Correspondence in collateral and self-reports on alcohol consumption: A within family analysis

Rutger C.M.E. Engels a,⁎, Haske Van Der Vorst a, Maja Deković b, Wim Meeus b

a Behavioral Science Institute, Radboud University Nijmegen, P.O. Box 9104, 6500 HE Nijmegen, The Netherlands
b Department of Child and Adolescent Studies, Utrecht University, The Netherlands

Abstract

The present study tests the degree to which parents and children correspond in their reports on each others quantity and frequency of alcohol consumption. Furthermore, the degree of inaccurate estimation by parents might be related to inappropriate parenting. Particularly, parents who have little control over and knowledge of their offspring’s activities and whereabouts might underestimate adolescent alcohol consumption. A full family design was employed in which both parents and two adolescents were included. A total of 428 Dutch families participated and filled in questionnaires at home in the presence of a trained interviewer on frequency and quantity of drinking. Findings showed that parents as well as children underestimate alcohol consumption of each other, in particular concerning the quantity of drinking. It appears that parents are better able to accurately estimate when their child is not drinking than when their child is drinking. Children on the other hand are better able to predict frequency and quantity of parental drinking, but not parental heavy drinking. Finally, parental underestimations of adolescent drinking are indeed related to lack of parental knowledge and control. However, this was primarily found among mothers. In conclusion, survey studies using collateral reports on parental and adolescent drinking should acknowledge the fact that in most cases family members underestimate alcohol consumption.

© 2006 Elsevier Ltd. All rights reserved.

Keywords: Alcohol use; Parents; Adolescents

1. Introduction

In research on adolescent alcohol consumption, assessment of drinking habits is usually conducted by administering retrospective self-reports. There is substantial evidence that adolescent actual alcohol...
consumption can be accurately assessed by self-reports, in particular when conditions of confidentiality and anonymity are met (e.g., Brener, Billy, & Grady, 2003; Brown, Kranzler, & Del Boca, 1992; O’Farell & Maisto, 1987). Still, collateral reports are often employed to verify the accuracy of adolescent self-reports on alcohol use and misuse (Connors & Maisto, 2003; Donohue et al., 2004; Johnson & O’Malley, 1997) because describing the degree of correspondence between collateral and self-reports provides insight into the convergent validity (Connors & Maisto, 2003). In the current study, we examine the correspondence between adolescent and parental reports on frequency and quantity of their alcohol consumption.

Collateral reports of parents, peers or teachers are often used to gather data on adolescent engagement in problem behaviors, such as depression, anxiety, aggression and delinquency (e.g., Mesman & Koot, 2000). Fewer studies specifically concentrated on whether parental reports can be employed to obtain data on their offspring drinking behaviors. It is relevant to examine the validity of parental reports because of (1) the increase in empirical studies using data from parents themselves on parental factors and the development of drinking in adolescents (Darling & Cumsille, 2003; Ennett, Bauman, Foshee, Pemberton, & Hicks, 2001), (2) the increasing number of primary prevention programs in which adolescent outcomes are assessed through parents only (e.g., Koutakis & Stattin, 2004), and (3) data on underestimation or overestimation of adolescent drinking by parents might also be indicative of poor parenting practices.

To our knowledge, only a very limited number of studies tested the validity of parental reports on adolescent drinking. In a study among 184 drug-abusing and conduct-disordered adolescents, Donohue and co-workers (2004) found high intercorrelations between parental and adolescent reports on alcohol use using retrospective assessment of drinking. In terms of mean levels of alcohol use, however, in approximately 50% of the cases, parental and offspring reports corresponded. In general, parents were more likely to underreport drinking in their children. In a study on food and alcohol intake among 47 students and their parents, Yatsuya et al. (2003) found moderate correlations between parent and adolescent reports on adolescent alcohol use. Looking at another relatively often used substance, nicotine, it appears that albeit parent and adolescent reports show moderate to high correspondence, inconsistencies are almost always due to parents underestimating their offspring engagement in cigarette smoking (Harakeh, Engels, De Vries, & Scholte, 2006).

