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Underage drinking: Prevalence and risk factors associated with drinking experiences among Argentinean children

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ABSTRACT

The aim of this study was to describe the prevalence and predictors of alcohol drinking behavior in children. Data were obtained from 367 children, aged 8–12 years ($M = 10.44$ years, $SD = 1.21$ years; 61.9% female) from the city of Córdoba, Argentina. Several scales were used to assess risk factors, including personality traits, alcohol expectancy (i.e., beliefs about the consequences of using alcohol), and perceived peer alcohol use, for alcohol drinking and alcohol drinking experiences. Hierarchical regression analysis was used to determine the contribution of multiple risk factors to the quantity of alcohol consumed. The results showed that 58% of the children had tasted alcohol, and approximately one-third drank alcohol again after the first drinking experience. Twelve-year-old children had a significantly higher prevalence of tasting and drinking alcohol and a significantly greater frequency and quantity of alcohol consumed than younger children. Eighty percent of the children who liked alcohol during their first drinking experience reported that they drank alcohol again. Among the children who did not like alcohol during their first drinking experience, only 31% drank alcohol again. Underage drinking usually occurred under adult supervision in family settings when parents or other relatives allowed them to drink or were aware of their children's drinking. The hierarchical regression analysis showed that being older and male, having more peers that drink alcohol, having higher levels of extroversion, and having alcohol expectancy for social facilitation increased the risk for greater alcohol use. The final model explained 33% of the total variance.

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Introduction

Drinking behavior and its negative consequences can be viewed from a developmental perspective. Age-related patterns have been reported for drinking behavior and alcohol-related problems (Masten, Faden, Zucker, & Spear, 2009; Windle et al., 2009). Age also modulates the role of risk and protective factors associated with a higher or lower probability of alcohol use and abuse (Masten et al., 2009; Windle et al., 2009). Moreover, the effects of acute and long-term alcohol administration differ by stage of development (Brown et al., 2009; Masten et al., 2009; Zucker, Donovan, Masten, Mattson, & Moss, 2009). Alcohol use among children is mostly experimental (Bekman, Goldman, Worley, & Anderson, 2011; Donovan, 2007; Gunn & Smith, 2010; McIntosh, MacDonald, & McKeganey, 2008), whereas regular and heavy drinking usually occur during adolescence (Volkow & Li, 2005), with individuals aged 18–24 years

exhibiting higher levels of alcohol drinking and alcohol use disorders than subjects of any other age (Auerbach & Collins, 2006; Brown et al., 2008, 2009). Data from the Monitoring the Future survey indicated that approximately 30% of adolescents in the United States drank alcohol during the previous month (Johnston, O'Malley, Bachman, & Schulenberg, 2010) and that approximately 20% drank more than five standard drinks during the two previous weeks (Johnston, O'Malley, Bachman, & Schulenberg, 2011).

A survey conducted in 14 Latin American countries (Pan American Health Organization [PAHO], 2009) indicated that the lifetime prevalence of alcohol use among high-school adolescents (14–17 years old) ranged from 39% in Bolivia to 78.2% in Uruguay. Uruguay and Bolivia also showed the highest and lowest last year (67% and 28%) and last month (50% and 16%) prevalence of alcohol use, respectively. In Argentina, the lifetime, last year, and last month prevalence of alcohol use (63%, 53%, and 42%, respectively) was similar to Paraguay (60%, 49%, and 40%), Chile (68%, 57%, and 40%), and Brazil (69%, 67%, and 48%). A similar prevalence of alcohol use was reported by other studies in Brazil (Galduróz & Carlini, 2007)

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and Mexico (Rojas-Guiot, Fleiz-Bautista, Medina-Mora Icaza, Morón, & Domenech-Rodríguez, 1999).

Epidemiological studies of alcohol consumption in Argentina indicated that 60% of adolescents (13–17 years old) are current drinkers, and 21% of these teenagers reported drunken episodes during the previous month (Department of Planning for the Prevention of Drug Addiction and the Fight Against Drug Trafficking [SEDRONAR], 2011).

Most of the studies that assessed underage drinking in Latin America sampled children aged 12 and older (Castillo Aldana, 2009; Galduróz & Caetano, 2004; Galduróz & Carlini, 2007; PAHO, 2007; SEDRONAR, 2009, 2010, 2011; Uruguayan Drug Observatory, 2012), with few studies of children under the age of 12 years (Galduróz et al., 2010; Miguez, Fernandez, Romero, & Mansilla, 2012; PAHO, 2007; Pilatti, Godoy, & Brussino, 2011a). For example, Miguez et al. (2012) surveyed a sample of children aged 10–12 years from the city of Córdoba, Argentina. They found that 52% of these children reported lifetime alcohol use. Moreover, 30% and 12% reported last year and last month alcohol use, respectively. Similarly, Pilatti et al. (2011a) found that 70% of children aged 8–12 years had tasted alcohol, and 30% drank again after that first experience. Approximately 12% reported having sipped alcohol, and 20% consumed more than one or two sips. Galduróz et al. (2010) found that almost one of 10 Brazilian children and adolescents aged 10–18 years exhibited heavy alcohol use, defined as 20 or more drinking episodes in the last month.

Synergistic mechanisms may exist between adolescent alcohol drinking and earlier contact with the drug (Windle et al., 2009). Data from animal studies showed that alcohol exposure early in life (e.g., during pregnancy or breastfeeding) increased alcohol consumption during adolescence and adulthood (Baer, Samson, Barr, Connor, & Streissguth, 2003; Chotro, Arias, & Laviola, 2007). Other animal studies (e.g., Rodd-Henricks et al., 2002) showed that alcohol exposure during adolescence increased the likelihood of subsequent pathological alcohol consumption, a phenomenon that Miller and Spear (2006) called the “generator of alcoholism.”

