

SECONDARY DATA ANALYSIS REPORT EXPLORING THE MENTAL HEALTH IMPLICATIONS OF COMORBID BEHAVIOURAL ADDICTIONS: INSIGHTS FROM THE QUINTE LONGITUDINAL STUDY

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ABSTRACT

Utilizing data from the Quinte Longitudinal Survey (QLS; Williams, Hann, McLaughlin, White, King, Schopflocher, West & Flexhaug, 2015), the present study sought to better understand the overlap among behavioural addictions in community-based adults ($N = 4,121$), as well as explore the mental health implications of experiencing comorbid behavioural addictions. Three broad sets of analyses are reported. The first set of analyses uses a similar set of addiction-related behaviours (problem gambling, excessive game playing, and excessive online chatting) as Parker et al. (2008, 2013) to demonstrate that a dysfunctional preoccupation latent variable explains a large amount of variability in addictive behaviour among adults. The second set of analyses extended the generalizability of the dysfunctional preoccupation construct by including additional addiction-related behaviours (excessive sexual behaviour, shopping, and substance use). The temporal stability of the dysfunctional preoccupation scores were found to be moderately high across the five waves of QLS data and scores were also found to be independent of both basic personality and intelligence among both men and women. In the third set of analyses individuals scoring high on dysfunctional preoccupation in the first year of the QLS were found to be at extreme risk for a cross-section of serious mental health problems at Time 1 and at subsequent years. Dysfunctional preoccupation scores were particularly linked with a cluster of five mental health problems: major depression, generalized anxiety, panic and agoraphobia, post-traumatic stress disorder, and substance abuse and dependency. Future directions for extending analyses with the QLS are also discussed.

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INTRODUCTION

Our understanding of behavioural addictions is undergoing considerable flux, as researchers and practitioners grapple with the mental health implications of expanded access to entertainment technologies, such as computer-video games, instant messaging, and media streaming (Karim & Chaudhri, 2012; Sussman & Arnett, 2014; Sussman, Lisha & Griffiths, 2011). The visual and auditory capabilities of computers, tablets, mobile devices, and video games have become increasingly sophisticated, with the Internet providing an ever more seamless environment for linking what were once quite independent recreational activities (King, Delfabbro & Griffiths, 2010). As noted by Di Nicola, Tedeschi, Mazza et al. (2010), researchers are only just beginning to appreciate the magnitude of the health care problem connected to behavioural addictions: “Behavioural addictions include indulgence in gambling, shopping, sex, Internet, affective relationships, work, physical activity or even food. All these activities are part of life and do not have any negative impact in the normal course; in fact, it is not the object that determine the addiction but a particularly intense and rigid relationship between the addict and the activity of choice” (p.82).

There is emerging evidence indicating that a number of specific behavioural addictions, particularly those characterized by dysfunctional preoccupations or repetitive behaviours (Internet or video/computer game abuse, online gambling and/or shopping abuse, etc.), share clinical, co-morbid, and neurobiological parallels with substance addictions (Grant & Chamberlain, 2014). It is worth noting that the Diagnostic and Statistical Manual-5 (DSM-5; American Psychiatric Association, 2013) would appear to recognize this overlap with gambling disorder, since this disorder now belongs to the category of Substance Related and Addictive Disorders (the only behavioural addiction to be recognized in the DSM-5).

The co-morbid nature of many different behavioural addictions continues to be of particular concern to researchers and clinicians (Robbins & Clark, 2015). For many individuals, the easy access to gambling, video games, computer gaming, and Internet activities (activities increasingly linked together via integrated computer programs or applications) increases the likelihood for multiple behavioural additions. Overlap between gambling and various types of excessive behaviours has long been reported in various adult populations. Greenberg, Lewis, and Dodd (1999), for example, found substantial intercorrelations among gambling, use of multiple legal substances, exercising, and the use of the internet and television in undergraduate students. Using a brief measure of 16 addiction-related behaviours in a sample of 948 undergraduates, MacLaren and Best (2010) found that 3 factors explained 53% of the variance for the 16 variables: the first factor related to compulsive helping, work, relationships, shopping, eating behaviours and exercise; the second factor related to prescription drugs, gambling and caffeine; while the third factor related to illegal drugs, alcohol, tobacco and compulsive sex. More recently, Sussman, Arpawong, Sun, Tsai, Rohrbach and Spruijt-Metz (2014) found high prevalence and co-occurrence of sex, exercise, Internet, and work in a large

($N = 717$) sample of young adults. There is also evidence for overlap among behavioural addictions in some clinical populations, particularly major depressive disorders (Lejoyeux et al., 2002; Shaw & Black, 2008) and bipolar disorders (Di Nicola et al., 2010).

Parker, Taylor, Eastabrook, Schell, and Wood (2008) reported on overlap among a small cluster of addiction-related behaviours (gambling, video games and Internet use) in a community-based sample of adolescents. They found that gambling, gaming, and Internet use could be accounted for by a single latent variable they called “dysfunctional preoccupation”-- excessive engagement in reward seeking behaviours. This latent variable explained 53% of the variance in gambling, video games, and Internet use in a sample of young adolescents ($N = 209$, age 13-15 years) and 59% of the variance in older adolescents ($N = 458$, age 16-18 years).

More recently, Villella et al. (2011) examined a large community-based adolescent sample ($N = 2,853$) and found moderately high intercorrelations for pathological gambling, compulsive buying, exercise addiction, internet addiction, and work addiction. The pattern of correlations were similar to those reported by Parker, Summerfeldt, Taylor, Kloosterman, and Keefer (2013) in two different adolescents samples; Parker et al. (2013) found that the dysfunctional preoccupation latent variable explained 49% of the variability in addiction-related measures of gambling, video games and Internet use in a clinical outpatient sample ($N = 270$) and 56% in a sample of special needs students ($N = 256$).

Co-morbid behavioural addictions are linked with a number of negative outcomes, from neglect of interpersonal relationships and obligations to negative health consequences ranging from sleep pathologies, obesity and functional somatic symptoms to even suicide (Hodgins, Mansley & Thygesen, 2006; Jenaro, Flores, Gómez-Vela, González-Gil & Caballo, 2007). It is worth emphasizing that the systematic study of treatment efficacy for behavioural addictions is in its “relative infancy” (Grant, Schreiber & Odiug, 2013). Few studies have examined the efficacy of treatments for specific behavioural addictions, therefore, few (if any) treatment recommendations can be made (Grant et al., 2013). The likelihood that an individual will present with multiple behavioural addictions, as well as comorbid mental disorders, only compounds the intervention and treatment challenges.

Given the broad health care implications of behavioural addictions, it is not surprising that researchers have called for more research on the overlap among behavioural addictions, as well as considering different ways to classify and conceptualize these health problems. In a series of recent papers Black and colleagues (Black, Coryell, Crowe, Shaw, McCormick & Allen, 2015; Black, Shaw & Blum, 2010) present preliminary evidence to suggest that gambling disorder should be considered as a potential spectrum disorder. Based on theory and clinical evidence, they point to several excessive behaviours potentially related to a gambling spectrum: internet use, compulsive buying, compulsive sexual behaviour, and

kleptomania. In a related and recent review paper, Robbins and Clark (2015) have suggested that these types of behavioural addictions should be considered part of an “impulsive-compulsive” spectrum. As noted above, Parker et al. (2008, 2013) have suggested that a number of behavioural addictions (i.e., problem gambling, problematic video/computer gaming, and excessive internet use) can be conceptualized as part of a general dysfunctional preoccupation factor—one that appears to be strongly connected to deficits in affect regulation.

Utilizing data from the Quinte Longitudinal Survey (QLS; Williams, Hann, McLaughlin, White, King, Schopflocher, West & Flexhaug, 2015; Thege, Woodin, Hodgins & Williams, 2015), the present study sought to better understand the overlap among behavioural addictions in community-based adults, as well as explore the mental health implications of experiencing comorbid behavioural addictions.

PRESENT STUDY

The 5-year QLS (Williams et al. 2015) was conducted between 2006 and 2011 with the broad goal of furthering research and understanding on problem gambling and other behavioural addictions. The QLS includes data that allows for a detailed examination of the linkages of a cluster of excessive behaviours with strong potential for abuse: gambling, video games, computer gaming, and various other Internet-based activities such as shopping and the use of pornography. The longitudinal design of the data-base, as well as the size of the sample, also allows researchers to examine the stability across time of co-occurring behavioural addictions, as well as identify vulnerable groups (e.g., emerging adults vs. older adults). Specific personality variables in the QLS data-base (e.g., traits linked to the 5-factor personality model) allow for some preliminary work exploring etiological factors for individuals reporting an excessive number of comorbid behavioural additions.

The present study consists of 3 broad sets of analyses. The first set examines the comorbidity of a cluster of behavioural addictions identified by Parker et al. (2008, 2013). Following the modelling procedures the research group has used extensively in the past (Parker et al. 2008, 2013), we sought to test whether the dysfunctional preoccupation model could be generalized to adults. If this model can be replicated, the QLS provides a unique set of data to explore gender and age differences for the dysfunctional preoccupation construct, as well as to examine some preliminary construct validity on the distinctiveness of the construct from basic personality and intelligence. An important step in validating the dysfunctional preoccupation construct is to demonstrate that it is a stable variables across time and predicts important aspects of mental health—research questions that can all be addressed with data from the QLS.

Presuming that the original dysfunctional analysis model (Parker et al., 2008, 2013) can be replicated in adults, an important limitation of this model is the narrow range of addiction-related behaviours used to assess the dysfunctional preoccupation construct (i.e., only problem gambling, excessive video games and excessive online chatting). To truly generalize the dysfunctional preoccupation construct to adults, however, there are a number of important behavioural domains that need to be included. The most obvious examples are excessive sexual behaviour, substance use, and excessive shopping. Fortunately the QLS provides a unique opportunity to broaden the conceptualization of the dysfunctional preoccupation construct by including measures of excessive sexual behaviour, excessive shopping, and substance use. The second set of analyses uses statistical procedures similar to the first section to validate an expanded dysfunctional preoccupation model. The QLS provides a unique set of data to explore gender and age differences for the expanded dysfunctional preoccupation construct, as well as to examine preliminary construct validity on the distinctiveness of the construct from basic personality and intelligence. A key set of analyses is the ability to examine the temporal stability of the dysfunctional preoccupation construct across 5 years of data.

The last set of analyses examines the stability of the expanded dysfunctional preoccupation variable to predict a cross-section of mental health variables over time. We are particularly interested in examining the impact of dysfunctional preoccupation (based on data at Time 1) on overall mental health across the five waves of data. We are also interested in the link between dysfunctional preoccupation and specific mental health problems. The QLS allows us to examine the predictive validity of dysfunctional preoccupation for a cross-section of specific mental health problems. Separate analyses will be conducted for: post-traumatic stress disorder, major depression, mania, generalized anxiety, panic attacks and agoraphobia, obsessive compulsive disorder, bulimia, binge eating, and substance abuse and dependence. We also explore the symptom overlap between the mental health problems strongly linked to the dysfunctional preoccupation construct and those that are not related. Potential differences in symptomatology may provide critical insights into the etiology of specific behavioural disorders (Grant et al., 2013).

METHODS

PARTICIPANTS

The present study included data from 4121 individuals (1867 men and 2254 women) collected via the Quinte Longitudinal Study (QLS; Williams et al., 2015) over a period of five years from 2006 to 2011. At the start of the study participants ranged in age from 17 to 80 years; the mean for men was 47.2 ($SD = 14.7$) and 45.2 ($SD = 13.6$) for women. The sample was primarily white (87.1%), with 4.4% aboriginal, 0.6% Asian, 0.3% Black, and 7.6% other or

ethnicity not reported. For educational background, 31.2% had no more than completed high school, 21.8% had some technical school, college or university, 42.9 had completed technical school, college or university, and 4.1% had advanced degrees. For marital status, 11.9% had never married, 71.5 were married or living common-law, 5.0% were separated, 7.7% divorced, and 3.9% widowed.

PROCEDURE

Thorough methodological details on the QLS can be found in Williams et al. (2015; see also McLaughlin, White, King, et al., 2014). Individuals were considered eligible for the study if they lived within a 70 kilometer radius of the city of Belleville, Ontario. Random digit dialing, where random telephone numbers are generated within the aforementioned radius, was used for recruitment. Although response rate was relatively low (21.3%) and comparable to studies in similar research areas (Williams et al., 2015), most individuals remained in the study once involved, with a considerably high retention rate (93.9%).

In the interest of having an adequate representation of both the general population and those at risk for problem gambling, two samples were recruited: a “general population sample” ($N = 3,065$) and an “at risk” sample ($N = 1,056$). To be included in the “at risk” sample an individual had to report at least one or more of the following conditions: 1. spend \$10 or more per month on lottery tickets, casino table games, bingo, or other games of skill against other people; 2. betting on horse racing or playing slot machines in the past year; 3. plan to gamble at a new gambling facility that was scheduled to be built in the area in the near future. Since the focus of the present study was on studying a cross-section of behavioural addictions the “general” and “at risk” groups were not differentiated.

An initial phone call was conducted to gain consent from the individuals to participate in the QLS. Once consent was gained, an individual was given three options to complete their surveys: online via an email link to the questionnaire, at the program office where they completed it on a computer, or if an individual was unfamiliar with computers, they were given the option to use a pen and pencil version of the questionnaire. Most respondents completed the online version of the survey at home (e.g., only 1.2 to 1.9% of participants completed the pen and pencil version of the survey). Each individual was given the opportunity to complete the survey once a year for five years.

MEASURES

The QLS involved a large number of variables and over five waves of data, however for the current study, only a subset of variables were used. Details about the other variables included in the QLS can be found in Williams et al. (2015).

Gambling Behaviours

The QLS adapted items from the *NORC Diagnostic Screen for Gambling Problems-Self Administered* (NODS-SA; Gerstein, Volberg, Harwood, Christiansen, et al., 1999), a self-assessment tool designed to assist respondents in evaluating whether to seek help for their gambling behaviour. The instrument is based on the APA's DSM-IV (American Psychiatric Association, 1994) criteria for pathological gambling. Respondents were asked about their behaviours in the previous 12 months.

Substance Use

The QLS adapted items from the *Alcohol, Smoking and Substance Involvement Screening Test* (ASSIST; Group W.H.O., 2002). The ASSIST was designed to be a brief screening tool to detect psychoactive substance use and related problems. Respondents were asked about their behaviours in the previous 12 months.

Other Behavioural Addictions

To assess the presence of various behavioural addictions, participants were asked a simple yes/no question: "Are there activities that you engage in where your over-involvement has caused significant problems for you in the past 12 months? Check off any that apply". Participants were given the option of reporting on various behavioural addictions: sex or pornography, shopping, Internet chat lines, video or Internet gaming. *The Behavioural Addiction Measure*, which was adapted from the *Problem and Pathological Gambling Measure* (Williams & Volberg, 2014), was given to any individual who reported excessive behaviours in order to assess the severity of that problem behaviour. The measure includes 21 items which make up three different sub categories: 13 items assessing psychosocial problems (e.g., financial or interpersonal), 3 items assessing impaired control (e.g., spending more time or money on the activity than intended), and 5 items assessing other characteristics (e.g., preoccupation, craving).

Mental Health

The *Composite International Diagnostic Interview-- Short Form* (CIDI-SF; Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998) is series of screening scales designed to assess a range of mental disorders according DSM-IV criteria (APA, 1994). The 12-month version was used to assess the following disorders: post-traumatic stress disorder (PTSD), major depression, mania, generalized anxiety, panic attacks and agoraphobia, obsessive compulsive, bulimia, and substance abuse and dependence.

STATISTICAL PROCEDURE

When there was a need to explore age-effects, the sample was classified into 4 age-groups (at the time of Wave 1: 29 years and under at the time of Wave 1 (14.0% of the sample); 30 to 49 years (46.1% of the sample); 50 to 65 years (28.8% of the sample); and 65 years or older (11.1% of the sample).

