

Don't Worry! Parental Worries, Alcohol-Specific Parenting and Adolescents' Drinking

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Abstract In the present study precursors (risk behavior, parental self-efficacy and parental awareness) of parental worries about their child's behavior during adolescence (12–16 years) were examined. To this end, a new measure of parental worries about the child's involvement in risk behavior is developed. Second, the effect of parental worries on adolescents' alcohol use was tested and third whether ineffective alcohol-specific parenting mediated this effect. Longitudinal data including four waves from 703 parent–adolescent (M age = 12.2 years, $SD = 0.5$) dyads were used to conduct latent path and growth analysis in Mplus. Results showed that parental awareness, confidence in the effectiveness of their parenting practices and adolescent risk behavior at age 12 related to higher levels of worries in parents. Furthermore, more parental worries predicted an increase in adolescents' drinking (slope), yet worries did not predict the amount of drinking at age 12 (intercept). In addition, parental worries predicted less restrictive rule setting and a lower quality of communication. This ineffective parenting accounted for the effect of parental worries on adolescent alcohol use. In conclusion, this study demonstrated that worries about risk behavior of their child uniquely contribute to higher drinking rates due to less effective parenting. These findings implicate that alcohol interventions should provide parents with effective leads to tackle the drinking behavior in their children (e.g. strict rules about alcohol).

Keywords Parental worries · Alcohol-specific parenting · Adolescents · Self-efficacy · Longitudinal design

Introduction

Nearly all parents are concerned about their child's lives and development. Given the developmental phase of adolescence, an increase in risk behavior (e.g. alcohol use, skipping school) in this particular period is considered to be normative behavior (Steinberg 2005). For example, at the age of 15 most Dutch adolescents have started drinking alcohol of whom 52 % drink on a weekly basis (Verdurmen et al. 2012). Therefore, parents of a youngster that reaches adolescence are prone to an increase in worries about their child's drinking behavior; they may think about the drinking behavior that their child may get involved in the future (Borkovec et al. 1998). Parents may ask themselves what they can or should do to prevent early drinking in their offspring. In this study we aim to get insight into the phenomenon of parental worries; how do worries relate to adolescents' alcohol use and alcohol-specific parenting practices.

Worry is an emotion elicited by negative thoughts about possible future occurrences that are often connected to past experience (Muris et al. 2000). As to our knowledge, little is known about parents who worry about the risk behavior, such as drinking alcohol, of their child. Based on theories on anxiety and assuming that worry is a key feature of anxiety disorders (Beck et al. 2001), two cognitive processes are distinguished that may also apply to worries in parents; threat appraisal and coping appraisal. For example, according to the protection motivation theory (PMT; Rogers 1975; Tanner et al. 1991) the level of parental worries relies on the risk estimated by parents that their

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child will engage in risk behavior and the perception of parents to be able to influence their child's risk behavior, e.g. drinking behavior. That is, parents who have reasons to believe that their child will engage in alcohol use, due to for example prior risk behavior, are more likely to worry about their child getting involved in other risk behaviors as well (threat appraisal). Moreover, parental awareness of the adolescent's risk behavior also makes parents worry more (Bogenschneider et al. 1998; Carroll et al. 1999). In addition, parents who do not feel capable (efficacious) of influencing this drinking behavior (coping appraisal), are also more likely to exhibit enhanced levels of worries. Thus, based on PMT, the first hypothesis of the current study is to test whether prior risk behavior of the adolescent and parents' perceived self-efficacy and awareness are important predictors of parental worries about adolescents' risk behavior.

The second interest of this study is to examine what parents do with their worries in terms of alcohol-specific parenting. Whereas a moderate level of worries can be effective with regard to effective parenting, high levels of worry may impede parents from acting effectively (Maloney et al. 2011). That is, highly worried parents would have problems with translating their worries into behavior (Borkovec et al. 1983; Roser and Thompson 1995). However, in contradiction to this possible result, Bogenschneider et al. (1998) examined parental worrying in relation to adolescents' drinking and showed that worried parents are more likely to discuss the risks of engaging in alcohol use with their child. Thus, in the study of Bogenschneider et al. worrying seems to drive parents to talk more frequently about the risks involved in drinking, probably in an attempt to change their children's behavior. Furthermore, Wilson et al. (2011) demonstrated in a sample of children with anxiety disorders that parental worry related to more anxious rearing as reported by the child, and to higher levels of parent reports of control and rejection, but not warmth. These findings indicate that parents' worries somehow get across to their children. It is suggested that it should be explored how children perceive their parents' worries and what further impact this has on their behavior (Wilson et al. 2011). It is important to discuss these findings in the light of what is known about effective parenting with regard to alcohol use.

