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Short Communication

Parental problem drinking predicts implicit alcohol expectancy in adolescents and young adults

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ABSTRACT

The present study aimed to investigate the influence of parental problem drinking on implicit and explicit alcohol expectancy of adolescents and young adults (12–24 years). The study was conducted via the Internet, employing a between-subjects design. We measured alcohol expectancy by means of an Implicit Association Test (IAT) and a self-report questionnaire. A short version of the Children of Alcoholics Screening Test (CAST) was used to measure alcohol-related parental problem behavior. Our results showed that increased CAST-scores were correlated with a stronger implicit association between the concepts alcohol and arousal. In contrast, no such relationship was observed between parental problem drinking and self-reported expectancy of alcohol arousal. These findings provide tentative evidence that an implicit cognitive processing bias is implicated in the intergenerational transmission of addictive behaviors.

1. Introduction

Children of addicted parents are the largest known risk group for the development of substance abuse problems, with 33% to 40% developing an alcohol use disorder (Sher, Grekin, & Williams, 2005) and an up to six-times-elevated risk of alcohol misuse or addiction (Cotton, 1979). The risk of transmission of an alcohol use disorder is assumed to be mediated by an interaction of genetic and environmental factors, with twin studies explaining up to 60% of the variance. Thus, children with a high-risk genotype may remain phenotypically inconspicuous, if not exposed to a risky environment (for a review, see Schuckit, 2009). There are three main moderating factors that may explain the increased risk for alcohol-related problems in children affected by parental alcohol problems (ChAPAPs[1]; cf. Wiers, et al., 2007). Firstly, the acquisition of a link between alcohol-related stimuli and the aversive effects of ethanol intoxications obviously reduces the risk of alcohol misuse. Such aversive effects, that are associated with alcohol consumption, however, appear to be experienced less intensely in ChAPAPs (Erblich, Earleywine, & Erblich, 2001). Secondly, there is evidence that ChAPAPs might also experience more rewarding effects from consuming alcohol (Krystal & Tabakoff, 2002). Finally, there is reason to assume that ChAPAPs might be more likely to suffer from an impairment of executive functions, which are associated with self-regulatory behavior (Wiers, Gunning, & Sergeant, 1998a). Thus, ChAPAPs not only have less reason to control their drinking behavior, but they might also be less able to do so.

Obviously, the anticipated affective consequences of one's behavior have a strong influence on behavioral decisions (e.g., Tice, Bratslavsky, & Baumeister, 2001). Accordingly, previous research has shown that positive and negative expectancies regarding the affective outcomes of alcohol consumption can predict alcohol use (e.g., Goldman, Del Boca, & Darkes, 1999). Within this scope, Wiers, Gunning, and Sergeant (1998b) reported stronger positive alcohol expectancies (e.g., relaxation, euphoria, sociability) in adolescent ChAPAPs than controls.

Most of the cognitive processes determining our perception, attitudes, and behavior are not consciously accessible. These implicit cognitive processes have a strong impact on addictive behavior, especially when resources for cognitive control are limited (e.g., Grenard, Ames, Wiers, Thush, Sussman, & Stacy, 2008). In recent years several response latency measures have been developed to assess such implicit processes and some of them adapted for addiction research (cf. Stacy & Wiers, 2010). The most widespread of these measures is the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). Previous research suggests that implicit alcohol cognitions, as measured with the IAT, are a good predictor of alcohol consumption especially under conditions of depleted self-control resources (Ostafin, Marlatt, & Greenwald, 2008). Similarly, Thush and

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[1] The acronym ChAPAPs is used here as an alternative to the more common term "children of alcoholics" (COA) because it is considered to be potentially stigmatizing and lacking precision as it is not inclusive of the whole population of children affected by parental alcohol problems (cf. Budde, Moesgen, Belles, & Klein, 2010).

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Wiers (2007) showed that IAT-scores were able to predict binge drinking in adolescents one year prospectively. In particular, implicit associations between alcohol and arousal have been shown to be a valid predictor of alcohol use (Houben & Wiers, 2006; for a review, see Rooke, Hine, & Thorsteinsson, 2008).

Building on these findings we expected a relationship between parental alcohol-related problems and implicit alcohol-arousal associations in offspring. Thus, the more parental alcohol-related problems the descendants report the more they were expected to associate the consumption of alcohol with rewarding arousal consequences.

2. Method

2.1. Sample

Participants were recruited via promotional materials that had been sent to schools and youth facilities across Germany. 128 German adolescents and young adults (102 females) between the age of 12 and 24 years completed the online study ($M = 15.18$ years, $SD = 2.23$). For completion of the study participation in a raffle was offered.