Children aged 10 years or less recognize alcoholic beverages and hold beliefs about the effects of alcohol on behavior (Cameron, Stritzke, & Durkin, 2003; Cranford, Zucker, Jester, Puttler, & Fitzgerald, 2010; Dunn & Goldman, 2000; Gunn & Smith, 2010). By the age of 12, many children already have had their first drinking experience (Donovan, 2007; Donovan & Molina, 2008; McIntosh et al., 2008; Windle et al., 2009; Zucker et al., 2009).

Based on distinctions between distal and proximal effects (McAdams & Donnellan, 2009), factors that affect the vulnerability to develop drinking behavior during childhood and adolescence have been classified into nonspecific and specific risk factors (Brown et al., 2009; Windle et al., 2009). Nonspecific risk factors include personality traits, antisocial and aggressive behavior, and rearing style, among others (Capaldi, Stoolmiller, Kim, & Yoerger, 2009; Windle et al., 2009). Specific risk factors include having peers or parents who drink and a combination of high positive alcohol expectancy and low negative alcohol expectancy (Windle et al., 2009; Zucker et al., 2009).

Personality traits related to impulse control are associated with alcohol use or the intention to drink (Hampson, Andrews, Barckley, & Severson, 2006). Disinhibition (Anderson et al., 2005), aggression, sociability (Hampson, Tildesley, Andrews, Luyckx, & Mroczek, 2010), and impulsivity (Gunn & Smith, 2010) are positively related to alcohol use among children under 12 years of age. Low behavioral control (i.e., impatience, distractibility, and impulsivity) has a positive yet indirect influence on the intention to drink, mediated by externalizing symptomatology (Wills, Ainette, Mendoza, Gibbons, & Brody, 2007).

Alcohol expectancy comprises beliefs about the positive and negative effects of alcohol on behavior, mood, and emotion (Goldman, Brown, Christiansen, & Smith, 1991). Positive alcohol expectancy is related to the initiation, maintenance, and escalation of drinking (Catanzaro & Laurent, 2004; Dunn & Goldman, 2000; Mackintosh, Earleywine, & Dunn, 2006; Randolph, Gerend, & Miller, 2006), whereas negative alcohol expectancy is more important for stopping, avoiding, or delaying drinking (Dijkstra, Sweeney, & Gebhardt, 2001; Jones, Corbin, & Fromme, 2001). Before direct experiences with alcohol, children develop expectations about the effects of alcohol through observation (i.e., vicarious learning; Cameron et al., 2003; Dunn & Goldman, 2000; Hipwell et al., 2005; Zucker, Donovan, Masten, Mattson, & Moss, 2008). Environmental factors, such as the influence of peers, also play an important role in alcohol use. Drinking by peers is one of the most important factors in the regulation of adolescent alcohol drinking. In a longitudinal study, D’Amico and McCarthy (2006) observed an impact of peer drinking on drinking initiation and escalation in early adolescence (10–15 years of age). Similarly, Simmons-Morton and Chen (2006) found a significant effect of peer drinking on adolescent alcohol use. Duncan, Duncan, and Strycker (2006) found that greater encouragement of alcohol use by friends was related to an increase in alcohol use rates from 9 to 16 years of age. In another longitudinal study, Capaldi et al. (2009) showed that peer drinking facilitated the frequency, quantity, and persistence of drinking-related behavior measured 3 years later.

First drinking experiences among children are usually provided by their parents or caretakers (Andrews, Tildesley, Hops, Duncan, & Severson, 2003; Johnson, Greenlund, Webber, & Berenson, 1997; van der Vorst, Engels, & Burk, 2010; Zucker et al., 2008). During late childhood and early adolescence, the parental influence declines, but the peer influence increases (Windle et al., 2009). Alcohol seeking for social facilitation purposes also increases (McIntosh et al., 2008). Drinking motives are strongly dependent on the setting. For example, social drinkers usually drink if they are in a social context but not when they are alone at home (Kuntsche, Knibbe, Gmel, & Engels, 2006). Social drinking contexts refer to situational (i.e., where consumption takes place) and motivational (i.e., why consumption occurs) elements that influence alcohol use (Clapp & Shillington, 2001; Thombs & Beck, 1994).

Previous research on drinking prevalence and risk factors related to alcohol use has largely focused on older adolescents. Few studies have been conducted with children under the age of 12 years (Brown et al., 2009; Donovan, 2007; Windle et al., 2009), particularly in the Latin American region. Therefore, studying the initiation and escalation of drinking before adolescence is important for better understanding the progression of drinking behaviors and detecting the factors that may influence later alcohol use in adolescence (Bekman et al., 2011; Cranford et al., 2010; Gunn & Smith, 2010). The present study sought to describe the prevalence and social contexts of alcohol consumption among Argentinean children and the influence of specific and nonspecific factors on these drinking behaviors. More specifically, this cross-sectional developmental study (i) described the progression of drinking experiences among children aged 8–12 years, (ii) described the social contexts of alcohol use, and (iii) analyzed whether personality, alcohol expectancy, and peer alcohol use predict different quantities of alcohol use.

Materials and methods

Subjects

The sample comprised 367 children, aged 8–12 years (mean = 10.44 ± 1.21 years) who were enrolled in nine elementary

schools (four public schools and five private schools) in the city of Córdoba, Argentina. The universe of the sample comprised public and private schools in Córdoba. According to the 2010 National Census, Córdoba is the second largest city in Argentina, with 1,329,694 citizens, 103,472 of whom are children aged 8–12 years. The city has 384 elementary schools and 94,474 students (Ministry of Education, Province of Córdoba, 2009). Schools and classrooms were selected based on accessibility. The sample comprised a higher percentage of girls (61.9%) than boys. The mean age of the participants was statistically similar across boys and girls. Twenty-four percent of the children were 8–9 years old, 55% were 10–11 years old, and 21% were 12 years old. The data were gathered during a 12-month period from November 2009 to November 2010. Only children whose parents provided written consent participated in the study.