Mainly through restrictive parenting, i.e. setting strict rules, parents can exert influence on the drinking of their children. There is a large body of evidence showing that restrictive rule setting helps to prevent adolescents from early (onset of) alcohol use (Jackson et al. 1997; Koning et al. 2011; Van der Vorst et al. 2005; Yu 2003). With respect to parental communication about alcohol, the associations with adolescent alcohol use are less obvious. Most studies showed that communicating more frequently

about alcohol use is related to enhanced levels of alcohol use (Ennett et al. 2001; Spijkerman et al. 2008; Van den Eijnden et al. 2011; Van der Vorst et al. 2005; Van der Vorst et al. 2010). A second aspect of parent-child communication which has been studied with respect to adolescents' alcohol use is the quality of communication. Overall, studies have shown a consistent pattern, with lower rates of substance use (Den Exter Blokland et al. 2009; Otten et al. 2007; Spijkerman et al., 2008) related to a better quality of parent-child communication, although, until now, no longitudinal evidence for this association has been found regarding alcohol use (Van den Eijnden et al. 2011). Thus, previous research suggests that an effective way to deal with worries would be to have qualitative good parent-child conversations about alcohol use instead of very frequent (less qualitative) conversations. Thus, it is expected that parents who are highly worried about their child show less effective alcohol-specific parenting behavior, represented by less restrictive rule setting, a lower quality and a higher frequency of communication. In turn, this ineffective parenting is expected to increase the amount of alcohol use.

Current Study

The aims of the current study are threefold. First, the concept of parental worries about their child's behavior is explored by examining precursors of different levels of worries in parents during adolescence (12–16 years). To this end, a new measure of parental worries about the child's involvement in risk behavior is developed and included in this study. Based on the protection motivation theory (PMT; Rogers 1975; Tanner et al. 1991), it is expected that adolescent risk behavior, parental self-efficacy and parental awareness predict more worry in parents. Second, we test the effect of parental worries on adolescents' alcohol use. As it is expected that highly worried parents show less effective parenting, we assume that more parental worries relate to higher levels of drinking among adolescents. Third, we examine to what extent parental worries influence their alcohol-specific parenting (rules, frequency and quality of communication about alcohol) and whether this accounts for the effect of parental worries on adolescents' drinking. Based on earlier research, we expect that parents who worry more about the behavior of their child, communicate more frequently about alcohol use, but not in a more qualitative context. Moreover, since worrying may stop parents from undertaking action, we expect that worried parents set less restrictive rules regarding alcohol use than non-worried parents. It is expected that ineffective parenting mediates the relation between parental worries and adolescents' alcohol use. A

longitudinal sample of 703 early adolescents and their parents, followed over a period of 4 years is used to test the expectations.

Method

Design and Procedure

The current study is part of a larger alcohol prevention randomized trial (see Koning et al. 2009), wherein 19 schools were randomly selected and assigned to either of the three intervention conditions, or the control condition. For the purpose of this study, only adolescents and parents who were assigned to the control condition were included in current analyses. The baseline data (T1) were collected at the beginning of the first year in secondary school (September/October 2006). The first (T2) follow-up was 10 months later in May/June 2007, again in May/June 2008 (T3) and May/June 2009 (T4). Questionnaires for parents and letters for consent were sent to their home addresses. This letter informed parents about the participation of the school in the project and parents were given the opportunity to refuse participation of their child (0.01 % refusal). Non-responding parents were reminded after 3 weeks by a letter and after another 2 weeks by phone. Trained research assistants administered digital questionnaires to adolescents in the classroom. As a result of a lack of individual or parental consent adolescents were allowed to refuse participation when data was collected.

Participants

Nine secondary schools, including 935 adolescents were selected to participate in the study. Due to initial non-response ($n = 29$) in adolescents and parents ($n = 184$), 722 parent–child dyads participated in the first wave. Another 19 adolescents were omitted in the analyses due to unreliable data on the alcohol items. This resulted in 703 parent–child dyads eligible for analyses.