RESULTS AND DISCUSSION

RELATIONSHIPS AMONG ADDICTION-RELATED PROBLEM BEHAVIOURS

The QLS data-set provides a unique opportunity to test whether the dysfunctional preoccupation latent variable identified by Parker et al. (2008, 2013) can be replicated in a large community-based sample of adults. Included in the QLS were measures of problem gambling, excessive video games, and excessive online chatting quite comparable to measures used by Parker et al. (2008, 2013). To test for possible gender differences in the pattern of intercorrelations among the problem gambling, video games, and online chatting variables, the equality of the covariance matrices for men and women was tested. As recommended by Cole (1987), multiple criteria were used to assess the equality of the matrices. The criteria for equivalence was a Steiger–Lind RMSEA index (RMSEA; Steiger & Browne, 1984) < .10 and a population gamma index (PGI; Tanaka & Huba, 1989) greater than .90. The results indicate that the pattern of intercorrelations for men and women at Time 1 were virtually identical: RMSEA = .025 and PGI = .998. Therefore, principal components analysis was used with men and women combined. Using the total sample ($N = 4,081$), the problem gambling, video games, and online chat variables from Time 1 were allowed to load on a single variable. Figure 1 presents the unrotated factor loadings which ranged from .48 to .68. Consistent with Parker et al. (2008, 2013), the dysfunctional preoccupation variable explained a substantial amount of the variability (38%) in the problem gambling, video games, and online chatting variables assessed at Time 1.

The amount of explained variability for the dysfunctional preoccupation variable proved to be quite consistent across the five waves of data. Separate principal components analyses for the problem gambling, video games, and online chatting variables at Time 2 to Time 5 found that the dysfunctional preoccupation variable explained 39% to 42% of the variability across the other four waves of data. Table 1 presents the correlations among the 3 addiction-related behaviours and dysfunctional preoccupation scores (sum of the problem gambling, video games, and online chatting variables) by gender and time.

AGE AND GENDER DIFFERENCES IN DYSFUNCTIONAL PREOCCUPATION

To explore for possible age and gender differences on the dysfunctional preoccupation scores, a series of gender by age-group ANOVAs were conducted with dysfunctional preoccupation scores for each wave of data as the dependent variable. Four age-groups were utilized (based on age at Time 1): 29 years and under; 30 to 49 years; 50 to 65 years; and 65 years or older. The main effects for gender and age-group, as well as the interaction of gender and age, were not significant for dysfunctional preoccupation assessed at Time 2 to Time 5. At Time 1, however, the main effect for age-group was significant, $F(3, 4073) = 6.27, p < .001$, as was the interaction of gender and age-group, $F(3, 4073) = 2.65, p < .05$. Univariate analyses found that for dysfunctional preoccupation scores at Time 1, men scored significantly higher than women only in the 29 years and under group, while individuals in the 29 years and under group scored higher on dysfunctional preoccupation than the other three age-groups. Table 2 presents the means and standard deviations (by age-group and gender) for dysfunctional preoccupation scores at Time 1.

Thege et al (2015) have suggested several possible explanations for an important pattern in the QLS results: the prevalence rate of excessive behaviours was the highest at the first assessment period and generally lower at Time 5. The first suggestion is that participants over-reported at Time 1 and underreported at later time points because they felt less anonymous or to reduce the number of items needed to complete that specific survey. Another suggestion from Thege et al. (2015) is that “because the sample was a non-clinical one, the survey itself may have served as a first intervention for many of the respondents. The repeated investigation of excessive behaviours—by raising participants’ awareness—could lead to true changes in behaviour; thus indicating that the consistent decreasing trend in problem severity is a reliable result of the present study and not a consequence of measurement bias” (p. 12).

TEMPORAL STABILITY OF THE DYSFUNCTIONAL PREOCCUPATION CONSTRUCT

Table 3 presents the correlations between dysfunctional preoccupation scores across the five waves of data collection (by gender). The dysfunctional preoccupation scores proved to be quite stable across assessment periods: the mean test-retest correlation for the dysfunctional preoccupation scores across the five waves of data was .49 for men and .57 for women. The 5-year test-retest correlations were .46 for men and .49 for women—reliability coefficients at levels quite consistent with those often reported with personality traits in adulthood (Costa & McCrae, 1992).

RELATIONSHIPS BETWEEN DYSFUNCTIONAL PREOCCUPATION AND BASIC PERSONALITY AND INTELLIGENCE

The QLS included several variables that provide important validity considerations for the dysfunctional preoccupation construct. More specifically, a measure of intelligence (matrix reasoning subscale from the WAIS-IV; Wechsler, 2008) and the five-factor model of personality (Costa & McCrae, 1992) were also included in the longitudinal study. It is important to be able to establish that new psychopathology-related constructs, like dysfunctional preoccupation, are independent of basic personality and intelligence (Widiger, Costa & Samuel, 2006).

Table 4 presents the correlations (separately by gender) between basic personality variables and dysfunctional preoccupation scores for all five waves of data. The table also presents correlations between intelligence and dysfunctional preoccupation scores. Overall, correlations between basic personality and dysfunctional preoccupation were low for most of the personality dimensions. The mean correlations across the five waves of data with Agreeableness were -.07 for men and -.12 for women, with Conscientiousness -.06 for men and -.09 for women, with Extraversion .01 for men and -.05 for women, and with Openness .00 for men and -.05 for women. Correlations for Neuroticism were slightly higher across the five waves than results for the other personality dimensions: mean correlation was .15 for men and .16 for women. The correlations between dysfunctional preoccupation and intelligence were all extremely low; the mean correlations across the five waves of data were -.03 for men and -.07 for women.

A hierarchical multiple regression analysis was also carried-out with dysfunctional preoccupation scores at Time 1 as the dependent variable and intelligence as the predictor variable entered in Step 1, followed by the five basic personality scores as predictor variables in Step 2. Time 1 dysfunctional preoccupation scores were used since they had the highest overall correlations with basic personality. Separate analyses were conducted for men and women and the results of the multiple regression analyses (including partial correlations) are displayed in Table 5. The analyses found that intelligence and basic personality accounted for only about 6% of the variance in dysfunctional preoccupation scores in men and 8% in women. Thus, the dysfunctional preoccupation construct is largely unrelated to basic personality and intelligence.

RELATIONSHIPS BETWEEN DYSFUNCTIONAL PREOCCUPATION AND OVERALL MENTAL HEALTH

During each of the five waves of the QLS, participants completed the CIDI-SF (plus a number of related items) to assess 12-month prevalence of a cross-section of mental disorders: 1. post-traumatic stress disorder, 2. major depression, 3. mania, 4. generalized anxiety, 5. panic

attacks and agoraphobia, 6. obsessive compulsive disorder, 7. bulimia, 8. binge eating¹, and 9. substance abuse and dependence². To examine the potential predictive validity of the dysfunctional preoccupation construct, we conducted a series of logistic regressions examining dysfunctional preoccupation scores for predicting the presence (or absence) of having at least one of the 9 mental disorders during the previous 12 months. Since the prevalence rates for many of these disorders differ by age and gender, these two variables were also included in the logistic regressions.

Table 6 reports on a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (assessed at Time 1) with the independent variable of experiencing at least 1 of the following mental disorders in the previous 12 months: 1. post-traumatic stress disorder, 2. major depression, 3. mania, 4. generalized anxiety, 5. panic attacks and agoraphobia, 6. obsessive compulsive disorder, 7. bulimia, 8. binge eating, and 9. substance abuse and dependence. Five separate logistic regressions were conducted, one for each wave. To explore the long-term predictive validity of the dysfunctional preoccupation construct, only scores from Time 1 were used in the logistic regressions.

The results of the logistic regressions were highly consistent across the five waves of data. The overall model was significant at each time point, with dysfunctional preoccupation, age and gender significantly predicting mental health status. Although the eta squared values were relatively small, the results indicate that increased dysfunctional preoccupation, younger individuals, and women were more likely to have experienced at least 1 mental health disorder in the previous 12-months. The dependent variables had the strongest relationship with mental health status at Time 1; although dysfunctional preoccupation assessed at Time 1 tended to predict more variability than age or gender. Mean eta squares were .020 for dysfunctional preoccupation, .011 for age, and .017 for gender.

EXTENDING THE DYSFUNCTIONAL PREOCCUPATION CONSTRUCT

The QLS provides an opportunity to extend the nomological framework for the dysfunctional preoccupation construct because the data-set includes measures of six important excessive or addition-related behaviours: problem gambling, video games, online chatting, sexual behaviour, shopping, and substance use. To test for possible gender differences in the pattern of intercorrelations among these six addiction-related behaviours, the equality invariance of the covariance matrices for men and women was first tested. The results indicate that the pattern of intercorrelations for men and women at Time 1 were virtually identical: RMSEA = 0.033 and PGI = 0.988. Therefore, principal components analysis was used for men and

¹ Binge eating was added at Wave 2.

² Although the QLS also assessed for the presence of schizophrenia and delusional disorder at each wave, these variables were not included in the present research project.

women combined. Using principal components analysis with the total sample ($N = 4\,081$) the problem gambling, excessive video games, excessive online chat, excessive sexual behaviour, excessive shopping, and substance use variables from Time 1 were allowed to load on a single variable. Figure 2 presents the unrotated factor loadings which ranged from .28 to .66; the dysfunctional preoccupation variable also explained 24% of the variability in the six addiction-related variables assessed at Time 1.

Confirmatory factor analysis was also used to test the equivalence of a 1-factor model for dysfunctional preoccupation in men and women (measured by problem gambling, excessive video games, excessive online chat, excessive sexual behaviour, excessive shopping, and substance use variables from Time 1). The model was found to be virtually identical in men and women ($GFI = .988$, $AGFI = .972$, and $RMSEA = .041$). Standardized parameter estimates (measured variable to latent factor) from this analysis were as follows for the total sample ($N = 4,081$): .250 for problem gambling; .214 for excessive video games; .355 for excessive online chat; .577 for excessive sexual behaviour; .140 for excessive shopping; and .292 for substance use.

The amount of explained variability for the expanded dysfunctional preoccupation variable proved to be quite consistent across the five waves of data. Separate principal components analyses for the six addiction-related variables at Time 2 to Time 5 found that the dysfunctional preoccupation variable explained 23% to 25% of the variability across the other four waves of data. Table 7 presents the correlations among the 6 excessive problem behaviours and dysfunctional preoccupation scores³ (sum of the 6 excessive problem behaviours) by gender and time.

AGE AND GENDER DIFFERENCES FOR THE EXPANDED DYSFUNCTIONAL PREOCCUPATION CONSTRUCT

Tables 8 to 12 present the means and standard deviations (by age-group and gender) for dysfunctional preoccupation scores at each time-point. To explore possible age and gender differences on the expanded dysfunctional preoccupation variable, a series of gender by age-group ANOVAs were conducted with dysfunctional preoccupation scores for each wave of data as dependent variables. Four age-groups were utilized (based on their age at Time 1): 29 years and under; 30 to 49 years; 50 to 65 years; and 65 years or older.

At Time 1, the main effect for age-group was significant $F(3, 4073) = 28.04$, $p < .001$, as well as the interaction of gender and age-group $F(3, 4073) = 2.88$, $p < .05$. Univariate analyses found that men scored significantly higher than women on dysfunctional preoccupation in the

³ For the rest of this report, unless otherwise stated, the phrase “dysfunctional preoccupation” or “dysfunctional preoccupation scores” refers to the sum of the six addiction-related behaviours.

29 years and under group only. All combinations of age-groups scored significantly different on dysfunctional preoccupation, with scores decreasing for the older the age-group.

The results for Time 2 were very similar to Time 1. The main effect for age-group was significant $F(3, 4073) = 13.00, p < .001$, as well as the interaction of gender and age-group $F(3, 4073) = 3.92, p < .01$. Univariate analyses found that men scored significantly higher than women on dysfunctional preoccupation in the 30 to 49 years group only. As at Time 1, all combinations of age-groups scored significantly different on dysfunctional preoccupation, with scores decreasing in the older the age-group.

For Time 3 the main effect for age-group was significant $F(3, 4073) = 11.98, p < .001$, as well as the interaction of gender and age-group $F(3, 4073) = 4.49, p < .01$. Univariate analyses found that men scored significantly higher than women on dysfunctional preoccupation in the 29 years and younger group, but women scored higher than men for the 50 years to 64 group. Individuals 65 years of age or older scored significantly lower on dysfunctional preoccupation than the other age-groups; the 50 years to 64 group also scored significant lower on dysfunctional preoccupation compared to the youngest group.

For Time 4 only the main effect for age-group was significant $F(3, 4073) = 6.28, p < .001$. Univariate analyses found that individuals 65 years of age or older scored significantly lower on dysfunctional preoccupation than the other age-groups. For Time 5 only the main effect for age-group was significant $F(3, 4073) = 7.54, p < .001$. Univariate analyses found that individuals in the 29 years and younger group scored significantly higher on dysfunctional preoccupation than the two oldest groups, while the 30 years to 49 group scored significantly higher than the oldest group.

TEMPORAL STABILITY OF THE EXPANDED DYSFUNCTIONAL PREOCCUPATION SCORE

The expanded dysfunctional preoccupation variable proved to be quite stable across the assessment period. Table 13 presents the correlations between dysfunctional preoccupation scores across the five waves of data collection (by gender). The mean dysfunctional preoccupation test-retest correlation was .51 for men and .52 for women. The 5-year test-retest correlations was .41 for men and .41 for women.

RELATIONSHIPS BETWEEN EXPANDED DYSFUNCTIONAL PREOCCUPATION SCORE AND BASIC PERSONALITY AND INTELLIGENCE

As noted above, the QLS included several variables (basic personality and intelligence) that provide important discriminant validity for the expanded dysfunctional preoccupation construct. Table 14 presents the correlations (separately by gender) between intelligence and personality variables and dysfunctional preoccupation scores for all five waves of the QLS. Overall, correlations between basic personality and dysfunctional preoccupation were low for

most of the personality dimensions. The mean correlations across the five waves of data with Agreeableness were $-.12$ for men and $-.13$ for women, with Conscientiousness $-.11$ for men and $-.11$ for women, with Extraversion $.01$ for men and $-.03$ for women, and with Openness $.05$ for men and $.01$ for women. Correlations for Neuroticism were slightly higher across the five waves than results for the other personality dimensions: mean correlation was $.23$ for men and $.20$ for women.

As documented in Table 14 the correlations between dysfunctional preoccupation and intelligence were all extremely low. The mean correlations across the five waves of data were $-.02$ for men and $-.06$ for women.

A hierarchical multiple regression analysis was also carried-out with the extended dysfunctional preoccupation scores at Time 1 as the dependent variable and intelligence as the predictor variable entered in Step 1, followed by the five basic personality scores as the predictor variables in Step 2. Time 1 dysfunctional preoccupation scores were used to be consistent with the results presented in Table 5. Separate analyses were conducted for men and women. The results of the multiple regression analyses (including partial correlations) are displayed in Table 15. Results found that intelligence and basic personality accounted for only about 13% of the variance in dysfunctional preoccupation scores among men and 10% among women.

RELATIONSHIPS BETWEEN EXPANDED DYSFUNCTIONAL PREOCCUPATION SCORES AND OVERALL MENTAL HEALTH

Table 16 summarizes a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (expanded score assessed at Time 1) with the independent variable of experiencing at least 1 of the following mental disorders in the previous 12 months: 1. post-traumatic stress disorder, 2. major depression, 3. mania, 4. generalized anxiety, 5. panic attacks and agoraphobia, 6. obsessive compulsive disorder, 7. bulimia, 8. binge eating, and 9. substance abuse and dependence. Five separate logistic regressions were conducted, one for each time-point. To explore the long-term predictive validity of the dysfunctional preoccupation construct, only scores from Time 1 were used in the logistic regressions.

The results were highly consistent across the five waves of data. The overall model was significant at each time point, with dysfunctional preoccupation, age and gender significantly predicting mental health status. Although the eta squared values tended to be small, the results indicate that those scoring higher on dysfunctional preoccupation, younger individuals, and women were more likely to have at least 1 mental health disorder in the previous 12-month period. The dependent variables had the strongest relationship with mental health status at Time 1 and dysfunctional preoccupation assessed at Time 1 tended to predict more

variability than age or gender. Mean eta square values were .035 for dysfunctional preoccupation, .008 for age, and .018 for gender.

RELATIONSHIPS BETWEEN EXPANDED DYSFUNCTIONAL PREOCCUPATION SCORES AND SPECIFIC MENTAL HEALTH PROBLEMS

The following section presents the results for a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (assessed at Time 1) with the independent variable of experiencing a specific mental health problem in the previous 12 months. The specific mental health problems included in these analyses were the following: post-traumatic stress disorder, major depression, mania, generalized anxiety, panic attacks and agoraphobia, obsessive compulsive disorder, bulimia, binge eating, and substance abuse and dependence. For each specific disorder, five separate logistic regressions were conducted, one for each time-point. To explore the long-term predictive validity of the dysfunctional preoccupation construct, only scores from Time 1 were used in the logistic regressions.

