that parental limit setting has declined across adolescence based on parents' perceptions as an attempt to grant autonomy to their adolescents. Not only is the extent of controlling behaviors subject to change, but also the influence of these behaviors differs across adolescents. For example, parents have a stronger influence on delinquent behaviors in younger adolescents than in older adolescents (Hoeve et al., 2009). Also, for the use of alcohol, studies have shown that parents' rules about alcohol, i.e. alcohol-specific parenting, impact younger children's drinking more strongly than that of older adolescents (Van der Vorst et al., 2005). The influence of parenting on adolescent behaviors may weaken as children mature because of the increasing influence of peers. In line with this dynamic perspective on the role of parents in adolescent development, we argue that the influence of general as well as behavior-specific

(parenting related to alcohol-specific socialization) parenting does not weaken over time, but changes from a more explicit way of guiding adolescent behavior to an implicit, automatic way of parenting. This change in parenting behavior may be elicited by the maturation of their child, which corroborates the transactional theory of development (Sameroff, 1975), that describes that child behavior can only be understood when considering interactions between child characteristics and contextual variables over time, such as parenting. Our hypothesis is based on three assumptions. First, in line with transactional models of development (Sameroff, 1975), adolescence comes with changes in the child, such as behavioral and emotional problems. Due to this increase in negative behaviors, parents may feel more stressed and may therefore fall back on their implicit/automatic parenting cognitions when adolescents become older (De Houwer et al., 2009; Wiers & Stacy, 2006). Second, also changes in independence and autonomy take place throughout adolescence. Evidence suggests that optimal parenting is attuned to the changing needs of the child, such as the level of autonomy. At younger ages, it is easier and more effective to set explicit strict rules against drinking compared to when adolescents are older (Van der Vorst et al., 2005) and these explicit rules no longer meet their need for autonomy. Third, at younger ages adolescents already observe messages that (dis)approve the use of alcohol in their social context (e.g. by alcohol use of parents), which shapes their own (implicit) attitudes about alcohol and their subsequent drinking behavior (Payne et al., 2016), even before they have initiated drinking. Yet, with age, their own (implicit) attitudes become more apparent when adolescents have more opportunity to drink due to the higher presence in (peer) contexts where alcohol is available (Wagner & Anthony, 2002). Thus, it is expected that at younger ages explicit parenting behaviors are more important in the understanding of adolescents' drinking behavior, whereas by age the implicit parenting cognitions may become more relevant.

Based on iterative reprocessing models, evaluations and subsequent behavior are the result of evaluative processes that are based on representations in memory (Gladwin et al., 2011) that can be divided into lower-order information and higher-order information. Lower-order evaluative processes are activated quickly and provide basic information (more automatically), whereas higher-order processes are slower and contain more complex evaluative information (more reflective). Thus, when parents are in a situation with sufficient time, cognitive resources and motivation, they are able to reflect upon their behavior and evaluate what is most effective in this specific situation for this specific child (i.e. reflective, explicit parenting). In contrast, when parents have limited time, have had a bad day, do not feel well, are tired or challenged by their child's negative behaviors, they will behave more automatically towards their child, which may be less effective. This automatic parenting behavior is likely to be based on parents' implicit beliefs about the outcomes and effects of their parenting behaviors and/or the way they have been parented themselves. By using self-reports to assess parenting behaviors, it is likely that researchers may only capture the reflective, explicit parenting behaviors, that is, parenting under optimal circumstances. However, parental self-reports on their parenting behaviors are subject to social desirability. Hence, parents tend to overestimate the positive characteristics of their parenting behavior (Noller and Callan, 1988). Implicit measures are less sensitive to social desirability and can be used to capture more automatic parental beliefs. Hence, implicit measures of parental beliefs are likely to contribute to our understanding about the role of parenting in adolescents' behavior (e.g., Koning et al., 2017).