On a theoretical level, inaccuracy of parents concerning adolescent drinking might be a signal of inappropriate parenting. In general, studies have shown that parents’ lack of knowledge regarding their child activities, and a lack of monitoring and supervision are related to engagement in delinquency (Kerr & Stattin, 2000), smoking (Harakeh, Scholte, De Vries, Vermulst, & Engels, 2004), and alcohol use (Ledoux, Miller, Choquet, & Plant, 2002). Perhaps when parents are not aware of their child’s drinking habits, this is imbedded in a more general pattern of parental disengagement and inattentiveness regarding child activities and needs. Furthermore, recent research underlines the relevance of parents enforcing rules on adolescent drinking in preventing early onset of drinking in youths (e.g., Van Der Vorst, Engels, Meeus, Van Leeuwe, & Dekovic, 2005). Data clearly show that, within families with no or limited rules on adolescent drinking, children are more likely to start drinking early and heavily. Parents errors in their reports on their child drinking might be reflected in lack of rules on drinking: If parents underestimate child drinking, they might not see the necessity to enforce rules on alcohol use. Finally, it is interesting to know whether heavy drinking parents are accurate in estimating their child drinking patterns. Since heavily drinking parents are less capable of adopting adequate child rearing practices (Barnow, Schuckit, Lucht, John, & Freyberger, 2002), it can be assumed that heavily drinking parents more strongly err in their reports on child drinking than abstaining or moderately drinking parents do. In summary, we
examined whether parenting skills and parental own drinking are related to discrepancies in adolescent and parent reports on adolescent drinking.

Several studies focus on the role of parental alcohol use and misuse in the development of adolescent drinking. Research focused on the direct effects of modeling (observational learning) on adolescent drinking (e.g., Akers, 1977; Reifman, Barnes, Dintcheff, Farell, & Uhteg, 1998; Yu, 2003) and on the (indirect) effect of parental drinking on selective peer affiliation (e.g., Engels, Knibbe, Drop, De Vries, & Van Breukelen, 1997; Engels & Van Der Vorst, 2003; Wood, Read, Mitchell, & Brand, 2004), on susceptibility to peer pressure (Fromme & Ruela, 1994; Li, Penz, & Chou, 2002), on alcohol expectancies and drinking motives (Blanton, Gibbons, Gerrard, Conger, & Smith, 1997; Gerrard, Gibbons, Zhao, Russell, & Reis-Bergan, 1999), and on parental alcohol-specific socialization practices (e.g., Jackson, Henriksen, & Dickinson, 1999; Van Der Vorst et al., 2005).1 In most surveys, self-report data of youth on their parental drinking habits are employed (see Darling & Cumsille, 2003). Although one might argue that the perception of children regarding their parental drinking is more relevant in predicting future adolescent drinking than the modeling behavior reported by parents (Marcus & Tisne, 1987), this line of reasoning has its drawbacks. If the modeling effects of parental drinking are only found in studies using collateral reports of children, the inevitable question concerning the implications for prevention is difficult to answer. Should we change the child distorted perceptions regarding their parental alcohol use (especially if they think that their parents drink more than actually is the case), should we make parents more aware of the misperceptions of their children, or should we still persuade parents to drink less because of the evident modeling effects on their children?

In the field of parental alcoholism and problem drinking, several studies have focused on the validity of child reports on the history of alcoholism within the family using extensive interview data (e.g., Andreasen, Endicott, Spitzer & Winokur, 1977; Merikangas et al., 1985), assessment of alcohol related problems by questionnaires (Cuijpers & Smit, 2001), the Short Michigan Alcoholism Screening Test (e.g., Roosa, Michaels, Grobbenbacher, & Gersten, 1993), or the CARTA Family Alcoholism History Questionnaire (Rhea, Nagoshi, & Wilson, 1993). However, only a few studies have been concentrated on the validity of adolescent and young adult reports of parental drinking habits in non-problem drinkers or alcohol abusers (see review on collateral reports of Connors & Maisto, 2003). In a small scale study of 49 students and their parents, O’Malley, Carey, and Maisto (1986) showed moderate associations between student reports on parental frequency and quantity of consumption and parental own reports. In a study among 177 adolescents and their parents, Smith, Miller, Krol, Simmons, and Gallen (1999), however, found no to small correspondence in drinking reports (quantity and frequency) of children and their parents. In general, children appeared to underestimate parental drinking behavior. Their findings were age-specific: the level of agreement was higher among older children.

The findings of these studies are difficult to generalize because of the small sample sizes. Furthermore, it is important to systematically examine differences in adolescent reports on paternal and maternal drinking. In the current study, we used data from 428 families in which both parents and two adolescent children are included. This also provides the opportunity to test whether children in the same family, but of different ages are similar in their estimations of parental alcohol use. The latter is important because Smith et al. (1999) indicate that children own drinking levels affect correspondence between child and

---

1 The references depicted are just examples of empirical studies. We do not intend to provide a complete overview of studies focusing on the role of parental drinking on adolescent drinking. This goes beyond the scope of this paper.
parents reports: if children hardly drink themselves, they more strongly underestimate parental drinking as compared to drinking children.

