OXFORD

Article

From Age 4 to 8, Children Become Increasingly Aware About Normative Situations for Adults to Consume Alcohol

Carmen Voogt [iD][1,2,*], **Koen Smit**[1,2,3], **Marloes Kleinjan**[1,4], **Roy Otten**[2,5,6], **Tessa Scheffers**[1], and **Emmanuel Kuntsche**[2,3]

[1]Trimbos Institute, Netherlands Institute of Mental Health and Addiction, Department Youth and Risky Behaviour, room 0.18, Da Costakade 45, 3521 VS Utrecht, The Netherlands, P.O. Box 725, 3500 AS Utrecht, The Netherlands [2]Behavioural Science Institute, Department Developmental Psychopathology, Radboud University, Montessorilaan 3 6525 HR Nijmegen, The Netherlands, P.O. Box 9104, 6500 HE, Nijmegen, The Netherlands [3]Centre for Alcohol Policy Research, Building HS2, Level 5, La Trobe University, Bundoora Victoria 3086, Australia [4]Department of General Social Sciences, Utrecht University, Heidelberglaan 1 3584 CS Utrecht, The Netherlands, P.O. Box 80140, 3508 TC Utrecht, The Netherlands [5]Pluryn, Department Research Development, Industrieweg 50, 6541 TW Nijmegen, The Netherlands, P.O. Box 53 6500 AB Nijmegen, The Netherlands [6]Psychology Department, The REACH Institute, Arizona State University, North Building 900 S. McAllister Ave., Room 205, P.O. Box 876005, Tempe, AZ 85287-6005, USA

*Trimbos Institute, Netherlands Institute of Mental Health and Addiction, Department Youth and Risky Behaviour, room 0.18. Da Costakade 45 3521 VS Utrecht The Netherlands, P.O. Box 725, 3500 AS Utrecht The Netherlands Tel.: +31 30 2959218; E-mail: cvoogt@trimbos.nl

Abstract

Aims: Limited cross-sectional studies have indicated that young children have some knowledge of the type of situations in which adults usually consume alcohol. However, it is unclear when and how this knowledge develops over time. This study tests the hypothesis that between the ages of 4 and 8, children become more knowledgeable about common drinking situations (e.g. 'partying') and uncommon situations (e.g. 'driving').

Methods: Data of two independent samples were used: a cross-sectional study (parents) and a three-wave longitudinal study (children). Parents and children were recruited via a convenience and random sampling strategy, respectively. To identify common, ambivalent, and uncommon drinking situations, parents ($N = 158$; 47% men) completed an online survey in which they indicated how common it is that any adult would drink alcohol in the 18 situations of the Dutch electronic appropriate beverage (eABT). Children ($N = 329$; 48.9% boys) completed the Dutch eABT to assess their knowledge of situations in which adults usually consume alcohol.

Results: General linear model repeated measures with *post-hoc* pairwise comparisons showed that parents' perceptions of common, ambivalent, and uncommon situations in which adults consume alcohol predicted the initial level and the change over time in children's knowledge of adults' alcohol use in these situations.

Conclusions: Children aged 4–8 become increasingly knowledgeable about drinking norms in specific situations which implies that they know in what kind of situation alcohol consumption is a common human behavior. This knowledge may put them at risk for early alcohol initiation and frequent drinking later in life.

INTRODUCTION

Descriptive social norms (DSN) refer to how prevalent or 'normal' a behavior is in a given context (Moreira *et al.,* 2009). They can be acquired through observation, imitation, and modelling of the collective behavior (Bandura, 1977; Maisto *et al.,* 1999). Ample evidence shows that DSN determine alcohol use and subsequent excessive alcohol use in adolescence and adulthood (Donovan *et al.,* 2004; Windle *et al.,* 2008; Andrews *et al.,* 2011; Kuendig and Kuntsche, 2012). A limited number of cross-sectional studies have demonstrated that norms regarding alcohol use (i.e. drinking norms) already exist in childhood (Jahoda *et al.,* 1980; Spiegler, 1983; Noll *et al.,* 1990; Zucker *et al.,* 1995;Kuntsche *et al.,* 2016 ; Voogt *et al.,* 2017a). Knowledge of drinking norms can be operationalized at two levels: person-specific (i.e. perception of who usually consumes alcohol) and situation-specific (i.e. perception of the situation in which adult's alcohol use commonly occurs) (Voogt *et al.,* 2017b). Of the few studies that have examined children's knowledge of drinking norms, two investigated situation-specific drinking norms (Kuntsche *et al.,* 2016; Voogt *et al.,* 2017a). To date, to our best knowledge, there is no evidence supporting the link between children's knowledge of (any type of) drinking norms and their drinking behavior later on. Insight into the development of children's knowledge of drinking norms is crucial, since perceiving alcohol consumption as normal is a strong risk factor for alcohol initiation in adolescence (Zucker et al., 2008) and even predicts subsequent excessive alcohol use years later (Donovan *et al.,* 2004; Windle *et al.,* 2008; Andrews *et al.,* 2011). If the drinking norm related to common, ambivalent, and uncommon situations is learned and developed in childhood and persists or is reinforced in the subsequent years, this might be a cause of concern as common drinking situations (e.g. party) are more likely to be associated with alcohol initiation and risky drinking in adolescence and beyond (Harford *et al.,* 2002; Neighbors *et al.,* 2006; Paschall and Saltz, 2007) compared to ambivalent or uncommon drinking situations (e.g. drinking in public parks).