Procedures

The headmaster of each school was initially contacted and informed of the goals of the study and its characteristics. After obtaining authorization from the school, the parents were informed about the study through a written note on the school's letterhead and were requested to sign an informed consent form. Children whose parents did not sign the informed consent form were excluded from the study. The questionnaires were administered during the course of a regular school day by a trained researcher. No personal information was required, and the voluntary nature of participation was emphasized. The students were informed that they could refuse to participate or quit at any time. The data were gathered individually in children aged 8–10 years and collectively in children aged 11–12 years.

The ability of children to differentiate between alcoholic and nonalcoholic beverages was assessed through an alcohol recognition question adapted from previous work (Dunn & Goldman, 2000). Children aged 8–10 years were exposed to 12 pictures of different alcoholic beverages (e.g., beer, wine, whisky, vodka, etc.). The procedure differed from Dunn and Goldman (2000) in that children were also exposed to an equivalent number of pictures of nonalcoholic beverages (e.g., milk, juice, soda, etc.). All of the beverages in the pictures were widely available in retail outlets in Córdoba. The children were asked to identify which pictures represented alcoholic beverages. Similar to the procedure described by Dunn and Goldman (2000), the children were not required to identify a minimum number of alcoholic beverages. We determined, however, that if a child was not able to identify an alcoholic beverage from the set of pictures offered, he or she would be excluded from the study. A child would also be excluded if he/she wrongly mentioned a nonalcoholic beverage as an alcoholic beverage. No children, however, reached these exclusion criteria. All children were able to select at least three pictures of alcoholic beverages and many recognized the complete set (mean and SEM: 9.82 ± 1.91). A similar procedure was conducted in children aged 11 and 12, although in this case answers were gathered collectively. Several studies have shown that elementary school children can successfully identify alcoholic beverages (e.g., Donovan et al., 2004; Dunn & Goldman, 2000; Wiers, Sergeant, & Gunning, 2000).

Measures

Alcohol experience

The children were asked if they had ever tasted alcohol: (1) Have you ever drunk an alcoholic beverage, even small sips? (2) How much did you like it? (from 1 = nothing, to 5 = a lot).

Alcohol drinking

Two questions were asked to assess drinking after the first experimentation and recent alcohol use: (1) Do you sometimes drink alcoholic beverages? (2) Did you drink alcoholic beverages during the last month? These questions made no explicit distinction between “drinking” alcohol or having a sip or taste of alcohol. Those who answered yes to question 1, however, were asked about drinking frequency (once per year, 2–4 times per year, 5–8 times per year, 2–3 times per month, once per week, 2–3 times per week) and quantity (1–2 sips, half a glass, one glass, two glasses, three glasses, four glasses, more than four glasses) during the past year. Answers to the first two questions were coded into a new ordinal variable that accounts for three different levels of alcohol experience (none = 1, tasted = 2, drinks = 3).

Big Five Questionnaire

A shortened version of the Big Five Questionnaire for Adolescents (Cupani & Ruarte, 2008) was used to measure five personality traits: extroversion, conscientiousness, neuroticism, agreeableness, and openness. The Spanish version of the scale consists of 13 items for each scale (Cupani & Ruarte, 2008), but only eight items per scale were used in the present study. A pilot study with 15 children helped determine which items needed further adaptation to the children's vocabulary. Reliability values for this sample were relatively low (between $\alpha = 0.60$ and 0.75) but acceptable for this population (Lemos, 2006).

Impulsive behaviors

Ten items were selected from the 18-item version of the Barratt Impulsiveness Scale for Adolescents (BIS-11-A) adapted to the local population (Reyna, Sánchez, & Ivacevich, 2009). A pilot study helped select items that were better understood by the children and identify items that needed adjustments to the children's vocabulary. The questionnaire was answered using a 5-point Likert scale (i.e., never, rarely, sometimes, often, always), indicating how often the children behaved as described in each sentence (e.g., “I get bored easily,” “I find it hard to wait for my turn in games or group activities”). Higher scores indicate increased impulsivity. Reliability values were adequate ($\alpha = 0.78$).

Aggressive behaviors

Ten items were selected from two local instruments (Brussino, 2002; Ison & Fachinelli, 1993). The questionnaires featured a 5-point Likert scale (i.e., never, rarely, sometimes, often, always), in which higher scores indicate more aggressive behavior (e.g., “I get into fights with other boys or girls,” “I make fun of my friends or people”). Reliability values were adequate ($\alpha = 0.79$).

Alcohol expectancy

The Alcohol Expectancy Scale for Argentinean Children (AEQ-AC; Pilatti, Godoy, & Brussino, 2010) is a 30-item questionnaire that assesses positive (i.e., sociability, relaxation, and courage) and negative (i.e., risk, aggression, and negative mood) effects that children anticipate as a consequence of alcohol consumption. The results of this and previous studies revealed adequate psychometric properties (Pilatti et al., 2010; Pilatti, Godoy, & Brussino, 2011b) and reliability values (from $\alpha = 0.71$ to 0.83).

Peer drinking

According to D'Amico and McCarthy (2006), the participants estimated how many of their friends drank alcohol by answering two questions: (1) How many of your male friends drink alcohol? and (2) How many of your female friends drink alcohol? (ranging from 1 = none to 5 = all). The answers were cumulated to form a measure of peer drinking.

