Published in final edited form as:

Pers Individ Dif. 2015 July 1; 80: 18–21. doi:10.1016/j.paid.2015.01.054.

Personality Profiles and Frequent Heavy Drinking in Young Adulthood

Jieting Zhang^{a,b,c}, Bethany C. Bray^c, Minqiang Zhang^b, and Stephanie T. Lanza^{c,d}

^aShenzhen University, China

^b Center for Studies of Psychological Application & School of Psychology, South China Normal University, China

^c The Methodology Center, The Pennsylvania State University, US

^d College of Health and Human Development, The Pennsylvania State University, US

Abstract

Few studies examining the link between personality and alcohol use have adopted a comprehensive modeling framework to take into account individuals' profiles across multiple personality traits. In this study, latent profile analysis (LPA) was applied to a national sample of young adults in the United States to identify subgroups defined by their profiles of mean scores on the Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness personality factors. Personality profiles were then used to predict heavy drinking. Five profiles were identified: Reserved, Rigid, Confident, Ordinary, and Resilient. Compared to individuals in the Ordinary profile, those with Reserved and Resilient profiles were at increased risk of frequent heavy drinking. These findings suggest which comprehensive personality profiles may place individuals at risk for problematic alcohol-related outcomes.

Keywords

big five; personality; binge drinking; young adulthood; latent profile analysis

1. Introduction

Several aspects of personality have been shown to be related to alcohol use. For example, Extraversion, Impulsivity, and Neuroticism have been shown to have a positive association with alcohol use, while Conscientiousness has a negative association with alcohol use

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Correspondence to: Jieting Zhang.

Corresponding Author 1: Stephanie Lanza, 204 E. Calder Way, Suite 400, The Methodology Center, State College, PA, US 16801; SLanza@psu.edu, fax: +1-814-863-0000. Corresponding Author 2: Minqiang Zhang, 55 W. Zhongshan Ave., South China Normal University, School of Psychology, Room 332, Guangzhou, Guangdong, China 510631; 2640726401@qq.com, fax: +86-020-8521-6412.

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(Natividade & Hutz, 2012; Loukas, Krull, Chassin, & Carle, 2000; Mellos, Liappas, & Paparrigopoulos, 2010).

Rather than occurring in isolation, however, personality dimensions (e.g., the 'Big Five' factors) co-exist within individuals, producing different pattern of personality traits. Latent profile analysis (LPA; Lazarsfeld & Henry, 1968) is a technique for identifying subgroups of individuals with similar means on two or more continuous indicators. This approach provides new insight into intra-individual patterns of personality traits, as well as how patterns are associated with outcomes, in a holistic way (Marsh, Lüdtke, Trautwein, & Morin, 2009). Specifically, it can simplify the investigation of higher-order interactions among personality factors with relatively few subgroups, while avoiding issues related to high error rates and reduced statistical power caused by the numerous higher-order interaction terms in multiple regression (Lanza, & Rhoades, 2012; Merz & Roesch, 2011).

Three personality profiles, Resilient, Undercontroller, and Overcontroller, have been identified consistently with NEO Personality Inventory and other instruments such as the California Child Q-set (Rammstedt, Riemann, Angleitner, & Borkenau, 2004). The Resilient group is low on Neuroticism and high on Extraversion, Openness, Agreeableness and Conscientiousness. The Overcontrollers group has high Neuroticism and low Extraversion, while the Undercontrollers group has low Agreeableness and Conscientiousness (Rammstedt et al., 2004). Several other personality profiles have been identified less consistently, including (1) Reserved with Low Openness (Herzberg et al., 2006), (2) Ordinary, with average scores across all personality factors (Rammstedt et al., 2004), (3) Confident with High Extroversion and Openness (Herzberg et al., 2006), and (4) Non-desirable, with the opposite characteristics of the Resilient group (Rammstedt et al., 2004).