The social environment strongly influences cognitive development (Bandura, 1977; Bjorklund and Causey, 2017). Parents, as the primary caretakers of children (Steinberg, 2002), stimulate children's cognitive development. Consequently, they are the primary source of children's knowledge of alcohol and its use in adult culture (Voogt *et al.,* 2017b). Evidence indicates that children as young as age 4 start to understand that alcohol is restricted to adults and more often consumed by men compared to women or children (i.e. person-specific drinking norms) (Jahoda *et al.,* 1980; Spiegler, 1983; Noll *et al.,* 1990; Zucker *et al.,* 1995; Kuntsche *et al.,* 2016). Children also start to comprehend that adults consume alcohol more often in more common drinking situations, such as when 'having a party', compared to more uncommon drinking situations, like when 'playing outdoors' (Kuntsche *et al.,* 2016) or when 'driving a car' (Voogt *et al.,* 2017a) (i.e. situation-specific drinking norms). As alcohol-related cognitions become more comprehensive over the course of development (Bjorklund and Causey, 2017; Voogt *et al.,* 2017a), situation-specific drinking norms should also become more comprehensive over the course of childhood. However, to our knowledge, to date, no study has adopted a longitudinal perspective on the development of situation-specific drinking norms among young children.

Situation-specific drinking norms can be divided in three types, i.e. common situations, where alcohol is frequently consumed (e.g. 'having a party'); ambivalent situations, where alcohol may or may not be consumed (e.g. 'watching TV'), and uncommon situations, where alcohol is consumed less frequently (e.g. 'driving a car') (Voogt

et al., 2017a). However, a formal test has not been conducted to determine the classification of these three types. The two previous cross-sectional studies that examined children's knowledge of situation-specific drinking norms used the electronic appropriate beverage task (eABT (Kuntsche *et al.,* 2016; Voogt *et al.,* 2017a)). The eABT is a user-friendly collection tool comprising a wide range of situations in which it is more or less common to drink alcohol. Children between 30 and 48 months start developing a set of important language skills (Evans and Keenan, 2009), such as speaking in complete sentences and understanding simple questions. These skills are important for understanding the eABT, which makes the task age-appropriate for 4 year-olds. This assessment tool allows us to gain more insight into whether young children become increasingly knowledgeable about drinking norms in specific situations. To examine this, it was necessary to identify situations in which alcohol use among adults is more—or less—common.

The current study had two aims. The first aim was to classify 18 situations of the Dutch eABT (Voogt *et al.,* 2017a) as either common, ambivalent, or uncommon for adult's alcohol use as perceived by parents (i.e. parental situation-specific drinking norms) using parental data. The parents' opinion of drinking in these three types of situations appears specifically important, as parents often act as role models for their children (Eadie *et al.,* 2010). The second aim was to use the obtained information and classification to investigate the development of children's knowledge of the types of situations in which adults usually consume alcohol (i.e. situation-specific drinking norms) over time by using the data from a three-wave longitudinal study. We expected that parental situation-specific drinking norms would predict the initial level and the change of children's knowledge of situation-specific drinking norms from age 4 to 8. Specifically, we expected that 4–6 year olds are already able to distinguish between common, ambivalent, and uncommon drinking situations—displayed as everyday life scenarios in the Dutch eABT—by attributing more alcoholic beverages to adults shown in common situations as opposed to ambivalent and uncommon situations (Voogt *et al.,* 2017a) (Hypothesis 1). Subsequently, we expected that, across the two yearly follow-ups, 4–6 year olds' attributions of alcoholic beverages to adults would increase in common situations, remain stable in ambivalent situations, and decrease in uncommon situations (Hypothesis 2).

METHODS

Parental data from a cross-sectional study (Study 1) and child data from a three-wave longitudinal study (Study 2) were used to test the hypothesis. Using data of two independent samples (parents and children) enabled us to present an approximation of a general parental norm (i.e. parental situation-specific drinking norms) instead of an family-specific norm that is biased by the family, and used this general parental norm to investigate the development of children's knowledge about situations in which it is more of less common for an adult to consume alcohol (i.e. children's situation-specific drinking norms). Both (independent) studies were approved by the Ethical Committee of the Faculty of Social Sciences of the (blinded) (ECSW2014-2411-272).

Study 1—Assessment of situation-specific drinking norms

Procedure In 2016, we conducted a study among parents to obtain parental situation-specific drinking norms and identify common,

ambivalent, and uncommon situations for adult's alcohol use. Parents were recruited through primary schools located in the center region of the Netherlands (i.e. Utrecht). All primary schools received an invitation letter to participate in the study. Schools were asked to distribute invitation letters to parents of first to fourth grade students aged 4–8 years. Parents who agreed to participate completed an online survey in Qualtrics using a personalized login link and a password. The survey took about 15 minutes to complete. A gift coupon of 10 Euros was given as an incentive at the end of the study.

Sample Out of 205 primary schools contacted, 39 schools (19.0%) agreed to participate. From these 39 schools, 158 parents participated in the study[1]. Reasons for non-participation of schools included (a) too busy (24.1%), (b) overburdened with invitations for study participation (13.9%), (c) lack of interest (1.2%), (d) participation in another study (15.1%), and (e) burden for the parents (1.2%). Schools also mentioned other reasons (7.8%) or did not specify reasons (36.7%). All parents completed the entire online survey, resulting in no missing values.

The parent sample included 75 fathers ($M_{age} = 41.28$, SD = 4.36) and 83 mothers ($M_{age} = 38.29$, SD = 5.53). Most parents were of Dutch origin (94.9%) and had a high social economic status[2] (81%). Fathers and mothers consumed 8.57 (SD = 6.41) and 4.43 (SD = 4.57) standardized alcohol units[3] in the last week, respectively.