The adolescent sample had a mean age of 12.19 ($SD = 0.5$), including 53 % boys and 47 % girls, 60 % in lower secondary vocational education (low education) and 40 % in higher general secondary and pre-university education (high education). Most of the responding parents were female (81.9 %). Most mothers (79 %) and fathers (74.0 %) had low educational levels (only vocational training).

Attrition Analyses

A total of 843 adolescents (95.5 %) at T2, 783 adolescents (88.7 %) at T3 and 764 adolescents (86.5 %) at T4, stayed

in the program and completed the follow-up assessments after ten, 22 and 34 months respectively. Also a total of 618 parents at T2 (87.9 %), 532 parents at T3 (75.7 %) and 496 parents (66.7 %) at T4 participated in the study.

Attrition analyses on demographic variables and alcohol use indicated that responding adolescents at T3 and T4 were more likely to be younger (T3: $t = 2.65$, $p = 0.01$; T4: $t = 2.73$, $p = 0.01$), were more often in lower education (T3: $\chi^2(1) = 18.24$, $p < 0.00$; T4: $\chi^2(1) = 16.67$, $p < 0.001$), and drank a lower average number of alcohol beverages per week at baseline (T3: $t = 4.67$, $p < 0.00$; T4: $t = 4.30$, $p < 0.00$). At T2, no significant differences were found on these characteristics. At T2, adolescents of participating parents reported a significantly higher quality of communication ($t = 3.79$, $p = 0.02$). At all other follow-up measurements no differences were found between responding and non-responding parents with respect to their rules and communication about alcohol use.

Measures

Except for parental worries, parental awareness and self-efficacy, all measures were reported by the adolescent. Parental self-efficacy, awareness and adolescent risk behavior was measured at baseline only; all other variables were assessed at four waves.

Parental worries were measured by asking parents how often they worry about whether their child (1) will start using drugs (2) will not complete school (3) will get in contact with the police (4) will hang around with ‘bad’ peers and (5) whether parents worry about the (future) alcohol use of their child. Parents responded on a 5-point scale from 1 ‘never’ to 5 ‘very often’. The mean score on these items describe the level of parental worries about the child with higher scores indicating more parental worries. The inter-item correlations between the five items measuring parental worries show moderate correlations ranging from 0.42 to 0.65 (Table 1). A one-factor confirmatory factor analysis (CFA) indicated high factor loadings on all worry items across all waves (ranging from 0.77 to 0.98). The model showed bad to moderate model fit ($\chi^2(df) = 833(163)$, $p < 0.00$; CFI = 0.86; RMSEA = 0.07). In addition, the reliability of the scale across four waves shows high reliability ($\alpha = 0.84–0.87$), which indicated that the set of worry items measured a single latent construct, i.e. parental worries about their child’s behavior.

Adolescents’ alcohol use was measured by using the Quantity-Frequency measure, a frequently used and valid measure to assess the average weekly alcohol use (Rehm et al. 1999; Van der Vorst et al. 2006). Frequency was measured by asking the number of days the adolescent usually drank on weekdays (Monday to Thursday) and weekend days (Friday to Sunday) (Engels and Knibbe

Table 1 Description and inter-correlations among the worry items

Worry items	1.	2.	3.	4.	5.
<i>How often do you worry about...</i>					
1. ...whether your child will start using drugs	X	0.56***	0.57***	0.64***	0.60***
2. ...whether your child will not complete school	0.47***	X	0.65***	0.52***	0.49***
3. ...whether your child will get in contact with the police	0.56***	0.58***	X	0.60***	0.57***
4. ...whether your child will hang around with 'bad' peers	0.53***	0.46***	0.56***	X	0.55***
5. ... the (future) alcohol use of your child	0.51***	0.42***	0.50***	0.46***	X
Cronbach's Alpha across the four waves	0.87	0.84	0.85	0.84	X

Under the diagonal line reflect the lowest correlations, above the diagonal line the highest correlations within the four waves

*** $p < .000$

2000). Quantity was measured by asking how many glasses of alcohol the adolescent usually drinks on a weekday and weekend day (Engels et al. 1999). Quantity-Frequency was computed by calculating the products of the number of days and the number of glasses, then summing the two products for weekdays and weekend days.