Bulimia: Table 17 reports on a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (expanded score assessed at Time 1) with the independent variable of experiencing bulimia during the previous 12 months. Five separate logistic regressions were conducted, one for each wave, using the dysfunctional preoccupation scores from Time 1. The results were highly consistent across the five waves of data. The overall model was significant at each time point, with dysfunctional preoccupation, age, and gender significantly predicting mental health status (although the eta squared values were all very small). Results indicate that increased dysfunctional preoccupation scores, younger individuals, and women were more likely to have developed bulimia in the previous 12 months. Mean *eta squares* were .005 for gender, .003 for age, and .002 for dysfunctional preoccupation.

Generalized Anxiety: Table 18 reports on a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (expanded score assessed at Time 1) with the independent variable of experiencing generalized anxiety during the previous 12 months. Five separate logistic regressions were conducted, one for each wave, using the dysfunctional preoccupation scores from Time 1. The results were highly consistent across the five waves of data. The overall model was significant at each time point, with dysfunctional preoccupation, age, and gender significantly predicting mental health status. Results indicate that increased dysfunctional preoccupation scores, younger individuals, and women were more likely to have developed generalized anxiety in the previous 12 months. Mean *eta squares* were .016 for dysfunctional preoccupation, .007 for gender, and .002 for age.

Binge Eating: Table 19 reports on a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (expanded score assessed at Time 1) with the independent variable of experiencing binge eating during the previous 12 months. Four⁴ separate logistic regressions were conducted, one for each wave, using the dysfunctional preoccupation scores from Time 1. The results were highly consistent across the time periods. The overall model was significant at each time point, with dysfunctional preoccupation and gender significantly predicting mental health status. Results indicate that increased dysfunctional preoccupation scores and women were more likely to have developed binge eating in the previous 12 months. *Eta square* values were very low; mean *eta squares* were .006 for dysfunctional preoccupation and .005 for gender.

Post-Traumatic Stress Disorder: Table 20 reports on a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (expanded score assessed at Time 1) with the independent variable of experiencing post-traumatic stress disorder during the previous 12 months. Five separate logistic regressions were conducted, one for each wave, using the dysfunctional preoccupation scores from Time 1. The results were highly consistent across the five waves of data. The overall model was significant at each time point, with dysfunctional preoccupation and gender significantly predicting mental health status (except Time 2 when gender was not significant). Results indicate that increased dysfunctional preoccupation scores and women were more likely to have post-traumatic stress disorder in the previous 12 months. Mean *eta squares* were .014 for dysfunctional preoccupation and .002 for gender.

Major Depression: Table 21 reports on a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (expanded score assessed at Time 1) with the independent variable of experiencing major depression during the previous 12 months. Five separate logistic regressions were conducted, one for each wave, using the dysfunctional preoccupation scores from Time 1. The results were highly consistent across the five waves of data. The overall model was significant at each time point, with dysfunctional preoccupation, age, and gender significantly predicting mental health status. Results indicate that increased dysfunctional preoccupation scores, younger individuals, and women were more likely to have developed major depressive disorder in the previous 12 months. Mean *eta squares* were .038 for dysfunctional preoccupation, .010 for gender, and .003 for age.

Mania: Table 22 reports on a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (expanded score assessed at Time 1) with the independent variable of experiencing mania during the previous 12 months. Five separate logistic regressions were conducted, one for each wave, using the dysfunctional

⁴ Binge eating was not included in the study until Wave 2.

preoccupation scores from Time 1. The overall model was significant at Times 1 to 3. At Time 1, dysfunctional preoccupation and gender significantly predicted mental health status; at Times 2 and 3 only dysfunctional preoccupation predicted. *Eta square* values were very low (the mean *eta square* across the 5 analyses was .002 for dysfunctional preoccupation).

Substance Abuse and Dependence: Table 23 reports on a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (expanded score assessed at Time 1) with the independent variable of experiencing substance abuse and dependence during the previous 12 months. Five separate logistic regressions were conducted, one for each wave, using the dysfunctional preoccupation scores from Time 1. To reduce the likelihood of symptom contamination, the dysfunctional preoccupation score was calculated without the substance behaviours items. The results of the analyses were highly consistent across the five waves of data. The overall model was significant at each time point, with dysfunctional preoccupation, age, and gender significantly predicting mental health status. Results indicate that increased dysfunctional preoccupation scores, younger individuals, and men were more likely to have experienced substance abuse and dependence in the previous 12 months. Mean *eta squares* were .017 for dysfunctional preoccupation, .009 for age, and .007 for gender.

Obsessive Compulsive Disorder: Table 24 reports on a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (expanded score assessed at Time 1) with the independent variable of experiencing obsessive compulsive disorder during the previous 12 months. Five separate logistic regressions were conducted, one for each wave, using the dysfunctional preoccupation scores from Time 1. The overall model was significant at Times 1 through 5. At obsessive compulsive disorder Time 1, age and dysfunctional preoccupation expanded model were significant. This result indicates those with increased dysfunctional preoccupation, and younger individuals are more likely to have obsessive compulsive disorder at Time 1, gender did not have an effect. This pattern was repeated at Time 2 and 3. Time 4 demonstrated a significant result for dysfunctional preoccupation only. At Time 5, dysfunctional preoccupation, age, and gender were all significant. Mean *eta squares* were .017 for dysfunctional preoccupation, .009 for age, and .007 for gender.

Panic and Agoraphobia: Table 25 reports on a series of logistic regressions analyzing the dependent variables of age, gender, and dysfunctional preoccupation (expanded score assessed at Time 1) with the independent variable of experiencing panic and agoraphobia during the previous 12 months. Five separate logistic regressions were conducted, one for each wave, using the dysfunctional preoccupation scores from Time 1. The results were highly consistent across the five waves of data. The overall model was significant at each time point, with dysfunctional preoccupation, age and gender significantly predicting mental health status. Results indicate that increased dysfunctional preoccupation scores, younger individuals, and

women were more likely to have experienced panic and agoraphobia in the previous 12 months. Mean *eta squares* were .013 for gender, .011 for dysfunctional preoccupation, and .005 for age.

DYSFUNCTIONAL PREOCCUPATION AND MENTAL HEALTH PROBLEMS: EXTREME GROUPS ANALYSES

To further explore the mental health implications of the dysfunctional preoccupation construct, two groups were created based on dysfunctional preoccupation scores at Time 1: individuals scoring “0” on the dysfunctional preoccupation scale (low DP group) and individuals scoring at the 90th percentile for their gender and age-group (high DP group).

Table 26 reports on a series of *chi-square* analyses (one for each time-period) comparing prevalence rates for the dysfunctional preoccupation group (low vs. high) for experiencing at least one of the following mental disorders in the previous 12 months: post-traumatic stress disorder, major depression, mania, generalized anxiety, panic attacks and agoraphobia, obsessive compulsive disorder, bulimia, binge eating, and substance abuse and dependence. The *chi-square* at Time 1 was significant, indicating that individuals with higher levels of dysfunctional preoccupation are more likely to have had a mental health disorder in the previous 12 months. This relationship was repeated for the other four waves of data (with *phi*-values demonstrating a medium effect size).

Figure 3 presents the prevalence rates for the high and low dysfunctional groups (low vs. high) from the *chi-square* analyses summarized on Table 26. There was a sizeable discrepancy between the two groups in having at least one mental health disorder in the previous 12 months. For the low dysfunctional preoccupation group the mean prevalence rate across the five waves of data was 7.4%, while the mean prevalence rate for the high group was 30.1%

Bulimia: Table 27 reports on a series of *chi-square* analyses (one for each wave) comparing prevalence rates for the dysfunctional preoccupation group (low vs. high) for experiencing bulimia in the previous 12 months. The *chi-square* at Time 1 was significant, indicating that individuals with higher levels of dysfunctional preoccupation are more likely to have had bulimia in the previous 12 months. This relationship was repeated for the other four waves of data (with *phi*-values demonstrating relatively low effect size).

Figure 4 presents the prevalence rates for the high and low dysfunctional groups (low vs. high) from the *chi-square* analyses summarized on Table 27. There was a sizeable discrepancy between the two groups in having bulimia in the previous 12 months. For the low group the mean prevalence rate across the five waves of data was 10.7%, while the mean prevalence rate for the high group was 48.9%.

Major Depression: Table 28 reports on a series of *chi-square* analyses (one for each wave) comparing prevalence rates for the dysfunctional preoccupation group (low vs. high) for experiencing major depression in the previous 12 months. The *chi-square* at Time 1 was significant, indicating that individuals with higher levels of dysfunctional preoccupation are more likely to have had major depression in the previous 12 months. This relationship was repeated for the other four waves of data (with *phi*-values demonstrating a relatively moderate effect size).

Figure 5 presents the prevalence rates for the high and low dysfunctional groups (low vs. high) from the *chi-square* analyses summarized on Table 28. There was a sizeable discrepancy between the two groups in having major depressive disorder in the previous 12 months. For the low group the mean prevalence rate across the five waves of data was 6.5%, while the mean prevalence rate for the high group was 31.9%.

Generalized Anxiety: Table 29 reports on a series of *chi-square* analyses (one for each wave) comparing prevalence rates for the dysfunctional preoccupation group (low vs. high) for experiencing generalized anxiety previous 12 months. The *chi-square* at Time 1 was significant, indicating that individuals with higher levels of dysfunctional preoccupation are more likely to have had generalized anxiety in the previous 12 months. This relationship was repeated for the other four waves of data (with *phi*-values demonstrating a relatively moderate effect size).

Figure 6 presents the prevalence rates for the high and low dysfunctional groups (low vs. high) from the *chi-square* analyses summarized on Table 29. There was a sizeable discrepancy between the two groups in having generalized anxiety in the previous 12 months. For the low group the mean prevalence rate across the five waves of data was 9.5%, while the mean prevalence rate for the high group was 40.7%.

Mania: Table 30 reports on a series of *chi-square* analyses (one for each wave) comparing prevalence rates for the dysfunctional preoccupation group (low vs. high) for experiencing mania in the previous 12 months. The *chi-square* at Time 1 was significant, however the only other analysis to be significant was at Time 4. The *phi*-values for Time 1 and 4 demonstrated a small effect size, suggesting a weak link between mania and dysfunctional preoccupation.

Obsessive Compulsive Disorder: Table 31 reports on a series of *chi-square* analyses (one for each wave) comparing prevalence rates for the dysfunctional preoccupation group (low vs. high) for experiencing obsessive compulsive disorder in the previous 12 months. The *chi-square* at Time 1 was significant, indicating that individuals with higher levels of dysfunctional preoccupation are more likely to have had obsessive compulsive disorder in the previous 12 months. This relationship was repeated for the other four waves of data (with *phi*-values demonstrating a small to medium effect size).

Figure 7 presents the prevalence rates for the high and low dysfunctional groups (low vs. high) from the *chi-square* analyses summarized on Table 31. There was a sizeable discrepancy between the two groups in having obsessive compulsive disorder in the previous 12 months. For the low group the mean prevalence rate across the five waves of data was 10.6%, while the mean prevalence rate for the high group was 50.4%.

Panic and Agoraphobia: Table 32 reports on a series of *chi-square* analyses (one for each wave) comparing prevalence rates for the dysfunctional preoccupation group (low vs. high) for experiencing panic and agoraphobia in the previous 12 months. The *chi-square* at Time 1 was significant, indicating that individuals with higher levels of dysfunctional preoccupation are more likely to have had panic and agoraphobia in the previous 12 months. This relationship was repeated for the other four waves of data (with *phi*-values demonstrating a small to medium effect size).

Figure 8 presents the prevalence rates for the high and low dysfunctional groups (low vs. high) from the *chi-square* analyses summarized on Table 32. There was a sizeable discrepancy between the two groups in having panic and agoraphobia disorder in the previous 12 months. For the low group the mean prevalence rate across the five waves of data was 9.6%, while the mean prevalence rate for the high group was 32.2%.

Post-Traumatic Stress Disorder: Table 33 reports on a series of *chi-square* analyses (one for each wave) comparing prevalence rates for the dysfunctional preoccupation group (low vs. high) for experiencing post-traumatic stress disorder in the previous 12 months. The *chi-square* at Time 1 was significant, indicating that individuals with higher levels of dysfunctional preoccupation are more likely to have had post-traumatic stress disorder in the previous 12 months. This relationship was repeated for the other four waves of data (with *phi*-values demonstrating a small to medium effect size).

Figure 9 presents the prevalence rates for the high and low dysfunctional groups (low vs. high) from the *chi-square* analyses summarized on Table 33. There was a sizeable discrepancy between the two groups in having post-traumatic stress disorder in the previous 12 months. For the low group the mean prevalence rate across the five waves of data was 10.2%, while the mean prevalence rate for the high group was 50.5%.

Substance Abuse and Dependency: Table 34 reports on a series of *chi-square* analyses (one for each wave) comparing prevalence rates for the dysfunctional preoccupation group (low vs. high) for experiencing substance abuse and dependence in the previous 12 months. To reduce the likelihood of symptom contamination, the dysfunctional preoccupation score was calculated without the substance-related items. The *chi-square* at Time 1 was significant, indicating that individuals with higher levels of dysfunctional preoccupation are more likely to have had substance abuse and dependence in the previous 12 months. This relationship was

repeated for the other four waves of data (with *phi*-values demonstrating a small to medium effect size).

Figure 10 presents the prevalence rates for the high and low dysfunctional groups (low vs. high) from the *chi-square* analyses summarized on Table 34. There was a sizeable discrepancy between the two groups in having substance abuse and dependence in the previous 12 months. For the low group the mean prevalence rate across the five waves of data was 11.1%, while the mean prevalence rate for the high group was 33.8%.

Binge Eating: Table 35 reports on a series of *chi-square* analyses (one for each wave) comparing prevalence rates for the dysfunctional preoccupation group (low vs. high) for experiencing binge eating in the previous 12 months. The *chi-square* at Time 2 (binge eating was not included in Wave 1) was significant, indicating that individuals with higher levels of dysfunctional preoccupation are more likely to have had binge eating in the previous 12 months. This relationship was repeated for the other three waves of data (with *phi*-values demonstrating a small effect size).

Figure 11 presents the prevalence rates for the high and low dysfunctional groups (low vs. high) from the *chi-square* analyses summarized on Table 35. There was a sizeable discrepancy between the two groups in having binge eating in the previous 12 months. For the low group the mean prevalence rate across the four waves of data was 10.3%, while the mean prevalence rate for the high group was 33.5%.

In summary, it is important to emphasize that individuals scoring high on dysfunctional preoccupation are at extreme risk for a cross-section of serious mental health problems. It is also worth noting that this relationship was established using only Time 1 scores for dysfunctional preoccupation. Thus dysfunctional preoccupation would appear to be an important predictor of various mental health problems. Although dysfunctional preoccupation was a significant predictor of virtually all of the mental health problems examined, this variable seemed to be particularly linked (based on *phi*-values) with the following five mental health problems: 1. major depressive disorder, 2. generalized anxiety disorder, 3. panic and agoraphobia, 4. PTSD, and 5. substance abuse and dependency. Figure 12 presents the mean prevalence rates (across the five waves of data) by high and low dysfunctional groups for these five disorders.

DYSFUNCTIONAL PREOCCUPATION AND SPECIFIC MENTAL HEALTH SYMPTOMS

In an effort to better understand the strong empirical relationships between dysfunctional preoccupation scores and the specific mental health disorders (see list on Figure 12), we examined specific mental health symptoms used in the QLS. Using data from Wave 1, we conducted a series of *t*-tests comparing dysfunctional preoccupation scores for individuals

who endorsed specific mental health symptoms (“yes” group) with individuals who did not (“no” group).

Major Depression: Table 36 reports on mean dysfunctional preoccupation scores by group (symptom present vs. not present) for all items used to identify individuals likely to have experienced major depression in the previous 12 months (significance levels adjusted using a Bonferroni correction). As documented in Table 36, significant items (1, 2, 3, 7a, 8, 9 and 10) were almost exclusively linked to mood-related symptoms. Very few of the somatic-related items (e.g. 4a, 4b, 5a, 5b, 6) were significant. This pattern of results suggests that the link between major depression disorder and dysfunctional preoccupation is likely connected to maladaptive attempts to thwart off negative emotional experiences. This finding is consistent with prior research with the dysfunctional preoccupation construct that found it strongly linked to poor self-regulating abilities (Parker et al., 2008, 2013).