To date, LPA has been used in only a limited number of studies to describe personality profiles. Based on the big-five factors, Merz et al. (2011) found a three-profile model: Well-adjusted (similar to Resilients), Reserved with Low Extraversion, and Excitable with High Neuroticism and Extraversion; while Kinnunen et al.(2012) found a five-profile model: Resilient, Overcontrolled, Undercontrolled, and Ordinary – also found in previous studies – and Reserved, characterized by high Conscientiousness but low on other factors. Personality profile models have not been constructed based on other models for personality traits to investigate relation between personality and drinking , however Neuroticism and Extraversion have been combined with sensation seeking traits to explore a latent profile model for young adults with alcohol use (Ayer et al., 2011). This study suggested that Extraverted, Deregulated young adults drank more frequently than those in the Regulated subgroup.

Further research is needed to advance our understanding about how a range of personality factors interact to confer risk for frequent binge drinking in young adulthood. The goal of the present study is to address this knowledge gap. Specifically, we identify subgroups of individuals in a national sample of U.S. young adults characterized by particular patterns across five personality dimensions and estimate the association between personality subgroup membership and frequent heavy drinking. Because early-onset drinking has been associated with the risk of heavy drinking as mediated through conduct problems (Rossow

&Emmanuel, 2013), early-onset drinking was considered as a control variable in the current study.

2. Methods

2.1. Participants

This study used data from the National Longitudinal Study of Adolescent Health (Add Health; Harris, 2013), longitudinal study in the U.S. We relied on data from two of the four available waves for individuals who were in grades 9–12 at the start of the study (initial $n=6072$). Data on early alcohol use were collected at Wave 1 (1994–1995; participants in grades 9–12); personality and young adult alcohol use were assessed at Wave 4 (2008–2009). Participants who did not provide responses to the personality assessment, frequency of binge drinking in young adulthood, or age at first drink were excluded from analysis (final $n=3110$; M age=30.9 years ($SD=1.3$) at Wave 4; 53% female; 65.4% White, 19.8% Black or African American, 3.7% American Indian or Native American, 4.3% Asian or Pacific Islander, 6.8 % other race). Females, whites, and those with higher parental education and socioeconomic levels were more likely to respond in Wave 4. However, non-response in Add Health Wave 4 was found to be primarily due to random variation in measurement, and Wave 4 non-response was not significantly associated with Wave 1 alcohol use behaviors (Brownstein et al., 2009), increasing the plausibility of our assumption of data being missing at random. Wave 4 sampling weights were applied in all analyses.

2.2. Measures

Mini International Personality Item Pool (Mini-IPIP)—At Wave 4, the ‘Big Five’ personality factors were assessed using the 20-item short form of the International Personality Item Pool with 5-point Likert scales for responses (Donnellan, Oswald, Baird, & Lucas, 2006). Factor scores were created for the five factors based on a recent psychometric investigation of the Mini-IPIP conducted on a similar sample (Baldasaro, Shanahan, & Bauer, 2013).

Frequent binge drinking in young adulthood—At Wave 4, participants were asked, “During the past 12 months, on how many days did you drink five or more drinks in a row?” Responses were recoded to indicate binge drinking weekly or more often (coded 1) versus less than weekly binge drinking (coded 0).

Early onset of alcohol use—At Wave 1, early onset of drinking was assessed using a question that asked, “Think about the first time you had a drink of beer, wine, or liquor when you were not with your parents or other adults in your family. How old were you then?” Similar to many studies (e.g., Rossow et al., 2013), early onset of alcohol use was defined as first use prior to age 14.

3. Results

3.1. Confirmatory Factor Analysis of Personality Subscales

Confirmatory factor analysis was used to confirm the five personality factors derived by Baldasaro et al. (2013) and to create factor scores for each individual. The confirmatory factor model provided marginal fit ($\chi^2=3952.09$, $df=160$, RMSEA= .07, CFI=.80, TLI=0.77, $\chi^2/df=24.7$). Table 1 presents the mean, SD, and reliability of each factor.

3.2. Identification of Personality Profiles

LPA was conducted using the five factor scores as continuous indicators to identify personality profiles in the population; models fitted with 1-8 profiles were compared using the AIC and BIC in order to select the optimal number of personality profiles. The model fit improved as the number of latent profiles increased; however, the incremental improvement in fit was considerably smaller after four profiles (BICs for models with 4–6 profiles: 36150.32, 36043.30, 35887.05; AICs for models with 4–6 profiles: 35981.12, 35837.84, 35645.33). The five-profile model was well-identified and theoretically interpretable, comprising profiles that have been described in the literature.