Rules about alcohol measured the degree of rule-setting of parents regarding alcohol use of the adolescent as perceived by the adolescent (Van der Vorst et al. 2005, 2006). Items included "I am allowed to have one glass of alcohol when my parents are at home", "I am allowed to drink several glasses of alcohol when my parents are not home" and "I am allowed to drink alcohol at a party with my friends." It consisted of the mean of ten items rated on a 5-point scale from 1 'never' to 5 'always' reversely scored, i.e. higher scores indicate more rule-setting behavior. Cronbach's alphas ranged from 0.81 to 0.94.

Frequency of communication about alcohol referred to how often in the past 12 months the adolescent indicated that the parent had talked with him/her about specific alcohol-related issues, such as the negative consequences of use, rules about alcohol use, discipline, telling the adolescent not to use, media portrayal of alcohol, and ways to resist peer pressure (Ennett et al. 2001; translated and adapted by Van der Vorst et al. 2005). We reduced the scale to six items (cf. Spijkerman et al. 2008) including a 5-point scale from 1 (never) to 5 (very often). Higher scores indicate higher frequency of communication. Cronbach's alpha ranged from 0.88 to 0.90.

Quality of communication about alcohol was measured by asking the adolescents' perceptions of the quality of communication about alcohol with their parents (Spijkerman et al. 2008). Items included "My parents and I are interested in each other's opinion regarding alcohol use", "If my parents and I talk about alcohol, I feel understood". The mean of six items rated on a 5-point scale ranging from 1 (not at all) to 5 (very much) was used. Higher scores indicate a higher quality of communication. Cronbach's alpha ranged from 0.79 to 0.86.

Parental self-efficacy assessed the level of confidence a parent has in one's own ability to prevent their child from drinking. The original five-item scale for smoking was developed by Engels and Willemsen (2004), but was adjusted for alcohol use by Van der Vorst et al. (2005) into a four-item scale. We excluded one item because of the young age of the adolescents ('Would your child listen if you tell him/her that you'd prefer that he/she not gets drunk?'). Other items are: 'If you undertake actions to curb your child's drinking, would they be effective?', 'Do you think you can stop your child from becoming drunk?' and 'Would your child accept your suggestions about not drinking too much?' The scale consists of five response categories ranging from 1 (*definitely not*) to 5 (*definitely*) and was measured at baseline only. For clarity reasons in the description of the data, the sample was divided into parents with a low (0) and high (1; 43.2 %) self-efficacy based on the median (3.6). In all subsequent analyses, the continuous scale was taken into account. The reliability was 0.67.

Risk behavior was measured by using the conduct problems subscale of the strength and difficulties questionnaire (SDQ; Goodman et al., 1998), translated by Van Widenfelt et al. (2003). The scale consisted of the sum of five items rated on a 3-point scale from 0 'not true' to 2 'certainly true', for example, "I get very angry and often lose my temper". In the description of the data this variable is recoded based on the median into a dichotomous variable representing adolescents with (1; 22 %) and without risk behavior (0) In all subsequent analyses, the continuous scale was taken into account. The reliability was 0.54.

Parental awareness was measured by asking parents whether their child had ever drunk alcohol. Parents responded on a five-point scale ranging from 1 (*no, never*) to 5 (*yes, multiple times a glass or more*). Our data showed that parents who reported that their child had ever drunk alcohol, have children who reported that their parents know that they have been drinking alcohol in 100 % of the cases. This indicates that when parents report that their child has

drunk alcohol can be considered as a proxy for parental awareness about their child's alcohol use.

Strategy for Analyses

First, to gain more insight into parental worries means and SD's were computed on parental worries over time in the total group and across subgroups (gender, level of education, risk behavior and self-efficacy of parents). Next, in an attempt to explore differential development of parental worries across groups of parents, latent class growth analysis (LCGA) was performed in Mplus 6.11 (Muthén and Muthén 2011) on parental worries measured at T1 to T4. LCGA is a person-centered statistical approach of identifying latent subgroups within a heterogeneous population that follow distinct trajectories over time for a given outcome that is measured repeatedly. The goal of LCGA is to identify the smallest number of latent classes that adequately describes the associations among the observed variables. We started with the most parsimonious 1-class model and fitted successive models with increasing numbers of classes.

