



Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Personality traits and their associations with substance use among adolescents

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ARTICLE INFO

Article history:

Received 18 September 2007

Received in revised form 29 April 2008

Accepted 8 May 2008

Available online 30 June 2008

Keywords:

Adolescent

Health

Personality

Alcohol

Tobacco

Illicit drugs

Risk behaviour

ABSTRACT

The aim of this study was to investigate whether there is an association between personality traits and self-reported risk consumption of substances among adolescents. A further aim was to evaluate whether the personality questionnaire Health relevant Personality Inventory (HP5i) can be used in a population of adolescents. The study participants included 3419 male and female adolescents with a median age of 18 years. The results showed that the respondents with risk consumption of substances had significantly higher levels of antagonism and impulsivity and lower levels of hedonic capacity, alexithymia and negative affectivity compared to those with no risk consumption of substances. The HP5 inventory could potentially be a valuable complementary instrument for investigating future health development among adolescents.

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1. Introduction

During the last decades there has been an increased interest in determining whether personality traits can predict an individual's future health development. Studies have, for example, shown that there exists a relationship between specific personality traits or cluster of traits and the onset of various health complaints, problems and illnesses (for reviews see Ozer & Benet-Martinez, 2006; Smith & MacKenzie, 2006).

Most studies investigating associations between personality profiles and health outcomes in adults have focused on physical illness (Ozer & Benet-Martinez, 2006; Smith & MacKenzie, 2006). Using physical outcome variables is, however, not necessarily the most suitable approach when studying adolescents. More typically, health-related variables associated with adolescent ages are symptoms of psychiatric illnesses such as depression, anxiety and anorexia nervosa. Furthermore, it is more common that young people are engaged in different types of risk-taking behaviour than adults, such as incidences of unsafe sex, drunk driving, and substance use.

Previous studies have found a relationship between substance use and personality traits such as lack of impulse control, antagonism and sensation seeking among adolescents (Feldstein & Miller, 2006). Risk-taking behaviour, especially regular use of substances, is also shown to have a major impact on future mental well-being, which in turn is linked to different types of negative health

outcomes (for review see Volkow & Li, 2005). For example, early onset of excessive alcohol consumption is associated with proneness to higher anxiety later in life (Berglund, Fahlke, Berggren, Eriksson, & Balldin, 2006), and excessive adolescent use of cannabis increases the risk of developing a psychotic illness and is likely to lower the age of onset of the disorder (Moore et al., 2007). Moreover, excessive substance abuse at an early age can have long-term effects on the brain, and studies have shown that heavy exposure to neurotoxins such as ethanol affects brain maturation and neurocognitive function (Spear, 2002). Adolescent substance use is also found to be associated with general health in adulthood, where high adolescent consumption is linked to a substantially lower level of adult physical and mental health, higher reliance on monetary support from social services, higher rates of criminal convictions and higher premature deaths (Larm et al., 2008). Hence, regular use of substances (e.g. tobacco, alcohol and illicit drugs) in adolescence can be seen as a risk factor or indicator of possible future health-related problems. Therefore, the overall aim of the present study was to investigate if health-related personality traits are associated with risk consumption of substances in adolescents.

Several well-studied instruments are available for assessing personality traits. However, on many occasions, such as when conducting surveys in epidemiological research and in specific clinical trials, it is not always feasible to use extensive inventories. One solution to this problem is to use selected facet scales from different instruments measuring specific personality traits of interest. The drawback to this procedure is that it is difficult to study the

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interaction between various factors when using only certain parts of a coherent and well-researched inventory. Another approach to these problems is to develop a much shorter inventory based on personality factors of a much lengthier instrument. One such inventory is the Health Relevant Five-Factor Personality Inventory (HP5i; Gustavsson, Jonsson, Linder, & Weinryb, 2003; Gustavsson, Eriksson, Hilding, Gunnarsson & Östensson, *in press*), which consists of five traits according to the five-factor model (Digman, 1990). The HP5 inventory has been shown to be relevant for explaining individual differences that influence the vulnerability to illness and illness progression. Although the HP5 inventory has been used in several studies, it has only been psychometrically validated for adults. Therefore, a further aim of this study was to evaluate whether this inventory could be validated for use among both male and female adolescents.

2. Methods

2.1. Participants and procedure

There were 4799 senior high school students eligible to be included in the study. To obtain a representative sample with respect to gender, socioeconomic background, rural and urban population and ethnicity, the students were recruited from 24 different senior high schools, all located in the south-west part of Sweden.

Out of 4799 students, 1329 were not present at the time for the investigation due to factors such as their sickness or lack of spare time. Thus, 3470 students were asked to fill out a self-administered paper-and-pencil questionnaire consisting of demographic questions, the HP5 inventory, and questions regarding risk consumption of tobacco, alcohol and illicit drugs. Out of 3470 questionnaires, 51 were excluded from the sample because they did not contain demographic information such as gender, age and school. As a result, there were 3419 participating students, 1636 males and 1783 females, or 48% and 52%, respectively. The median age for both sexes was 18 years.

