



Energy drink consumption and later alcohol use among early adolescents



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HIGHLIGHTS

- We examined associations between energy drink and alcohol use among adolescents.
- Frequency of energy drink use predicted increases in frequency of alcohol use over time.
- Levels of parental monitoring partially accounted for this association.

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ABSTRACT

Introduction: Little is known about the association between energy drink and other substance use in early adolescence despite the fact that the consumption of energy drinks during this developmental period is becoming increasingly common. The aim of this study was to examine concurrent and longitudinal associations between energy drink and alcohol use among middle school students. In addition, sensation seeking and parental monitoring were examined as factors that could potentially explain any associations found.

Methods: A sample of 144 youth participating in the Camden Youth Development Study was utilized. Self-report questionnaire data was collected over a 16-month period.

Results: Frequency of energy drink use at the initial assessment predicted increases in frequency of alcohol use 16 months later (adjusting for initial frequency of alcohol use). Levels of parental monitoring partially accounted for this association; in contrast, there was no evidence that sensation seeking was related to this association.

Conclusion: Youth who consume energy drinks in early adolescence are at risk for alcohol use later; this may be partially related to low levels of parental monitoring being associated with the consumption of both substances. Future research is needed to further explain this association; this may lead to opportunities for early intervention for youth at high risk for alcohol use.

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1. Introduction

The consumption of energy drinks is increasingly prevalent among children and adolescents. Between 2004 and 2009, energy drink sales increased by approximately 240% in the U.S. (Mintel Global New Products Database, 2009), and 31% of 12- to 17-year-olds report consuming energy drinks on a regular basis (as reviewed in Burrows, Pursey, Neve, & Stanwell, 2013). This trend has caused concern over the possible consequences and correlates of such use. The consumption of energy drinks has been linked with seizures, cardiac dysrhythmias, and heart failure among children, adolescents, and young adults (Seifert, Schaechter, Hershonin, & Lipzultz, 2011). Among young adults, energy drink consumption is linked to risk-taking behaviors, such as alcohol use and heavy drinking (Velazquez, Poulos, Latimer, &

Pasch, 2012). Possible associations between energy drinks and alcohol consumption during early adolescence have been sparsely examined, however. Supporting the possibility that there may be an association, a recent study demonstrated cross-sectional associations between caffeine use in middle adolescence and conduct disorder and violence symptoms (Kristjansson, Sigfusdottir, Frost, & James, 2013), behaviors that are associated with alcohol use. The purpose of this study was to examine whether frequency of energy drink consumption is associated with frequency of alcohol use among early adolescents, both concurrently and longitudinally. For comparison, associations between other types of caffeine use (coffee and soda) and alcohol use were explored. In addition, the influence of two factors that might explain any associations between energy drink and alcohol consumption (sensation seeking and parental monitoring) were examined.

Due to the paucity of research on energy drinks specifically, we examined previous research regarding associations between caffeine use more broadly and alcohol use. Two lines of research support the notion that there could be an association between energy drink

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(and caffeine more broadly) and alcohol use. First, studies examining polysubstance use have found that individuals who use one licit or illicit substance, such as caffeine, alcohol, nicotine, or marijuana, tend to use others (Kendler, Schmitt, Aggen, & Prescott, 2008); this appears to be partially due to a common genetic factor (Hettema, Corey, & Kendler, 1999; Kozlowski et al., 1993; Swan, Carmelli, & Cardon, 1996; though there are substance-specific factors as well: Hettema et al., 1999; Kendler, Myers, & Prescott, 2007). Second, prior research focusing on the correlation between caffeine use or dependence and use of and/or dependence on other substances has shown significant positive associations. Bernstein, Carroll, Thuras, Cosgrove, and Roth (2002) found that teenagers who abused or were dependent on any type of drug (other than caffeine) consumed a significantly greater amount of caffeine than individuals who were not dependent on or abusing a drug. Similarly, Tennant and Detels (1976) found that abusers of hashish, alcohol, and amphetamines were more likely to have started consuming coffee by the age of 12 when compared with non-abusers. In the only longitudinal study examining caffeine and other substance use among early adolescents, Collins, Graham, Rousculp, and Hansen (1997) found that adolescents who drank less than six cups of coffee (low-risk group) per month were more likely to have never used alcohol or tobacco when compared with individuals who drank more than six cups of coffee (high-risk group) in the past month. Of those who had not yet initiated use of alcohol or nicotine at the first assessment, those in the high-risk group were more likely to have initiated use of these substances one year later than those in the low-risk group.