Figure 1 shows the mean scores on the five personality factors for each profile, as well as the relative sizes of the profiles. Profile 1, labeled *Ordinary* (45.1% of the sample), is the most prevalent profile and reflects individuals closest to the mean across all personality dimensions. Profile 2, labeled *Rigid* (9.5%), is characterized by the highest Neuroticism and the lowest on the other four factors. Profile 3, labeled *Confident* (28.5%), is characterized by relatively low Neuroticism and relatively high Extraversion, Openness, and Agreeableness. Profile 4, labeled *Reserved* (6.9%), is characterized by the highest Conscientiousness but relatively low on the other four factors. Profile 5, labeled *Resilient* (10.1%), is characterized by the lowest Neuroticism and the highest Extraversion, Openness, and Agreeableness, as well as relatively high on Conscientiousness.

3.3. Predicting Frequent Binge Drinking in Young Adulthood from Personality Profiles

Posterior probabilities were generated from an LPA with frequent binge drinking in young adulthood included as a covariate. After participants were assigned to their most likely personality profile, profile membership was treated as known, and used to predict frequent binge drinking in young adulthood using logistic regression. This “inclusive” classify-analyze approach ensures that the personality profile–binge drinking association is not attenuated as it is in standard approaches (Bray, Lanza, & Tan, 2014). Early alcohol use was included as a covariate in the regression model with the Ordinary profile specified as the reference group.

Overall, both personality profiles and early alcohol use were significant predictors of young adult frequent heavy drinking (Wald test=33.53 and 22.28, respectively; $p<0.001$ for both). As shown in Table 2, individuals with Reserved and Resilient profiles had significantly higher odds of frequent heavy drinking compared to individuals with an Ordinary profile; these individuals were 2.26 and 1.99 times more likely to report frequent heavy drinking than those with an Ordinary profile, respectively ($p<.001$ for both). In contrast, individuals with

Confident and Rigid profiles were not significantly more likely to report frequent heavy drinking compared to those with an Ordinary profile. Not surprisingly, individuals who reported early alcohol use had significantly higher odds of frequent heavy drinking compared to those who did not ($OR=1.93$; $p<.001$).

4. Discussion

4.1 Personality Profiles

In the present study, five personality profiles emerged based on the LPA of responses to the Mini IPIP. The Resilient, Confident and Ordinary subgroups are similar to the subgroups found in previous empirical studies (e.g., Herzberg et al., 2006; Kinnunen et al., 2012; Rammstedt et al., 2004). The Rigid subgroup, which was also labeled “Non-desirable” by Rammstedt et al. (2004), shared characteristics with both “Overcontrollers” (i.e., high Neuroticism and low Extraversion) and “Undercontrollers” (i.e., low Agreeableness and Conscientiousness). The Reserved subgroup shares characteristics with one identified by Kinnunen et al. (2010) that was characterized by high Conscientiousness but low in other factors. Merz et al. (2011) described the primary characteristic of Reserved individuals as low Extraversion, whereas Herzberg et al. (2006) considered low Openness the main characteristic.

Our identification of this particular set of personality profiles and their relative sizes was based on a large, national sample of young adults in the US. Profiles identified in other populations may differ due to sample characteristics as well as sample size, which affects statistical power for identifying subgroups (Dziak, Lanza, & Tan, 2014).

4.2 Association between Personality Profiles and Frequent Binge Drinking

Membership in the Reserved and Resilient subgroups were associated with the highest odds of frequent binge drinking. The different level of Extroversion, Openness, and Agreeableness between these two groups indicates interactions among personality factors when influencing drinking behavior. For the two groups with above-average Extraversion, Openness, and Agreeableness (i.e., Resilient and Confident), the Resilient group with distinctly higher Agreeableness had a higher rate of drinking. For the two groups with below-average Extraversion, Openness, and Agreeableness (i.e., Reserved and Rigid), the Reserved group with substantially higher Conscientiousness had a higher rate of drinking.

