Addictive Behaviors 89 (2019) 121–127

Contents lists available at ScienceDirect

Addictive Behaviors

journal homepage: www.elsevier.com/locate/addictbeh

# Very early drinking: Event history models predicting alcohol use initiation from age 4 to 11 years

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## HIGHLIGHTS

- Prospective national study predicted childhood alcohol initiation, age 4–11 years.
- Based on 11,355 child-parent pairs studied since infancy in Millennium Cohort Study.
- 2% of UK children had first drink prior to age 8 and 13% by age 11.
- Children more likely to initiate alcohol use when higher in behavioral undercontrol.
- Heightened risk of very early drinking when parents drink or use drugs

## ARTICLE INFO

*Keywords:*
Children
Alcohol initiation
Behavioral undercontrol
Event history
Longitudinal

## ABSTRACT

While it is not normative to initiate alcohol use prior to adolescence, substantial numbers of children do so. However, relatively little is known about the prevalence or predictors of alcohol initiation in childhood, compared to extensive research on adolescent initiation and alcohol use. The present study examines patterns and predictors of very early drinking initiation in childhood, focusing on child behavioral undercontrol and parent alcohol and drug use as time-varying risk factors across childhood, independent of sociodemographic background variables. Event history analyses model and predict the age of alcohol initiation across ages 4 to 11 in the ongoing Millennium Cohort Study. Methodological strengths include the prospective design initiated in infancy (prior to any alcohol consumption), multiple reporters, and large representative sample of children and parents ($n$ = 11,355). Key predictors are child behavioral undercontrol and parent alcohol and drug use assessed across childhood. Weighted results show that < 2% of children had their first drink of alcohol prior to their 8th birthday, rising to 13% by age 10–11 years. Odds of initiation are higher when parents rated children as behaviorally undercontrolled and when at least one parent in the household reported drinking alcohol and/or using illegal drugs, independent of sociodemographic group differences. Thus, an important minority initiated drinking during childhood, and there are key risk factors for early drinking. Increased focus on the epidemiology, etiology, and prevention of childhood drinking is needed.

## 1. Introduction

Initiation of alcohol use earlier in adolescence predicts numerous social and health problems (Agrawal et al., 2006; Clark, Cornelius, Kirisci, & Tarter, 2005; Grant & Dawson, 1997; Hingson, Heeren, & Winter, 2009), but less is known about the prevalence or predictors of alcohol initiation in childhood (Donovan, 2007; Zucker, Donovan, Masten, Mattson, & Moss, 2008). Explanations for harms of adolescent drinking include: Interference with normative developmental tasks, harming social relationships, increased deviant peer associations, and addiction (Baumrind & Moselle, 1985; Kuntsche et al., 2013; Maggs & Schulenberg, 2005; Warner & White, 2003). By logical extension, alcohol initiation in *childhood* may be particularly harmful. Children's smaller size and greater physical, cognitive, and social immaturity may increase vulnerability to acute and long-term harm (Donovan, 2009; Masten, Faden, Zucker, & Spear, 2008; Staff, J, et al., 2016). Moreover, risks of child drinking may be compounded by greater deviance, longer exposure, and earlier escalations to harmful use.

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https://doi.org/10.1016/j.addbeh.2018.09.030
Received 16 February 2018; Received in revised form 24 September 2018; Accepted 24 September 2018
Available online 25 September 2018
0306-4603/ © 2018 Published by Elsevier Ltd.

Compared to extensive US and international surveillance data on adolescent and adult drinking (e.g., CBHSQ, 2015; Degenhardt et al., 2008; Hasin & Grant, 2015; Miech, Johnston, O'Malley, Bachman, & Schulenberg, 2018), less research has focused on the timing of childhood drinking initiation and its predictors. This relative monitoring likely reflects the greater prevalence in the teens when initiation becomes increasingly normative (Donovan, 2007). Recent studies in the United States have assessed alcohol use at early ages ranging from 10 to 12 and identified key social, behavioral, and demographic predictors (Colder et al., 2013; Colder et al., 2018a; Donovan & Molina, 2011; Foster, Hicks, & Zucker, 2018). Most have used non-representative community-based samples, employed greatly different measures, and provided widely ranging prevalence estimates. However, national studies in the United Kingdom (UK) document that important proportions of children report some alcohol use. In WHO-sponsored surveys in Great Britain, up to 5% of 11-year-olds reported drinking at least every week (Currie et al., 2012), and in England, 1.8% of 10-year-olds born in 1991–92 in the regionally-representative ALSPAC study reported drinking in the prior six months (Macleod et al., 2008). In the present sample comprising all four UK countries, 13% of 10- and 11-year olds had initiated alcohol use, defined as having had a drink of alcohol—more than a few sips (Maggs, Staff, Patrick, Wray-Lake, & Schulenberg, 2015). This is similar to the 12% of 11-year-olds in England who had drunk alcohol (HSCIC, 2014). Thus while it is clearly not normative to initiate alcohol use prior to adolescence, substantial numbers do so (Donovan, 2007; Masten et al., 2008). Given heightened risks of early—and very early—initiation, understanding etiological risk factors for childhood initiation may yield unique insights into highest-value prevention targets (Donovan, 2004).