Measures *Parental situation-specific drinking norms.* Parents were asked how common[4] it is that any adult would drink alcohol in the 18 situations displayed in the eABT. Responses were measured on a 5-point Likert scale ranging from (1) 'very common' to (5) 'very uncommon'. Mean scores were calculated for each of the 18 eABT situations.

Study 2—Assessment of children's knowledge of situation-specific drinking norms

Procedure Following a standard procedure to obtain a large nationwide sample of children (Stone *et al.*, 2015), five provinces (i.e. Groningen, Gelderland, Zeeland, Zuid-Holland, and Flevoland) were randomly selected from five regions in the Netherlands (i.e. north, east, south, west, and central, respectively). Invitation letters for study participation were send to all primary schools in these five provinces. Schools that agreed were asked to distribute invitation letters to parents of first and second grade students. Active informed consent was obtained from the parents of 4- to 6-year olds.

The child data of this three-wave longitudinal study were collected during home visits between May and August of 2015 (T1: baseline), 2016 (T2), and 2017 (T3). The children took about 40 minutes to complete the Dutch eABT (Voogt *et al.*, 2017a) on a tablet computer. The eABT consists of 18 black and white drawings of men and women and/or children (72 persons in total: 26 children and

46 adults) in different situations presented on the top of the screen and 12 colored beverage pictures (four alcoholic, eight non-alcoholic) presented on the bottom (Fig. 1). For each person displayed in a given drawing and indicated by an arrow, the child was asked what the person is drinking by pointing to one of the 12 beverages. By doing so, the children's answers were automatically stored in a database, and the arrow moved to the next person. At the end of each home visit, a small present (e.g. a pencil) was given to the child (Voogt *et al.*, 2017a).

Sample Out of 831 primary schools contacted, 92 schools (11.1% of total; Gelderland: 8.6%; Flevoland: 7.3%; Groningen: 14.1%; Zeeland: 17.4%; Zuid-Holland: 7.8%) agreed to participate. These 92 schools presented 4394 children of which 329 children (7.5%) participated at T1. For details about the sample, see (Voogt *et al.*, 2017a).

There were no missing data, as all children completed the entire eABT at T1. Retention rates were 97.9% (*n* = 322) at T2 and 97.6% (*n* = 321) at T3. Retention analyses on demographic characteristic (gender, age, and ethnicity) and situation-specific drinking norms revealed that completers (*n* = 316: children who completed T1, T2, and T3) differed from non-completers (*n* = 13) only in terms of age (*M* = 4.76, SD = 0.73 versus *M* = 5.23, SD = 0.83), as they were more likely to be younger (*t*(326) = 2.26, *P* = 0.03) at T1.

At T1, the child sample ranged in age from 4 to 6 years (*M* = 4.78, SD = 0.78) and comprised 48.9% boys. Most children (98.1%) were of Dutch origin.

Measures *Children's situation-specific drinking norms (T1–T3).* We calculated the mean percentage scores for all adults (i.e. fathers, mothers, grandpas, grandmas, male friends, and female friends) in all 18 eABT situations to whom children attributed any alcoholic beverage (i.e. the number of alcoholic beverages attributed to adults divided by the number of adults in a specific situation). To illustrate, if a child attributed beer, white wine, champagne, and water to the father, mother, male friend, and female friend in the party situation of the eABT, this resulted in a score of 75% (three alcoholic beverages/four adults). Subsequently, the random choice percentage (i.e. percentage as expected by chance, that is, four alcoholic of the 12 beverages = 33.3%) was subtracted from the mean percentage scores (e.g. 75–33.3% = 31.7%) to account for chance (Voogt *et al.*, 2017a).

Analytical strategy

Using SPSS 25.0, the analyses were conducted in three steps. First, descriptive statistics were performed to describe the measures (i.e. situation-specific drinking norms) of the participants in both studies (i.e. Study 1: parents; Study 2: children).

Second, using the data from Study 1, the mean scores of parental situation-specific drinking norms were calculated for each of the 18 eABT situations. The 18 raw score means were converted to *z*-scores and ranked from the most common to the least common drinking situation. Based on the *z*-scores, the 18 eABT situations were divided into three categories, resulting in 'uncommon' (0), 'ambivalent' (1), and 'common' (2) drinking situations. Since no cut-offs have been published yet, we opted to get an equal distribution of common, ambivalent, uncommon drinking situations and chose +/−0.50 cut-offs for positive and negative *z*-scores, with values in between (around zero) representing ambivalent situations.

In the third step, scores of children's situation-specific drinking norms at T1, T2, and T3 (corrected for chance) were created for

---

[1] The non-response rate on the individual level cannot be provided, as participants selected themselves for the survey and information on non-participants was not available.

[2] Social economic status was measured by asking parents to indicate their highest grade of school they completed (1 = low; 2 = middle; 3 = high).

[3] One standardized alcohol unit contains ten gram of ethanol.

[4] We used the term 'common' instead of 'acceptable' as it better reflects DSN which refer how prevalent alcohol use is in drinking situations while injunctive social norms refer to how approved alcohol use is (Voogt *et al.*, 2013).