What parents do with their worries in terms of alcohol-specific parenting and how this parenting behaviour effects adolescents' drinking was analyzed by using path models with latent variables of parenting practices and linear growth modeling (LGM) based on adolescents' drinking reported at four time points (T1, T2, T3, T4). Each of the latent variable, rule setting, quality and frequency of communication, contains four observed variables that represent the assessment of the parenting practice at each time point. In LGM, two latent factors (intercept and slope) were a result of the linear growth model. The intercept represents information in the sample concerning the mean and variance of the collection of individual intercepts that characterize each individual's growth curve. The linear slope has a mean and variance of the total sample, and represents the linear trend or slope of an individual's trajectory over time. The time scores for the slope growth factor are fixed, so that the intercept (zero time score) and the growth model parameterization could be estimated using Maximum Likelihood (ML; Muthén and Muthén 2011). The residual variances of the outcome variables are estimated and allowed to be different across time. First, the effect of parental worries (intercept) on adolescents' alcohol use (slope) was tested without inclusion of the parenting variables. To test whether this effect is mediated by their parenting we followed the steps as suggested by MacKinnon et al. (2002). First, the latent variables of alcohol-specific parenting practices were regressed on the intercept of parental worries. Second, the effect of alcohol-specific parenting on adolescents' alcohol use (slope) was analyzed while controlling for the effect of parental worries

(intercept). Last, it was tested whether the mediation effect was statistically significant by using the indirect command in Mplus (MacKinnon et al. 2002).

To test the unique contribution of parental worries to differences in parenting and alcohol use, prior adolescent risk behavior, parental self-efficacy and parental awareness were included in the model. We regressed the parental worries at T1 on these predictors. The full model (see Fig. 1) was tested while controlling for gender and level of education.

Missing data were handled by using full estimation maximum likelihood (Muthén and Muthén 2011).

Results

Descriptive Data on Parental Worries

Table 2 shows the means and standard deviations of parental worries at the different waves for the total group, boys and girls, adolescents in low and high levels of education and parents with a low and high self-efficacy.

Overall, the level of parental worries significantly decreases over time. In addition, parents seem to worry more about boys compared to girls at all waves (T1: $t = -3.46, p < 0.00$, T2: $t = -3.15, p < 0.00$, T3: $t = -3.56, p < 0.00$, T4: $t = -4.17, p < 0.00$). No significant differences have been found for the level of parental worries with respect to the level of education the adolescents are in. Furthermore, parents with a low self-efficacy worry significantly more than parents with a high self-efficacy at all waves (T1: $t = 5.97, p < 0.00$, T2: $t = 3.90, p < 0.00$, T3: $t = 3.74, p < 0.00$, T4: $t = 2.77, p < 0.00$). Last, parents seem to worry more at all waves (T1: $t = -4.57, p < 0.00$, T2: $t = -5.20, p < 0.00$, T3: $t = -3.68, p < 0.00$, T4: $t = -3.19, p < 0.00$) when their child reports more risk behavior at baseline.

Latent Class Growth Analysis of Parental Worries

The LCGA model fit statistics showed that the two-class solution was not significantly better than a one-class solution. Though the Entropy was high ($H = 0.98$), the Lo Mendell Rubin Likelihood Ratio test showed that a two-class solution did not significantly fit the data more than the one-class solution (LMR LRT = 58, $p = 0.29$). As a result, based on the level of parental worries, the adolescent and parent population should be treated as one group. The average score of parental worries at time 1 (intercept) is 1.8 (0.02) and declines slightly, yet significantly over time (slope = $-0.01, p = <0.001$). The low variance in the slope (0.000) is in line with the homogenous group of parents that resulted from the LCGA analysis. This