To summarize, the purpose of the present study is threefold: (1) to examine correspondence between adolescent and parental reports on frequency and quantity of drinking in adolescents, (2) to examine adolescent and parental reports on frequency and quantity of drinking in parents, and (3) to test whether discrepancies in child and parental reports on adolescent drinking are related to lack of parental knowledge, parental control and house rules on alcohol, as well as parental own drinking. Differences between siblings and fathers and mothers will be explored.

2. Method

2.1. Participants and procedure

Data for this study are collected as a part of a broader longitudinal survey “Family and Health”, in which different socialization processes underlying various health behaviors in adolescence are examined (Harakeh, Scholte, De Vries, Vermulst, & Engels, 2005; Van Der Vorst et al., 2005). In the present study, data from the first wave are reported. A sample of Dutch families with at least two children between the ages of 13 to 16 years old were asked to participate in the study by writing them a letter. Extended information on the sample procedures is reported in Harakeh et al. (2005) and Van Der Vorst et al. (2005). These families were contacted by phone, and selected for further participation based on the following criteria: the parents had to be married or living together, and the youngsters and their parents should be biologically related. Besides this, families with twins or with offspring who had mental or physical disabilities were excluded from the study. Because an equal division of education and an equal amount of sibling dyads were strived for (i.e., boy–boy, boy–girl, girl–girl, girl–boy), a further selection was made. Finally, a total of 428 Dutch families took part in this research project.

Participants were interviewed at their home in the presence of a trained interviewer. All four family members filled out an extensive questionnaire individually and separately. It took approximately 2 h to complete the questionnaire. The respondents were not allowed to discuss the questions or answers with each other. Each family was rewarded with a check of 30 euros after all the four family members completed the questionnaire. Each family consisted of both biological parents and two adolescent children. Most of the participants were of Dutch origin (>95%). The mean age of the older siblings was 15.22 (S.D. = .60) and varied between 14 and 17 years. The mean age of the younger siblings was 13.36 (S.D. = .50) and varied between 13 and 15 years. Sex of both siblings was almost equally divided. 52.8% of the older adolescents were boy and 47.2% girl. With regard to the sex of the younger adolescents, 47.7% boys and 52.3% girls were included. The three educational levels of the adolescents (low, middle and high) were equally represented.

2.2. Measures

The following items on frequency of drinking in the past 4 weeks and quantity of drinking in the past week were filled out by each family member on their own alcohol consumption. Furthermore, parents filled out these items for both children, and both children filled out these items on paternal and maternal drinking.
2.2.1. Alcohol consumption

Each of the four family members was asked about the frequency of their alcohol use in the past 4 weeks. The participants had to respond on a 6-point scale ranging from (1) ‘have not been drinking’ to (6) ‘every day’ (Engels & Knibbe, 2000). The quantity of drinking was assessed by asking the number of glasses of alcohol the respondents had been drinking in the previous week during weekdays and in weekends into contexts at home and outside the home (Engels, Knibbe & Drop, 1999). The scores on these questions were summed to get an indication about the total number of glasses each family member consumed in the past week.

We distinguished three measures of drinking: frequency, quantity and heavy drinking (for men, consuming >21 glasses per week, and for women, consuming more than 14 glasses per week; the cut-off scores for men and women are derived from official guidelines of the Dutch government on ‘safe or healthy’ drinking levels).

2.2.2. Rules about alcohol

We developed a 10-item scale to measure the degree parents permit their children to consume alcohol in various situations, such as drinking in the presence of parents at home, drinking in absence of parents at home, getting drunk when going out with friends, coming home drunk, drinking during the week or in the weekend. Higher scores indicate stricter rules about alcohol consumption (Van Der Vorst et al., 2005). The response categories ranged from (1) ‘not applicable at all’ to (5) ‘completely applicable’. The internal consistency of this scale was high with Cronbach’s alphas of .89 (mother about oldest child, MO), .86 (mother about youngest child, MY), and .90 (father about oldest child, FO), and .88 (father about youngest child, FY).

2.2.3. Parental knowledge

We employed a Dutch version of the 6-item scale of Brown et al. (1993) (see for details on Dutch version Engels, Deković, & Meeus, 2002). In this scale family members are asked to report how much their parents know, for instance, about who their friends were, how they spent their money and what they did with their free time. The response categories ranged from (1) ‘my mother or father does not know anything’ to (5) ‘my mother or father knows everything’. The internal reliability was .82 (MO), .87 (MY), .80 (FO), and .86 (FY).