2.2. Measures and procedure

A client-side JAVA applet – a reliable tool for conducting online research ensuring high stimulus timing accuracy (Schmidt, 2001) – was provided via an Internet website hosted at Dortmund University of Technology. Previous research has corroborated the validity of alcohol IAT measures via the internet and their comparability with laboratory measures (Houben & Wiers, 2008).

The present version of the IAT was adopted from Houben and Wiers (2006). After 20 practice trials for the discrimination of depictions of five alcoholic and non-alcoholic beverages, participants practiced the discrimination of five words for active (i.e. lively, funny, cheerful, active, talkative) and neutral (i.e. historical, apart, steep, wide, compact). After these 40 practice trials, participants had to go through 60 combined trials in which the categories alcohol/active and non-alcohol/neutral shared the same response key. In the following 20 practice trials the required response for sorting the concepts alcohol and non-alcohol was reversed. Finally, in the last 60 combined trials the alcohol/neutral and non-alcohol/active shared a response key. In every trial the category exemplars stayed in the center of the screen until response. In case participants gave a false categorization response a red cross appeared and stayed beneath the category exemplar until they responded with the appropriate key. The inter-trial-interval was set to 500 ms.

Perception of parental drinking problems and adverse social interactions due to alcohol misuse was measured with an adapted short version of the Children of Alcoholics Screening Test (CAST; Hodgins, Maticka-Tyndale, el-Guebaly, & West, 1995). Unlike the conventional CAST*1 (6 items), the present version (CAST*2; 2×6 items) allowed to discriminate between maternal, paternal or joint problem behavior.

In order to measure explicit alcohol-arousal expectancy participants could indicate on a 5-point Likert scale their agreement/disagreement with the statement "After drinking alcohol, I feel…", completed by each of the same five arousal-related adjectives employed in the IAT (cf. Houben & Wiers, 2006).

To measure binge-drinking, participants were asked to indicate how often they had been drinking more than 5 alcoholic beverages on a single occasion in the previous month (cf. Gmel, Rehm, & Kuntsche, 2003). Scale anchors were 1 (never), 2 (1–3 times), 3 (4–10 times), and 4 (>10 times). Participants' alcohol consumption was measured on a 5-point scale indicating how often they had been drinking the following beverages during the last month: beer, beer-mix, (sparkling) wine, cocktails/long-drinks, alcopops, or hard liquor. Here, scale anchors were 1 (never), 2 (1–4 times), 3 (5–8 times), 4 (9–12 times), and 5 (≥13 times).

3. Results

An IAT-Score was calculated with the D600 algorithm (Greenwald, Nosek, & Banaji, 2003; Houben & Wiers, 2006), reflecting the mean reaction time (RT) difference between the two relevant categorization tasks. This difference was calculated in such a way that higher IAT scores indicated faster performance for incompatible blocks (alcohol/neutral vs. no alcohol/active) relative to compatible blocks (alcohol/active vs. no alcohol/neutral). In keeping with Greenwald et al. (2003), response latencies below 300 ms and above 3000 ms were regarded as outliers ($M = 1.31\%$, $SD = 5.82$) and recoded to 300 ms and 3000 ms, respectively. RTs for false responses were standardized on the level of each participant and error penalties of 600 ms were given. On average, participants gave 8.99% false responses on the critical trials ($SD = 6.7$). Twenty-one participants who gave more than 15% false responses on the critical trials had to be excluded from further analysis (e.g., Karpinski, Steinman, & Hilton, 2005). To reduce effects of excessive slowness and premature responses (cf. Greenwald, Nosek, & Banaji, 2003) we excluded one participant who exceeded the group mean RT on the critical trials ($M = 792.04$ ms, $SD = 134.93$) by more than three standard deviations.

The remaining 106 participants were faster on compatible blocks ($M = 718.87$ ms, $SD = 114.42$) than on incompatible blocks ($M = 854.24$ ms, $SD = 158.66$). This difference was highly significant, $t(105) = -11.019$, $p < .001$.

Next, a continuous score was calculated for the Children of Alcoholics Screening Test (CAST*1; $M = 1.02$, $SD = 1.72$, *range* = 0–6; $\alpha = .86$) that did not discriminate between paternal or maternal problem drinking. The IAT-score was significantly correlated with parental alcohol-related problem behavior ($r = -.195$, $p < .05$), whereas explicit alcohol expectancy ratings were not ($p = .258$).

Separate analysis for the continuous father ($M = .76$, $SD = 1.41$, *range* = 0–6, $\alpha = .80$) and mother sub-scales ($M = .34$, $SD = 1.15$, *range* = 0–6, $\alpha = .91$) revealed a stronger association between paternal problem drinking and the IAT-score ($r = -.173$, $p = .076$) than between maternal problem drinking and the IAT-score ($r = -.121$, $p = .216$).