The aim of the current study is to investigate the influence of explicit and automatic parenting behaviors on adolescents' alcohol use (prevalence and amount of drinking) in a longitudinal design including 111 parent-child dyads. Based on the dynamic developmental perspective and the transactional theory of development, age is considered a moderator. It is

expected that particularly among older adolescents, automatic parenting cognitions are a stronger predictor than explicit parenting cognitions. In addition, as the impact of parenting may differ based on parent gender (Najman et al. 2021) or adolescent gender (Bo & Jaccard, 2020), parent and adolescent gender were also taken into account as moderators. Insight into the role of explicit and automatic parenting behaviors across adolescence may contribute to the refinement of developmental theories regarding parenting and adolescent behavior.

Method

Participants

The data for this study were collected as part of IMPAC, a longitudinal project on the role of parenting cognitions in Dutch and Belgian adolescents' alcohol use. The first measurement wave (T₁) was conducted in September/October 2015, the second (T₂) in April/May 2016 and the third wave in September/October 2016. In the current study, the first two waves are included. A total of 962 adolescents from three Dutch secondary schools and their parents were invited to participate in the project. The data collection included computer-based questionnaires and tasks, completed separately by adolescents and their parents. In Belgium, 470 adolescents and 75 parents participated at T₁. However, due to high drop-out at T₂ (N adolescents= 26 and N parents=44), because data collection at schools was no longer possible, which makes longitudinal analyses unreliable, these data were not included in the current study.

At T₁, 883 (91.8%) adolescents and 133 parents of the total sample (7.2%) participated in the project. At T₂, 818 (85%) adolescents participated. For the current study, only families who contributed complete data were included. Fifteen parents were excluded because they failed to complete either the questionnaire or the computer task. Seven parents could not be matched due to non-participation of their child at T₁. Of the resulting 111 parent-adolescent dyads, 15 were excluded because the adolescent did not participate at T₂. The final sample

therefore consisted of 96 parent-adolescent dyads with complete data. At the baseline, the mean age of the adolescents (55.2% boys) was 14.89 years ($SD = 1.56$, range 12-18) and the mean age of the parents (71.9% mothers) was 47.5 years ($SD = 5.29$, range 37-68). The adolescents were enrolled in different educational tracks, with 20.8% in lower secondary vocational education, 22.9% in higher general secondary education and 56.3% in pre-university education. Among the parents, 20.8% had completed primary or secondary education only, 30.2% had completed vocational school, and 49.0% had a college or university degree.

Compared with the participants in the 96 included dyads, adolescents who were excluded from the analyses were older, $t(881) = 2.44, p = .015$, and more likely to attend higher general secondary education, $\chi^2(2, N = 883) = 41.21, p < .001$. Moreover, at T₁, they reported higher levels of weekly drinking, $t(142.85) = 3.33, p = .001$, and lower levels of parental rule-setting about alcohol use, $t(122.99) = -3.01, p = .003$. There were no differences between the included and excluded participants in terms of gender and lifetime prevalence of alcohol use.

Procedure

The recruitment of participants took place through the local authority of a municipality in the North Holland province of the Netherlands. Eight secondary schools were approached, three of which agreed to participate in the project. Each of these schools took part in one of the three educational tracks described above. Prior to the first measurement, parents received a letter that included information on the aims of the project, the possibility to decline participation of their child (0.3% of the parents did so), and an invitation to participate themselves during a general parent meeting at their child's school.

The adolescents completed a computer-based task and questionnaire at school during regular school hours. Researchers and trained research assistants were present to supervise the

data collection (i.e., introduce the project and the procedure, answer questions, and ensure maximum privacy). The confidentiality of the responses was guaranteed. Parents who could not participate in or finish the data collection during the parent meeting received a card with their personal login details and instructions to complete the task and questionnaire at home. Non-responding parents were invited again through a follow-up email sent by the school's department head. All the participants gave passive informed consent through a voluntary option to participate and the possibility to stop participation at any moment during the study. This is acceptable considering the rather low invasiveness of participation in this study.

Measures

At T₁, the parents completed a computer task (RRT) measuring their automatic alcohol-specific parenting cognitions and a digital questionnaire measuring their explicit alcohol-specific parenting cognitions. Adolescents reported on their lifetime prevalence of alcohol use and average weekly drinking at both waves.