2.2.4. Behavioral control

This is the extent to which adolescents perceive their parents to be exerting control on their whereabouts and activities (Engels, Finkenauer, Kerr, & Stattin, 2005; original version of the scale: Kerr & Stattin, 2000). The answering categories ranged from 1 (never) to 5 (always) with a high mean score indicating high parental behavioral control. This was assessed with 5 items (e.g., ‘Before you leave on a Saturday evening, does your mother want to know with whom and/or where you are’). The response scales varied from 1 ‘never’ to 5 ‘always’. The internal reliability was .66 (MO), .66 (MY), .70 (FO), and .77 (FY).

2.3. Strategy for analyses

In the present study, we assessed the agreement between self-reports and collateral reports (i.e., family members) on frequency and quantity of alcohol consumption, using self-reports as criteria for validity. Chi-square tests were conducted to test whether collateral reports corresponded significantly with self-
reports (see Harakeh et al., 2006). Standard measures to assess performance are sensitivity, specificity, positive predictive value and negative predictive value (for a similar way of analyzing performance, see Bisson, Nadeau, & Demers, 1999). Sensitivity indicates the ability of collateral reports to correctly identify those who drink. Specificity indicates the ability of collateral reports to correctly identify those who do not drink. Kappa was calculated to measure the level of agreement, indicating the actual similarity between two reporters as a proportion of the potential similarity. Kappa values ≥ .75 indicate excellent agreement, while values ≥ .40 indicate poor agreement (Fleiss, 1981). Positive predictive value (PPV) refers to the proportion of subjects who were identified by others as drinking and who actually drink, and negative predictive value (NPV) to the proportion of subjects who were identified by others as not drinking and who actually do not drink. Pearson and Spearman correlations were computed to test the relative correspondence in reports.

Finally, we tested whether discrepancies in parental and their offsprings’ reports on adolescent alcohol consumption are affected by inadequate parenting, e.g., poor general knowledge on adolescent activities, poor behavioral control, and lack of rules on adolescent drinking. We also tested whether parent’s own drinking is related to discrepancies between parental and their offspring reports. Absolute difference scores in parental and their offsprings’ reports on adolescent alcohol consumption were calculated and thereafter correlations between difference scores and parenting variables and parental drinking were computed.

3. Results

3.1. Descriptive analyses

The reports of the parents on engagement of their children in drinking are low: in most cases more than half of the percentage reported by adolescents. No substantial differences were found between reports of fathers and mothers. Children also underestimate alcohol consumption of their parents. Although mothers (23.9%) and fathers (34.1%) indicate to drink at least 4 days a week, the estimation by children was substantially lower. Although it seemed to be that the youngest child is better in predicting frequency of drinking among their parents than the oldest child, no robust differences were found on quantity of drinking. It should be mentioned that the strongest errors by children were made on parental heavy drinking (Table 1).

3.2. Collateral reports of parents on frequency of adolescent drinking

First, we tested the performance of parents to accurately estimate the frequency of drinking in their offspring. Concerning maternal reports we found a significant correspondence for the oldest child: \( \chi^2 [1, n=423] = 50.95, p < .001 \), with a kappa of .31, and for the youngest child: \( \chi^2 [1, n=421] = 25.89, p < .001 \), with a kappa of .23. Similar findings were observed for paternal reports (\( \chi^2 \) Oldest Child [1, n=427] = 54.26, \( \chi^2 \) Youngest Child [1, n=426] = 60.25).

---

2 One may wonder why we used cut-off scores on originally continuous (intensity of alcohol use) and ordinal (frequency of drinking) measurements. The use of correlations or regression analyses is problematic because these methods provide insights into the relative accuracy but not the absolute accuracy; this is important as it is possible that systematic underestimation of adolescent drinking by parents may still lead to high correlations. Second, although some of the measures are indeed continuous or ordinal, the responses are sometimes skewed (especially for adolescent drinking) making it preferable to focus on categories, and use chi-square analyses. For reasons of comparability we also conducted correlations between collateral and self-reports.
Other measures to describe agreement between self-reports of children and parental reports are shown in Table 2. Sensitivity appeared to be low among both fathers and mothers, which means that parents do not accurately estimate when their older and younger child are drinking. However, parents do quite accurately know when their child is not drinking (see figures on specificity in Table 2). Specificity appears to be lower for the oldest child in both parents. Parents who report that their children drink are accurate in more than 71% of the cases (except mother on youngest child). Both parents are however better in their estimations when their child is not drinking regularly.