Generalized Anxiety: Table 37 reports on mean dysfunctional preoccupation scores by group (symptom present vs. not present) for all items used to identify individuals likely to have experienced generalized anxiety in the previous 12 months (significance levels adjusted using a Bonferroni correction). As noted in Table 37, after the Bonferroni correction, only the first item (1a) remained significant: “During the past 12 months, have you experienced excessive anxiety or worry on most days for 6 or more months?” It is worth noting that this is the item that attempts to tap the most intense and persistent aspects of the disorder. Perhaps the chronicity connected to persistent worry is the phenomenological link between this specific symptom and dysfunctional preoccupation scores. Although this specific analysis cannot address causality, it is worth noting that the analyses summarized in Table 18 documents the ability of dysfunctional preoccupation scores measured in Time 1 to predict generalized anxiety status across multiple time-points.

Panic and Agoraphobia: The results for panic and agoraphobia symptoms are consistent with the findings for generalized anxiety disorder. Table 38 presents mean dysfunctional preoccupation scores by group (symptom present vs. not present) for all items used to identify individuals likely to have experienced panic and agoraphobia in the previous 12 months. After the Bonferroni correction, only the first item (1a) remained significant: “In the past 12 months, have you had any panic attacks?” These are times when you suddenly feel intensely frightened, anxious, or very uneasy. As with results for generalized anxiety, this is the item that taps the most intense and persistent aspects of the disorder.

Post-Traumatic Stress Disorder: Table 39 reports on mean dysfunctional preoccupation scores by group (symptom present vs. not present) for all items used to identify individuals likely to have experienced post-traumatic stress disorder in the previous 12 months (significance levels adjusted using a Bonferroni correction). The pattern of results is quite similar to what was found with major depression; items connected to mood-related symptoms

tended to be significant (e.g., items 2, 3, 4, 6, 10 and 11), while somatic or cognitive-related symptoms were not (e.g. items 8, 9, 14, 16.). As with major depression, the link between PTSD and dysfunctional preoccupation may be chronic and maladaptive attempts to thwart off negative emotional experiences.

Substance Abuse and Dependence: Table 40 reports on mean dysfunctional preoccupation scores by group (symptom present vs. not present) for all items used to identify individuals likely to have experienced substance abuse and dependence in the previous 12 months (significance levels adjusted using a Bonferroni correction). To reduce the likelihood of symptom contamination, the dysfunctional preoccupation score was calculated without the substance-related items. Although the substance-related items were not included, it is important to note that dysfunctional preoccupation scores differed for all 17 items. Even after a Bonferroni correction, individuals who endorsed any item connected to substance abuse and dependency had higher dysfunctional preoccupation scores.

CONCLUSION

Using a similar set of addiction-related behaviours (problem gambling, excessive game playing, and excessive online behaviour) as Parker et al. (2008, 2013) we were able to empirically demonstrate that the dysfunctional preoccupation latent variable identified in adolescent samples can be generalized to a community-based sample of adults. The temporal stability of the dysfunctional preoccupation scores were found to be moderately high across the 5-years of the QLS— with test-retest reliabilities at levels typically found with personality variables in adult samples (Costa & McCrae, 1992). This stable dysfunctional preoccupation score was also found to be quite independent of both basic personality (five-factor model) and intelligence. Dysfunctional preoccupation scores (derived from just problem gambling, excessive game playing, and excessive online behaviour) were also found to be a significant predictor of a cross section of serious mental health problems across multiple time-points.

The QLS provides an opportunity to extend the nomological framework for the dysfunctional preoccupation construct by including additional addiction-related behaviours: excessive sexual behaviour, shopping, and substance use. Using six measures of excessive behaviours (problem gambling, excessive game playing, excessive online behaviour, excessive sexual behaviour, shopping, and substance use) we were able to empirically demonstrate that a dysfunctional preoccupation latent variable accounts for a sizeable amount of variability among the behavioural addiction variables. Consistent with previous analyses with the narrower dysfunctional preoccupation construct, the temporal stability of the expanded dysfunctional preoccupation scores were found to be moderately high across the five waves of

data. This variable was also found to be quite independent of both basic personality and intelligence in both men and women.

Individuals scoring high on dysfunctional preoccupation in the first year of the QLS were found to be at extreme risk for a cross-section of serious mental health problems at subsequent years. Although dysfunctional preoccupation was a significant predictor of many different mental health problems, it was particularly linked with a cluster of five serious mental health problems: major depression, generalized anxiety, panic and agoraphobia, PTSD, and substance abuse and dependency. This finding is consistent with the overlap among behavioural addictions that has been reported in some clinical populations, particularly major depressive disorder (e.g., Lejoyeux et al., 2002; Shaw & Black, 2008).

When we examined the symptom overlap between the mental health problems strongly linked to the dysfunctional preoccupation construct the pattern of results suggested that the association was often connected to maladaptive attempts to thwart off negative emotional experiences. This finding is consistent with prior research with the dysfunctional preoccupation construct that found it strongly linked to poor affect regulation abilities (Parker et al., 2008, 2013).

LIMITATIONS AND FUTURE DIRECTIONS

One of the strengths of the QLS is that it included data that allows for a detailed examination of the linkages of a cluster behavioural addictions (specifically, problem gambling, video games, online chatting, sexual behaviour, shopping, and substance use). The longitudinal design of the data-base, as well as the size of the sample, also allows researchers to examine the stability across time of co-occurring behavioural addictions.

The limitations of the QLS have been reviewed elsewhere (Thege et al., 2015), although there are a number of issues relevant to the present study. The sample was from a very specific geographic region (within 70 kilometers of the city of Belleville, Ontario); the sample was primarily white and relatively old as an overall sample (mean age of 46.1 years). As noted by Thege, the age distribution of the sample limits the “generalizability of the present findings concerning spontaneous remission in age groups more at-risk for developing addictions (e.g., adolescents) or in clinical populations, where more severe symptomatology and higher number of comorbid disorders are characteristic” (p. 12). As noted earlier, Thege et al (2015) have also flagged concerns about the fact that the prevalence rate of excessive behaviours was the highest at the first assessment period and generally lower at Time 5. It is unclear, for example, whether participants over-reported at Time 1 and underreported at later time points because they felt less anonymous or to reduce the number of items needed to complete the,

or if completing the survey functioned to raise participants' awareness about potential mental health issues, thus subtly changing future behaviours.

The QLS contains a wealth of variables for future follow-up. Having established the stability of the dysfunctional preoccupation construct, it would be useful to examine the relationship year to year in scores for this variable with stressful events and experiences. On a year to year basis, the QLS measured the presence of a variety of stressful events: dropped out of school, starting a new job, significant change in work demands, being fired or laid off, continuing unemployment, significant changes in family life (death, divorce, separation, pregnancies, birth of children), moving to a new home, etc. It would be interesting to examine the impact the presence of stressful events plays on levels of dysfunctional preoccupation, as well as the mediating role stressful events may play in the relationship between dysfunctional preoccupation and specific mental health problems. A similar set of analyses could be proposed for quality of life. Across the 5 yearly surveys, the QLS included a variety of quality of life variables (e.g., marital satisfaction, overall life satisfaction, social/family functioning, community involvement, and work satisfaction).

There are also a number of demographic and life-time variables included on the QLS that could be used to explore the etiology of dysfunctional preoccupation. For example, the QLS contains a detailed set of questions regarding life time stressors and family background, as well as questions that explore educational, socioeconomic, and risky behaviour backgrounds. The current study focused on using dysfunctional preoccupation scores to predict current or future mental health problems and symptoms. It would be very interesting to use the dysfunctional preoccupation scores to predict current or future risky behaviours (legal and illegal).

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TABLES AND FIGURES

Table 1: Correlations among problem gambling, video games, online chatting, and dysfunctional preoccupation scores by gender and time

Time 1 (Men N = 1848; Women N = 2233)	1	2	3	4
1. Gambling	-	.02	.02	.86*
2. Online chatting	.08*	-	.13*	.37*
3. Video games	.20*	-.01	-	.42*
4. Dysfunctional preoccupation	.84*	.43*	.55*	-
Time 2 (Men N = 1848; Women N = 2230)	1	2	3	4
1. Gambling	-	.07*	.19*	.85*
2. Online chatting	-.01*	-	.24*	.45*
3. Video games	.30*	-.01	-	.58*
4. Dysfunctional preoccupation	.82*	.39*	.63*	-
Time 3 (Men N = 1851; Women N = 2232)	1	2	3	4
1. Gambling	-	.17*	.10*	.86*
2. Online chatting	.05*	-	.07*	.46*
3. Video games	.22*	.12*	-	.49*
4. Dysfunctional preoccupation	.81*	0.37*	.69*	-
Time 4 (Men N = 1851; Women N = 2231)	1	2	3	4
1. Gambling	-	.02	.24*	.86*
2. Online chatting	.04	-	-.01	.29*
3. Video games	.10*	.01	-	.61*
4. Dysfunctional preoccupation	.77*	.33*	.64*	-
Time 5 (Men N = 1847; Women N = 2231)	1	2	3	4
1. Gambling	-	-.01	.12*	.88*
2. Online chatting	.08*	-	0.28*	.31*
3. Video games	.08*	-.01	-	.53*
4. Dysfunctional preoccupation	0.84*	.47*	.43*	-

Note: Men below the diagonal; women above; * $p < .05$.

Table 2: Means and standard deviations (by age-group and gender) for dysfunctional preoccupation scores at Time 1

Age group	Men			Women			Total		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
29 years and under	0.89	2.02	245	0.54	1.63	324	0.69	1.82	569
30 to 49 years	0.55	1.58	807	0.44	1.35	1075	0.49	1.46	1882
50 to 64 years	0.42	1.23	545	0.47	1.33	631	0.45	1.29	1176
65 years and older	0.35	1.30	251	0.35	1.11	203	0.35	1.22	454
Total	0.53	1.53	1848	0.45	1.37	2233	0.49	1.45	4081

Table 3: Test-retest correlations for dysfunctional preoccupation scores (separately by gender)

Wave	Time 1	Time 2	Time 3	Time 4	Time 5
Time 1	-	.59	.53	.50	.49
Time 2	.66	-	.63	.55	.58
Time 3	.37	.47	-	.56	.61
Time 4	.37	.47	.60	-	.65
Time 5	.46	.53	.45	.47	-

Note: Men ($N = 1790$) below the diagonal; women above ($N = 2163$); all correlations significant ($p < .001$)

Table 4: Correlations between dysfunctional preoccupation scores (all time-points) and basic personality and intelligence

	Dysfunctional Preoccupation									
	Time 1		Time 2		Time 3		Time 4		Time 5	
	M	W	M	W	M	W	M	W	M	W
Agreeableness	-.10*	-.18*	-.08*	-.13*	-.07*	-.09*	-.03	-.10*	-.06*	-.09*
Conscientious	-.09*	-.12*	-.07*	-.09*	-.04	-.07*	-.01	-.06*	-.07*	-.09*
Extraversion	-.01	-.05*	.01	-.06*	.01	-.06*	.01	-.05*	.02	-.04
Neuroticism	.24*	.24*	.15*	.16*	.10*	.14*	.11*	.13*	.17*	.14*
Openness	-.02	-.04	.02	-.05*	.01	-.06*	-.02	-.02	.01	-.06*
Intelligence	-.03	-.08*	-.01	-.10*	-.04	-.07*	-.03	-.05*	-.04	-.07*

Note: M = men ($N = 1666$); W = women ($N = 2067$); * $p < .05$

Table 5: Hierarchical multiple regression for Time 1 dysfunctional preoccupation scores

Step & Variable	Men ($N = 1722$)				Women ($N = 2136$)			
	B	Beta	Partial Corr.	R ²	B	Beta	Partial Corr.	R ²
Intelligence	-.009	-.034	-.034	.001	-.024*	-.088*	-.088*	.008*
Agreeableness	-.002	-.008	-.007		-.030*	-.111*	-.105*	
Conscientious	.001	.004	.003		-.006	-.022	-.020	
Extraversion	.022*	.069*	.065*		.009*	.032*	.030*	
Neuroticism	.056*	.260*	.219*		.036*	.205*	.178*	
Openness	-.008	-.032	-.031	.064*	.001	.004	.004	.080*

Note: * $p < .001$.

Table 6. Summary of logistic regression analyses (for each time) predicting having at least one mental health problem in the previous 12 months from dysfunctional preoccupation, gender, and age

IV	DV	χ^2	t-value	df	Eta square
Time 1: Mental Health	Time 1 Dys. Preoccupation	271.73*	11.14*	4076	0.030
	Age		-6.66*	4076	0.011
	Gender		8.58*	4076	0.018
Time 2: Mental Health	Time 1 Dys. Preoccupation	189.37*	8.16*	3896	0.017
	Age		-6.83*	3896	0.012
	Gender		7.97*	3896	0.016
Time 3: Mental Health	Time 1 Dys. Preoccupation	193.35*	7.80*	3859	0.016
	Age		-7.09*	3859	0.013
	Gender		8.32*	3859	0.018
Time 4: Mental Health	Time 1 Dys. Preoccupation	160.18*	8.18*	3788	0.017
	Age		-5.99*	3788	0.009
	Gender		6.86*	3788	0.012
Time 5: Mental Health	Time 1 Dys. Preoccupation	216.04*	8.90*	3759	0.021
	Age		-6.59*	3759	0.011
	Gender		8.79*	3759	0.020

Note. IV = Independent variable; DV = dependent variables; Mental Health = presence of at least one mental disorder in past 12 months vs. no disorder; Dys. Preoccupation = Dysfunctional Preoccupation scores; * $p < .001$

Table 7: Correlations among excessive problem behaviours and dysfunctional preoccupation scores by gender and time

Time 1 (Men N = 1848; Women n = 2233)	1	2	3	4	5	6	7
1. Gambling	-	.02	.02	.11*	.10*	.18*	.86*
2. Online chatting	.08*	-	.13*	.33*	-.01	.06*	.37*
3. Video games	.20*	-.01	-	.25*	.02	.04*	.42*
4. Sexual behaviour	.07*	.21*	.08*	-	.10*	.15*	.28*
5. Shopping	.03	-.01	-.01	.15*	-	.11*	.09*
6. Substances	.18*	.06*	.02	.14*	.01	-	.19*
7. Dysfunctional preoccupation	.84*	.43*	.55*	.16*	.02	.16*	-
Time 2 (Men N = 1848; Women N = 2230)	1	2	3	4	5	6	7
1. Gambling	-	.07*	.19*	.04*	.08*	.12*	.85*
2. Online chatting	-.01	-	.24*	-.00	-.01	.14*	.45*
3. Video games	.30*	-.01	-	-.00	.07*	.04*	.58*
4. Sexual behaviour	.06*	.35*	.01	-	.18*	.09*	.03
5. Shopping	.02	-.00	-.01	-.01	-	.08*	.08*
6. Substances	.17*	.04	.04*	.10*	.04	-	.15*
7. Dysfunctional preoccupation	.82*	.39*	.63*	.19*	.01	.16*	-

Table 7 continued

Time 3 (Men N=1851; Women N = 2232)	1	2	3	4	5	6	7
1. Gambling	-	.17*	.10*	.09*	.07*	.16*	.86*
2. Online chatting	.05*	-	.07*	.14*	.11*	.11*	.46*
3. Video games	.22*	.12*	-	.29*	.06*	.08*	.49*
4. Sexual behaviour	.03	.16*	.17*	-	.19*	.12*	.23*
5. Shopping	.07*	.18*	.16*	.15*	-	.04	.11*
6. Substances	.19*	-.00	.08*	.06*	.00	-	.19*
7. Dysfunctional preoccupation	.81*	.37*	.69*	.15*	.17*	.17*	-
Time 4 (Men N=1851; Women N = 2231)	1	2	3	4	5	6	7
1. Gambling	-	.02	.24*	.02	.14*	.18*	.86*
2. Online chatting	.04	-	-.00	-.00	.16*	-.01	.29*
3. Video games	.10*	.00	-	-.00	.15*	.11*	.61*
4. Sexual behaviour	.12*	-.01	.09*	-	-.00	-.01	.02
5. Shopping	.06*	-.00	.02	-.01	-	.10*	.21*
6. Substances	.20*	.03	.03	.12*	-.00	-	.19*
7. Dysfunctional preoccupation	.77*	.33*	.64	.13*	.05*	.16*	-
Time 5 (Men N=1847; Women N = 2231)	1	2	3	4	5	6	7
1. Gambling	-	-.00	.12*	.15*	.13*	.15*	.88*
2. Online chatting	.08*	-	.28*	-.00	.00	-.00	.31*
3. Video games	.08*	-.00	-	.51*	.10*	.13*	.53*
4. Sexual behaviour	.03	.00	-.01	-	.05*	.09*	.31*
5. Shopping	-.01	.26*	-.00	.04	-	.05*	.15
6. Substances	.21*	.17*	.12*	.22*	.10*	-	.18*
7. Dysfunctional preoccupation	.84*	.47*	.43*	.02	.09*	.28*	-