Relational Responding Task (RRT). In the RRT, the parents were presented with a range of strict and tolerant statements (20 statements) concerning alcohol-specific parenting that were to be judged as true or not true by pressing one of two keys on a computer keyboard. In short, the parents were asked to act “as if” they endorsed a strict parenting style and again “as if” they endorsed a tolerant parenting style. Task performance in the RRT is a function of the degree to which the (instructed) response rules (as if...) coincide with a respondent's automatic cognitions. Accordingly, by comparing task performance across critical test phases, one can obtain an index of a respondent's automatic cognitions. In the current study, the RRT included seven blocks, each consisting of 20 trials. See Koning et al. (2017) for a more detailed description of the RRT.

The RRT data were scored using the D1 algorithm, after the exclusion of all data stemming from the induction trials (see De Houwer et al., 2015). Response latencies

exceeding the cutoff value of 10,000 ms were excluded (i.e., 21 trials in total, 0.21%). None of the participants responded faster than 300 ms on more than 10% of the trials. The RRT scores were computed (range -1.03-1.54) so that higher scores reflected stricter automatic parenting cognitions. More specifically, a positive score indicates better performance in the test phase where participants were asked to “as if” they endorsed a strict parenting style than in the test phase where they acted “as if” they endorsed a tolerant parenting style. A negative score indicates the reversed pattern of performance.

Questionnaires. To obtain a measure of *explicit alcohol-specific parenting cognitions* (Van der Vorst et al., 2005), the parents were first asked to indicate, on a 5-point scale (1 = *not at all acceptable*; 5 = *very acceptable*), the extent to which they believed it was acceptable for an adolescent < 18 years (the minimum age required to legally buy and consume alcohol in The Netherlands) to consume alcohol or get drunk in each of eight different situations (e.g. “drink alcohol during family dinner”, “getting drunk at a party with friends”). In addition, they were asked to indicate, on a 5-point scale (1 = *certainly not*, 5 = *definitely*), the likelihood that they would approve the alcohol consumption of their own child in each of 10 different situations (e.g. “one glass when my partner is at home or I am at home”, “my child is allowed to get drunk while going out with friends”). The responses were reversed so that higher scores represented stricter alcohol-specific parenting cognitions. A total score of explicit parenting cognitions was computed by averaging the responses across items (Cronbach’s alpha = .95).

To capture *adolescents’ lifetime prevalence of alcohol use*, the adolescents were asked to indicate how often in their life they had drunk alcohol (with a minimum of one glass), ranging from zero to 40 or more on a 14-point scale. The responses were then recoded to distinguish non-drinkers (0= zero times) and drinkers (1=1 or more times). To measure *weekly drinking*, the adolescents were asked to report (a) the typical number of week days (Monday to Thursday) on which they consumed alcohol, (b) the typical number of alcoholic drinks

consumed during a week day, (c) the typical number of weekend days (Friday to Sunday) on which they consumed alcohol, and (d) the typical number of alcoholic drinks consumed during a weekend day. The number of drinking days was multiplied by the number of drinks for both week days and weekend days. Both indices were then summed to obtain a single index of adolescent weekly drinking (see Engels and Knibbe, 2000).

The moderating variable age was measured by asking adolescents' date of birth. Age in years was calculated based on the date of data collection. For the interpretation of the interactions, age was recoded into three categories; <14 years, 14-15 years and ≥ 16 years.