We believed that energy drinks—more than other types of caffeinated beverages—would be particularly strongly associated with alcohol use because of the association between energy drink consumption and risk-taking behaviors (including those related to substance use) among young adults (Velazquez et al., 2012) and adolescents (Kristjansson et al., 2013). Also, energy drink consumption is less common than many other types of caffeine consumption (especially soda, among early adolescents); therefore, frequent use of energy drinks could potentially be a marker for a more risk-taking behavioral pattern. Finally, energy drinks contain more caffeine than other caffeinated beverages; therefore, youth who enjoy consuming them may be prone to seek out beverages that change how they feel, perhaps including alcohol.

If energy drink and alcohol consumption are associated, there would be many possible explanations for this finding. Individual and family characteristics are important in youths' development, and in this study, we considered sensation seeking (individual factor) and parental monitoring (family factor) as factors that might explain any association between energy drink and alcohol consumption, due to their associations with externalizing and substance use behaviors in youth (Jones & Lejuez, 2005; Kosten, Ball, & Rounsaville, 1994; Pettit, Laird, Dodge, Bates, & Criss, 2001; Steinberg, Fletcher, & Darling, 1994). Supporting associations between these factors and caffeine and alcohol use, Jones and Lejuez (2005) found that sensation seeking was positively associated with membership in a caffeine dependent/heavy consumption group, and sensation seeking is related to early adolescent alcohol use (Flory, Lynam, Milich, Leukefeld, & Clayton, 2004; MacPherson, Magidson, Reynolds, Kahler, & Lejuez, 2010). Adolescents who perceive low levels of parental monitoring are more likely to have initiated alcohol or marijuana use (DiClemente et al., 2001; Pettit et al., 2001; Steinberg et al., 1994). We know of no research to date examining associations between perceived parental monitoring and energy drink (or other caffeine) use.

The goal of the present study was to examine the association between energy drink and alcohol use among early adolescents. We sought to address four hypotheses, each formed based on the literature reviewed above and theoretical considerations. Based on the overall associations between caffeine consumption and the consumption of other substances and on the association between energy drink

consumption and risk-taking behavior, we expected that: (1) there would be a concurrent association between frequency of early adolescent energy drink consumption and frequency of alcohol use, and (2) frequency of early adolescent energy drink consumption would predict increases in alcohol use over time. Third, based on their joint associations with substance use and risk-taking behavior, we predicted that sensation seeking and parental monitoring might partially account for the associations between energy drink and alcohol consumption. Finally, based on prior research linking coffee and other substance use in a similar age group (Collins et al., 1997) as well as the high prevalence of soda consumption, we expected that coffee, but not soda, consumption would also be associated with alcohol use.

2. Methods

2.1. Participants

The sample in the present study consisted of participants in the Camden Youth Development Study (N = 153). All 6th and 7th grade students attending a charter school in Camden, New Jersey were recruited. This age group was selected because a high percentage of adolescents begin utilizing substances (e.g., alcohol) during this developmental period (Johnston, O'Malley, & Bachman, 2000). Eighty-eight percent of parents contacted consented to their child's participation in the study. At the initial assessment, 144 (94% of those whose parents gave consent; 50% female) students participated. At the final assessment 16 months later, data was collected from 127 students, which represented 96% of students initially recruited for the study who still attended the school (intermediate assessments were conducted but are not included in this study due to low frequencies of alcohol use at younger ages, as expected based on national norms; Johnston, O'Malley, Bachman, & Schulenberg, 2010). 32.2% of participants self-identified as Black or African American, 69.2% as Hispanic, 5.6% as Native American, 2.1% as White and 6.3% as "Other." Among students in these grades at this school, 43% of families received public assistance (not including unemployment or social security benefits) and 81% qualified for free lunches.

2.2. Procedures

Questionnaires were administered in classrooms. One masters-level research assistant read the questionnaires aloud, while one or two other research assistants were available to help students with questions. Students who were not present on the scheduled administration day were given the opportunity to participate approximately two days later.

2.3. Measures

2.3.1. Caffeinated drinks

Frequencies of consumption of energy drinks, coffee, and soda over the past four months were assessed. Participants were asked, "In the past 4 months, how often did you drink...?" Possible responses were: 0 = none, 1 = less than once a month, 2 = 1 to 3 times a month, 3 = 1 to 3 times a week, and 4 = most days.

2.3.2. Alcohol

Frequency of drinking alcohol (beer, wine, or hard liquor) in the past four months was assessed on a five-point scale similar to that used for caffeinated drinks: 0 = none, 1 = less than once a month, 2 = at least once a month, but less than once a week, 3 = 1 to 3 times a week, or 4 = most days. The questions specified that a drink of alcohol had to be "not just a sip or taste of someone else's."

2.3.3. Sensation seeking

The UPPS-P-Child Version (Zapolski, Stairs, Settles, Combs, & Smith, 2010) was utilized to measure sensation seeking. The sensation-seeking

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