Social drinking contexts

Situational and motivational characteristics of alcohol use were assessed using a list of 24 items obtained from an exploratory pilot study conducted with children aged 8–12 years ($n = 117$, 54% males; Pilatti, unpublished). In the preliminary study, children who reported alcohol drinking were asked the following questions: (1) With whom do you drink alcohol? (2) On what occasions do you drink alcohol? (3) Why do you drink alcohol? Answers to these questions were used to compose the statements employed in the present study. The items referred to drinking motives (e.g., because I am curious) and situations (e.g., when my father or mother are present). The children were asked to indicate how often (from 1 = never to 5 = always) they drank alcohol in each of the 24 drinking contexts. These questions were posed only to children who had progressed beyond the experimental use of alcohol ($n = 125$).

Statistical analyses

Univariate distributions were examined and screened for outliers and missing data. Minimal missing data (i.e., less than 5% in any of the variables analyzed) were completed using the estimation–maximization procedure (Tabachnick & Fidell, 2009). Five outliers (≥ 3.29 SD from the mean and clearly apart from the rest of the distribution in the box plot graphics) were eliminated. Subsequent descriptive and inferential analyses were conducted with the sample of 362 children. Normality assumptions were assessed by analyzing the symmetry kurtosis and visually inspecting the score distributions. All of the scales exhibited appropriate (± 1.60) values (George & Mallery, 2003).

The prevalence of drinking behavior and context of alcohol use were assessed using descriptive analyses. The association between risk factors and drinking measures was calculated using Pearson correlations. The association between dichotomous variables, such as sex and type of school, was calculated using Cramer's V coefficient. Hierarchical regression analysis was performed to determine the contribution of multiple risk factors on alcohol use (i.e., none, tasting, drinking). All of the variables with significant Pearson correlations (i.e., < 0.05) were entered into the model.

Results

Prevalence of alcohol use

Alcohol taste

Over half of the children (58%) had tasted an alcoholic beverage. Tasting increased as a function of age, from 47% in 9-year-old children to 82% in 12-year-old children. Tasting was significantly greater in the oldest group of children compared with 9 year olds ($\chi^2 = 17.626$, $p \leq 0.001$), 10 year olds ($\chi^2 = 16.395$, $p \leq 0.001$), and 11 year olds ($\chi^2 = 17.871$, $p \leq 0.001$). A significant difference between genders was found. Boys (71%) were significantly more likely to be tasters than girls (50%; $\chi^2 = 14.247$, $p \leq 0.001$).

Table 1
Prevalence of alcohol use in the total sample as a function of sex and age.

Drinking experience	Total $n = 362$	Female $n = 224$	Male $n = 138$	Age group (years)				
				8	9	10	11	12
				$n = 29$	$n = 57$	$n = 80$	$n = 119$	$n = 77$
	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
Tasting	210 (58)	112 (50)	98 (71)	19 (65.5)	27 (47.4)	41 (51.3)	62 (52.1)	63 (81.8)
Last weekend	15 (4.1)	11 (4.9)	4 (2.9)	1 (3.4)	1 (1.8)	2 (2.5)	3 (2.5)	8 (10.4)
Last month	40 (11)	23 (10.3)	17 (12.3)	5 (17.2)	5 (8.8)	4 (5)	9 (7.6)	17 (22.1)
Drinking	124 (34.3)	60 (26.8)	64 (46.4)	8 (27.6)	13 (22.8)	24 (30)	37 (31.1)	42 (54.5)

Alcohol drinking

One-third of the children reported that they drank again after their first experimentation, and one of 10 children had drunk alcohol during the past month. Similar to tasting, the prevalence of drinking increased with age. The prevalence of drinking in 12 year olds was significantly higher than the prevalence of drinking in 8 year olds ($\chi^2 = 6.144$, $p \leq 0.01$), 9 year olds ($\chi^2 = 13.635$, $p \leq 0.001$), 10 year olds ($\chi^2 = 9.701$, $p \leq 0.001$), and 11 year olds ($\chi^2 = 10.668$, $p \leq 0.001$). One of four of the 8 year olds reported drinking/sipping alcohol sometimes, whereas over half of the 12 year olds reported drinking/sipping sometimes. The percentage of children who had drunk alcohol during the last weekend (4%) and past month (11%) was low, and most of these children were 12 year olds (10% for last weekend and 22% for past month), although 17% of the 8 year olds also reported drinking alcohol during the past month. The prevalence of drinking was significantly higher among boys (46%) than girls (27%; $\chi^2 = 14.553$, $p \leq 0.001$).

Drinking frequency and quantity

Sipping alcohol was the most frequent drinking behavior. Specifically, 23% of the children reported taking one or two sips once or a few times per year (26.6%). Eleven percent of the children reported drinking half a glass or more every time they drank an alcoholic beverage, and 8% drank at least monthly. Tables 1–3 present the prevalence of drinking for each indicator used in the present study. The results are presented for the entire sample as a function of sex and age.

A contingency table was used to examine the association between children's alcohol liking and drinking progression beyond experimental use. Answers to alcohol liking questions were recorded into two categories to indicate liking or disliking alcohol. Respondents who answered that they had never tasted alcohol were not included in this analysis. Respondents who answered that they disliked alcohol were coded as 1, and respondents who answered that they liked alcohol (from "a little" to "a lot") were coded as 2. Children who said that they liked alcohol were much more likely to keep drinking after their first drinking experience than children who disliked alcohol ($\chi^2 = 50.89$, $p \leq 0.001$). Specifically, 80% of the children who liked alcohol during their first experimentation reported that they drank alcohol again. Among children who did not like alcohol during their first experimentation, only 31% drank alcohol again. Boys were more likely to like alcohol than girls ($\chi^2 = 9.31$, $p \leq 0.01$). Potential associations between religious practices and alcohol drinking were analyzed. The association between participation in religious ceremonies and alcohol drinking, however, did not reach significance ($\chi^2 = 1.53$, $p \geq 0.20$).