Data analyses

Descriptive statistics and pairwise correlations among the study variables were obtained for the total group, for boys and girls and each age category separately. To examine the unique predictive role of automatic and explicit parenting cognitions on adolescents' alcohol use six months later, we performed logistic (for lifetime prevalence) and zero-inflated negative binomial (for weekly drinking) regression analyses, while controlling for age and sex at T₁. For weekly drinking, also weekly drinking at T₁ was included in the analysis as this allows the investigation of the contribution of parenting on a change in weekly drinking from T₁ to T₂. Since *weekly drinking* has a high variance relative to the mean, which indicates overdispersion, a zero-inflated negative binomial model was used (Long, 1997). The MLR estimator is robust to non-normality of life-time prevalence of drinking and is therefore used in the analysis. The interaction terms between the parenting behaviors*age (centered), parenting behaviors*adolescent gender and parenting*parent gender were added to the model separately per moderator. Analyses were conducted in Mplus (Version 7.31, Muthén and Muthén, 2015). In line with Nieminen, Lehtiniemi, Vähäkangas, Huusko, and Rautio (2013), we used the standardized β s as effect size indices, whereby $\beta < 0.2$ was considered a small, $0.2 < \beta < 0.5$ a moderate, and $\beta > 0.5$ a strong effect. Since the p-value is

considered to be confounded because of its dependence on sample size (Altman & Bland, 1995), a significance level of $p < .10$ was used to interpret the results.

Ethical Statement

All authors have abided by the Ethical Principles of Psychologists and Code of Conduct as set out by the BABCP and BPS. The study, including the passive informed consent procedure, is approved by the Ethics Committee of the Faculty of Social and Behavioral Sciences of Utrecht University (FETC14-016).

Results

Descriptive statistics and pairwise correlations among the study variables are presented in Tables 1 and 2, respectively. The mean RRT score was not significantly different from zero, but because the order of the critical blocks was not counterbalanced to reduce variance and thus maximize correlations (see Hofmann et al., 2005), the absolute RRT score cannot be interpreted (also see Blanton and Jaccard, 2006). The explicit measure of parenting cognitions revealed a strong tendency to adopt a strict parenting style. Although no significant differences were found in explicit parenting cognitions regarding boys' and girls' alcohol use ($t = -1.02, p = .31$), at the automatic level, parents appeared to display a stricter parenting style for girls than for boys ($t = -1.93, p = .05$; Table 1). Automatic and explicit parenting cognitions were significantly and positively correlated, although the correlation was numerically small. Furthermore, stricter explicit parenting cognitions were associated with a lower likelihood of ever having consumed alcohol and with lower levels of weekly drinking, both cross-sectionally and longitudinally. Stricter automatic parenting cognitions were cross-sectionally and longitudinally associated with lower levels of weekly drinking, but not with the lifetime prevalence of alcohol use.

[Insert Table 1 and 2 around here]

Table 3 shows the results of the regression analyses. Regarding the lifetime prevalence of alcohol use, the results indicated that stricter explicit parenting cognitions predicted a lower likelihood of ever having consumed alcohol at T₂ (at the $p < .10$ level). This effect appeared to be moderated by age ($B = -3.19, \beta = -0.41, p = .004$) and adolescent ($B = 0.14, \beta = 0.67, p < .000$) and parent gender ($B = 0.19, \beta = 0.70, p = .013$). That is, the effect of stricter explicit parenting cognitions on the lifetime prevalence of alcohol use was particularly pronounced for older adolescents, adolescent girls and mothers. Automatic parenting cognitions were not predictive of the lifetime prevalence of alcohol use.

[Insert Table 3 around here]

Regarding weekly drinking, no main effects for automatic and explicit parenting cognitions were identified. We did find an interaction effect between automatic parenting cognitions with age ($B = -0.53, \beta = -0.35, p = .044$) and with parent gender ($B = -4.57, \beta = -1.66, p = .032$). That is, among older adolescents and fathers, the stricter automatic parenting cognitions had a protective effect on weekly drinking.. In addition, there was a significant interaction effect between explicit parenting and adolescent gender ($B = -0.07, \beta = -0.57, p = .002$) indicating that stricter explicit parenting predicted a lower level of weekly drinking among boys.

