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# Psychopathological factors associated with problematic alcohol and problematic Internet use in a sample of adolescents in Germany



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#### ABSTRACT

In Germany, high prevalence rates for problematic alcohol use and problematic Internet use in adolescents were reported. The objective of the present study was to identify psychopathological factors associated with these two behavior patterns. To our knowledge, this is the first investigation assessing psychopathological factors for both problematic alcohol and problematic Internet use in the same sample of adolescents. We surveyed a sample of 1444 adolescents in Germany regarding problematic alcohol use, problematic Internet use, psychopathology and psychological well-being. We conducted binary logistic regression analyses. 5.6% of the sample showed problematic alcohol use, 4.8% problematic Internet use, and 0.8% both problematic alcohol and problematic Internet use. Problematic Internet use compared to those without problematic Internet use. Conduct problems and depressive symptoms were statistically significant associated with both problematic alcohol and problematic Internet use. Male gender and less peer problems were associated with problematic alcohol use. For the first time associations between adolescent problematic alcohol and problematic Internet use due to common psychopathological factors were identified. However, in addition to shared factors, we found also specific psychopathological correlates associated with these two behavior patterns.

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### 1. Introduction

1.1. Prevalence of problematic alcohol and problematic Internet use in adolescents in Germany

During the last several years, the surge in reported cases of problematic Internet use in adolescents across the globe continues to be a growing problem (e.g. Wang et al., 2013). Following the definition of Shaw and Black (2008) problematic Internet use (also commonly referred as internet addiction or pathological Internet use) is "...characterized by excessive or poorly controlled preoccupations, urges or behaviors regarding computer use and

internet access that lead to impairment or distress". Akin to problematic Internet use, problematic alcohol use is also relatively prevalent in adolescent populations. In contrast to problematic Internet use, problematic alcohol use has been rigorously investigated and considered to be an important public health concern for the past several year (e.g. see McCambridge et al., 2011). In Germany, high prevalence rates for problematic Internet use and problematic alcohol use in adolescents were reported. Four recently published studies (Durkee et al., 2012; Rumpf et al., 2014; Tsitsika et al., 2014; Wartberg et al., 2015) had investigated samples of German adolescents and estimated the prevalence of problematic Internet use in this age group between 0.9% (Tsitsika et al., 2014) and 4.8% (Durkee et al., 2012). Problematic alcohol use was assessed by the Federal Center for Health Education (BZgA, 2015) in a representative sample of adolescents (aged between 12 and 17 years). The measure for problematic alcohol use in the

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BZgA-survey was "frequent binge drinking" (consumption of five or more standard drinks of alcohol at least on 4 out of the last 30 days) and in 2010 5.2% of the German adolescents reported this behavior pattern.

# 1.2. Psychopathological factors associated with problematic alcohol and problematic Internet use in adolescence

Problematic alcohol use or problematic Internet use in adolescents could be described as a risk behavior or "problem-behavior" (Jessor, 1987). In general, such behavior patterns occur more frequently in adolescence compared to other stages of life (Scheithauer et al., 2008). According to the "Problem Behavior Theory" of Jessor (1998) different problematic behavior patterns can be understood as an expression of an underlying syndrome (Scheithauer et al., 2008) and could share a similar pattern of psychopathological factors. For reasons of consistency (with the Problem Behavior Theory) we use for the two behavior patterns the terms "problematic alcohol use" and "problematic Internet use".

Regarding psychopathological factors related to adolescent problematic Internet use, the best empirical evidence is available for conduct problems (e.g. Ko et al., 2009) and depressive symptoms (e.g. Wang et al., 2013). In a smaller number of studies, associations between problematic Internet use in adolescents and ADHD (e.g. Carli et al., 2013a) or social phobia/social anxiety (e.g. Yen et al., 2007) were revealed. Conduct problems (i.e. externalizing problems) are the most important psychopathological factors associated with problematic alcohol use in adolescents (e.g. Young et al., 2008). However, the findings regarding the associations between adolescent problematic alcohol use and internalizing problems (depressive symptoms, anxiety), as well as the results concerning ADHD (Marshall, 2014) are mixed (Chartier et al., 2010).