The study was carried out in the participants' classrooms during the months of October and November 2005. The students were informed that participation was voluntary and assured of the confidentiality of their responses. Ethical approval for the study was granted from the Regional Ethical Review Board at the University of Gothenburg.

2.2. Instruments

Participants responded to questions regarding their use of tobacco, alcohol and illicit drugs. They were asked to rate their tobacco consumption (i.e. use of cigarettes and/or use of snuff) on a five-point frequency scale ranging from 1 ("I have never tested") to 5 ("I use every day"). Using tobacco every day was set as the index for risk consumption of tobacco. Concerning alcohol, respondents were asked to rate their number of alcohol intoxications during the last 12 months on a five-point frequency scale ranging from 1 ("none"), 2 ("1–4 times"), 3 ("5–10 times"), 4 ("11–20 times"), 5 ("21–50 times") to 6 ("more than 50 times"). Being intoxicated by alcohol twice a month or more during the last year (i.e. 5 or more points) was set as the index for risk consumption of alcohol. This cut-off was used because previous research found that 30–40% of the adolescents who were studied drank alcohol every second week, or even more often, a pattern which is considered to be above the cut-off for harmful use (Hamm & Hope, 2003). The participants in the present study were asked if they had ever used illicit drugs (yes/no), and any use was coded as the index of risk consumption of illicit drugs.

Personality traits were assessed using the HP5 inventory (Gustavsson et al., 2003, *in press*), which consists of 20 self-state-

ments, each of which is rated on a four-point Likert response format ranging from 1 ("does not apply at all") to 4 ("applies completely"). In the statistical analysis, the 20 items were grouped into five facet scales (i.e. four items per scale) corresponding to the Five-Factor Model overall traits: agreeableness, conscientiousness, neuroticism, extraversion and openness (Digman, 1990). The five scales of the HP5 inventory are labelled as antagonism (as a facet of agreeableness), impulsivity (as a facet of conscientiousness), hedonic capacity (as a facet of extraversion), negative affectivity (as a facet of neuroticism) and alexithymia (as a facet of openness).

Of the total sample, 121 individuals had missing data on all 20 items of the HP5 inventory, and the internal dropout varied from 35 to 89 cases across all items. After deleting those who could not participate from the list, 2937 individuals (1377 males and 1560 females) out of the 3419 were eligible for the computation of scale scores.

2.2.1. Evaluation of HP5i measurement model

The fit of the HP5i measurement was tested using confirmatory factor analysis (CFA) (Brown, 2006). Each of the 20 items was allowed to load on only one of the five latent factors (i.e. the scale, as described above). In addition, measurement invariance across gender was addressed by constraining all important measurement parameters (factors, loadings and intercepts) to be equal across gender (Brown, 2006). In previous analyses (Gustavsson et al., *in press*), two items were not completely invariant in intercepts over gender, as the same level of a latent variable gives different observed item responses for males and females. One of these items concerns positive mood in anticipating social appointments (an item from the hedonic capacity scale) and gave higher scores for females than expected. The other item is a verbal aggression item (from the antagonism scale), which gave higher scores for males than expected. In the present CFA, these two intercept parameters have been allowed to be freely estimated in both groups. Moreover, previous CFAs have also indicated the need to take into account a small but consistent problem attributed to similar wording of one item pair. Thus, the proposed CFA model also comprises freeing one parameter (error correlation), freely estimated in the first group and then constrained across groups.

Parameters in the model were estimated by Robust Maximum Likelihood following the standard procedure for the treatment of ordinal data as implemented in the LISREL 8.80 programme (Jöreskog, 2002). Diverse indices were used in the evaluation to capture different aspects of model fit (Brown, 2006). Absolute fit was assessed by the Standardised Root Mean Square Residual (SRMR), and parsimony fit was assessed by the Root Mean Square Error of Approximation (RMSEA). Finally, incremental fit was assessed by the Comparative Fit Index (CFI). These indices and proposed cut-off points were chosen on the basis of their performance in previous Monte-Carlo simulations and recommendations based on these simulations (Brown, 2006; Hu & Bentler, 1998, 1999). Specifically, good model fit is indicated by a SRMR below 0.08, a RMSEA around 0.05 and values above 0.95 for CFI. Calculations in the study sample showed that the estimated measurement invariance model (with 347 degrees of freedom and a Satorra-Bentler $\chi^2 = 1946$; $p < 0.001$) possessed acceptable fit according to the recommended criteria with SRMR = 0.072, RMSEA = 0.056 and CFI = 0.951. The estimated factor loadings varied from 0.41 to 0.89, with a median of 0.68. Reliability estimates taken from the CFA were 0.74 for antagonism, 0.81 for impulsivity, 0.80 for hedonic capacity, 0.67 for negative affectivity and 0.69 for alexithymia.

2.3. Data analyses

Logistic regression analyses were used for estimating odds ratios (OR) for the five personality scales of the HP5 inventory

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