Social drinking contexts

Table 4 shows the prevalence of alcohol use in different social drinking contexts, referring to situational and motivational

Table 2
Prevalence of drinking frequency and drinking quantity in the total sample and by sex.

Sex	Drinking frequency					Drinking quantity			
	None	1 per year	Few per year	<Monthly	2–4 per month	1–2 Sips	½ Glass	1 Glass	>1 Glass
	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
Female	164 (73.2)	25 (11.2)	19 (8.5)	7 (3.1)	9 (4)	41 (18.3)	9 (4)	8 (3.6)	2 (0.9)
Male	74 (53.6)	23 (16.7)	29 (21)	8 (5.8)	4 (2.9)	43 (31.2)	12 (8.7)	3 (2.2)	6 (4.3)
Total	238 (65.7)	48 (13.3)	48 (13.3)	15 (4.1)	13 (3.6)	84 (23.2)	21 (5.8)	11 (3)	8 (2.2)

elements that influence alcohol use. These data correspond to only the 124 children who reported drinking any quantity of alcohol, including sipping, after the first tasting experience. The percentages describe how many of these children answered that they drank alcohol for that specific motive or in that specific situation. Values correspond to the percentage of children that answered they had drunk alcohol in that specific social drinking context. The five most frequent drinking contexts were “when an adult allows me to drink,” “because I am curious,” “when a relative gives me alcohol to drink,” “at a family party,” and “because I like the taste of alcoholic drinks.” Five of the 11 most frequent drinking contexts referred to contexts where parents, other family members, or an adult was present, whereas three corresponded to contexts where peers were present.

Bivariate analysis

Table 5 shows Pearson correlations between the predictive factors (i.e., specific and nonspecific risk factors) and drinking measures. A strong correlation was found between having more friends who drink alcohol and more drinking experiences. Sociability and relaxation alcohol expectancies were the only dimensions of alcohol expectancy related to drinking experience (none, tasting, and drinking). These two dimensions were also related to drinking quantity and frequency. Overall, these associations reflected more alcohol use among the children with higher positive alcohol expectancies. Drinking frequency and quantity had a small but significant negative relationship with risk and aggression alcohol expectancies. Children who held less negative alcohol expectancies had a greater probability of drinking alcohol.

All personality factors were related to drinking experience, drinking quantity, and drinking frequency. Personality traits related to lack of impulse control (i.e., impulsivity, extroversion, and aggression) had positive associations with alcohol measures, whereas conscientiousness and agreeableness were negatively related to alcohol use. Specifically, more disinhibited children who had higher scores on impulsivity, aggression, and extroversion were more likely to have greater alcohol use. Conversely, children who were more responsible, gentle, and pleasant had a lower prevalence of drinking behaviors.

Sex, age, and school type were associated with all of the drinking measures. Being older, male, and enrolled in public schools were positively related to greater alcohol use.

Multivariate regression analysis

To analyze the utility of risk factors to predict greater alcohol consumption, a multivariate regression analysis was conducted, with the quantity of alcohol drinking as the dependent variable. The answers related to the quantity of alcohol use exhibited a skewed distribution because most of the children reported no or very little alcohol use. These answers were recoded into the following: no drinking, sipping (one or two sips), and drinking half a glass or more. Sex, age, and type of school (public and private) were entered into the first step, and personality traits (impulsivity, aggression, extroversion, agreeableness, conscientiousness, openness, and neuroticism) were entered into the second step. Perceived peer alcohol use and alcohol expectancy dimensions (sociability, relaxation, and risk and aggression) were entered into the third and fourth steps, respectively. The model accounted for 33% of the total variance. The examination of the beta coefficients indicated that age, extroversion, perceived peer drinking, and risk and aggression alcohol expectancies were the best predictors of a greater quantity of alcohol use (Table 6).

In the first step, sex, age, and type of school accounted for 9% of the variance ($F_3 = 11.90, p < 0.001$). More specifically, greater alcohol use was more likely to occur among male ($\beta = 0.18, p < 0.001$) and older ($\beta = 0.20, p < 0.001$) children enrolled in public schools ($\beta = -0.11, p < 0.05$). In the second step, the addition of personality scales increased the explained variance to 10% ($F_7 = 6.27, p < 0.001$). Higher extroversion ($\beta = 0.181, p < 0.001$) and impulsivity ($\beta = 0.13, p < 0.05$) scores predicted greater alcohol use. In the third step, drinking peers increased the explained variance to 29% ($F_1 = 50.87, p < 0.001$). Children who perceived that more of their peers drank alcohol had greater alcohol use ($\beta = 0.35, p < 0.001$). Finally, in the fourth step, negative alcohol expectancies (i.e., drinking that resulted in greater risk and aggressive behavior) increased the explained variance to 33% ($F_3 = 5.70, p < 0.001$). Children who had less expectancy that alcohol would heighten risky and aggressive behavior were more likely to drink ($\beta = -0.11,$

Table 3
Prevalence of drinking frequency and drinking quantity as a function of age.

