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Examining co-patterns of depression and alcohol misuse in emerging adults following university graduation

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ABSTRACT

Depression and alcohol use disorders are highly comorbid. Typically, alcohol use peaks in emerging adulthood (e.g., during university), and many people also develop depression at this time. Self-medication theory predicts that depressed emerging adults drink to reduce negative emotions. While research shows that depression predicts alcohol use and related problems in undergraduates, far less is known about the continuity of this association after university. Most emerging adults "mature out" of heavy drinking; however, some do not and go on to develop an alcohol use disorder. Depressed emerging adults may continue to drink heavily to cope with the stressful (e.g., remaining unemployed) transition out of university. Accordingly, using parallel process latent class growth modelling, we aimed to distinguish high- from low-risk groups of individuals based on joint patterns of depression and alcohol misuse following university graduation. Participants (N = 123) completed self-reports at three-month intervals for the year post-graduation. Results supported four classes: class 1: *low stable depression and low decreasing alcohol misuse* (n = 52), class 2: *moderate stable depression and moderate stable alcohol misuse* (n = 35), class 3: *high stable depression and low stable alcohol misuse* (n = 29), and class 4: *high stable depression and high stable alcohol misuse* (n = 8). Our findings show that the co-development of depression and alcohol misuse after university is not uniform. Most emerging adults in our sample continued to struggle with significant depressive symptoms after university, though only two classes continued to drink at moderate (class 2) and high (class 4) risk levels.

1. Introduction

Depression and alcohol misuse are highly co-occurring problems (Grant et al., 2004). It is one of the most frequent mental health co-morbidities in the general population (Conway, Compton, Stinson, & Grant, 2006), with about one-third of people with a depressive disorder also meeting criteria for an alcohol use disorder (AUD; Davis, Uezato, Newell, & Frazier, 2008). It is critical to examine the comorbidity between depression and alcohol misuse, as people who suffer from both (relative to those with just one of these problems) present with greater clinical severity, have poorer treatment responses, and are more likely to relapse (Baker et al., 2007; Lubman, Allen, Rogers, Cementon, & Bonomo, 2007). Thus, researchers should conduct studies to better understand the pathways of comorbid depression and alcohol misuse.

Emerging adulthood (ages 18 to 25) is a period of new freedom (Arnett, 2005). Most emerging adults in Canada attend some form of post-secondary school (Shaienks, Gluszynski, & Bayard, 2008) and for many, this is often their first time living independently from their parents. During this time, there is a normative developmental peak in alcohol use and other risky behaviours, and as a result, emerging adults experience diverse and severe alcohol problems (Arnett, 2005; Johnston, O'Malley, Bachman, & Schulenberg, 2007). The prevalence of alcohol use disorders (AUDs) is highest in emerging adulthood relative to other developmental periods (Adlaf, Demers, & Gliksman, 2005; NIAAA, 2015). Not only does alcohol misuse (i.e., heavy drinking, alcohol-related problems) peak during this time, but there is also a rapid increase in the number of people suffering from depression symptoms (Bayram & Bilgel, 2008). Nearly 30% of emerging adults report struggling with depressive symptoms (Ibrahim, Kelly, Adams, & Glazebrook, 2013), and depression relates to drinking problems in this population (Grothues et al., 2008).

Self-medication theory provides a framework to understand why depression and alcohol misuse co-occurs in emerging adulthood. The self-medication hypothesis posits that people drink alcohol to numb painful emotions (Khantzian, 1997). Over time, emerging adults with depression learn that alcohol helps them cope with negative feelings,

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and this increases risk for alcohol problems. Consistent with theory, the literature shows that emerging adults with depression endorse coping motives for drinking (Grant, Stewart, & Mohr, 2009), which in turn increase risk for alcohol problems. However, emerging adults who drink to cope do not seem to be drinking heavier than their peers who drink for other reasons (e.g., to feel positive emotions; Kuntsche, Knibbe, Gmel, & Engels, 2005). One potential explanation for this is that many people drink heavily in university – a context where heavy drinking is accepted and even encouraged – therefore, it may be difficult to tease apart co-patterns of depression and drinking during this time.

Most emerging adults "mature out" of heavy drinking after graduating from university; however, some people do not and are the ones at high risk to develop serious alcohol problems later in life. Thus, these individuals are at a greater risk for alcohol misuse compared to those who "mature out." The transition out of university may be when depression-related drinking diverges from the drinking patterns of non-depressed emerging adults. This is a stressful and potentially defeating transition (Wendlandt & Rochlen, 2008), and these people may feel lost, experience difficulty finding work, remain unemployed, and suffer from increased levels of negative affect (Keough & O'Connor, 2016). Consequently, depressed emerging adults may continue to drink heavily to cope during this tough time and experience more alcohol-related problems as a result, while their non-depressed peers mature out. Therefore, the transition out of university may be a particularly critical time to examine the co-development of depression and alcohol misuse. This has implications for understanding how depressive pathways to drinking problems unfold from emerging to full adulthood.