Note: Men below the diagonal; women above; * p < .05

Table 8: Means and standard deviations for dysfunctional preoccupation scores at Time 1 by gender and age-group

Age group		Men	Women	Total
29 years & under	Mean	2.21	1.69	1.91
	SD	3.64	4.00	3.86
	N	232	314	546
30 to 49 years	Mean	1.48	1.11	1.27
	SD	2.91	2.19	2.53
	N	776	1035	1811
50 to 64 years	Mean	0.86	0.95	0.91
	SD	1.93	2.04	1.99
	N	537	615	1152
65 years & older	Mean	0.61	0.66	0.63
	SD	2.02	1.74	1.90
	N	245	199	444
Total sample	Mean	1.27	1.11	1.18
	SD	2.70	2.48	2.58
	N	1790	2163	3953

Table 9: Means and standard deviations for dysfunctional preoccupation scores at Time 2 by gender and age-group

Age group		Men	Women	Total
29 years & under	Mean	1.18	1.25	1.22
	<i>SD</i>	2.44	3.07	2.81
	<i>N</i>	232	314	546
30 to 49 years	Mean	1.19	0.86	1.00
	<i>SD</i>	2.65	2.13	2.37
	<i>N</i>	776	1035	1811
50 to 64 years	Mean	0.65	0.84	0.75
	<i>SD</i>	1.75	1.93	1.85
	<i>N</i>	537	615	1152
65 years & older	Mean	0.44	0.59	0.51
	<i>SD</i>	1.70	1.55	1.63
	<i>N</i>	245	199	444
Total sample	Mean	0.92	0.88	0.90
	<i>SD</i>	2.29	2.20	2.24
	<i>N</i>	1790	2163	3953

Table 10: Means and standard deviations for dysfunctional preoccupation scores at Time 3 by gender and age-group

Age group		Men	Women	Total
29 years & under	Mean	1.30	0.93	1.09
	<i>SD</i>	3.45	2.14	2.78
	<i>N</i>	232	314	546
30 to 49 years	Mean	1.03	0.81	0.90
	<i>SD</i>	2.28	2.23	2.26
	<i>N</i>	776	1035	1811
50 to 64 years	Mean	0.57	0.80	0.70
	<i>SD</i>	1.35	2.00	1.73
	<i>N</i>	537	615	1152
65 years & older	Mean	0.31	0.51	0.40
	<i>SD</i>	1.12	1.47	1.29
	<i>N</i>	245	199	444
Total sample	Mean	0.83	0.80	0.81
	<i>SD</i>	2.15	2.10	2.12
	<i>N</i>	1790	2163	3953

Table 11: Means and standard deviations for dysfunctional preoccupation scores at Time 4 by gender and age-group

Age group		Men	Women	Total
29 years & under	Mean	1.00	0.78	0.87
	<i>SD</i>	2.70	2.02	2.34
	<i>N</i>	232	314	546
30 to 49 years	Mean	0.90	0.70	0.79
	<i>SD</i>	2.34	2.08	2.20
	<i>N</i>	776	1035	1811
50 to 64 years	Mean	0.63	0.74	0.69
	<i>SD</i>	1.63	2.03	1.86
	<i>N</i>	537	615	1152
65 years & older	Mean	0.41	0.46	0.43
	<i>SD</i>	1.48	1.18	1.35
	<i>N</i>	245	199	444
Total sample	Mean	0.77	0.70	0.73
	<i>SD</i>	2.11	1.99	2.05
	<i>N</i>	1790	2163	3953

Table 12: Means and standard deviations for dysfunctional preoccupation scores at Time 5 by gender and age-group

Age group		Men	Women	Total
29 years & under	Mean	1.08	0.81	0.93
	<i>SD</i>	3.12	2.25	2.66
	<i>N</i>	232	314	546
30 to 49 years	Mean	0.87	0.66	0.75
	<i>SD</i>	2.38	2.07	2.21
	<i>N</i>	776	1035	1811
50 to 64 years	Mean	0.52	0.59	0.56
	<i>SD</i>	1.56	1.54	1.55
	<i>N</i>	537	615	1152
65 years & older	Mean	0.34	0.49	0.41
	<i>SD</i>	1.18	1.40	1.28
	<i>N</i>	245	199	444
Total sample	Mean	0.72	0.65	0.68
	<i>SD</i>	2.17	1.91	2.03
	<i>N</i>	1790	2163	3953

Table 13: Test-retest correlations for expanded dysfunctional preoccupation scores (separately by gender)

Wave	Time 1	Time 2	Time 3	Time 4	Time 5
Time 1	-	.57	.49	.39	.41
Time 2	.54	-	.62	.51	.51
Time 3	.46	.47	-	.54	.57
Time 4	.41	.53	.66	-	.61
Time 5	.41	.52	.50	.59	-

Note: Men ($N = 1790$) below the diagonal; women above ($N = 2163$); all correlations significant ($p < .001$)

Table 14: Correlations between expanded dysfunctional preoccupation scores (all time-points) and basic personality and intelligence

	Dysfunctional Preoccupation									
	Time 1		Time 2		Time 3		Time 4		Time 5	
	M	W	M	W	M	W	M	W	M	W
Agreeableness	-.18*	-.18*	-.10*	-.16*	-.12*	-.12*	-.09*	-.10*	-.10*	-.13*
Conscientious	-.20*	-.15*	-.10*	-.11*	-.08*	-.10*	-.08*	-.05*	-.11*	-.11*
Extraversion	-.05	-.03	.01	-.02	.01	-.06*	-.00	-.03	.01	-.04*
Neuroticism	.35*	.27*	.21*	.22*	.18*	.17*	.19*	.15*	.22*	.19*
Openness	.06*	.02	.08*	.00	.04	-.01	.04	.03	.05*	.01
Intelligence	-.03	-.05*	-.01	-.06*	-.03	-.06*	-.02	-.06*	-.04	-.06*

Note: M = men ($N = 1666$); W = women ($N = 2067$); * $p < .05$

Table 15: Hierarchical multiple regression for expanded dysfunctional preoccupation scores (Time 1)

Step & Variable	Men (N = 1722)				Women (N = 2136)			
	B	Beta	Partial Corr.	R ²	B	Beta	Partial Corr.	R ²
Intelligence	-.015	-.031	-.031	.001	-.030*	-.059*	-.059*	.003*
Agreeableness	-.033*	-.064*	-.062*		-.045*	-.090*	-.085*	
Conscientious	-.030*	-.055*	-.051*		-.024*	-.049*	-.044*	
Extraversion	.038*	.067*	.066*		.030*	.056*	.054*	
Neuroticism	.122*	.311*	.268*		.082*	.248*	.215*	
Openness	.024*	.051*	.052*	.130*	.025*	.056*	.056*	.097*

Note: * $p < .001$.

Table 16. Summary of logistic regression analyses (for each time) predicting having at least one mental health problem in the previous 12 months from expanded dysfunctional preoccupation, gender, and age

IV	DV	χ^2	t-value	df	Eta square
Time 1: Mental Health	-Time 1 Dys. Preoccupation	410.68*	15.24*	4,076	0.054
	-Age		-5.00*	4,076	0.006
	-Gender		9.09*	4,076	0.020
Time 2: Mental Health	-Time 1 Dys. Preoccupation	241.87*	10.61*	3,896	0.028
	-Age		-5.86*	3,896	0.009
	-Gender		8.18*	3,896	0.017
Time 3: Mental Health	-Time 1 Dys. Preoccupation	209.63*	11.98*	3,859	0.036
	-Age		-5.91*	3,859	0.009
	-Gender		8.72*	3,859	0.019
Time 4: Mental Health	-Time 1 Dys. Preoccupation	226.5*	11.22*	3,788	0.032
	-Age		-4.93*	3,788	0.006
	-Gender		7.15*	3,788	0.013
Time 5: Mental Health	-Time 1 Dys. Preoccupation	242.75*	10.19*	3,759	0.027
	-Age		-5.59*	3,759	0.008
	-Gender		8.97*	3,759	0.021

Note. IV = Independent variable; DV = dependent variables; Mental Health = presence of at least one mental disorder in past 12 months vs. no disorder; * $p < .001$

Table 17. Summary of logistic regression analyses (for each time) predicting having bulimia in the previous 12 months from dysfunctional preoccupation, gender, and age

IV	DV	χ^2	t-value	df	Eta square
Time 1 - Bulimia	Time 1 Dys. Preoccupation	62.64*	5.59*	4,072	0.002
	Age		-3.02*	4,072	0.003
	Gender		3.63*	4,072	0.008
Time 2 - Bulimia	Time 1 Dys. Preoccupation	55.48*	5.52*	3,890	0.001
	Age		-2.26*	3,890	0.003
	Gender		3.62*	3,890	0.008
Time 3 - Bulimia	Time 1 Dys. Preoccupation	63.15*	5.47*	3,857	0.002
	Age		-2.68*	3,857	0.004
	Gender		3.75*	3,857	0.004
Time 4 - Bulimia	Time 1 Dys. Preoccupation	43.54*	3.66*	3,785	0.002
	Age		-2.64*	3,785	0.003
	Gender		3.28*	3,785	0.003
Time 5 - Bulimia	Time 1 Dys. Preoccupation	35.56*	3.47*	3,755	0.002
	Age		-2.70*	3,755	0.002
	Gender		3.01*	3,755	0.002

Note. IV = Independent variable; DV = dependent variables; * $p < .001$

Table 18. Summary of logistic regression analyses (for each time) predicting having generalized anxiety in the previous 12 months from dysfunctional preoccupation, gender, and age

IV	DV	χ^2	t-value	df	Eta square
Time 1 - Generalized Anxiety	Time 1 Dys. Preoccupation	134.85*	9.68*	3,992	0.023
	Age		-3.06*	3,992	0.002
	Gender		5.03*	3,992	0.006
Time 2 - Generalized Anxiety	Time 1 Dys. Preoccupation	89.50*	6.54*	3,806	0.011
	Age		-3.00*	3,806	0.002
	Gender		5.79*	3,806	0.009
Time 3 - Generalized Anxiety	Time 1 Dys. Preoccupation	92.12*	8.05*	3,784	0.017
	Age		-2.01*	3,784	0.001
	Gender		4.96*	3,784	0.006
Time 4 - Generalized Anxiety	Time 1 Dys. Preoccupation	105.96*	8.35*	3,705	0.018
	Age		-3.23*	3,705	0.003
	Gender		4.84*	3,705	0.006
Time 5 - Generalized Anxiety	Time 1 Dys. Preoccupation	79.62*	5.91*	3,684	0.009
	Age		-3.55*	3,684	0.003
	Gender		5.05*	3,684	0.007

Note. IV = Independent variable; DV = dependent variables; * $p < .001$

Table 19. Summary of logistic regression analyses (for each time) predicting having binge eating in the previous 12 months from dysfunctional preoccupation, gender, and age

IV	DV	χ^2	t-value	df	Eta square
Time 1 - Binge Eating	Time 1 Dys. Preoccupation	61.75*	6.05*	3,830	0.009
	Age		-1.20	3,830	0.000
	Gender		4.69*	3,830	0.006
Time 2 - Binge Eating	Time 1 Dys. Preoccupation	42.52*	4.56*	3,795	0.005
	Age		-1.21	3,795	0.000
	Gender		4.41*	3,795	0.005
Time 3 - Binge Eating	Time 1 Dys. Preoccupation	37.44*	5.02*	3,729	0.007
	Age		-1.43	3,729	0.001
	Gender		3.39*	3,729	0.003
Time 4 - Binge Eating	Time 1 Dys. Preoccupation	40.21*	4.00*	3,711	0.004
	Age		-1.16	3,711	0.000
	Gender		4.50*	3,711	0.005
Time 5 - Binge Eating	Time 1 Dys. Preoccupation	61.75*	6.05*	3,830	0.009
	Age		-1.20	3,830	0.000
	Gender		4.69*	3,830	0.006

Note. IV = Independent variable; DV = dependent variables; * $p < .001$

Table 20. Summary of logistic regression analyses (for each time) predicting having post-traumatic stress disorder (PTSD) in the previous 12 months from dysfunctional preoccupation, gender, and age

IV	DV	χ^2	t-value	df	Eta square
Time 1 - PTSD	Time 1 Dys. Preoccupation	113.68*	10.22*	4,038	0.025
	Age		-1.34	4,038	0.000
	Gender		3.17*	4,038	0.002
Time 2 - PTSD	Time 1 Dys. Preoccupation	38.18*	6.43*	3,885	0.011
	Age		-0.76	3,885	0.000
	Gender		1.74	3,885	0.001
Time 3 - PTSD	Time 1 Dys. Preoccupation	52.11*	6.41*	3,847	0.011
	Age		-1.84	3,847	0.001
	Gender		3.27*	3,847	0.003
Time 4 - PTSD	Time 1 Dys. Preoccupation	47.81*	7.15*	3,775	0.013
	Age		-0.24	3,775	0.000
	Gender		2.23*	3,775	0.001
Time 5 - PTSD	Time 1 Dys. Preoccupation	49.06*	6.68*	3,742	0.012
	Age		-1.21	3,742	0.000
	Gender		2.84*	3,742	0.002

Note. IV = Independent variable; DV = dependent variables; * $p < .001$

Table 21. Summary of logistic regression analyses (for each time) predicting having major depression in the previous 12 months from dysfunctional preoccupation, gender, and age

IV	DV	χ^2	t-value	df	Eta square
Time 1 - Major Depression	Time 1 Dys. Preoccupation	300.40*	14.00*	3,541	0.052
	Age		-3.48*	3,541	0.003
	Gender		6.29*	3,541	0.011
Time 2 - Major Depression	Time 1 Dys. Preoccupation	192.75*	11.20*	3,388	0.036
	Age		-3.72*	3,388	0.004
	Gender		5.17*	3,388	0.008
Time 3 - Major Depression	Time 1 Dys. Preoccupation	206.69*	11.56*	3,382	0.038
	Age		-3.85*	3,382	0.004
	Gender		5.67*	3,382	0.009
Time 4 - Major Depression	Time 1 Dys. Preoccupation	177.99*	11.20*	3,346	0.036
	Age		-2.86*	3,346	0.002
	Gender		5.74*	3,346	0.010
Time 5 - Major Depression	Time 1 Dys. Preoccupation	157.71*	9.83*	3,307	0.028
	Age		-3.46*	3,307	0.004
	Gender		6.51*	3,307	0.013

Note. IV = Independent variable; DV = dependent variables; * $p < .001$

Table 22. Summary of logistic regression analyses (for each time) predicting having mania in the previous 12 months from dysfunctional preoccupation, gender, and age

IV	DV	χ^2	t-value	df	Eta square
Time 1 - Mania	Time 1 Dys. Preoccupation	40.53*	5.03*	4,037	0.006
	Age		-1.78	4037	0.001
	Gender		2.96*	4,037	0.002
Time 2 - Mania	Time 1 Dys. Preoccupation	8.69*	2.03*	3,868	0.001
	Age		-1.94	3868	0.001
	Gender		0.73	3868	0.000
Time 3 - Mania	Time 1 Dys. Preoccupation	12.91*	3.38*	3,837	0.003
	Age		-1.20	3837	0.000
	Gender		1.37	3837	0.000
Time 4 - Mania	Time 1 Dys. Preoccupation	1.60	-0.39	3764	0.000
	Age		-1.21	3764	0.000
	Gender		0.05	3764	0.000
Time 5 - Mania	Time 1 Dys. Preoccupation	6.06	1.56	3725	0.001
	Age		-1.69	3725	0.001
	Gender		0.61	3725	0.000

Note. IV = Independent variable; DV = dependent variables; * $p < .001$

Table 23. Summary of logistic regression analyses (for each time) predicting having substance abuse and dependence in the previous 12 months from dysfunctional preoccupation, gender, and age