3.3. Collateral reports of parents on quantity of adolescent drinking

The performance of parents to accurately estimate the quantity of drinking in their offspring is also depicted in Table 2. Concerning maternal reports we found a significant correspondence ($\chi^2$ Oldest Child $[1, n=396]=153.12$, $p<.001$, $K=.60$) and ($\chi^2$ Youngest Child $[1, n=413]=125.17$, $p<.001$, $K=.53$). Other measures to describe agreement between self-reports of children and parental reports are shown in Table 2. Sensitivity appeared to be low among both fathers and mothers, which means that parents do not accurately estimate when their older and younger child are drinking. However, parents do quite accurately know when their child is not drinking (see figures on specificity in Table 2). Specificity appears to be lower for the oldest child in both parents. Parents who report that their children drink are accurate in more than 71% of the cases (except mother on youngest child). Both parents are however better in their estimations when their child is not drinking regularly.

The scores on frequency and quantity of drinking were dichotomized (see also Smith et al., 1999). Adolescents who drank less than once a month were scored 0 and those who drank at least once a month scored 1. Adolescents who drank less than 4 glasses in the past week were scored 0 and those who consumed 4 or more glasses scored 1.

3.3. Collateral reports of parents on quantity of adolescent drinking

The performance of parents to accurately estimate the quantity of drinking in their offspring is also depicted in Table 2. Concerning maternal reports we found a significant correspondence ($\chi^2$ Oldest Child $[1, n=396]=153.12$, $p<.001$, $K=.60$) and ($\chi^2$ Youngest Child $[1, n=413]=125.17$, $p<.001$, $K=.53$). Other measures to describe agreement between self-reports of children and parental reports are shown in Table 2. Sensitivity appeared to be low among both fathers and mothers, which means that parents do not accurately estimate when their older and younger child are drinking. However, parents do quite accurately know when their child is not drinking (see figures on specificity in Table 2). Specificity appears to be lower for the oldest child in both parents. Parents who report that their children drink are accurate in more than 71% of the cases (except mother on youngest child). Both parents are however better in their estimations when their child is not drinking regularly.

3.3. Collateral reports of parents on quantity of adolescent drinking

The performance of parents to accurately estimate the quantity of drinking in their offspring is also depicted in Table 2. Concerning maternal reports we found a significant correspondence ($\chi^2$ Oldest Child $[1, n=396]=153.12$, $p<.001$, $K=.60$) and ($\chi^2$ Youngest Child $[1, n=413]=125.17$, $p<.001$, $K=.53$). Similar findings were seen for paternal reports ($\chi^2$ Oldest Child $[1, n=404]=143.94$, $p<.001$, $K=.57$) and ($\chi^2$ Youngest Child $[1, n=402]=122.71$, $p<.001$, $K=.52$). The findings on other measures to describe the agreement between self-reports of children and parental reports provide a similar picture as for frequency of drinking. Sensitivity is quite low, especially for maternal reports for the youngest child (15.5), and
specificity is high. In general, PPV and NPV are satisfactory except for maternal reports on quantity of drinking of the youngest child.

3.4. Collateral reports of adolescents on parental drinking

Table 3 shows the performance of children in estimating their parents drinking behavior. Concerning reports of the oldest child we found a significant correspondence in frequency of drinking ($\chi^2_{\text{Mother}}$ [1,

Table 2
Performance of the parental reports to estimate adolescent drinking

<table>
<thead>
<tr>
<th></th>
<th>Self-reports oldest child</th>
<th>Self-reports youngest child</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weekly drinking ≥ 4 glasses last week</td>
<td>Weekly drinking ≥ 4 glasses last week</td>
</tr>
<tr>
<td><strong>Reported by mother</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td>35.1</td>
<td>47.2</td>
</tr>
<tr>
<td>Specificity</td>
<td>92.4</td>
<td>93.9</td>
</tr>
<tr>
<td>PPV</td>
<td>71.2</td>
<td>80.7</td>
</tr>
<tr>
<td>NPV</td>
<td>72.6</td>
<td>76.8</td>
</tr>
</tbody>
</table>