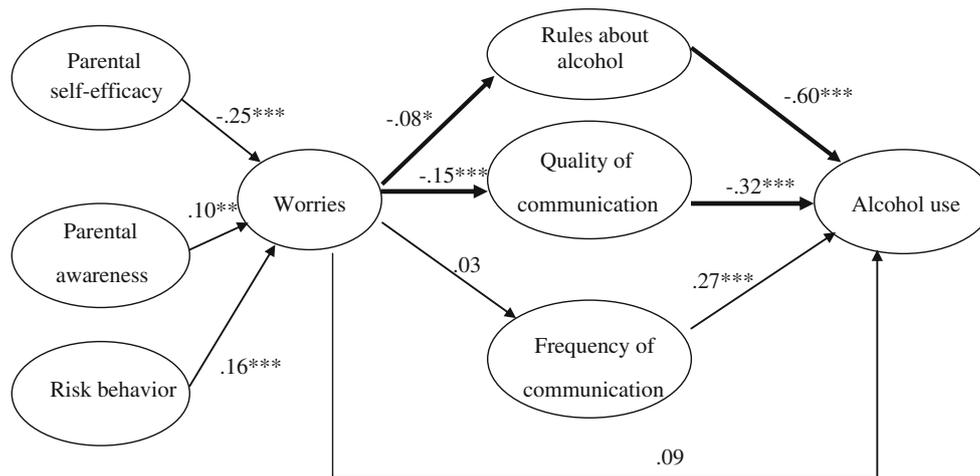


Fig. 1 Predictors of parental worries and mediation analyses of parental worries on adolescent alcohol use through frequency of communication, rules about alcohol use and quality of communication. *Bold arrows* indicate significant mediation. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Model fit: $\chi^2 = 372(153)$, $p < 0.00$; CFI = 0.91; RMSEA = 0.05

Table 2 Means and SD's of parental worries for the total group, across gender, level of education, risk behaviour and self-efficacy

	Total	Gender		Level of education		Risk behavior		Self-efficacy	
		Girls	Boys	Low	High	Low	High	Low	High
Parental worries T1	1.90 (0.67) _a	1.81 (0.64)	1.99 (0.69)*	1.94 (0.69)	1.86 (0.65)	1.84 (0.64)	2.12 (0.76) [‡]	2.04 (0.67)	1.74 (0.63) [†]
Parental worries T2	1.83 (0.61) _{a, b}	1.75 (0.57)	1.90 (0.63)*	1.83 (0.63)	1.83 (0.58)	1.76 (0.59)	2.08 (0.61) [‡]	1.91 (0.62)	1.71 (0.57) [†]
Parental worries T3	1.80 (0.58) _c	1.70 (0.57)	1.88 (0.58)*	1.82 (0.59)	1.77 (0.57)	1.76 (0.56)	1.99 (0.61) [‡]	1.88 (0.60)	1.68 (0.55) [†]
Parental worries T4	1.76 (0.60) _d	1.63 (0.53)	1.87 (0.64)*	1.79 (0.62)	1.74 (0.59)	1.71 (0.56)	1.93 (0.70) [‡]	1.83 (0.64)	1.67 (0.52) [†]

In the total group, comparisons are made over time. Means that do not share subscripts differ at $p < 0.05$

* Significantly different from girls at $p < 0.05$

[‡] Significantly different from adolescents with low risk behavior at $p < 0.05$

[†] Significantly different from parents with a low self-efficacy at $p < 0.05$

indicates that the development of worries over time is similar for all parents and can therefore not be differentially predicted by specific variables.

Predictors of Parental Worries

Regression analysis of parental worries (intercept and slope) on risk behavior, parental self-efficacy and parental awareness, while controlling for gender and level of education revealed significant predictors (Table 3). The intercept of parental worries is significantly predicted by risk behavior of their child ($\beta = 0.17$, $p < 0.001$), their perceived self-efficacy ($\beta = -0.32$, $p < 0.001$) and awareness of their child's alcohol use ($\beta = 0.14$, $p = 0.01$). That is, more adolescent risk behavior, a lower self-efficacy and

more parental awareness predicts a higher level of parental worries. No significant predictors are found for the development (slope) of worries in parents, which can be explained by the homogenous development of worries in parents represented by the variance of zero.

Parental Worries and Adolescents' Alcohol Use

The direct effect of parental worries on adolescents' alcohol use is tested without the inclusion of alcohol-specific parenting factors. Parental worries did not significantly predict the intercept of adolescents' alcohol use ($\beta = 0.05$, $p = 0.47$) yet, more parental worries did significantly predict a stronger increase in drinking among adolescents ($\beta = 0.30$, $p < 0.001$).

Table 3 Linear regression analyses of parental worries (intercept and slope) on gender, level of education, risk behavior, parental self-efficacy and parental awareness measured at baseline

N = 703	Intercept			Slope		
	B	β	CI	B	β	CI
Gender	0.12**	0.12	0.03–0.21	0.01	0.13	0.00–0.01
Level of education	–0.07	–0.07	–0.16–0.02	0.01	0.17	–0.00–0.01
Risk behavior	0.09***	0.17	0.04–0.15	0.00	–0.04	–0.00–0.00
Parental self-efficacy	–0.24***	–0.32	–0.32–0.17	0.00	0.14	–0.00–0.00
Parental awareness	0.07***	0.14	0.02–0.12	–0.00	–0.24	–0.00–0.00

** $p < .01$ *** $p < .000$

Testing the Full Model: Predictors, Parental Worries, Alcohol-Specific Parenting and Adolescents' Alcohol Use

Figure 1 shows the relations between predictors and parental worries, parental worries and alcohol-specific parenting, and alcohol-specific parenting and adolescents' alcohol use. The model showed a moderate model fit (χ^2 (df) = 372(153), $p < 0.00$; CFI = 0.91; RMSEA = 0.05).