Age (years)	Drinking frequency					Drinking quantity			
	None	1 per year	Few per year	<Monthly	2–4 per month	1–2 Sips	½ Glass	1 Glass	>1 Glass
	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)	F (%)
8	21 (72.4)	3 (10.3)	4 (13.8)	0 (0)	1 (3.4)	7 (24.1)	1 (3.4)	0 (0)	0 (0)
9	44 (77.2)	5 (8.8)	6 (10.5)	1 (1.8)	1 (1.8)	10 (17.5)	2 (3.5)	0 (0)	1 (1.8)
10	56 (70)	13 (16.3)	7 (8.8)	2 (2.5)	2 (2.5)	17 (21.3)	5 (6.3)	2 (2.5)	0 (0)
11	82 (68.9)	14 (11.8)	14 (11.8)	5 (4.2)	4 (3.4)	28 (23.5)	5 (4.2)	2 (1.7)	2 (1.7)
12	35 (45.5)	13 (16.9)	17 (22.1)	7 (9.1)	5 (6.5)	22 (28.6)	8 (10.4)	7 (9.1)	5 (6.5)

Table 4
Prevalence of social drinking contexts by sex and age. Only children who had progressed beyond the experimental use of alcohol answered these questions.

	Total n = 124, %	Sex		Age (years)				
		Girls n = 60, %	Boys n = 64, %	8 n = 9, %	9 n = 13, %	10 n = 24, %	11 n = 36, %	12 n = 42, %
When an adult allows me to drink	70	66	73	68	54	79	70	69
Because I am curious	65	64	66	56	77	54	73	62
When a relative gives me a drink	62	59	64	68	77	71	57	54
At a family party	61	62	59	67	77	54	54	64
Because I like the taste of alcoholic drinks	42	46	39	68	39	30	30	57
When my parents give me a drink	34	31	38	44	39	29	46	22
Because my father or mother drinks	30	31	30	33	39	38	35	19
Because other people drink	29	25	33	22	23	21	32	33
When hanging out with my friends	26	21	30	22	23	25	16	36
At parties with my friends	24	21	27	11	46	25	11	31
Because other kids around my age drink	22	16	27	22	23	25	8	31
To be less shy	17	12	22	11	39	13	14	18
Because my friends insist that I drink	15	5	23	22	31	8	8	17
Because my brothers/sisters drink	13	10	16	33	8	5	14	14
When I am alone and nobody sees me	12	7	17	11	23	13	11	10
When I am bored, to have fun	13	13	13	22	31	17	3	12
Because my friends drink	13	8	17	11	23	17	0	19
Because it's easier to have a good time	13	12	14	33	15	13	5	14
When I am feeling sad	12	10	14	33	8	21	8	7
Because I can forget my problems	11	8	14	11	31	13	8	7
Because I look older	12	7	17	11	15	17	15	14
When I am nervous, to relax	11	8	14	33	31	13	8	3
Because I feel lonely	8	7	9	33	23	8	5	0
To be like people on TV	6	3	8	11	15	13	3	0

Percentages do not sum to 100% because they describe how many of these children answered that they had drunk alcohol in that specific social drinking context.

$p < 0.001$). The final variables that significantly predicted greater alcohol use were age, extroversion, perceived peer alcohol use, and risk and aggression alcohol expectancy.

Discussion

The aim of the present study was to describe the prevalence and social contexts of drinking behavior and determine the risk factors associated with greater alcohol use in Argentinean children aged 8–12 years. An important finding was a large percentage of children had tasted alcohol (58%), and approximately one-third drank alcohol again after their first drinking experience. This high prevalence of alcohol tasting was similar to previous studies conducted

in Argentina (Miguez et al., 2012; Pilatti et al., 2011a) and other countries (Andrews et al., 2003; Cameron et al., 2003; Donovan & Molina, 2008; McIntosh et al., 2008). The prevalence of drinking beyond experimental alcohol use was greater than in previous studies (Bekman et al., 2011; Donovan & Molina, 2008; Gunn & Smith, 2010). An important caveat is that drinking was defined in the present study as any alcohol use after the first drinking experience. No explicit distinction was made between sipping alcohol and consuming more than just a few sips. The prevalence of drinking in children aged between 8 and 12 years has been reported to be approximately 10% in studies that explicitly differentiated drinking from sipping or tasting someone else's drink (Donovan & Molina, 2008; Gunn & Smith, 2010).

Table 5
Bivariate analysis between the predictor and the criterion variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1.	1.0																		
2. AGE	0.03	1.0																	
3. SCH	-0.06	0.23***	1.0																
4. IMP	0.20**	0.06	0.10	1.0															
5. AGR	0.30**	0.20**	0.04	0.60**	1.0														
6. EXT	0.10	0.03	0.02	0.14**	0.18**	1.0													
7. AGRE	-0.28**	-0.12*	0.06	-0.33**	-0.42**	0.15**	1.0												
8. CONS	-0.20**	-0.22**	0.40*	-0.44**	-0.38**	-0.05	0.56**	1.0											
9. OPE	-0.04	-0.25**	0.06	-0.28**	-0.24**	0.14**	0.42**	0.56**	1.0										
10. NEUR	-0.03	0.01	-0.07	0.44**	0.40**	0.22**	-0.17**	-0.22**	-0.11*	1.0									
11. SOC	-0.02	0.07	-0.08	0.04	0.11*	0.16**	0.06	0.08	0.14*	0.12*	1.0								
12. REL	0.02	0.06	0.39*	0.05	0.08	0.17**	0.08	0.05	0.11*	0.12*	0.69**	1.0							
13. COR	0.03	-0.11*	0.02	0.02	0.02	0.13*	0.11*	0.06	0.09	0.07	0.35**	0.38**	1.0						
14. RyA	-0.04	-0.04	0.03	-0.06	-0.03	0.16**	0.15**	0.11*	0.16**	0.01	0.12*	0.10*	0.51**	1.0					
15. EN	-0.16**	0.13*	0.37*	-0.05	0.02	-0.01	0.07	0.08	0.02	0.06	0.25**	0.19**	0.14**	0.18**	1.0				
16. PEER	0.09	0.14	0.23**	0.28**	0.28**	0.13*	-0.15**	-0.21**	-0.13*	0.18**	0.18**	0.10*	0.02	-0.11*	0.03	1.0			
17. EXP	0.23**	0.20**	-0.09	0.32**	0.31**	0.26**	-0.20**	-0.25**	-0.11*	0.23**	0.23**	0.18**	0.01	-0.09	0.06	0.41**	1.0		
18. F	0.19**	0.21**	-0.14**	0.28**	0.30**	0.24**	-0.19**	-0.23**	-0.12*	0.16**	0.21**	0.18**	-0.01	-0.13*	0.06	0.46**	0.86**	1.0	
19. Q	0.20**	0.22**	-0.13*	0.26**	0.29**	0.23**	-0.19**	-0.23**	-0.12*	0.14**	0.23**	0.19**	0.02	-0.12*	0.06	0.45**	0.86**	0.97**	1.0