Table 3
Performance of the child reports to estimate parental drinking

<table>
<thead>
<tr>
<th></th>
<th>Self-report mother</th>
<th>Self-report father</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drinking ≥ 4 days</td>
<td>≥ 4 glasses last week</td>
</tr>
<tr>
<td><strong>Reported by oldest child</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td>46.1</td>
<td>70.1</td>
</tr>
<tr>
<td>Specificity</td>
<td>95.0</td>
<td>91.3</td>
</tr>
<tr>
<td>PPV</td>
<td>74.6</td>
<td>91.3</td>
</tr>
<tr>
<td>NPV</td>
<td>84.7</td>
<td>70.9</td>
</tr>
</tbody>
</table>

| **Reported by youngest child** |                           |                             |
| Sensitivity    | 48.5               | 66.7                | 24.6                | 50.3               | 76.3                | 24.7                |
| Specificity    | 97.1               | 88.3                | 96.2                | 93.4               | 87.2                | 98.8                |
| PPV            | 84.5               | 88.0                | 55.2                | 80.0               | 95.1                | 82.6                |
| NPV            | 85.4               | 67.4                | 87.1                | 78.4               | 52.9                | 84.7                |

High sensitivity scores mean that mothers and fathers could accurately estimate whether their child was actually drinking. High specificity scores imply that parents could accurately estimate whether their child was actually not drinking. PPV scores refer to the proportion of children who were identified by parents as drinking and who actually drink, and NPV scores to the proportion of children who were identified by parents as not drinking and who actually do not drink.
n=423] = 103.12, p < .001, K = .47, and χ²_Father [1, n=424] = 113.08, p < .001, K = .50). Similar findings were seen for the youngest child reports (χ²_Mother [1, n=415] = 132.45, p < .001, K = .53, and χ²_Father [1, n=419] = 107.28, p < .001, K = .48). For quantity of drinking, we found a high correspondence in reports of the oldest child χ²_Mother [1, n=396] = 153.12, p < .001, K = .60, and χ²_Father [1, n=404] = 143.94, p < .001, K = .57, and for the youngest child χ²_Mother [1, n=411] = 125.17, p < .001, K = .53, and χ²_Father [1, n=402] = 122.70, p < .001, K = .52. Correspondence was lowest for heavy drinking among parents according the oldest child χ²_Mother [1, n=396] = 61.45, p < .001, K = .36, and χ²_Father [1, n=404] = 52.68, p < .001, K = .30), and youngest child χ²_Mother [1, n=411] = 36.30, p < .001, K = .27, and χ²_Father [1, n=402] = 63.42, p < .001, K = .32.

In general, sensitivity was quite satisfactory concerning the quantity of drinking (cut-off point: >4 glasses in the last week) for both children and both parents. Lowest scores were found on parental heavy drinking illustrating the fact that children underreport high levels of drinking in parents. The specificity was high in all analyses, indicating that children hardly report drinking in parents when it is not the case. The PPV and NPV are moderate to good, although the NPV appears to be quite low for child reports on parental quantity of drinking.

3.5. Additional analyses

For reasons of comparability, we computed correlations between collateral and self-reports as this is another way to calculate (relative) correspondence (see review by Connors & Maisto, 2003) (Table 4). However, please notice that high correlations do not imply high absolute correspondence: a correlation between collateral and self-reports can be 1 while there is zero correspondence in scores. These correlations were computed on the untransformed raw data on frequency and quantity of drinking. These findings indicate moderate to high associations between parental reports on adolescent drinking and adolescent self-reports, and between adolescent reports on parental drinking and parental self-reports. In general, somewhat higher correspondence was found for adolescent reports on parental drinking and self-reports, and concerning drinking of the oldest child (as compared to the younger child). Furthermore, we also calculated correlations excluding the abstainers, which of course lead to a decrease in correspondence, especially concerning adolescent drinking. In the latter group, substantial numbers of abstainers (according to both parents and children, see Table 2) are apparent accounting for moderate to high correlations between parent and adolescent reports.

Table 4
Correlations between collateral and self-reports on alcohol consumption

| Collateral reports | Frequency of drinking | | Quantity of drinking | | |
|-------------------|----------------------|------|----------------------|------|
|                    | Youngest child        | Oldest child | Mother | Father | Youngest child | Oldest child | Mother | Father |
| Oldest child      | .77 (.64)            | .74 (.66) | .65 (.53)             | .65 (.60) |
| Youngest Child    | .75 (.57)            | .71 (.64) | .64 (.51)             | .47 (.40) |
| Mother            | .57 (.57)            | .64 (.64) | .33 (.19)             | .55 (.47) |
| Father            | .54 (.64)            | .60 (.66) | .38 (.19)             | .58 (.51) |

Associations regarding frequency of drinking are tested by Spearman correlations, and associations regarding quantity of drinking by Pearson correlations. Correlations between collateral and self-reports within the group of drinkers (abstainers excluded) are depicted between brackets. For all correlations: p < .001.
3.6. Which parents make inaccurate estimations of adolescent drinking?