Though counterintuitive that the Reserved and Resilient groups had the highest odds of binge drinking, they may be indicative of two different drinking patterns and/or drinking motives, led by different alcohol expectancies. Several studies (e.g., Mezquita et al., 2010; Stewart, Loughlin, & Rhyno, 2001) have found that increased drinking quantity was predicted by enhancement motives, which were related to high Extraversion or low Conscientiousness. In the current study, the Resilient group may have greater tendency toward social contact and may therefore be more vulnerable to temptations in social drinking circumstance, while the Confident group, which may have lesser motivation to get along with others, may be more able to detach from social pressure leading to social drinking.

The Reserved subgroup, with high rates of frequent binge drinking here, may experience less inclination to explore novelty and have less openness to the outside world. They may thus be at risk for Type I alcoholism characterized by “passive-dependent traits, low novelty seeking, high harm avoidance, and high reward dependence” (Mellos et al., 2010). Compared with the Rigid group, which is characterized by even lower Openness, the Reserved group may be more inclined to adhere to rules in their daily life. Therefore, they may be more likely to repress any tendency to break conformity, thus producing more pressure. Drinking may be a compensatory way for them to gain the feeling of relaxation, or fulfill the need subconsciously.

Investigation of various drinking motivations as mediators of the association between personality profiles and frequent binge drinking or different types of alcoholism are important areas for future research. This study lays the groundwork for further study of the mechanisms by which risk is conferred for these population subgroups.

Several limitations of this study are worth noting. First, the most appropriate way to handle missing data when linking latent profiles with other variables has not yet been determined. Second, as with any self-report study on substance use, the questions about drinking may be sensitive, leading to error in reporting or missingness. Such errors, however, most likely attenuate the association between personality profiles and frequent binge drinking, rendering our results somewhat conservative. Third, as with previous studies, the Mini-IPIP did not yield personality scales with high reliability (Baldasaro et al., 2013; Donnellan et al., 2006). Furthermore, the latent profile model in the current study had not included all the traits associated with binge drinking (e.g., impulsiveness, Whiteside & Lynam, 2001). Finally, the ‘Big Five’ inventory was assessed only in Wave 4 of the longitudinal study, and therefore we were not able to examine the association longitudinally.

Acknowledgments

The project described was supported by Award Number P50-DA010075 from the National Institute on Drug Abuse, Award Number GZIT2013-ZB0465 from the Project of Guangzhou Quality Monitoring System for Elementary Education and Award Number BHA130053 from Social Science Fund for Education. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Drug Abuse or the National Institutes of Health.

This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgement is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (<http://www.cpc.unc.edu/addhealth>). No direct support was received from grant P01-HD31921 for this analysis.

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Latent profile analysis was applied to identify young adults' personality subgroups. Reserved, Rigid, Confident, Ordinary and Resilient profiles were identified. The percentage for each profiles were 6.9%, 9.5%, 28.5%, 45.1%, 10.1% respectively. Reserved and Resilient profiles were at more risk of frequent heavy drinking. Early alcohol use was also a significant predictor of frequent heavy drinking.

Figure 1.
Mean personality factor scores for each of the five identified personality profiles.

Table 1

Descriptive statistics for the five indicators in the latent profile analysis.

Personality Factor	Items Included in Scale	Mean	SD	Reliability
Neuroticism	4	0.02	0.85	0.64
Extraversion	4	0.00	0.86	0.72
Openness	4	−0.02	0.82	0.65
Agreeableness	4	−0.02	0.85	0.70
Conscientiousness	4	−0.01	0.83	0.65

Table 2

Logistic regression coefficients for the model predicting frequent binge drinking from personality profiles and early alcohol use.

	β	SE	Wald	Odds/OR	95% CI
Intercept	-2.26	0.10	468.51**	0.12	[0.09, 0.13]
Personality Profile			33.53**		
Rigid	-0.16	0.23	0.48	0.85	[0.54, 1.34]
Confident	-0.30	0.17	3.01	0.74	[0.53, 1.04]
Reserved	0.81	0.24	11.51**	2.26	[1.41, 3.61]
Resilient	0.69	0.19	13.26**	1.99	[1.37, 2.88]
Early alcohol use	0.66	0.14	22.28**	1.93	[1.47, 2.54]

Note. Ordinary personality profile specified as the reference group.

**
 $p < .001$