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. SCH, school type; IMP, impulsivity; AGR, aggression. Big Five Scales: EXT, extroversion; AGRE, agreeableness; CONS, conscientiousness; OPE, openness; NEUR, neuroticism. CEA-N scales: SOC, social enhancement alcohol expectancy; REL, relaxation alcohol expectancy; COR, courage alcohol expectancy; RyA, risk and aggression alcohol expectancies; EN, negative mood alcohol expectancy; PEER, friend's alcohol use; EXP, drinking type experience (none, tasting, drinking); F, frequency of alcohol use; Q, quantity of alcohol use.

Table 6
Predictive utility of specific and nonspecific risk factors on type of drinking experience.

	Step 1		Step 2		Step 3		Step 4	
	β	t	β	t	β	t	β	t
Sex	0.175	3.463***	0.062	1.155	0.073	1.467	0.073	1.488
Age	0.198	3.902***	0.145	2.846*	0.142	2.980**	0.129	2.753**
School type	-0.110	-2.161*	-0.149	-2.969**	-0.067	-1.380	-0.065	-1.363
Impulsivity			0.128	2.004*	0.068	1.121	0.080	1.352
Aggressive behavior			0.123	1.896	0.052	0.851	0.038	0.635
Extroversion			0.183	3.373***	0.148	2.902**	0.143	2.851**
Agreeableness			-0.042	-0.633	-0.062	-0.995	-0.061	-1.000
Conscientiousness			-0.085	-1.211	-0.036	-0.547	-0.048	-0.736
Openness			-0.008	-0.134	-0.011	-0.186	-0.028	-0.486
Neuroticism			0.042	-0.735	-0.016	-0.303	-0.034	-0.641
Drinking peers					0.352	7.132***	0.320	6.547***
Social enhancement AE							0.112	1.785
Relaxation AE							0.071	1.152
Risk and aggression AE							-0.110	-2.425*
DW = 1.787								
R	0.301		0.438		0.543		0.572	
ΔR^2			0.110		0.103		0.033	
R^2	0.09		0.192		0.294		0.327	
$R \cdot A_j$	0.083		0.169		0.272		0.300	

* $p < 0.05$, ** $p < 0.01$; *** $p < 0.001$. Personality factors: impulsivity, aggressive behavior, extroversion, agreeableness, conscientiousness, openness, neuroticism; Social factors: drinking peers: perceived quantity of peers who drink alcohol; Cognitive factors: alcohol expectancies (AE): alcohol expectancies for social facilitation, relaxation alcohol expectancies, risk and aggression alcohol expectancies.

Another important finding was that the hedonic nature of the first alcohol drink was associated with later alcohol drinking behavior. Children who liked alcohol during the first tasting experience were much more likely to keep drinking alcohol than children who disliked alcohol. Previous work (McIntosh et al., 2008) found that disliking alcohol was one of the main reasons for not continuing drinking after the first alcohol use. Children in the present study were not asked about the reasons for not repeating their first drinking experience. Therefore, conclusively postulating a causal relationship between alcohol dislike and subsequent drinking behavior is not possible.

Twelve-year-old children had a significantly higher prevalence of alcohol tasting and drinking and a greater frequency and quantity of alcohol use than younger children. These findings support previous studies that indicated that this age is an important transitional period that is critical for the onset of drinking behavior (Cameron et al., 2003; Masten et al., 2009; Windle et al., 2009). Overall, the findings of this cross-sectional study are consistent with theories (Brown et al., 2009; Zucker et al., 2009) that consider alcohol use as a developmental phenomenon. Alcohol use among children mostly corresponds to infrequent sipping behavior (Donovan & Molina, 2008). In the present study, the children reported drinking small quantities of alcohol with a very low frequency.

Consistent with previous studies (Donovan, 2007; McIntosh et al., 2008; Warner & White, 2003), underage drinking usually occurred under adult supervision in family settings when parents or other relatives allowed the children to drink or were aware of the children's drinking. This pattern of alcohol use corresponds to what has been defined as "opportunistic consumption" (Donovan, 2007). Parents' or family members' awareness of children's drinking may add a certain degree of validity to sipping or drinking alcohol, turning what children regard as an inappropriate behavior into a permissible activity. Indeed, Cameron et al. (2003) found that drinking when parents were present was the most-often cited drinking context when children were asked when it was right to drink alcohol.