Some parents may be more prone to inaccurately estimate their child drinking behavior than others. We tested whether the magnitude of inaccuracy, depicted by the absolute difference between parental report on adolescent drinking and adolescent self-report, is associated with lack of parental knowledge and parental control, and lack of house rules on drinking by computing Pearson correlations. Furthermore, we tested whether drinking parents might be more prone to err in the estimation of their offspring drinking behavior by correlations (Table 5). With respect to the fathers, it appeared that level of inaccuracy was not related to more general knowledge on child activities or to ways of controlling child behaviors. Nevertheless, higher levels of inaccuracy were associated with less enforcement of rules on adolescent drinking, and to their own drinking (only counts for quantity of alcohol use). For mothers, we found that higher levels of knowledge on adolescent whereabouts were related with lower levels of inaccuracy. Furthermore, enforcement of rules on drinking was also related with higher levels of accuracy. In only 1 out of 4 cases (oldest child, quantity) maternal drinking was positively associated with inaccurate estimations of adolescent drinking.

4. Discussion

There is ample empirical research demonstrating that adolescent self-reports on recent alcohol consumption are quite accurate if certain conditions, such as assuring privacy, anonymity and confidentiality, are met (see review by Brener et al., 2003). We stress that this primarily counts for recent alcohol use because several studies have shown that even in people who only drink for a short period of time (like youths) substantial inconsistencies in self-reports concerning the history of drinking are found (see Bailey, Flewelling, & Rachal, 1992; Brener et al., 2003; Engels, Knibbe, & Drop, 1997). Nonetheless, departing from the point that adolescent self-reports on current drinking are generally valid, one of the aims of the present study was to examine whether parents are able to accurately estimate their offspring drinking behavior.

Our findings show that parents are substantially underreporting adolescent alcohol use (see Donohue et al., 2004). The high scores on specificity and low scores on sensitivity are illustrating this conclusion. When children do not drink, parents are quite capable of perceiving this correctly, however, when children...
indeed consume alcohol, many parents still assume that their children are abstaining or drinking less than is actually the case. In addition, parents make the strongest errors concerning drinking of their youngest child. In The Netherlands, from the age of 15 to 16, youths are starting to consume alcohol regularly. Parents might be more aware of drinking when children drink regularly than when they drink occasionally. Since alcohol use in this age group is strongly concentrated in contexts like parties and public drinking places (Knibbe, Van De Goor, & Drop, 1993), most parents would probably know that going out in the weekend is associated with consumption of alcohol. Concerning children in early adolescence, it might be more difficult to predict for parents where, with whom, and how much they drink, and apparently they drink more than parents expect. In addition, in the past years, children in the younger age groups, and especially girls, more often start their drinking career by using alcohol pops and mix drinks instead of the traditional beverages like beer and wine. Since in The Netherlands many parents do not even know that mix drinks contain alcohol, it might not be surprising that parents underestimate drinking in 12–14 year olds. All in all, with respect to the involvement of parents in primary prevention programs, our findings point to the need to pay attention to parents having accurate knowledge on the phase of drinking their child is in, as the first step in undertaking constructive actions is always recognition of the problem (e.g., Williams & Perry, 1998).

Inevitable, when parents do not think their children started to drink at all or that they started to drink regularly or heavily, they might not be engaged in specific actions to prevent children from drinking. If parents start to discuss alcohol matters, such as the influence of peers or advertisements, after children already initiated drinking, this might be too late and ineffective (Ennett et al., 2001). Our findings yield that parents who enforce rules on adolescent drinking are better able to accurately estimate quantity and frequency of drinking in their offspring, whereas more general controlling efforts are not related to accurate estimations. Apparently, in families where alcohol is a topic of discussion, and parents enforce clear and strict rules on the situations and contexts children are allowed to drink, parents have more knowledge on their child’s behaviors. This is important since several studies have shown that enforcing rules as well as knowledge on child behaviors by parents is related to lower engagement of children in alcohol use (Foley, Altman, Durant, & Wolfsman, in press; Van Der Vorst et al., 2005), and other problem behaviors (e.g., Kerr and Stattin, 2000). It should be stressed that longitudinal research should reveal whether parental inaccuracy on child drinking is predicting changes in drinking in youths over time.3