With a conservative cut-point-score of 3 of the CAST*1 20 participants (18.9%) were identified as ChAPAPs (cf. Hodgins, Maticka-Tyndale, el-Guebaly, & West, 1995). The dichotomously categorized CAST*1-score was only marginally correlated with the IAT-Score ($r = -.161$; $p = .099$) with ChAPAPs showing a stronger alcohol-arousal association ($M = -177.39$, $SD = 111.80$) than controls ($M = -125.59$, $SD = 128.28$). In particular, 14 participants were identified as ChAPAPs due to exclusively paternal alcohol-related problems and five due to exclusively maternal alcohol-related problems, while one participant reported alcohol-related problems for both parents.

On average, participants had a score of 1.37 on the binge-drinking scale ($SD = .68$). There was no significant difference between ChAPAPs ($M = 1.40$, $SD = .59$) and controls ($M = 1.36$, $SD = .70$) regarding binge-drinking, $F(1, 104) = .054$, $p = .816$. The mean-score on the alcohol consumption scale was 1.38 ($SD = .54$). Also here no significant difference between ChAPAPs ($M = 1.43$, $SD = .38$) and controls ($M = 1.37$, $SD = .57$) was observed, $F(1, 104) = .157$, $p = .693$.

Both explicit and implicit alcohol expectancy measures were significantly associated with binge drinking and the amount of certain alcohol beverages consumed during the last month before testing (see Table 1). No relationship, however, was found between explicit and implicit alcohol arousal expectancy measures ($r = -.047$, $p = .634$).

Table 1
Correlations of implicit and explicit alcohol expectancy measures, parental problem behavior and alcohol consumption habits.

Measure	CAST*1	Alcohol consumption	Binge drinking
1. Implicit alcohol arousal expectancy	−.195*	−.198*	−.223*
2. Explicit alcohol arousal expectancy	.111	.531***	.400***

Note. $N = 106$. Implicit alcohol arousal expectancy. Implicit Association Test. A D600 IAT-Score was calculated (cf. Greenwald et al., 2003). Higher IAT-Scores indicate faster performance for the incompatible block (alcohol/neutral vs. no alcohol/active) than for the compatible block (alcohol/active vs. no alcohol/neutral). Explicit alcohol arousal expectancy. A higher score indicates more alcohol arousal expectancy. CAST*1. Children of Alcoholics Screening Test with the conventional scoring. A higher score indicates more parental alcohol-related problems. Binge drinking. Number of times participant have drunken more than five alcoholic beverages during the last month at a single occasion. A higher score indicates more drinking. Alcohol consumption. Mean number of times participants have drunk several alcoholic beverages during the last month. A higher score indicates more drinking.

* $p < .05$, 2-tailed.
*** $p < .001$, 2-tailed.

4. Discussion

Parental problem drinking was revealed to be significantly correlated with implicit, but not with explicit alcohol arousal expectancy. Thus, the more adolescents and young adults indicated that their parents show drinking-related problem behavior the more strongly they associated alcohol with arousal, as measured with the IAT. To our knowledge, no such relationship has been reported in an original article before. Notably, parental drinking-related problems and high levels of parental alcohol consumption are not equatable measures. Accordingly, Pieters, van den Vorst, Engels, and Wiers (2010) found no relationship between the amount of paternal alcohol consumption and children's implicit alcohol-arousal associations. Moreover, the convergent validity of both explicit and implicit arousal measures was corroborated by a significant correlation with binge drinking and self-reported alcohol consumption. That is, the more alcohol participants reported to drink the higher their explicit and implicit arousal expectancies were. However, as implicit and explicit measures were not correlated they may be related to different aspects of binge drinking and alcohol consumption, which is in accordance with a dual-process perspective on alcohol-related cognitions (Deutsch & Strack, 2005; Stacy & Wiers, 2010). In line with previous findings, the present results further demonstrate the limitations of self-report measures and the method employed may help to identify at-risk groups as a target of preventive interventions. In practice this may translate to considering the implicit alcohol consumption-arousal-nexus as a focal point when challenging unrealistic expectations and problematic alcohol use in ChAPAPs (cf. Wiers & Hoffman, 2010).

Finally, we would like to point to some limitations of the present study that should be addressed in future research. An inherent constraint lies in its correlational nature. At present, it cannot be ruled out that alcohol expectancy affected the retrieval of alcohol-related parental problem behavior. Ideally, a longitudinal design would provide greater insight into the causal relationship indicated between these variables. Moreover, a real-life assessment of alcohol consumption and binge-drinking would offer a more accurate account of the practical implications of the present results.

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Contributors

All authors contributed to the design of the study. Stefan Belles and Axel Budde conducted literature searches, provided summaries of previous research studies, conducted the statistical analysis, and wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

Conflict of interest

All authors declare that they have no conflicts of interest.

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