Similar to Donovan (2007) (also see Johnson et al., 1997; McIntosh et al., 2008), many children indicated that they drank alcohol because one of their parents had provided the alcoholic beverage. A belief held in some European countries is that children who begin to drink under parental supervision will have safe and

limited drinking practices during adolescence and adulthood (van der Vorst et al., 2010). Argentina is a South American country with a large prevalence of European descent, and this European immigration has influenced Argentinean culture. Argentinean parents appear to share the belief that their children will exhibit lower drinking rates if they supervise their drinking behavior at home. The present cross-sectional study did not assess the effects of drinking at home and drinking with parents on later alcohol drinking. Results from other studies, however, indicated that parental supervision of children's drinking did not have beneficial effects. An early onset of drinking is associated with a greater likelihood of alcohol abuse (McGue & Iacono, 2008; Warner & White, 2003), and adolescents who drink at home are more likely to begin drinking at an earlier age (Warner & White, 2003) and drink at higher levels (Komro, Maldonado-Molina, Tobler, Bonds, & Muller, 2007; van der Vorst et al., 2010).

Some of the children mentioned that their drinking occurred when "hanging out" with peers, at parties with friends, or because other children drank alcohol. The characteristics of this drinking context, in which alcohol use is unsupervised and validated and encouraged by peers, increase the risk of continued use (McIntosh et al., 2008). The occurrence of alcohol use in the peer context was lower than in the parental context, suggesting that children at this age find interactions with parents more important than interactions with peers (also see Johnson et al., 1997).

Two other important contexts of alcohol use were curiosity and alcohol liking (Johnson et al., 1997; McIntosh et al., 2008). Alcohol use at religious ceremonies has been mentioned as another significant context of alcohol use (Donovan & Molina, 2008). The instrument employed in the present study lacked items that referred to alcohol sipping/drinking in a religious context. No association was found, however, between religious practices and alcohol drinking. Moreover, preliminary unpublished data gathered by our research group indicated that children did not describe the use of alcohol at religious ceremonies as a motivational or situational characteristic associated with their drinking behavior.

Positive alcohol expectancies, particularly beliefs about the effects of alcohol on social facilitation, were positively related to drinking measures (Bot, Engels, & Knibbe, 2005; Cameron et al., 2003; Randolph et al., 2006). Previous studies indicated greater

negative than positive alcohol expectancy during childhood (Hipwell et al., 2005; Randolph et al., 2006) and *vice versa* during adolescence (Cameron et al., 2003; Dunn & Goldman, 2000). Greater exposure to drinking models is one of the most important factors implicated in this transition from negative to positive alcohol expectancy (Cumsille, Sayer, & Graham, 2000; Martino, Collins, Ellickson, Schell, & McCaffrey, 2006). The lack of a relationship between the remaining dimensions of alcohol expectancy and drinking experience is likely related to the lack of direct experience with alcoholic beverages (Anderson et al., 2005). Alcohol expectancies began to develop before alcohol consumption, but their specificity and complexity significantly increased when patterns of alcohol intake were established. When alcohol consumption increases in quantity and frequency, children and adolescents are faced with a variety of new consequences that amplify and modify their repertoire of anticipated effects (Leigh & Stacy, 2004; Randolph et al., 2006).

Perceived peer alcohol use was associated with all drinking measures (Simmons-Morton & Chen, 2006; Zucker et al., 2009) and was the strongest predictor of greater alcohol drinking among children. Specifically, children who perceived that more of their peers drank alcohol were at a higher risk for being drinkers themselves, highlighting the role of this social group in drinking (Capaldi et al., 2009; Duncan et al., 2006; Windle et al., 2009). Toward the end of childhood and the beginning of adolescence, children spend less time with their parents and increase their level of interaction with peers. These changes increase their peers' ability to influence beliefs, behaviors, and preferences in children and adolescents (Windle et al., 2009). A significant influence of personality traits on drinking, especially a positive relationship between extroversion (George, Connor, Gullo, & Young, 2010; McAdams & Donnellan, 2009) and a lack of impulse control (McAdams & Donnellan, 2009; National Institute on Alcohol Abuse and Alcoholism, 2006), has been repeatedly proposed. The present study provided support for this hypothesis. Personality traits are assumed to be distal factors that influence drinking onset and escalation and a broader set of behaviors.

The multivariate analysis found that age, extroversion, perceived peer drinking, and negative alcohol expectancy were the best predictors of greater alcohol use. Specifically, being older, having more peers who drink alcohol, having higher levels of extroversion, and having lower levels of alcohol expectancy for risk and aggression increased the risk for greater alcohol use. This final model explained 33% of the total variance.

Importantly, the present study has some limitations. Accidental or convenience sampling was used, and children were mostly enrolled in private schools, thus limiting the generalizability of the results. An effort was made to obtain a comparable percentage of children from each type of school (public and private). The schools, however, were chosen based on the availability of contacts, with a higher percentage of children from private schools. Moreover, it is possible that children whose schools agreed to participate differed from children whose schools did not agree to participate. Children who had permission from their parents to participate may have also differed from those who did not have the authorization.

Variables from different conceptual levels, such as personality, social, and cognitive factors, were included. Various other factors, such as parental alcohol use, parenting style, and motives for not drinking alcohol, were not considered. Stritzke and Butt (2001) found reduced alcohol drinking in children who feared the negative consequences of drinking and in children who were under familial or religious restrictions against alcohol use.

The present study also used a transversal design, which does not allow the establishment of causal relationships between variables. Future studies should determine the modulatory effects of the

variables analyzed. The present results, however, correspond to the cross-sectional data of an ongoing longitudinal study that seeks to determine the prospective effects that personality, social, and cognitive factors have on alcohol drinking.

Overall, the most important results of the present study were the high prevalence of drinking behavior in late childhood and early adolescence and the identification of risk factors that further increase the probability of drinking among these subjects. These results emphasize the importance of studying drinking behavior early during development (Brown et al., 2009; D'Amico & McCarthy, 2006; Masten et al., 2009) and support recent studies that assessed the impact of underage drinking (Bekman et al., 2011; Cranford et al., 2010; Gunn & Smith, 2010).

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