IV	DV	χ^2	t-value	df	Eta square
Time 1 - Substance Abuse and Dependence	Time 1 Dys. Preoccupation	86.70*	6.33*	1,953	0.020
	Age		-5.05*	1,953	0.013
	Gender		-6.69*	1,953	0.022
Time 2 - Substance Abuse and Dependence	Time 1 Dys. Preoccupation	64.73*	5.18*	1,910	0.014
	Age		-5.23*	1,910	0.014
	Gender		-4.95*	1,910	0.013
Time 3 - Substance Abuse and Dependence	Time 1 Dys. Preoccupation	31.05*	5.88*	2,081	0.016
	Age		-2.90*	2,081	0.004
	Gender		-2.35*	2,081	0.003
Time 4 - Substance Abuse and Dependence	Time 1 Dys. Preoccupation	44.79*	5.74*	1,992	0.016
	Age		-2.24*	1,992	0.003
	Gender		-2.29*	1,992	0.003
Time 5 - Substance Abuse and Dependence	Time 1 Dys. Preoccupation	47.46*	5.83*	2,022	0.017
	Age		-2.54*	2,022	0.003
	Gender		-2.23*	2,022	0.002

Note. IV = Independent variable; DV = dependent variables; * $p < .001$

Table 24. Summary of logistic regression analyses (for each time) predicting having obsessive compulsive disorder in the previous 12 months from dysfunctional preoccupation, gender, and age

IV	DV	χ^2	t-value	df	Eta square
Time 1 - Obsessive Compulsive Disorder	Time 1 Dys. Preoccupation	66.48*	6.86*	3,994	0.012
	Age		-3.75*	3,994	0.004
	Gender		1.35	3,994	0.000
Time 2 - Obsessive Compulsive Disorder	Time 1 Dys. Preoccupation	44.22*	6.18*	3,839	0.010
	Age		-2.40*	3,839	0.001
	Gender		1.22	3,839	0.000
Time 3 - Obsessive Compulsive Disorder	Time 1 Dys. Preoccupation	36.93*	5.68*	3,806	0.008
	Age		-2.26*	3,806	0.001
	Gender		1.00	3,806	0.000
Time 4 - Obsessive Compulsive Disorder	Time 1 Dys. Preoccupation	15.89*	4.60*	3,733	0.006
	Age		-0.31	3,733	0.000
	Gender		0.37	3,733	0.000
Time 5 - Obsessive Compulsive Disorder	Time 1 Dys. Preoccupation	29.44*	3.60*	3,703	0.003
	Age		-2.92*	3,703	0.002
	Gender		2.18*	3,703	0.001

Note. IV = Independent variable; DV = dependent variables; * $p < .001$

Table 25. Summary of logistic regression analyses (for each time) predicting having panic and agoraphobia in the previous 12 months from dysfunctional preoccupation, gender, and age

IV	DV	χ^2	t-value	df	Eta square
Time 1 - Panic and Agoraphobia	Time 1 Dys. Preoccupation	153.37*	7.44*	3,917	0.014
	Age		-5.29*	3,917	0.007
	Gender		7.31*	3,917	0.013
Time 2 - Panic and Agoraphobia	Time 1 Dys. Preoccupation	131.72*	6.68*	3,757	0.012
	Age		-4.55*	3,757	0.005
	Gender		7.23*	3,757	0.014
Time 3 - Panic and Agoraphobia	Time 1 Dys. Preoccupation	116.20*	5.31*	3,729	0.008
	Age		-4.93*	3,729	0.006
	Gender		6.98*	2,739	0.017
Time 4 - Panic and Agoraphobia	Time 1 Dys. Preoccupation	87.81*	5.95*	3,670	0.010
	Age		-3.60*	3,670	0.004
	Gender		5.71*	3,670	0.009
Time 5 - Panic and Agoraphobia	Time 1 Dys. Preoccupation	122.99*	6.79*	3,607	0.013
	Age		-4.55*	3,607	0.006
	Gender		6.56*	3,607	0.012

Note. IV = Independent variable; DV = dependent variables; * $p < .001$

Table 26. *Chi-square* analyses (for each time) comparing prevalence rates for the dysfunctional preoccupation groups (low vs. high) in having at least one mental health problem in the previous 12 months

2 by 2 Variables		χ^2	Phi	Low DP N	High DP N
Time 1 – Mental Health	Time 1 – Dysfunctional Preoccupation	323.31*	0.34	2537	330
Time 2 – Mental Health	Time 1 – Dysfunctional Preoccupation	147.28*	0.23	2461	306
Time 3 – Mental Health	Time 1 – Dysfunctional Preoccupation	200.81*	0.27	2426	303
Time 4 – Mental Health	Time 1 – Dysfunctional Preoccupation	180.91*	0.26	2394	294
Time 5 – Mental Health	Time 1 – Dysfunctional Preoccupation	139.56*	0.23	2375	294

Note. Mental Health = presence of at least one mental disorder in past 12 months vs. no disorder; DP = dysfunctional preoccupation; * $p < .001$

Table 27. *Chi-square* analyses (for each time) comparing prevalence rates for the dysfunctional preoccupation groups (low vs. high) in having bulimia in the previous 12 months

2 by 2 Variables		χ^2	Phi	Low DP N	High DP N
Time 1 – Bulimia	Time 1 – Dysfunctional Preoccupation	58.02*	0.14	2525	313
Time 2 – Bulimia	Time 1 – Dysfunctional Preoccupation	41.96*	0.12	2445	288
Time 3 – Bulimia	Time 1 – Dysfunctional Preoccupation	39.77*	0.12	2414	290
Time 4 – Bulimia	Time 1 – Dysfunctional Preoccupation	32.84*	0.11	2382	280
Time 5 – Bulimia	Time 1 – Dysfunctional Preoccupation	14.43*	0.07	2363	286

Note. DP = dysfunctional preoccupation; * $p < .001$

Table 28. *Chi-square* analyses (for each time) comparing prevalence rates for the dysfunctional preoccupation groups (low vs. high) in having major depression in the previous 12 months

2 by 2 Variables		χ^2	Phi	Low DP N	High DP N
Time 1 – Major Depression	Time 1 – Dysfunctional Preoccupation	329.02*	0.36	2039	122
Time 2 – Major Depression	Time 1 – Dysfunctional Preoccupation	186.35*	0.28	1974	138
Time 3 – Major Depression	Time 1 – Dysfunctional Preoccupation	195.77*	0.28	1964	145
Time 4 – Major Depression	Time 1 – Dysfunctional Preoccupation	178.28*	0.27	1956	140
Time 5 – Major Depression	Time 1 – Dysfunctional Preoccupation	134.04*	0.24	1953	147

Note. DP = dysfunctional preoccupation; * $p < .001$

Table 29. *Chi-square* analyses (for each time) comparing prevalence rates for the dysfunctional preoccupation groups (low vs. high) in having generalized anxiety in the previous 12 months

2 by 2 Variables		χ^2	Phi	Low DP N	High DP N
Time 1 – Generalized Anxiety	Time 1 – Dysfunctional Preoccupation	161.68*	0.24	2449	258
Time 2 – Generalized Anxiety	Time 1 – Dysfunctional Preoccupation	84.40*	0.18	2329	244
Time 3 – Generalized Anxiety	Time 1 – Dysfunctional Preoccupation	136.71*	0.23	2323	238
Time 4 – Generalized Anxiety	Time 1 – Dysfunctional Preoccupation	95.72*	0.19	2300	239
Time 5 – Generalized Anxiety	Time 1 – Dysfunctional Preoccupation	70.02*	0.16	2270	242

Note. DP = dysfunctional preoccupation; * $p < .001$

Table 30. *Chi-square* analyses (for each time) comparing prevalence rates for the dysfunctional preoccupation groups (low vs. high) in having mania in the previous 12 months

2 by 2 Variables		χ^2	Phi	Low DP N	High DP N
Time 1 – Mania	Time 1 – Dysfunctional Preoccupation	32.45*	0.11	2509	312
Time 2 – Mania	Time 1 – Dysfunctional Preoccupation	11.64*	0.07	2439	296
Time 3 – Mania	Time 1 – Dysfunctional Preoccupation	7.70*	0.05	2404	293
Time 4 – Mania	Time 1 – Dysfunctional Preoccupation	0.00	0.00	2375	289
Time 5 – Mania	Time 1 – Dysfunctional Preoccupation	6.08*	0.05	2351	283

Note. DP = dysfunctional preoccupation; * $p < .001$

Table 31. *Chi-square* analyses (for each time) comparing prevalence rates for the dysfunctional preoccupation groups (low vs. high) in having obsessive compulsive disorder (OCD) in the previous 12 months

2 by 2 Variables		χ^2	Phi	Low DP N	High DP N
Time 1 – OCD	Time 1 – Dysfunctional Preoccupation	83.04*	0.17	2478	297
Time 2 – OCD	Time 1 – Dysfunctional Preoccupation	36.07*	0.12	2423	284
Time 3 – OCD	Time 1 – Dysfunctional Preoccupation	43.53*	0.13	2392	283
Time 4 – OCD	Time 1 – Dysfunctional Preoccupation	19.54*	0.09	2349	275
Time 5 – OCD	Time 1 – Dysfunctional Preoccupation	40.25*	0.12	2332	276

Note. DP = dysfunctional preoccupation; * $p < .001$

Table 32. *Chi-square* analyses (for each time) comparing prevalence rates for the dysfunctional preoccupation groups (low vs. high) in having panic and agoraphobia in the previous 12 months

2 by 2 Variables		χ^2	Phi	Low DP N	High DP N
Time 1 – Panic and Agoraphobia	Time 1 – Dysfunctional Preoccupation	83.63*	0.17	2355	249
Time 2 – Panic and Agoraphobia	Time 1 – Dysfunctional Preoccupation	61.12*	0.15	2266	244
Time 3 – Panic and Agoraphobia	Time 1 – Dysfunctional Preoccupation	59.07*	0.15	2255	246
Time 4 – Panic and Agoraphobia	Time 1 – Dysfunctional Preoccupation	84.45*	0.18	2232	231
Time 5 – Panic and Agoraphobia	Time 1 – Dysfunctional Preoccupation	78.70*	0.18	2204	237

Note. DP = dysfunctional preoccupation; * $p < .001$

Table 33. *Chi-square* analyses (for each time) comparing prevalence rates for the dysfunctional preoccupation groups (low vs. high) in having post-traumatic stress disorder (PTSD) in the previous 12 months

2 by 2 Variables		χ^2	Phi	Low DP N	High DP N
Time 1 – PTSD	Time 1 – Dysfunctional Preoccupation	170.54*	0.25	2489	280
Time 2 – PTSD	Time 1 – Dysfunctional Preoccupation	58.87*	0.15	2434	285
Time 3 – PTSD	Time 1 – Dysfunctional Preoccupation	60.20*	0.15	2394	275
Time 4 – PTSD	Time 1 – Dysfunctional Preoccupation	98.04*	0.19	2365	264
Time 5 – PTSD	Time 1 – Dysfunctional Preoccupation	73.55*	0.17	2344	267

Note. DP = dysfunctional preoccupation; * $p < .001$

Table 34. *Chi-square* analyses (for each time) comparing prevalence rates for the dysfunctional preoccupation groups (low vs. high) in having substance abuse and dependence in the previous 12 months

2 by 2 Variables		χ^2	Phi	Low DP N	High DP N
Time 1 – Substance Abuse and Dependence	Time 1 – Dysfunctional Preoccupation	102.47*	0.24	1321	173
Time 2 – Substance Abuse and Dependence	Time 1 – Dysfunctional Preoccupation	68.05*	0.20	1337	166
Time 3 – Substance Abuse and Dependence	Time 1 – Dysfunctional Preoccupation	65.69*	0.19	1515	185
Time 4 – Substance Abuse and Dependence	Time 1 – Dysfunctional Preoccupation	78.26*	0.21	1470	186
Time 5 – Substance Abuse and Dependence	Time 1 – Dysfunctional Preoccupation	78.26*	0.21	1470	186

Note. DP = dysfunctional preoccupation; dysfunctional preoccupation scores were calculated without substance items included; * $p < .001$

Table 35. *Chi-square* analyses (for each time) comparing prevalence rates for the dysfunctional preoccupation groups (low vs. high) in having binge eating in the previous 12 months

2 by 2 Variables		χ^2	Phi	Low DP N	High DP N
Time 2 – Binge Eating	Time 1 – Dysfunctional Preoccupation	46.65*	0.13	2382	271
Time 3 – Binge Eating	Time 1 – Dysfunctional Preoccupation	26.41*	0.10	2350	272
Time 4 – Binge Eating	Time 1 – Dysfunctional Preoccupation	37.40*	0.12	2331	269
Time 5 – Binge Eating	Time 1 – Dysfunctional Preoccupation	16.52*	0.08	2322	270

Note. Binge eating was not included in Wave 1; DP = dysfunctional preoccupation; * $p < .001$

Table 36. Mean dysfunctional preoccupation scores for individuals reporting or not reporting specific major depression symptoms (Time 1 data)

IV	Symptom Description	DV	t-value	“No” Mean	“Yes” Mean
Major Depressive Disorder - Item 1	During the past 12 months, was there ever a time when you felt sad, blue, or depressed for two weeks or more in a row almost every day?	Time 1 - Dysfunctional Preoccupation	15.21*	0.93	2.46
Major Depressive Disorder - Item 2a	During the past 12 months, was there ever a time when you lost interest in most things like hobbies, work, or activities that usually give you pleasure for a period of two weeks or more in a row almost every day?	Time 1 - Dysfunctional Preoccupation	10.93*	0.82	2.26
Major Depressive Disorder - Item 2b	During that two week period, did you also lose interest in most things like hobbies, work, or activities that usually give you pleasure?	Time 1 - Dysfunctional Preoccupation	3.11*	1.56	2.66
Major Depressive Disorder - Item 3	During that period did you gain or lose weight without trying (5% of body weight or 10 pounds)?	Time 1 - Dysfunctional Preoccupation	3.41*	1.99	2.79
Major Depressive Disorder - Item 4a	During that period did you have more trouble falling asleep than you usually do?	Time 1 - Dysfunctional Preoccupation	1.44	2.13	2.51
Major Depressive Disorder - Item 4b	During that period did you find yourself being excessively sleepy?	Time 1 - Dysfunctional Preoccupation	1.70	1.67	2.48
Major Depressive Disorder - Item 5a	During that period were you more agitated or restless than is usual for you?	Time 1 - Dysfunctional Preoccupation	2.81	1.78	2.56
Major Depressive Disorder - Item 5b	During that period were you more physically slow or inactive than is usual for you?	Time 1 - Dysfunctional Preoccupation	0.98	1.52	1.94

Table 36 continued

IV	Symptom Description	DV	t-value	“No” Mean	“Yes” Mean
Major Depressive Disorder - Item 6	During that period did you experience a lot of fatigue or loss of energy?	Time 1 - Dysfunctional Preoccupation	0.95	2.12	2.46
Major Depressive Disorder - Item 7a	During that period, did you feel down on yourself, no good, or worthless?	Time 1 - Dysfunctional Preoccupation	6.24*	1.52	3.00
Major Depressive Disorder - Item 7b	During that period, did you feel excessive or inappropriate guilt about things?	Time 1 - Dysfunctional Preoccupation	0.92	0.146	1.79
Major Depressive Disorder - Item 8	During that period did you have a lot more trouble concentrating or making decisions than usual?	Time 1 - Dysfunctional Preoccupation	3.39*	1.81	2.66
Major Depressive Disorder - Item 9	During that period did you think a lot about death - either your own, someone else's, or death in general?	Time 1 - Dysfunctional Preoccupation	3.11*	2.10	2.84
Major Depressive Disorder - Item 10	Did these problems significantly interfere with your life or activities at the time?	Time 1 - Dysfunctional Preoccupation	3.45*	1.98	2.80

Note. “No” = symptom not present in previous 12 months vs. “Yes” = symptom present; * *p* is significant after Bonferroni correction.