Fig. 1. Screen shot of the party drawing of the Dutch eABT task.

each child and each eABT situation (resulting in $329 \times 18 = 5922$ cases). Subsequently, the three categories of parental situation-specific drinking norms (i.e. uncommon, ambivalent, common) were used to predict the initial level (Hypothesis 1) and the change over time (Hypothesis 2) of children's knowledge of the type of situation in which adults usually consume alcohol. To test the two hypotheses, a general linear model (GLM) repeated measures with *post-hoc* pairwise comparisons was performed.[5] Children's situation-specific drinking norms were added as within-subject factors and parental situation-specific drinking norms as between-person factors. *Post-hoc* pairwise comparisons were corrected for multiple comparisons using the Bonferroni method at $\alpha = 0.05$ level, since this is the most robust univariate technique in terms of power and control of the Type I error rate (Field, 2009). The Greenhouse-Geisser correction for $\varepsilon < 0.75$ and the Huynh-Feldt correction for $\varepsilon \geq 0.75$ were used when sphericity assumptions were violated (Mauchly's test of sphericity) (Field, 2009). *F*-statistics and its associated degrees of freedom and *P*-values are reported.

---

5 GLM repeated measures were also conducted using the scores of children's situation-specific drinking norms at T1, T2, and T3 (corrected for chance) that were aggregated for each eABT situation (resulting in 18 cases instead of 5299 (329×18) cases). As the results remained consistent, we opt for using 5922 cases. The results can be obtained from the first author upon request.

RESULTS

Descriptive analyses

Study 1 Parents indicated 'party' as the most common drinking situation (those with the highest *z*-scores), followed by 'Christmas dinner,' 'dinner in a restaurant,' 'barbecue,' and 'terrace' (Table 1). 'Campsite,' 'having dinner,' 'celebrating Saint Nicolas,' 'watching TV,' 'having a picnic,' 'beach,' and 'playing a board game' were classified as ambivalent drinking situations. Uncommon drinking situations included 'amusement park,' 'train,' 'reading a book,' 'having lunch,' 'at the office,' and 'driving a car.'

Study 2 Children attributed the most alcoholic beverages to adults in the situations 'watching TV' (T1: ambivalent), 'party' (T2: common), and 'party' (T3: common). The least alcoholic beverages were attributed to the situations 'reading a book' (T1: uncommon), 'having lunch' (T2: uncommon), and 'at the office,' (T3: uncommon). A complete overview of children's attributions of alcoholic beverages to adults in the common, ambivalent, and uncommon drinking situations can be found in Table 1.

GLM repeated measures

GLM repeated measures with *post-hoc* pairwise comparisons using a Bonferroni correction showed that what parents perceive as common, ambivalent, and uncommon situations for adult's alcohol use predicted the initial level (Hypothesis 1) and the change over time (Hypothesis 2) of children's attributions of alcoholic beverages

Table 1. Raw score means and *Z*-scores of situation-specific drinking norms in 18 eABT situations given by parents (*N* = 158) and mean percentages of situation-specific drinking norms in 18 eABT situations given by 4- to 6-year-olds (*N* = 329) over two consecutive years

Situations (number of adults displayed)ᵃ	Raw score means of parental situation-specific drinking norms (*N* = 158 parents)	Z-scores of parental situation-specific drinking norms (ranking from most common to least common) (*N* = 158 parents)	Mean percentages of children's situation-specific drinking norms (SD) (sequence) (*N* = 329 children)		
	T1	T1	T1	T2	T3
Common drinking situation (*n* = 20)					
Party (*n* = 4)	4.39	1.54 (1)	36.47 (30.98) (2)	39.67 (32.83) (1)	51.98 (34.81) (1)
Christmas (*n* = 4)	4.35	1.50 (2)	33.51 (29.67) (5)	35.71 (30.26) (3)	38.44 (32.60) (5)
Restaurant (*n* = 4)	4.20	1.38 (3)	34.42 (28.33) (3)	34.80 (28.57) (5)	43.01 (31.12) (3)
Barbeque (*n* = 4)	4.13	1.32 (4)	32.83 (27.84) (6)	37.61 (30.75) (2)	44.22 (31.85) (2)
Terrace (*n* = 2)	3.61	0.87 (5)	33.89 (35.12) (4)	33.59 (36.47) (6)	34.65 (36.63) (7)
Ambivalent drinking situation (*n* = 15)					
Camping (*n* = 2)	3.11	0.45 (6)	31.16 (33.27) (8)	26.75 (33.57) (9)	26.90 (34.46) (8)
Dinner (*n* = 2)	2.82	0.20 (7)	27.51 (35.08) (15)	22.49 (34.86) (13)	20.97 (33.14) (13)
Saint-Nicholas (*n* = 4)	2.76	0.15 (8)	33.28 (29.51) (7)	30.93 (28.14) (7)	36.63 (31.11) (6)
TV (*n* = 1)	2.57	−0.01 (9)	42.25 (49.47) (1)	35.26 (47.85) (4)	41.34 (49.32) (4)
Picnic (*n* = 2)	2.35	−0.19 (10)	30.40 (32.95) (9)	22.64 (31.42) (12)	22.64 (32.61) (11)
Beach (*n* = 2)	2.28	−0.25 (11)	27.66 (34.41) (12)	22.70 (33.54) (11)	22.49 (34.64) (12)
Board game (*n* = 2)	2.23	−0.30 (12)	30.24 (34.11) (10)	26.75 (34.90) (10)	23.71 (33.59) (10)
Uncommon drinking situation (*n* = 13)					
Amusement park (*n* = 4)	1.56	−0.87 (13)	28.65 (27.57) (11)	27.13 (25.81) (8)	25.91 (27.66) (9)
Train (*n* = 2)	1.46	−0.95 (14)	26.90 (34.01) (17)	17.17 (28.18) (15)	19.60 (31.77) (14)
Book (*n* = 1)	1.30	−1.09 (15)	24.01 (42.78) (18)	13.37 (34.09) (17)	9.12 (28.83) (16)
Lunch (*n* = 2)	1.15	−1.21 (16)	27.51 (34.20) (16)	12.01 (25.61) (18)	9.12 (22.94) (17)
Office (*n* = 2)	1.10	−1.26 (17)	27.66 (33.51) (13)	14.89 (27.99) (16)	12.01 (26.48) (18)
Car (*n* = 2)	1.06	−1.29 (18)	27.66 (33.51) (14)	17.63 (29.36) (14)	15.20 (28.37) (15)
Common drinking situation, *M* (SD)	4.13 (.52)	1.32 (.27)	34.22 (19.44)	36.28 (21.62)	42.46 (22.03)
Ambivalent drinking situation, *M* (SD)	2.59 (.60)	0.01 (.28)	31.78 (20.50)	26.80 (18.55)	27.81 (20.68)
Uncommon drinking situation, *M* (SD)	1.27 (.29)	−1.11 (.17)	27.06 (19.38)	17.03 (15.17)	15.16 (15.70)