Previous studies argue that adolescents are quite accurate in their reports of parental substance use. Although this counts for quite overt and dichotomous behavior like smoking (in most cases adults are daily smoking or not smoking at all, see Engels et al., 1999), or behaviors with a low prevalence like hard drug use, this seems to be less obvious for alcohol consumption. Parents might drink at various occasions and moments of the day which are not at all visible for their children. For instance, parents might drink during the day when their offspring is at school, might drink at parties and special evenings when children are not apparent, or in the evening when children are sleeping. One of the few studies comparing child and parental reports on parental drinking also report significant and strong underestimations of children (Smith et al., 1999). Albeit adolescent and parental reports are strongly correlated, children are less capable of correctly reporting drinking levels in parents, and even less capable of reporting heavy drinking in parents. Smith and colleagues conclude that to assess modeling effects of exposure to parental drinking, it is more relevant to use child reports than to use parental reports. We do not entirely agree.

3 It is good to mention that if children do not drink, and parents accurately report this, the correlation between differences in estimations between parent and child and parental rules is zero.
There is evidence from longitudinal research that modeling effects of parental drinking on the development of drinking in adolescence are small but consistent. So, we know that they play a role. But what should we do in terms of prevention when some children highly underestimate parental alcohol use. Tell them the true story, which in the end could enhance the modeling effects. Or should we specifically focus on children who quite accurately predict parental drinking. They might be at risk, since they are apparently so keen on alcohol use.

Still, if inaccurate estimations by children, whose reports are mostly used in survey studies, lead to undervaluing of the effects of modeling influences of parental drinking on adolescent drinking, this might lead to the wrong conclusion, namely that parental drinking hardly plays a role in uptake of drinking in youths (see Harris, 1995). These explanations are speculative, but it would be interesting to observe how different reports (collateral and self-reports) on parental drinking are predicting the course of drinking in youth. Second, the associations between parental and child alcohol consumption cannot entirely be explained by modeling processes. It is possible that parental drinking is reflected in inappropriate parenting practices, which in turn lead to adolescent drinking (Barnow et al., 2002; Van Zundert, Van Der Vorst, Vermulst, and Engels, in press). Inaccurate estimations of parental drinking might lead to inaccurate parameter estimations with respect to the impact of parental use on parenting practices and therefore deflating the role alcohol plays in child upbringing and family relations.

In order to gain accurate estimates of correspondence, it is essential that (a) the conditions under which questionnaires are filled in are similar for respondent and target person, (b) instruments assessing alcohol use are similar, and (c) there is only a limited interval between the moment respondents and the target person fill in the form. Concerning the latter, if children fill in the form about parental drinking for a different week than the parents themselves, this would enhance the chance of obtaining unreliable estimates of correspondence (see Smith et al., 1999). Ideal would be that parents and children would fill in the forms at the same moment, as we did. There are however some limitations that should be mentioned. First, our sample of relatively well-functioning families does not permit conclusions with respect to whether children are able to predict alcohol use in alcohol abusing or alcohol dependent parents. Furthermore, Sobell, Agrawal and Sobell (1997) argued that spouses should be the preferred collateral reporters instead of friends, siblings or children. Our findings seem to underscore this by showing that children were not able to accurately estimate heavy drinking by parents. In addition, we assume that it is preferable if parents and children are not interviewed on potentially risky behaviors at the same time in the same context. Although participants were told by the interviewer that they should fill in the questionnaires on their own and not in the same room, and that their reports would be handled strictly confidential, it might be possible that children as well as parents try to hide their drinking and provide lower estimates of their alcohol use. This assumption is underlined by research showing that the prevalence of substance use appears to be higher in school surveys than in household surveys (Gfroerer, Wright, & Kopstein, 1997). Of course, when this would be the case, this would suggest that the relatively low sensitivity scores concerning parents reports on their offspring behaviors are an underestimation of the true scores.

In summary, this is one of the first studies employing a full family design in order to look at correspondence in reports on alcohol consumption between family members. Previous studies suffered from small sample sizes, could not compare scores of mothers and fathers or did not compare different children in the same family. Our findings clearly show that (a) parents are substantially underestimating alcohol use in both early and mid-adolescents, (b) parents encounter in particular problems with accurately estimating that their child is drinking when this is indeed the case, (c) when parents differ in their reports from their children, this is related to poor parenting in terms of a lack of knowledge on
adolescent activities and a lack of rules on drinking, (d) children are better able to predict ‘ordinary’ parental drinking patterns than heavy drinking, and (e) children do not seem to differ in accurately estimating paternal and maternal drinking.

Acknowledgments

Rutger Engels was supported by a fellowship of the Dutch Organization of Scientific Research during the preparation of this manuscript.

References