Table 37. Mean dysfunctional preoccupation scores for individuals reporting or not reporting specific generalized anxiety symptoms (Time 1 data)

IV	Symptom Description	DV	t-value	“No” Mean	“Yes” Mean
Generalized Anxiety Disorder - Item 1a	During the past 12 months, have you experienced excessive anxiety or worry on most days for 6 or more months?	Time 1 - Dysfunctional Preoccupation	15.06*	1.08	3.55
Generalized Anxiety Disorder - Item 1b	Do you usually worry about one particular thing, such as your job security or the failing health of a loved one, or several different things?	Time 1 - Dysfunctional Preoccupation	0.89	3.16	3.77
Generalized Anxiety Disorder - Item 2	Do you find it difficult to stop worrying?	Time 1 - Dysfunctional Preoccupation	1.76	2.06	3.77
Generalized Anxiety Disorder - Item 3.1	Symptoms that also occur when worried or anxious: restless or feeling keyed up or on edge	Time 1 - Dysfunctional Preoccupation	1.79	2.88	4.21
Generalized Anxiety Disorder - Item 3.2	Symptoms that also occur when worried or anxious: easily tired	Time 1 - Dysfunctional Preoccupation	0.26	3.89	3.70
Generalized Anxiety Disorder - Item 3.3	Symptoms that also occur when worried or anxious: difficulty concentrating	Time 1 - Dysfunctional Preoccupation	1.32	3.03	4.06
Generalized Anxiety Disorder - Item 3.4	Symptoms that also occur when worried or anxious: irritable	Time 1 - Dysfunctional Preoccupation	1.40	2.91	4.05
Generalized Anxiety Disorder - Item 3.5	Symptoms that also occur when worried or anxious: muscle tension	Time 1 - Dysfunctional Preoccupation	0.16	3.70	3.81

Note. “No” = symptom not present in previous 12 months vs. “Yes” = symptom present; * *p* is significant after Bonferroni correction.

Table 38. Mean dysfunctional preoccupation scores for individuals reporting or not reporting specific panic and agoraphobia symptoms (Time 1 data)

IV	Symptom Description	DV	t-value	“No” Mean	“Yes” Mean
Panic and Agoraphobia - Item 1	In the past 12 months, have you had any panic attacks? These are times when you suddenly feel intensely frightened, anxious, or very uneasy?	Time 1 - Dysfunctional Preoccupation	14.57*	0.97	2.56
Panic and Agoraphobia - Item 2	About how many attacks did you have in the past 12 months?	Time 1 - Dysfunctional Preoccupation	0.73	2.34	2.10
Panic and Agoraphobia - Item 3a	Do these attacks just happen in situations where you are in danger or are the center of attention?	Time 1 - Dysfunctional Preoccupation	1.25	2.50	3.00
Panic and Agoraphobia - Item 3b	Do these attacks often happen in situations where you believe escape might be difficult or where help may not be available if you have a panic attack?	Time 1 - Dysfunctional Preoccupation	1.15	2.32	2.80
Panic and Agoraphobia - Item 4	Do you therefore avoid these types of situations, endure them with a great deal of distress, or try to ensure the presence of a companion?	Time 1 - Dysfunctional Preoccupation	2.15	1.85	3.40
Panic and Agoraphobia - Item 5.1	Symptoms during panic attacks: racing or pounding heart	Time 1 - Dysfunctional Preoccupation	0.09	2.54	2.50
Panic and Agoraphobia - Item 5.2	Symptoms during panic attacks: sweating	Time 1 - Dysfunctional Preoccupation	1.36	2.25	2.82
Panic and Agoraphobia - Item 5.3	Symptoms during panic attacks: trembling or shaking	Time 1 - Dysfunctional Preoccupation	0.80	2.35	2.67
Panic and Agoraphobia - Item 5.4	Symptoms during panic attacks: fear of dying	Time 1 - Dysfunctional Preoccupation	1.31	2.37	3.01

Table 38 continued

IV	Symptom Description	DV	t-value	“No” Mean	“Yes” Mean
Panic and Agoraphobia - Item 5.5	Symptoms during panic attacks: feelings of choking	Time 1 - Dysfunctional Preoccupation	1.51	2.38	3.26
Panic and Agoraphobia - Item 5.6	Symptoms during panic attacks: chest pain	Time 1 - Dysfunctional Preoccupation	2.42	2.14	3.13
Panic and Agoraphobia - Item 5.7	Symptoms during panic attacks: things around you seem unreal	Time 1 - Dysfunctional Preoccupation	2.21	2.25	3.27
Panic and Agoraphobia - Item 5.8	Symptoms during panic attacks: nausea or stomach pain	Time 1 - Dysfunctional Preoccupation	1.00	2.37	2.80
Panic and Agoraphobia - Item 5.9	Symptoms during panic attacks: dizzy or lightheaded	Time 1 - Dysfunctional Preoccupation	1.55	2.21	2.82
Panic and Agoraphobia - Item 5.10	Symptoms during panic attacks: numbness or tingling	Time 1 - Dysfunctional Preoccupation	2.15	2.24	3.21
Panic and Agoraphobia - Item 5.11	Symptoms during panic attacks: hot flashes or chills	Time 1 - Dysfunctional Preoccupation	0.82	2.62	2.26
Panic and Agoraphobia - Item 5.12	Symptoms during panic attacks: fear of losing control or going crazy	Time 1 - Dysfunctional Preoccupation	2.05	2.17	3.01

Note. “No” = symptom not present in previous 12 months vs. “Yes” = symptom present; * *p* is significant after Bonferroni correction.

Table 39. Mean dysfunctional preoccupation scores for individuals reporting or not reporting specific post-traumatic stress disorder (PTSD) symptoms (Time 1 data)

IV	Symptom Description	DV	t-value	“No” Mean	“Yes” Mean
PTSD-Item 1	Have you been exposed to a traumatic event involving actual or threatened death or serious injury?	Time 1 - Dysfunctional Preoccupation	4.90*	1.11	1.44
PTSD - Item 2	Did your response involve intense fear, helplessness, horror, or agitation?	Time 1 - Dysfunctional Preoccupation	3.45*	1.14	1.79
PTSD - Item 3	In the past 12 months, have you had persistent distressing recollections of this event?	Time 1 - Dysfunctional Preoccupation	4.49*	1.44	2.73
PTSD - Item 4	In the past 12 months, have you had persistent distressing dreams of this event?	Time 1 - Dysfunctional Preoccupation	5.71*	1.48	3.51
PTSD - Item 5	In the past 12 months, have you have ‘flashbacks’ of the event where you seem to be reliving it?	Time 1 - Dysfunctional Preoccupation	2.66*	1.47	2.66
PTSD - Item 6	In the past 12 months, have you had intense psychological or physical distress when exposed to reminders of the event?	Time 1 - Dysfunctional Preoccupation	7.68*	1.26	3.54
PTSD - Item 7	Do you try to avoid thoughts/feelings/conversations associated with the event?	Time 1 - Dysfunctional Preoccupation	3.46*	1.69	3.47
PTSD - Item 8	Do you try to avoid activities/people/places associated with the event?	Time 1 - Dysfunctional Preoccupation	2.66	2.11	3.50
PTSD - Item 9	Do you have amnesia (no memory) for some part of the event?	Time 1 - Dysfunctional Preoccupation	2.27	2.40	3.88
PTSD - Item 10	Have you lost interest in a lot of things that you used to enjoy?	Time 1 - Dysfunctional Preoccupation	3.97*	1.84	3.89
PTSD - Item 11	Do you have a feeling of detachment from others?	Time 1 - Dysfunctional Preoccupation	6.45*	1.38	4.60

Table 39 continued

IV	Symptom Description	DV	t-value	“No” Mean	“Yes” Mean
PTSD - Item 12	Do you have a limited range of emotional feelings?	Time 1 - Dysfunctional Preoccupation	2.26	2.32	3.62
PTSD - Item 13	Do you have a sense of a shortened future?	Time 1 - Dysfunctional Preoccupation	2.56	2.20	3.58
PTSD - Item 14	Do you have difficulty falling or staying asleep?	Time 1 - Dysfunctional Preoccupation	1.49	2.72	4.43
PTSD - Item 15	Do you find yourself much more irritable?	Time 1 - Dysfunctional Preoccupation	2.42	2.79	5.03
PTSD - Item 16	Do you have more difficulty concentrating?	Time 1 - Dysfunctional Preoccupation	0.74	4.48	3.78
PTSD - Item 17	Do you have a heightened startle reflex or find yourself much more on edge?	Time 1 - Dysfunctional Preoccupation	3.60*	2.00	5.33

Note. “No” = symptom not present in previous 12 months vs. “Yes” = symptom present; * *p* is significant after Bonferroni correction.

Table 40. Mean dysfunctional preoccupation scores for individuals reporting or not reporting specific substance abuse and dependence symptoms (Time 1 data)

IV	Symptom Description	DV	t-value	“No” Mean	“Yes” Mean
Substance Abuse and Dependence - Item 3a	Has your use of any of these substances caused significant financial concerns for you or someone close to you in the past 12 months?	Time 1 - Dysfunctional Preoccupation	7.61*	0.66	2.43
Substance Abuse and Dependence - Item 3b	Has your use of any of these substances either caused you to borrow a significant amount of money or sell some of your possessions in the past 12 months?	Time 1 - Dysfunctional Preoccupation	12.54*	0.66	5.39
Substance Abuse and Dependence - Item 4	Has your use of any of these substances caused significant mental problems such as anxiety, depression, paranoia, or strange thoughts for you or someone close to you in the past 12 months?	Time 1 - Dysfunctional Preoccupation	8.07*	0.66	2.51
Substance Abuse and Dependence - Item 5a	Has your use of any of these substances caused serious problems in your relationship with your spouse/partner, or important friends or family in the past 12 months?	Time 1 - Dysfunctional Preoccupation	8.41*	0.65	2.25
Substance Abuse and Dependence - Item 5b	Has your use of any of these substances caused you to repeatedly neglect your children or family in the past 12 months?	Time 1 - Dysfunctional Preoccupation	6.98*	0.68	4.75
Substance Abuse and Dependence - Item 6a	Has your use of any of these substances caused you or someone else to have significant health problems or to be injured in the past 12 months?	Time 1 - Dysfunctional Preoccupation	3.07*	0.67	1.96
Substance Abuse and Dependence - Item 6b	In the past 12 months, have you repeatedly used any of these substances in ways or in situations that are dangerous?	Time 1 - Dysfunctional Preoccupation	5.66*	0.67	2.00

Table 40 continued

IV	Symptom Description	DV	t-value	“No” Mean	“Yes” Mean
Substance Abuse and Dependence - Item 7a	Has your use of any of these substances caused significant work or school problems for you or someone else in the past 12 months?	Time 1 - Dysfunctional Preoccupation	4.61*	0.68	2.48
Substance Abuse and Dependence - Item 7b	Has your use of any of these substances caused you to miss a significant amount of time off work or school in the past 12 months?	Time 1 - Dysfunctional Preoccupation	9.54*	0.67	4.86
Substance Abuse and Dependence - Item 8a	Has your use of any of these substances caused you or someone close to you to commit illegal acts to support your substance use in the past 12 months?	Time 1 - Dysfunctional Preoccupation	9.89*	0.67	5.80
Substance Abuse and Dependence - Item 8b	Has your use of any of these substances caused you or someone close to you to have legal problems in the past 12 months?	Time 1 - Dysfunctional Preoccupation	7.42*	0.67	3.62
Substance Abuse and Dependence - Item 9	Is there anyone else who would say that your use of any of these substances has caused any significant problems for you or someone close to you in the past 12 months, regardless of whether you thought it was true?	Time 1 - Dysfunctional Preoccupation	8.70*	0.64	2.15
Substance Abuse and Dependence - Item 10	In the past 12 months, have you used any of these substances in larger amounts, or for a longer time, or more frequently than you intended to?	Time 1 - Dysfunctional Preoccupation	5.41*	0.65	1.34
Substance Abuse and Dependence - Item 11	In the past 12 months, did you find that you had to use more and more of any of these substances to get the same effect you wanted?	Time 1 - Dysfunctional Preoccupation	9.83*	0.64	2.33
Substance Abuse and Dependence - Item 12	In the past 12 months, did you spend a great deal of time thinking about or doing things to obtain any of these substances?	Time 1 - Dysfunctional Preoccupation	6.59*	0.67	2.47

Table 40 continued

IV	Symptom Description	DV	t-value	“No” Mean	“Yes” Mean
Substance Abuse and Dependence - Item 13	In the past 12 months, have you made unsuccessful attempts to cut down, control or stop using any of these substances?	Time 1 - Dysfunctional Preoccupation	6.66*	0.60	1.18
Substance Abuse and Dependence - Item 14	In the past 12 months, did you experience withdrawal symptoms when you stopped using the substance?	Time 1 - Dysfunctional Preoccupation	5.53*	0.63	1.17

Note. “No” = symptom not present in previous 12 months vs. “Yes” = symptom present; * *p* is significant after Bonferroni correction.

Figure 1. Factor loadings for the latent variable of “dysfunctional preoccupation” for the total sample (N = 4081)

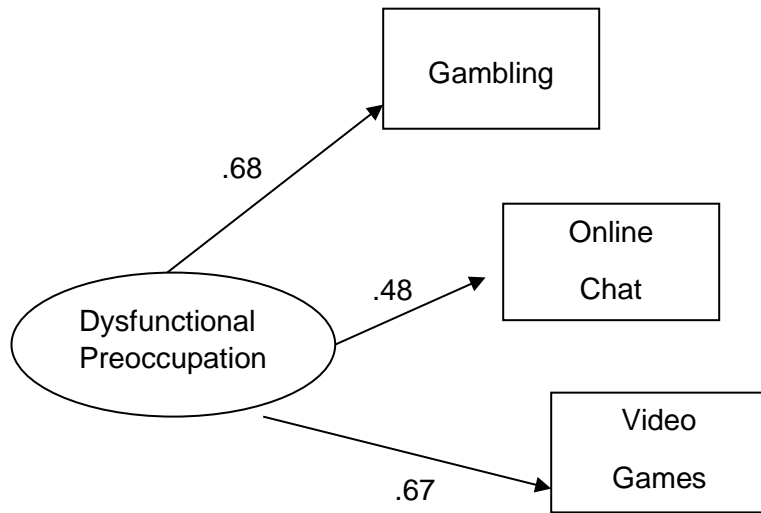


Figure 2. Factor loadings for the expanded dysfunctional preoccupation latent variable for the total sample (N = 4081)

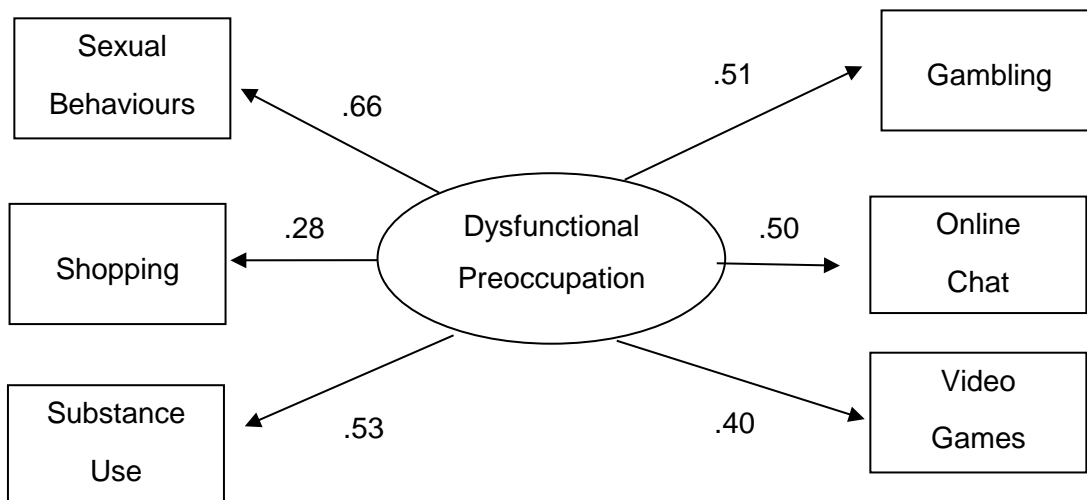


Figure 3. Prevalence rates (for all five waves) of having at least one mental health problem in the previous 12 months for the high and low dysfunctional groups