M: mean z-scores of parental situation-specific drinking norms and mean percentages of children's situation-specific drinking norms accounted for chance. T1: baseline assessment (2015). T2: first-year follow-up (2016). T3: second-year follow-up (2017).

ᵃAdults (*n* = 46) include all male and female adults: fathers, mothers, grandpas, grandmas, male friends, and female friends.

to adults in these three types of drinking situations over time. Specifically, 4- to 6-year olds distinguished between common, ambivalent, and uncommon drinking situations, as they attributed more alcoholic beverages to adults in the common drinking situations compared to adults in the ambivalent and uncommon situations ($F(2, 5919) = 323.15$, $P < 0.001$). As depicted in Fig. 2, this knowledge of the type of situation in which adults usually consume alcohol changes significantly over time ($F(3.96, 11,717.24) = 46.27$, $P < 0.001$). Children's attribution of alcoholic beverages to adults increased highly in common drinking situations, decreased slightly in ambivalent drinking situations, and decreased highly in uncommon drinking situations.

DISCUSSION

By using data from two independent studies, including parents (Study 1) and children (Study 2: three-wave longitudinal study), we aimed to identify situations that parents deem common, ambivalent, or uncommon in terms of adults' alcohol use. Subsequently, we aimed

to examine whether this classification predicted children's baseline knowledge of the types of situations in which adults usually consume alcohol (i.e. situation-specific drinking norms) and its development over 2 years. To our knowledge, the current study is the first to provide longitudinal evidence on the development of situation-specific drinking norms among young children.

The results from Study 1 showed that parents ranked situations involving working and driving as the two most uncommon situations for adult's alcohol use while partying and having Christmas dinner were ranked as the two most common situations. The results from Study 2 showed that children also considered these situations as uncommon and common drinking situations, respectively. Remarkably, children considered 'watching TV' as common situation for adults to drink alcohol, while parents ranked this situation as ambivalent suggesting that children might be more aware of habitual drinking by parents than parents themselves are aware.

The classification of common, ambivalent, and uncommon situations in which adults consume alcohol could subsequently enable us to examine the development of children's knowledge of situation-
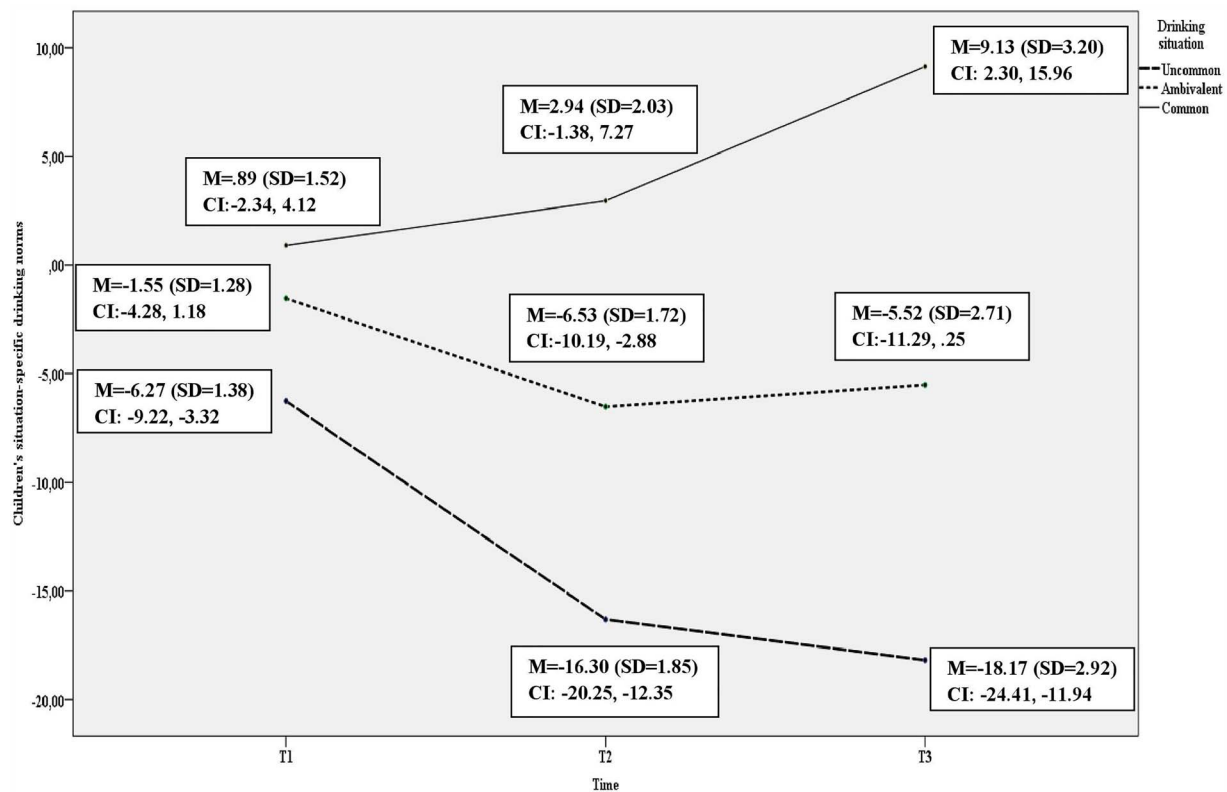
Fig. 2. Children's knowledge of situation-specific drinking norms over time depending on situation-specific drinking norms from parents.