In summary, conduct or externalizing problems seem to be shared psychopathological factors related to problematic alcohol and problematic Internet use in adolescence. This could be partly facilitated due to underlying personality characteristics, e.g. a recent study reported higher impulsivity in male adult patients with Internet gaming disorder and as well in patients with alcohol use disorder (Choi et al., 2014). The importance of internalizing problems (especially depressive symptoms) is empirically well-established for problematic Internet use, but for adolescent problematic alcohol use, the results are inconsistent. To our knowledge, our study is the first assessing psychopathological factors for both problematic alcohol and problematic Internet use in the same sample of adolescents. Whereas until now only results in different samples and between studies could be compared, this methodological approach (using the same measures in one sample) facilitates the direct comparison of psychopathological factors associated with these two problematic behavior patterns.

# 1.3. Aim and research questions of the study

The objective of the present study was to identify psychopathological factors associated with problematic alcohol and problematic Internet use. Furthermore, we wanted to compare the patterns of these psychopathological factors. We explored the following research questions:

How frequently do problematic alcohol use, problematic Internet use and a combined problematic use of the Internet and alcohol occur in adolescents?

Which psychopathological factors are associated with problematic alcohol use and with problematic Internet use?

Which similarities and differences in the patterns of psychopathological factors can be revealed?

#### 2. Methods

### 2.1. Data collection

The data have been collected within the project "Saving and Empowering Young Lives in Europe – Mental health promotion through prevention of risky and self-destructive behavior" (SEYLE), funded by the European Union (Wasserman et al., 2010). This project is a randomized controlled multicenter study, involving ten European countries and Israel. A study protocol for the SEYLE project was compiled by Wasserman et al. (2010) and additionally, Carli et al. (2013b) described further methodological aspects of the survey (e.g. including randomization strategy, translations and reliability values of the used instruments).

In Germany, the randomization was based on schools in the Rhein-Neckar-District (100 schools were randomized, 41 of these schools were requested for participation and 26 schools accepted to participate in the SEYLE project). Due to the unique design of the German school system, schools were classified to one out of three categories ("Gymnasium"=high educational level/"Realschule"=medium educational level/"Hauptschule"=low educational level). Subsequently, the schools were selected and randomized separately for each category (Carli et al., 2013b). Adolescents (8th and 9th graders) were recruited from the randomly selected 26 German schools (more details on the process of randomization can be found in the description of Carli et al., 2013b). The sample was representative for 8th and 9th graders in the Rhein-Neckar-District, which shows a sociodemographic composition that is comparable to overall Germany. All data were collected through structured questionnaires administered to adolescents in the 26 schools. Data collection was carried out in January 2010 on a sample of 1444 adolescents (response rate: 72% of the 2016 adolescents who were invited to participate) using a standardized self-report questionnaire. This investigation was conducted within the confines of the school classrooms. Data collection was carried out by trained members of the project team (they administered the questionnaires). Teachers were present during the survey; however, they were not involved in the assessment. Written informed consent of adolescents and at least one caregiver were obtained prior to the study. The study was approved by the local ethical committee of the Medical Faculty of the University Hospital Heidelberg.

## 2.2. Measures

Problematic Internet use in adolescents was measured for the last six months using the Young Diagnostic Questionnaire (YDQ, Young, 1998). Because of its brevity (eight items, binary "yes" vs. "no" response format), the YDQ is very well suited for epidemiological studies and was used in other studies to measure "problematic Internet use" (e.g. Huang et al., 2009). As a screening instrument, the YDQ can be used for the determination of a dimensional score of problematic Internet use (but not to confirm a diagnosis, e.g. of "Internet gaming disorder", American Psychiatric Association, 2013). "By summing up the values of all eight items of the questionnaire, a YDQ sum score was calculated with a higher sum indicating higher risk levels of problematic Internet use. According to Young (1998), adolescents who answered yes to five or more of the criteria were classified as having problematic Internet use.

To assess problematic alcohol use, we combined two measures of alcohol consumption (frequency and quantity). The adolescents were asked how often they had consumed an alcoholic drink (1="never", 2="once a month or less", 3="2-4 times a month", 4="2-3 times a week", 5="4 or more times a week", 6="every day", 7="several times a day"). An alcoholic drink was specified as

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