Discussion

In a recent cross-sectional study, Koning et al. (2017) demonstrated the differential role of automatic and explicit parenting cognitions in adolescents' drinking behavior. The present study aimed to extend this work by (a) employing a longitudinal design, (b) using adolescent-reported (rather than parent-reported) measures of alcohol use, and (c) examining whether

gender and age moderate the effects of automatic and explicit parenting cognitions on adolescents' alcohol use. In line with dynamic and transactional development theories, the findings suggest that automatic and explicit parenting cognitions are differentially related to adolescents' drinking behavior over time: Whereas stricter explicit parenting cognitions predicted a lower likelihood of ever having consumed alcohol six months later, stricter automatic parenting cognitions predicted lower levels of weekly drinking among older adolescents, boys and fathers.

In line with our expectations, we observed a small, albeit significant overlap between automatic and explicit parenting cognitions. This finding is in line with the idea that automatic cognitions, as measured by the RRT, reflect a different aspect of (alcohol-specific) parenting than the explicit cognitions that are captured with traditional self-reports. Moreover, it demonstrates that parenting reflects an even more multifaceted process, with automatic complex beliefs about parenting and alcohol use which can be captured by the RRT (Tibboel et al., 2017). As has been shown for automatic processes in general (De Houwer et al., 2009; Wiers and Stacy, 2006), such automatic cognitions may guide parenting practices in suboptimal situations (e.g. time pressure, stress, fatigue), when deliberate and reflective parenting based on explicit attitudes and beliefs is impeded. Moreover, as the results of the current study point out, automatic cognitions may well diverge from explicit, self-reported parenting processes. Whereas no differences were found in explicit parenting cognitions regarding boys' and girls' alcohol use, the effect of explicit parenting cognitions on more regular drinking was protective particularly for boys. Moreover, indices of automatic cognitions suggest that parents may display a stricter parenting style for girls as compared to boys, yet there is no differential impact on drinking behavior. As such, this study confirms the previous work (Koning et al., 2017) by illustrating the potential added value of capturing automatic parenting processes in relation to adolescent alcohol use.

In their cross-sectional study, Koning et al. (2017) found that explicit parenting cognitions were particularly predictive for adolescents' lifetime prevalence of alcohol use (i.e., drinking status), whereas automatic parenting cognitions were more strongly related to the frequency of drinking. The current study partly confirmed these findings. Explicit, but not automatic, parenting cognitions were longitudinally related to adolescents' lifetime prevalence of alcohol use. That is, a stricter explicit parenting style predicted a lower likelihood of ever having consumed alcohol six months later. Moreover, this protective effect was particularly pronounced for older adolescents. Previous research has demonstrated the efficacy of parents setting strict rules aimed at postponing the onset of drinking (Koning et al., 2009; 2017; Smit et al., 2008). The current findings confirm the relevance of explicit parenting for delaying the onset of drinking and show that clear non-drinking rules may still be efficient among older adolescents who spend increasingly less time under direct parental supervision (Dickson et al., 2015).

Interestingly, when looking at adolescents' weekly drinking levels, contrary to our previous cross-sectional study (Koning et al., 2017), we did not find main effects of either explicit or automatic parenting cognitions. This finding may be explained by the fact that the current study employed adolescent rather than parent-reported measures of drinking behavior. It has been well documented that parents may, due to recall biases and/or social desirability tendencies, underestimate their children's alcohol use as well as over-report their own level of strictness (Engels et al., 2007; Steinberg et al., 1994), leading to stronger associations among these constructs (Engels et al., 2007) than would have been found with adolescent reports. That being said, in the current study, we did find a significant interaction effect between automatic parenting cognitions and age, indicating that the protective effect of stricter automatic parenting on lower levels of weekly drinking was only observed among older adolescents. This is in line with the results of the previous study (Koning et al., 2017), which

showed that stricter automatic cognitions predicted a lower frequency of drinking among adolescents. Moreover, the average age of the current sample was slightly younger than that of the cross-sectional study, which may explain why, in the current study, the effect of automatic parenting cognitions on weekly drinking levels was only identified among older adolescents.