This study examines patterns and predictors of very early drinking initiation, focusing on child behavioral undercontrol and parent substance use as time-varying risk factors, beyond sociodemographic background. We use event history analysis to model and predict the age of alcohol initiation across ages 4 to 11 in the Millennium Cohort Study (MCS), a large nationally-representative sample of UK children followed since infancy (Joshi, Hansen, & Dex, 2010). This prospective design overcomes several methodological limitations of much past research on childhood alcohol initiation. First, many studies focused on adolescents or adults with no prospective information on antecedents assessed in early or middle childhood prior to alcohol initiation (e.g., Miech et al., 2018). Second, initiation age is typically asked retrospectively, sometimes about events occurring many years or decades earlier (e.g., Hingson, Heeren, & Winter, 2006; Sartor, Lynskey, Heath, Jacob, & True, 2006). Forward telescoping—the tendency to recall later ages of initiation with increasing time from the event—leads to unreliability and bias in reported onset age (Parra, O'Neill, & Sher, 2003). Third, although important studies have prospectively collected rich etiological data in childhood and substance use data in adolescence (e.g., Colder, Frndak, et al., 2018a; Donovan & Molina, 2013; Foster et al., 2018; Masse & Tremblay, 1997; Sung, Erkanli, Angold, & Costello, 2004; Wong et al., 2006), samples were typically small and school- or community-based; these highlight regional differences but have insufficient cases to focus on very early use (e.g., Kaplow et al., 2002). The longitudinal MCS began in infancy; is nationally representative; assessed risk factors prior to drinking; utilized multiple reporters; obtained self-reports on age of initiation at age 10–11 years; and includes adequate numbers of early initiators.

## 2. Risk factors for early alcohol use initiation

### 2.1. Child behavioral undercontrol

Numerous theories and empirical studies identify childhood behavioral undercontrol and neuropsychological deficits as key predictors of early adolescent substance initiation, escalation, and later-life disorders (Chassin, Colder, Hussong, & Sher, 2016; Moffitt, 1993; Staff et al., 2015; Tarter et al., 1999; Wong et al., 2006; Zucker et al., 2008). As a broad term encompassing impaired executive attention, response inhibition deficits, impulsivity, and conduct problems (Chassin et al., 2016), behavioral undercontrol may underlie an externalizing risk phenotype for substance use disorders (Zucker, Heitzeg, & Nigg, 2011). Notably, children who do not follow normative developmental progressions to increased behavioral control early in childhood face challenges in other developmental domains, including academics and peer relations (Bierman, Kalvin, & Heinrichs, 2015; Blair & Raver, 2015), in part due to disruptive, difficult behaviors. Empirically, childhood aggression, hyperactivity, prosocial peer rejection, and low achievement predict alcohol use initiation in early adolescence (e.g., < 15 years of age) and other problem behaviors (Caspi, Henry, McGee, & Moffitt, 1995; Colder, Frndak, et al., 2018a; Donovan, 2004; Donovan & Molina, 2011; Sartor et al., 2006; Staff et al., 2015; Wong et al., 2006; Zucker et al., 2008). Similarly, conduct problems in childhood predict alcohol initiation by age 10 after adjusting for covariates (Macleod et al., 2008).

### 2.2. Parent alcohol and drug use

Mothers' and fathers' substance use predicts child alcohol and other substance use. In a systematic and meta-analytic review of modifiable parenting factors, Yap, Cheong, Zaravinos-Tsakos, Lubman, and Jorm (2017) found that parental alcohol use reliably predicts adolescent alcohol initiation, with a small effect size. For example, parents' modeling of positive alcohol attitudes and parent alcohol use are associated with children's and adolescents' early drinking and positive alcohol attitudes (Colder, Shyhalla, & Frndak, 2018b; Donovan, 2004; Donovan & Molina, 2011; Kosterman, Hawkins, Guo, Catalano, & Abbott, 2000; Macleod et al., 2008; Patrick, Maggs, Greene, Morgan, & Schulenberg, 2014; Sartor et al., 2006; Voogt et al., 2017; Zucker et al., 2008). Parent substance use more generally also predicts adolescent alcohol, tobacco, and marijuana use (Bailey et al., 2016; Garnier & Stein, 2002; Hawkins, Catalano, & Miller, 1992).

### 2.3. Sociodemographic background

Initiation timing may vary by sociodemographic background. In some studies, boys initiate earlier than girls (Donovan, 2007; Sartor et al., 2006), although risk factors predicting initiation are similar across gender (Donovan, 2004). In the US and UK, there are group differences by ethnicity, with White adolescents being more likely to initiate alcohol use and heavy drinking than Black, Asian, and other non-Hispanic groups (Chen, Yi, Williams, & Faden, 2009; Fuller, 2012; Green & Ross, 2010; Miech et al., 2018; Svendsen et al., 2012). There are also regional differences within countries (Currie et al., 2012; Miech et al., 2018), including in the MCS (Maggs et al., 2015), and various differences between multiple indicators of social class with alcohol use earlier in life (e.g., Colder, Shyhalla, & Frndak, 2018b; Donovan & Molina, 2011; Macleod et al., 2008; Melotti et al., 2011). In the MCS, mothers' higher employment status predicts children's lower likelihood of drinking by age 10/11 (Maggs et al., 2015).

### 2.4. Hypotheses

The current study extends prior research by focusing earlier in development, using a much larger sample, and testing whether repeatedly-assessed childhood risk factors predict early drinking initiation. Event history analyses predict the age of alcohol initiation across ages 4 to 11, testing the hypotheses that greater child behavioral undercontrol and parent alcohol and other drug use across childhood would predict earlier initiation of alcohol use. Given possible sociodemographic group differences that may shift the over-time hazard of children's alcohol initiation, we include child gender, ethnicity, and country as child risk factors and parent education, occupational status, and marital status as parent risk factors, to better isolate the predictive

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