specific drinking norms over time. It appears that children as young as 4–6 years old can already distinguish situations in which the consumption of alcoholic beverages is more or less common. Accordingly, children attributed less alcoholic beverages to adults in the ambivalent and uncommon drinking situations. These results add to two previous cross-sectional studies (Kuntsche *et al.*, 2016; Voogt *et al.*, 2017a), showing that situation-specific drinking norms are already present in very young samples. Parents indicated 'party' as the most common drinking situation (those with the highest *z*-scores), followed by 'Christmas dinner,' 'dinner in a restaurant,' 'barbecue,' and 'terrace' (Table 1). 'Campsite,' 'having dinner,' 'celebrating Saint Nicolas,' 'watching TV,' 'having a picnic,' 'beach,' and 'playing a board game' were classified as ambivalent drinking situations. Importantly, this study indicated that children become increasingly aware of situation-specific drinking norms as they grow older. Specifically, they attributed greater consumption of alcoholic beverages to adults in the common drinking situations (e.g. 'having a party') compared to the uncommon drinking situations (e.g. 'driving a car'). It should be noted, however, that children's attributions of alcoholic beverages to adults in the ambivalent drinking situations slightly decreased over time, where a stable pattern was expected. It seems that from age 4 onwards, children are increasingly capable of internalizing normative information through observational learning of adults (Bandura, 1977; Maisto *et al.*, 1999) or from exposure to media messages, thereby developing a greater knowledge of the prevalence and context of adult's alcohol use. This is especially true for the common drinking situations in which alcohol is frequently consumed (most visible for children) and the uncommon drinking situations in which alcohol is less frequently consumed (least visible for children). Thus, as children get older they seem to be more

aware of drinking norms related to adults' alcohol use in specific situations.

Limitations and strengths

Among the limitations are the low school participation rates of parents (19%) and children (11.1%), possibly due to a high participation rate in research studies in the Netherlands (Van Loon *et al.*, 2003). The under representativeness of allochthones and parents with a low social economic status is another limitation that might have affected the generalizability of the study results. This is, unfortunately, common in contemporary substance use research (Thrul *et al.*, 2016; Van Dorsselaer *et al.*, 2016a). However, the gender division, average age, and drinking status reflected the general population of parents in the Netherlands (Van Dorsselaer *et al.*, 2016b), suggesting that the parental sample is not overly biased. Moreover, we used a probability measure (i.e. common, ambivalent, and uncommon) to assess parental situation-specific drinking norms as opposed to a frequency or intensity measure, which is more common (Borsari and Carey, 2003). This makes it more difficult to compare our study results with prior research. Nonetheless, a probability measure is thought to be less affected by social desirability bias compared to a frequency or intensity measure, especially when asking about adults' alcohol use in uncommon drinking situations, like working and driving. By using an alternative measure, we contributed to the social norms literature by systematically classifying situations in which adult's alcohol use is deemed common, ambivalent and uncommon.

Among the strengths are the utilization of two independent samples (i.e. parents and children) that offered an independent assessment of drinking norms in specific situations. Using a general parental

norm is a more 'objective' measure to classify common, ambivalent and uncommon situations for adult's alcohol use than using the classification of children's own parents as the views of the participants in the independent samples are not intertwined as there is no intergenerational transference of this type of social norm. This was important because the aim of the study was to investigate what children know about drinking norms of adults (parents) in general and not about the specific drinking norms of their own parents. Strengths specific to Study 2 are the longitudinal study design with a large nationwide sample of children aged 4–8 years ($N = 329$); high retention rate (98% over 3 year); application of a user-friendly and age-appropriate assessment technique (eABT (Kuntsche *et al.*, 2016; Voogt *et al.*, 2017a)) to measure children's situation-specific drinking norms; and natural, familiar, and safe environment without disruption in which the data from children was collected (i.e. during home visits) (Sweet and Appelbaum, 2004).