It has been suggested that once adolescents get older and start drinking (and experimenting with other substances; Hernandez-Serrano et al., 2021), explicit parenting may become less effective since adolescents demand more autonomy and spend more time with their peers, and factors such as the frequency and quantity of alcohol use become more apparent. Hence, contrary to the clear non-drinking rule to which parents may explicitly adhere when their children have not yet started drinking, for parents of drinking adolescents, it may be more difficult to effectively deal with their children's drinking behavior. In fact, relatively little is known about effective parenting strategies to diminish the amount of drinking in comparison to the onset or frequency of drinking. However, we argue that the influence of parents is not diminishing. Instead, as the previous (Chassin et al., 1986; Koning et al., 2017) and current results suggest, parental influence remains important across adolescent development and may in fact be subject to change, with explicit parenting behaviors becoming less and automatic parenting cognitions becoming more important over the course of adolescence.

This study is the first to demonstrate that automatic and explicit parenting cognitions differentially predict adolescent drinking behavior over time. However, some limitations of the study design should be noted. First, the sample size of the current study was quite small. More research using larger samples would thus be needed to substantiate our claims. Moreover, our results are based on a convenience sample and may therefore be influenced by sample selection bias. As the attrition analyses indicate, the included adolescents reported

relatively low levels of drinking and relatively high levels of parental rule-setting about alcohol use. The relatively low levels of drinking may have contributed to the significant effects of parenting particularly among older adolescents and boys as they drink more alcohol and thus more variance can be explained. Thus, the reported effects may be different among more at-risk groups of adolescents. However, if anything, this selective attrition means that our findings may be considered conservative. Furthermore, a large percentage of participating parents were female (71%). It is known that father and mothers use different parenting skills (Biblarz & Stacey, 2010) and impact their child's wellbeing in different ways (e.g. McKinney & Renk, 2008). Future research should include a sample of adolescents covering a larger span across adolescence, including a more balanced sample of mothers and fathers. Second, our measure of automatic parenting cognitions is relatively new. More research is needed to establish the validity of the RRT to capture automatic parenting cognitions. Third, although our longitudinal design enabled us to study changes in drinking behavior predicted by differences in parenting cognitions, it does not have the same internal validity as experimental designs. Hence, no inferences about causality can be made. Moreover, the time frame between the two waves were six months only. In six months, not much change can be expected in adolescents' level of drinking, so therefore future longitudinal studies could investigate the role of automatic and explicit parenting cognitions on adolescents' alcohol use over a larger time span. Last, current findings only apply to the parenting cognitions and behavior among Dutch parents, which can therefore not be generalized as such to other contexts (i.e. countries). Research has shown that e.g. norms about alcohol are not uniform within a single country (Anderson et al., 2018), let alone between countries, due to amongst other things, different alcohol policies. Replication of the current study among parents from different countries would be needed.

Despite these limitations, we believe this study has important theoretical and practical implications. First, our results confirm that automatic parenting processes can be captured using an indirect measure, and that these automatic processes are unique in their nature as well as their relationship with adolescent drinking behavior. This insight may form the basis of a much broader research line aimed at uncovering the relationship between automatic parenting processes and offspring behavior beyond the domain of alcohol use (Koning et al., 2017). Second, the current findings show that automatic parenting cognitions are uniquely related to the alcohol use of drinking adolescents, even in predicting changes in drinking behavior over time. In fact, our results suggest that automatic cognitions may be more important than explicit parenting when targeting adolescents' amount of drinking. For the development and refinement of intervention programs aimed at reducing alcohol use in adolescence, it is therefore of critical importance for the role of automatic parenting processes to be addressed. For example, parents should be made aware of their remaining influence across adolescence. This may influence their self-efficacy and subsequent involvement in explicit parenting behaviors. Third, our findings suggest that strict parenting is effective in delaying the onset and reducing the amount of alcohol use, even among older adolescents. This finding is especially relevant in the context of the increase of the legal drinking age from 16 to 18 years in the Netherlands in 2014. Thus, the role of parents in adolescents' alcohol use should not be underestimated once adolescents are older and have already initiated drinking. We argue that the influence of parents is subject to change as a function of adolescents' age, with a prevailing role of automatic parenting over explicit parenting.

Data Availability Statement

Data available on request from the first author.

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