More parental awareness ($\beta = 0.10$, $p = 0.01$), a lower self-efficacy ($\beta = -0.25$, $p < 0.00$) and higher levels of adolescents' risk behaviour ($\beta = 0.16$, $p < 0.00$) significantly related to more parental worries.

Parental worries predicted less restrictive rule setting ($\beta = -0.08$, $p = 0.05$) and a lower quality of communication ($\beta = -0.15$, $p < 0.00$). Frequency of communication was not influenced by the level of parental worries ($\beta = 0.03$, $p = 0.46$). Rules about alcohol ($\beta = -0.60$, $p < 0.00$), quality ($\beta = -0.32$, $p < 0.00$) and frequency of communication about alcohol ($\beta = 0.27$, $p < 0.00$) did, whereas parental worries ($\beta = 0.09$, $p = 0.09$) did not significantly change the development of adolescents' alcohol use. The indirect effects of parental worries on adolescents' drinking via rule setting (indirect effect = 0.05, $p = 0.05$) and quality of communication about alcohol use (indirect effect = 0.05, $p = .01$) were statistically significant. That is, less restrictive rule setting and a lower quality of communication account for the effect of parental worries on adolescents' alcohol use. The model explained 45 % of the variance in the development of drinking among adolescents and 11 % of the variation in parental worries.

Discussion

The focus of this study was to gain more insight into the concept of parental worries about the child's behavior. To this end, a new reliable measure of parental worries was

developed. The findings show that parents with a lower self-efficacy, more awareness of their child's drinking and those with offspring who report more risk behavior report elevated levels of worries (cf. PMT theory). Furthermore, parental worries predict less effective alcohol-specific parenting and a stronger increase in adolescents' subsequent alcohol use.

Parental Worries

The first aim of the study was to examine precursors of parental worries in order to get a better understanding of this cognitive process in parents. First, it was shown that worries about the child's risk behavior are a relatively stable and thus trait-like behavior. That is, the level of parental worries decreases slightly and this decrease over time is similar for all parents. This indicates that highly worried parents can be identified early in adolescence as highly worried parents of 12-year old adolescents are also the ones that worry a lot up to age 15. It is crucial to be able to identify the highly worried parents as these worries in parents predict a higher level of drinking in their offspring.

Precursors of Parental Worries

The current study showed that the protection motivation theory (PMT; Rogers 1975; Tanner et al. 1991), that originates from anxiety disorder research, is also applicable to a phenomenon that is apparent in most parents, namely parental worries about their child's risk behavior. The two cognitive processes that are distinguished in anxiety research, threat appraisal and coping appraisal play also a role in the manifestation of parental worries. That is, in line with previous research (Bogenschneider et al. 1998; Carroll et al. 1999) a higher risk estimated by parents that their child will engage in alcohol use (exemplified by adolescents' prior risk behavior) and the perception of parents not to be able to influence their child's drinking behavior respectively predict how much parents worry about their child. In turn, parental

worries are related to the development of drinking during adolescence, but not with the alcohol use at age 12. This indicates that parents anticipate on their child's drinking by showing elevated levels of worry prior to actual drinking. Previous risk behavior and the uncertainty parents have regarding the effectiveness of their rearing practices evidently contribute to the worries parents have about their child. Indeed, these worries seem to be grounded as adolescents of worried parents increase their rate of drinking more rapidly. Thus, worries in parents predict an increase in adolescents' alcohol use from age 12 to 15, and parents' self-efficacy and adolescents' risk behavior plays an important role in this.