Practical implications

Evidence of children's knowledge about situation-specific drinking norms and its development over time has the potential to contribute to primary alcohol prevention. When this knowledge persists or reinforces in the subsequent years, it can create the impression that alcohol use is omnipresent and socially endorsed in the social and physical surroundings, which was found to be related to adolescents' (risky) drinking (Kuntsche *et al.*, 2008). Since most Dutch children start drinking during early adolescence (Van Dorsselaer *et al.*, 2016a), primary alcohol prevention is mainly focusing on this age period. However, so far, prevention has not been very successful in reducing alcohol use among adolescents (Onrust *et al.*, 2016). Although authors argue that prevention should start early (Zucker, 2008), not much is known about what 'early' actually means. This is because most studies have been conducted among drinkers rather than on factors related to alcohol use that are rooted in childhood, e.g. (any type of) social norms. Providing inside into the development of children's knowledge about situation-specific drinking norms is a first step to answer the question how early primary alcohol prevention should start. Future research should explore whether knowledge about situation-specific drinking norms, acquired and developed in childhood, persists or is reinforced in adolescence. It should also examine the impact of children's knowledge of (any type of) drinking norms on alcohol initiation and subsequent use later in life. Additionally, future research should aim to investigate whether exposure to parental alcohol use (i.e. seeing parents drink: Smit *et al.*, 2018) predict the acquisition and development of (any type of) children's drinking norms, as parents often serve as role models regarding alcohol (Eadie *et al.*, 2010), and they might, unintendedly, transmit the 'normality' of alcohol use in different drinking situations to their children. First evidence indicates that it is not parental alcohol use per se which has a direct impact on children's alcohol-related cognitions and alcohol use, but rather children's exposure to this consumption, that is, when parents drink alcoholic beverages in the presence of children and children see the consequences of their drinking (Smit *et al.*, 2018). For example, drinking may occur after work when children aren't around, compared to drinking in a restaurant when children are present and witness parents drinking behavior (Voogt *et al.*, 2017a, 2017b). Possible differences in children's exposure to observable drinking behavior and its consequences can explain why children's knowledge of drinking norms differ between common, ambivalent, and uncommon drinking situations. Furthermore, future research needs to focus on the influence of (social) media exposure on

the acquisition and development of (any type of) children's drinking norms. So far, the influence of (social) media exposure have not been explored in much detail among young children (Casswell, 1996; Kuntsche and Kuntsche, 2019). Researchers are only just beginning to explore the effect of (social) media exposure on alcohol use (initiation) in adolescence, with a noticeable gap in relation to children's developing alcohol-related cognitions, such as situation-specific drinking norms. It would also be beneficial to expand current research with future qualitative work by interviewing children to understand situation-specific drinking norms and their origins in more detail.

CONCLUSION

This study enhances our understanding of situation-specific drinking norms in several ways. First, the findings confirm the importance to distinguish between common, ambivalent, and uncommon drinking norms. Second, the findings revealed that children as young as 4–6 years old already have knowledge of these three types of situation-specific drinking norms. Third, the findings demonstrated that children from age 4–8 become increasingly knowledgeable about drinking norms in specific situations. Although several important conclusions can be derived from our findings, more research is needed to further understand how knowledge of (any type of) drinking norms in childhood is acquired (e.g. parental alcohol use exposure, (social) media) and how it affects alcohol initiation and subsequent drinking patterns usually occurring several years later.'

CONFLICT OF INTEREST STATEMENT

There is no conflict of interest.

REFERENCES

Andrews JA, Hampson S, Peterson M (2011) Early adolescent cognitions as predictors of heavy alcohol use in high school. *Addict Behav* **36**:448–55. doi: 10.1016/j.addbeh.2010.12.011.

Bandura A (1977) *Social Learning Theory*. Englewood Cliffs, NY Prentice-Hall.

Bjorklund DF, Causey KB (2017) *Children's Thinking: Cognitive Development and Individual Differences*. Thousand Oaks, CA SAGE Publications.

Borsari B, Carey KB (2003) Descriptive and injunctive norms in college drinking: a meta-analytic integration. *J Stud Alcohol Drugs* **64**:331–41. doi: 10.15288/jsa.2003.64.331.

Casswell S (1996) Alcohol use: growing up and learning about drinking: children in Dunedin in the 1980s. In Silva PA, Stanton WR (eds). *From*

Child to Adult: The Dunedin Multidisciplinary Health and Development Study. Auckland, New ZealandOxford University Press, 206–24.

Donovan JE, Leech SL, Zucker RA, *et al.* (2004) Really underage drinkers: alcohol use among elementary students. *Alcohol Clin Exp Res* **28**:341–9. doi: 10.1097/01.ALC.0000113922.77569.4E.

Eadie D, MacAskill S, Brooks O, Heim D, Forsyth A, Punch S. (2010) *Pre-teens Learning About Alcohol: Drinking and Family Contexts, York, United Kingdom*. https://pdfs.semanticscholar.org/b9a8/4479cda18819f6e33d3eb99495da8c458b57.pdf.

Evans S, Keenan T (2009) *An Introduction to Child Development*. Thousand Oaks, CASAGE Publications.

Field AP (2009) *Discovering Statistics using SPSS*. LondonSAGE Publications.

Foxcroft DR, Moreira MT, Almeida Santimano NML *et al.* (2015) Social norms information for alcohol misuse in university and college students. *Cochrane Database Syst Rev 12*: **3**. doi: 10.1002/14651858.CD006748.pub4.

Harford TC, Wechsler H, Seibring M (2002) Attendance and alcohol use at parties and bars in college: a national survey of current drinkers. *J Stud Alcohol Drugs* **63**:726–33. doi: 10.15288/jsa.2002.63.726.

Jahoda G, Davies JB, Tagg S (1980) Parents' alcohol consumption and children's knowledge of drinks and usage patterns. *Br J Addict* **75**:297–303. doi: 10.1111/j.1360-0443.1980.tb01383.x.

Kuendig H, Kuntsche E (2012) Solitary versus social drinking: an experimental study on effects of social exposures on in situ alcohol consumption. *Alcohol Clin Exp Res* **36**:732–8. doi: 10.1111/j.1530-0277.2011.01663.x.

Kuntsche E, Kuendig H, Gmel G (2008) Alcohol outlet density, perceived availability and adolescent alcohol use: a multilevel structural equation model. *J Epidemiol Community Health* **62**:811–6.