While the relationship between depression and alcohol misuse in undergraduates is well supported (e.g., Mushquash et al., 2013), research on patterns of misuse after university is limited. We will be among the first to examine the co-development of these constructs during the critical, potentially defeating transition out of university. If we can identify meaningful transition points in emerging adulthood, there may be opportunities to intervene early and thus improve their overall mood and well being in the future. Therefore, we used parallel process latent class growth modelling (LCGM) to identify potential subgroups based on joint trajectories of depression and alcohol misuse following university graduation. The overarching hypothesis was that using parallel process LCGM, we would be able to distinguish high from low risk classes. While we did not predict the specific number of co-development classes, we hypothesized that at least one group would emerge as high risk (i.e., high levels of depression and alcohol misuse), given the associations between depression and alcohol problems (DeVido & Weiss, 2012).

2. Method

2.1. Participants and procedure

Undergraduates were recruited from two English-speaking universities in Montreal ($N = 123$; $Mage = 23.18$, $SDage = 2.17$; 71% women). Participants were recruited using a snowball sampling method, through means such as flyers, online research participant pools, and by providing information sessions to university classes. In order be eligible to participate, students had to: a) be in their graduating year of undergraduate studies; b) not have taken more than one-term (i.e., four consecutive months) off from school (excluding summer); c) be a full-time student; and d) be fluent in English. Eligible participants completed hour-long online assessments at baseline (one-to-two months before graduation) and at three-month intervals post graduate for one year (five measurements total). The goal of the initial assessment was to obtain baseline levels of each construct before participants left university. All participants were given a maximum of one month to complete the measures for a given time point assessment. In the initial sample, 61% of students were Caucasian and minority ethnicities represented were East Asian, South-East Asian, and Pacific Islander (9%); Middle Eastern, North African, and Central Asian (9%); Hispanic (6%); Black (4%); South Asian (3%); Aboriginal (1%); and 7% reported "other." Participants were compensated with $15 CAD per survey with a potential to receive $25 CAD for completing surveys at all time points ($100 max compensation). All participants gave informed consent to participate in this research study. The Ethics Review Board at Concordia University approved study procedures. Data was taken from a larger study examining patterns of maturing out among undergraduate students (Keough & O'Connor, 2016).

Of the initial sample, 85% of participants completed the three-month assessment ($n = 101$), 74% completed the six-month assessment ($n = 88$), 70% completed the nine-month assessment ($n = 82$), and 62% completed the final one-year assessment ($n = 74$). Of participants who completed surveys at all time points ($n = 69$), employment status at one-year was as follows: 52% full time, 32% part-time, and 16% unemployed. Also, at one-year follow-up, 71% of participants were not enrolled in any postsecondary education, 23% were in a graduate program, and a small minority (6%) returned to complete part-time undergraduate studies.

2.2. Measures

2.2.1. The Alcohol Use Disorders Identification Test

The Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Barbor, de la Fuente, & Grant, 1993) uses 10 items to provide an assessment of alcohol misuse, which includes measurement of alcohol use and related problems (e.g., "*How often during the last year have you found that you were not able to stop drinking once you had started?*") The AUDIT was administered at all time points and was used as the primary measure to assess maturing out of alcohol misuse. Participants responded to items on response scales, ranging from 0 (*never*) to 4 (*four or more times a week*) for items 1–8, and from 0 (*no*) to 2 (*yes, during the last year*) for items 9 and 10. Total sum scores were used. The AUDIT has been shown to have very good test-retest reliability ($r = 0.84$) and adequate internal consistency ($\alpha = 0.76$).

2.2.2. The Center for Epidemiological Studies Depression Scale

The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) includes 20 items and measures depressive symptoms in the past week (e.g., "*I felt that everything I did was an effort*"). The CES-D was given at all time points and was used as the primary measure of depressive symptoms. Participants responded to items on scales ranging from 0 (*rarely or never*) to 3 (*most or all of the time*). Total scores were used. The CES-D has been shown to have high internal consistency ($\alpha = 0.85$–0.90) and moderate test-retest reliability ($r = 0.40$; Radloff, 1977).

2.3. Data analysis plan

Prior to running the parallel process LCGM, descriptive statistics and correlations were inspected. A missing data analysis was then conducted to examine any potential baseline group differences between participants with complete versus those with incomplete. Next, using Mplus version 8.0, a parallel process LCGM analysis was conducted to examine the joint trajectories (or co-development) of depression and alcohol misuse among emerging adults during their transition year out of university. Parallel process LCGM analysis allows for the identification of unobserved distinct groups of people who have similar developmental trajectories (Muthen & Muthen, 2000). In our study, we were interested in the number of subgroups (or classes) based on initial levels and changes in *both* alcohol misuse *and* depression symptoms.

Consistent with recommendations (Jung & Wickrama, 2008), we examined models with one to five classes. To determine the best fitting class solution, we used the Bayesian Information Criterion (BIC) and