Parental Worries, Alcohol-Specific Parenting and Alcohol Use

The third aim of the study was to investigate what parents do with their worries in terms of alcohol-specific parenting (i.e. frequency and quality of communication and rules about alcohol use). This study showed that parents who worried more, showed less effective parenting behavior. That is, they set less restrictive rules, and had less qualitative conversations about alcohol with their child, whereas the frequency of communication was not influenced by worries of parents. This finding is in contrast with the cross-sectional study of Bogenschneider et al. (1998) who found that more worries were related to a higher frequency of communication. However, Bogenschneider et al. (1998) used a measure that reflected the communication about a variety of risk behaviors with higher scores indicating to have spoken with both parents instead of a more frequent communication as was used in the current study. The present study, thus, showed that with respect to the frequency of communication about alcohol this finding could not be replicated. The current study, however, is in agreement with previous studies on general worries (Borkovec 1983) and anxiety research (Maloney et al. 2011), showing that worried parents did not undertake action neither by communicating more frequently nor by setting restrictive rules for drinking. In addition, the quality of communication decreased when parents worried more. Thus, worries seem to withhold parents from effective parenting behavior. This leniency in parents and the low quality of parent–child communication eventually results in higher rates of drinking in their offspring (Jackson et al. 1997; Van der Vorst et al. 2005, 2006; Yu 2003). These findings demonstrate that parental worries are an important concept in the understanding of alcohol-specific parenting.

Taking into account that self-efficacy is a strong predictor of parental worries, it is likely that the low self-efficacy in worried parents makes it difficult to set restrictive rules and have qualitative conversations. It seems that parents who worry about their child's activities are reluctant to set rules

about alcohol and find it difficult to talk about alcohol in a qualitative manner due to feelings of incompetence. This finding is an important lead for the development of future alcohol prevention programs involving parents. Teaching parents about ways to effectively influence their offspring's alcohol use, for instance by setting strict rules, may not resolve their worries directly, but may increase their actual parenting behavior, and may thereby diminish the impact of worries on adolescents' alcohol use.

Limitations and Strengths

In light of the strengths of this study, such as the innovative topic, the large sample size and the use of multi reports, some limitations should be addressed. First, though longitudinal data on parental worries is available, only the intercept of parental worries is included in the current analysis. While we had good reasons for doing so, such as the homogeneous development of worries in parents, and the low variance, overall it is more informative to include multiple waves. This may also have resulted in the relatively low fit of the tested models. As we attempted to get a better insight in the concept of parental worries, we found it informative to include the results of the originally planned analysis (growth modeling). However, future analysis may use a composite measure of parental worries reported at multiple waves. Second, parental worries reflect worries of parents about a variety of child behaviors (i.e. alcohol use, skipping school), whereas parenting behavior concerns alcohol-specific parenting. A measure that consists of multiple items is considered to be more robust than a single item measure. Therefore, we decided to use a newly developed general parental worry scale, which showed to have a high internal validity. In this regard it should be noted that an additional analysis with the alcohol-specific worry item only yielded similar outcomes, indicating that worries in parents reflect a general pattern of worries about their child. This study provided a first glance in the concept of parental worries and future research examining parental worries in relation to a broader array of child and parenting behaviors is desired. Third, predictors of parental worries as well as parental worries included in the tested model were assessed at one time-point, ruling out the possibility to infer causal relations. Fourth, current findings are based on adolescents' self-reports, whereas other methods such as cross-reports or diary reports may have yielded more reliable data. However, self-reports have been found to be fairly reliable (Koning et al. 2009; Wagenaar et al. 1993), and other methods are rather expensive when using large samples. Fifth, adolescents participated in this study from age 12 to 16. Though this is an important period in the adolescent development (Steinberg 2005), it would be interesting to examine precursors of parental worries before the age of 12. By doing so, important targets for prevention earlier in childhood may be detected.

Implications

The current study has a number of implications that should be discussed. More insight is gained into the concept of parental worries and its relation to parenting behavior and adolescents alcohol use. In conjunction with a low degree of self-efficacy about the effectiveness of one's parenting behavior, worries of parents result in less effective parenting and more alcohol use among adolescent children. Therefore, parents should be made aware of their possibilities to influence their child's behavior, for example by prohibiting underage drinking within a high quality communication context. A Dutch alcohol prevention program (PAS: Koning et al. 2009) effectively postponed the onset of drinking by increasing restrictive rule setting in parents (Koning et al. 2011). Yet, the current findings indicate that, apart from pointing at the relevance of strict rules, parents should also be made aware of the importance of qualitative parent-child conversations about alcohol. Particularly since previous research has shown that strict rules are most effective when combined with qualitative communication about alcohol (Koning et al. 2012).

Conflict of interest The authors declare that there is no conflict of interest.

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