Kuntsche E, Le Mével L, Zucker RA (2016) What do preschoolers know about alcohol? Evidence from the electronic appropriate beverage task (eABT). *Addict Behav* **61**:47–52. doi: 10.1016/j.addbeh.2016.05.004.

Kuntsche E, Kuntsche S (2019) Parental drinking and characteristics of family life as predictors of preschoolers' alcohol-related knowledge and norms. *Addict Behav* **88**:92–8.

Maisto SA, Carey KB, Bradizza CM (1999) Social learning theory. In Leonard KE, Blane HT (eds). *Psychological Theories of Drinking and Alcoholism*, 2nd edn. NYGuilford Press, 106–63.

Neighbors C, Oster-Aaland L, Bergstrom RL *et al.* (2006) Event-and context-specific normative misperceptions and high-risk drinking: 21st birthday celebrations and football tailgating. *J Stud Alcohol Drugs* **67**:282–9. doi.org/10.15288/jsa.2006.67.282.

Noll RB, Zucker RA, Greenberg GS (1990) Identification of alcohol by smell among preschoolers: evidence for early socialization about drugs occurring in the home. *Child Dev* **61**:1520–7. doi: 10.1111/j.1467-8624.1990.tb02880.x.

Onrust SA, Otten R, Lammers J *et al.* (2016) School-based programmes to reduce and prevent substance use in different age groups: what works for whom? Systematic review and meta-regression analysis. *Clin Psychol Rev* **44**:45–59.

Paschall MJ, Saltz RF (2007) Relationships between college settings and student alcohol use before, during and after events: a multi-level study. *Drug Alcohol Rev* **26**:635–44.

Smit K, Otten R, Voogt CV *et al.* (2018) Exposure to drinking mediates the association between parental alcohol use and preteen alcohol use. *Addict Behav* **87**:244–50. doi: 10.1016/j.addbeh.2018.07.026.

Spiegler DL. (1983) *Children's attitudes toward alcohol. J Stud Alcohol Drugs* **44**:545-552. doi: 10.15288/jsa.1983.44.545.

Steinberg L (2002) *Adolescence*, 6th edn. NYMcGraw-Hill.

Stone LL, Janssens JM, Vermulst AA *et al.* (2015) The strengths and difficulties questionnaire: psychometric properties of the parent and teacher version in children aged 4-7. *BMC Psychol* **3**:4. doi: 10.1186/s40359-015-0061-8.

Sweet MA, Appelbaum MI (2004) Is home visiting an effective strategy? A meta-analytic review of home visiting programs for families with young children. *Child Dev* **75**:1435–56. doi: 10.1111/j.1467-8624.2004.00750.x.

Thrul J, Pabst A, Kraus L (2016) The impact of school nonresponse on substance use prevalence estimates-Germany as a case study. *Int J Drug Policy* **27**:164–72. doi: 10.1016/j.drugpo.2015.06.005.

Van Dorsselaer S, Tuithof M, Verdurmen J, Spit M, Van Laar M, Monshouwer K. (2016a) Jeugd en Riskant Gedrag 2015 [Youth and Risk Behavior 2015], Utrecht, The Netherlands. https://assets.trimbos.nl/docs/8e6ef71f-d74e-4696-a67b-98ef82fb2235.pdf.

Van Dorsselaer S, Tuithof M, Monshouwer, K. (2016b) Factsheet Peilstationsonderzoek Ouders 2015 [Factsheet Peilstation Study Parents 2015], Utrecht, the Netherlands. https://www.trimbos.nl/docs/4bc451ed-00a5-4fb6-b6e0-def4cc96fd9f.pdf.

Van Loon AJM, Tijhuis M, Picavet HSJ *et al.* (2003) Survey non-response in the Netherlands: effects on prevalence estimates and associations. *Ann Epidemiol* **13**:105–10.

Voogt C, Otten R, Kleinjan M *et al.* (2017a) Alcohol-related knowledge and alcohol-related norms in four to six year olds - evidence from the Dutch electronic appropriate beverage task. *Alcohol Clin Exp Res* **41**:1637–47. doi: 10.1111/acer.13452.

Voogt C, Beusink M, Kleinjan M *et al.* (2017b) Alcohol-related cognitions in children (aged 2-10) and how they are shaped by parental alcohol use: a systematic review. *DAD* **177**:277–90. doi: 10.1016/j.drugalcdep.2017.04.006.

Voogt CV, Larsen H, Poelen EA *et al.* (2013) Longitudinal associations between descriptive and injunctive norms of youngsters and heavy drinking and problem drinking in late adolescence. *J Subst Use* **18**:275–87.

Windle M, Spear LP, Fuligni AJ *et al.* (2008) Transitions into underage and problem drinking: developmental processes and mechanisms between 10 and 15 years of age. *Pediatrics* **121**:S273–89. doi: 10.1542/peds.2007-2243C.

Zucker RA, Donovan JE, Masten AS *et al.* (2008) Early developmental processes and the continuity of risk for underage drinking and problem drinking. *Pediatrics* **121**:S252–72. doi: 10.1542/peds.2007-2243B.

Zucker RA (2008) Anticipating problem alcohol use developmentally from childhood into middle adulthood: what have we learned? *Addiction* **103**:100–8.

Zucker RA, Kincaid SB, Fitzgerald HE *et al.* (1995) Alcohol schema acquisition in preschoolers: differences between children of alcoholics and children of nonalcoholics. *Alcohol Clin Exp Res* **19**:1011–7. doi: 10.1111/j.1530-0277.1995.tb00982.x.