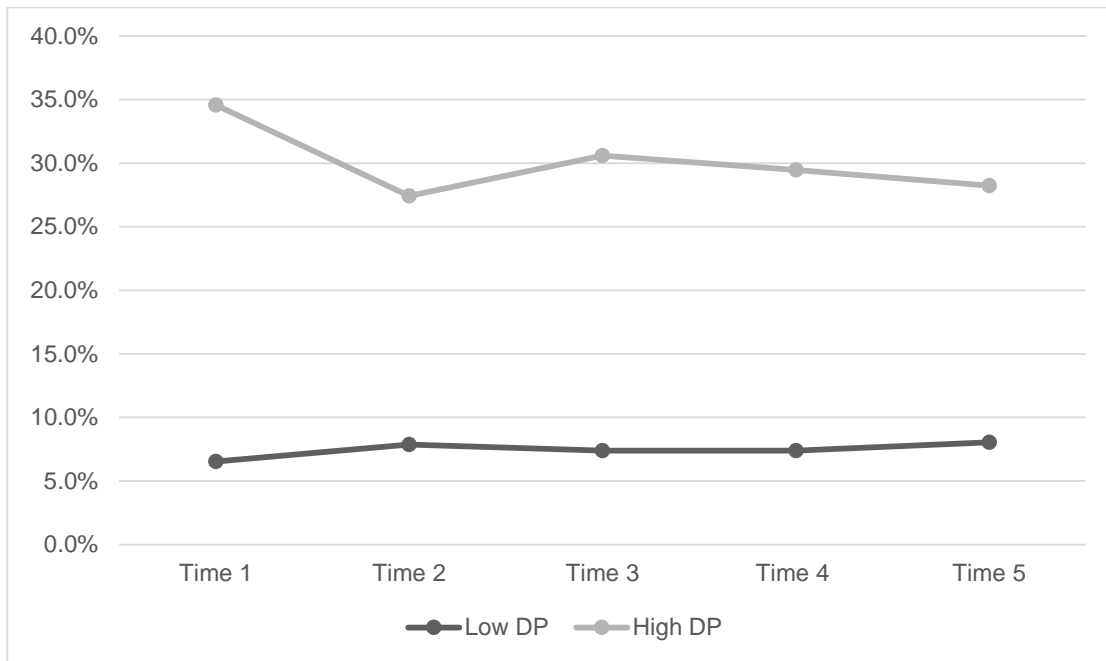


Figure 4. Prevalence rates (for all five waves) of having bulimia in the previous 12 months for the high and low dysfunctional groups

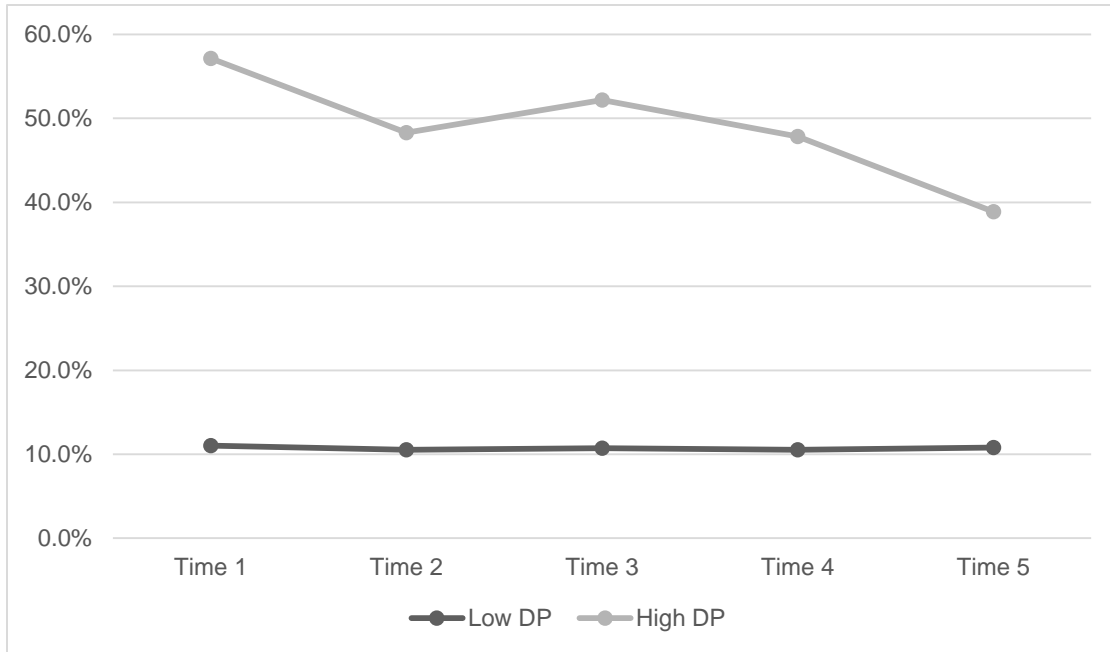


Figure 5. Prevalence rates (for all five waves) of major depression in the previous 12 months for the high and low dysfunctional groups

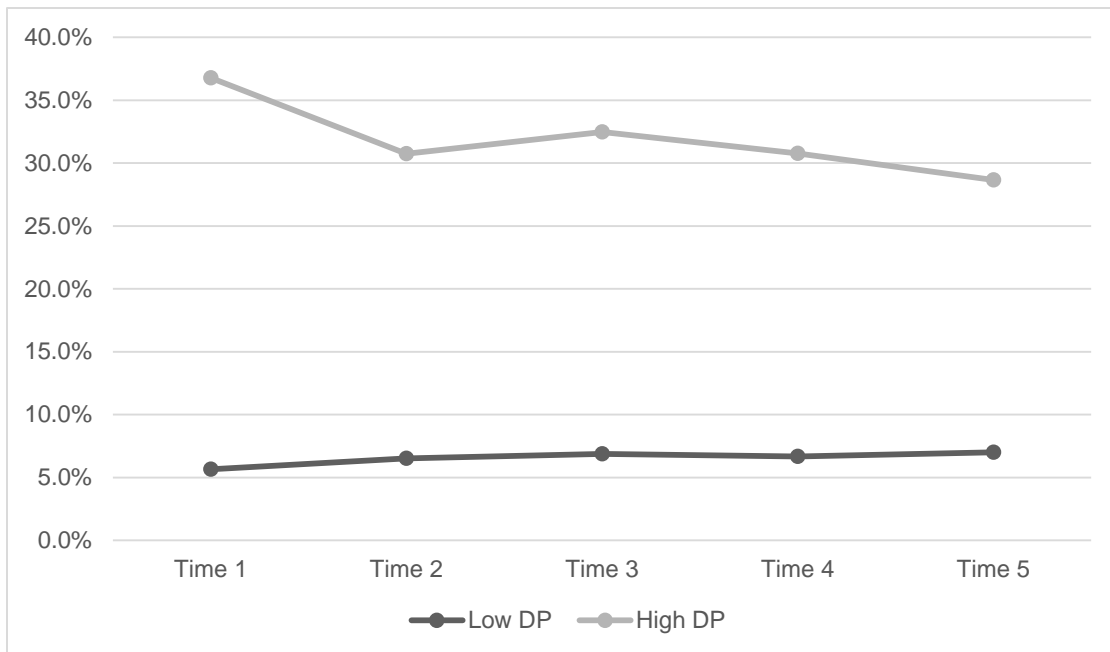


Figure 6. Prevalence rates (for all five waves) of having generalized anxiety in the previous 12 months for the high and low dysfunctional groups

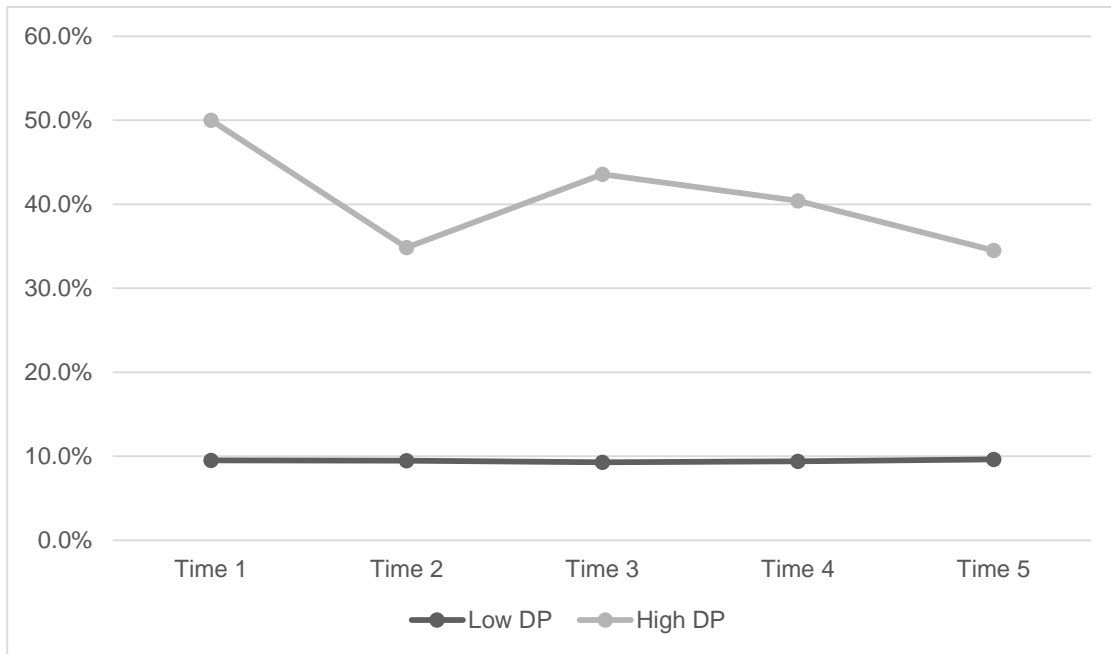


Figure 7. Prevalence rates (for all five waves) of having obsessive compulsive disorder in the previous 12 months for the high and low dysfunctional groups

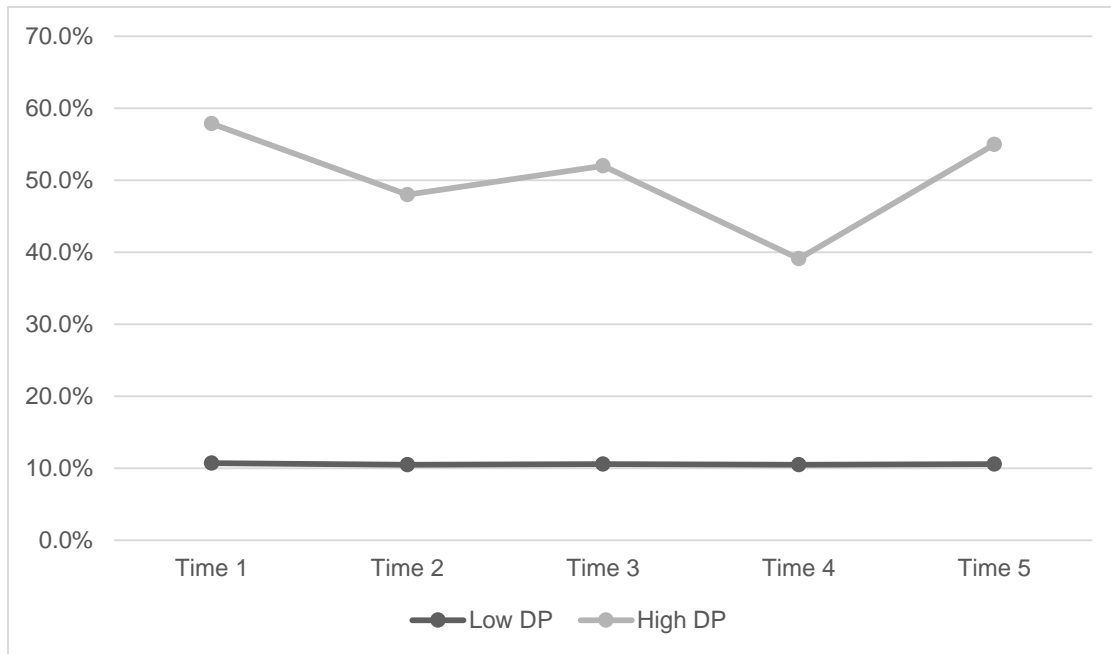


Figure 8. Prevalence rates (for all five waves) of having panic and agoraphobia in the previous 12 months for the high and low dysfunctional groups

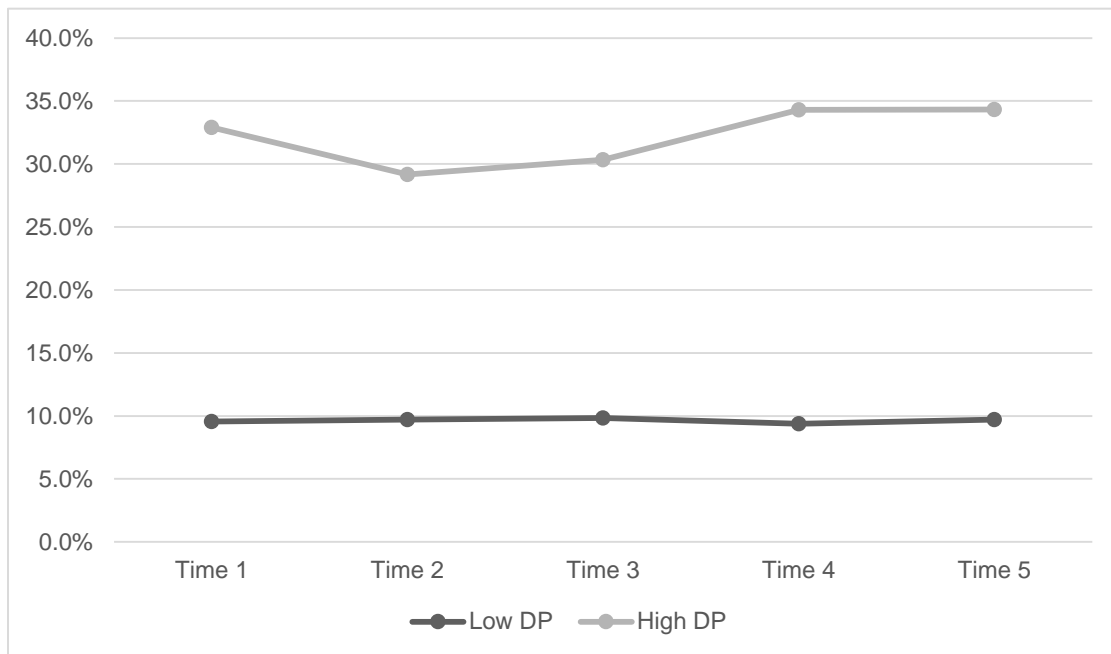


Figure 9. Prevalence rates (for all five waves) of having PTSD in the previous 12 months for the high and low dysfunctional groups

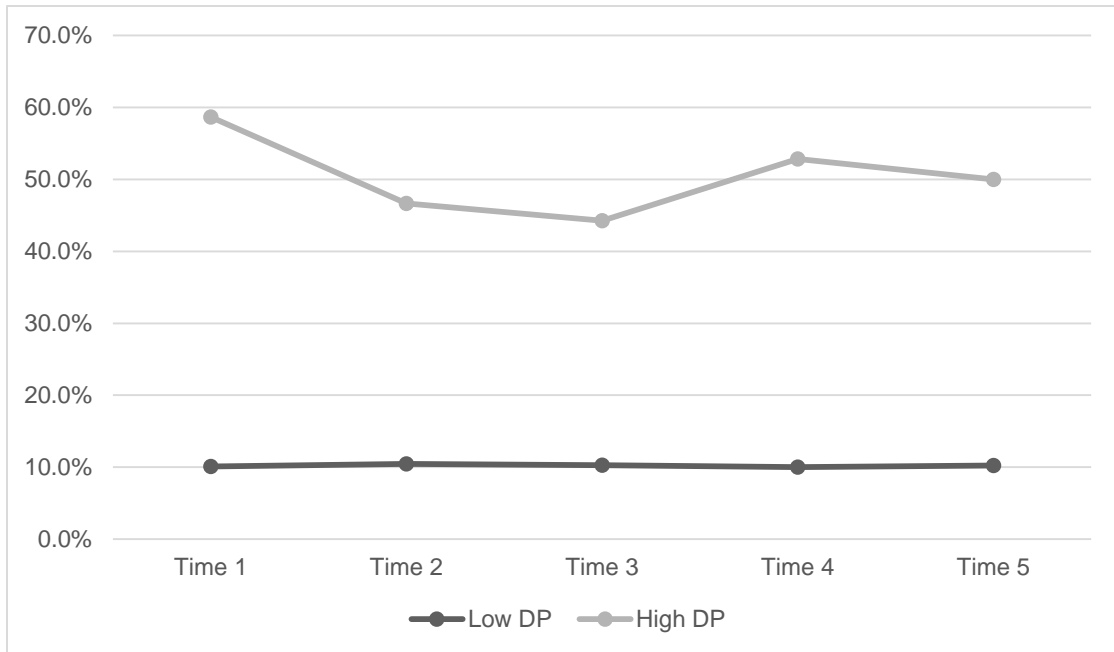


Figure 10. Prevalence rates (for all five waves) of having substance abuse and dependence in the previous 12 months for the high and low dysfunctional groups

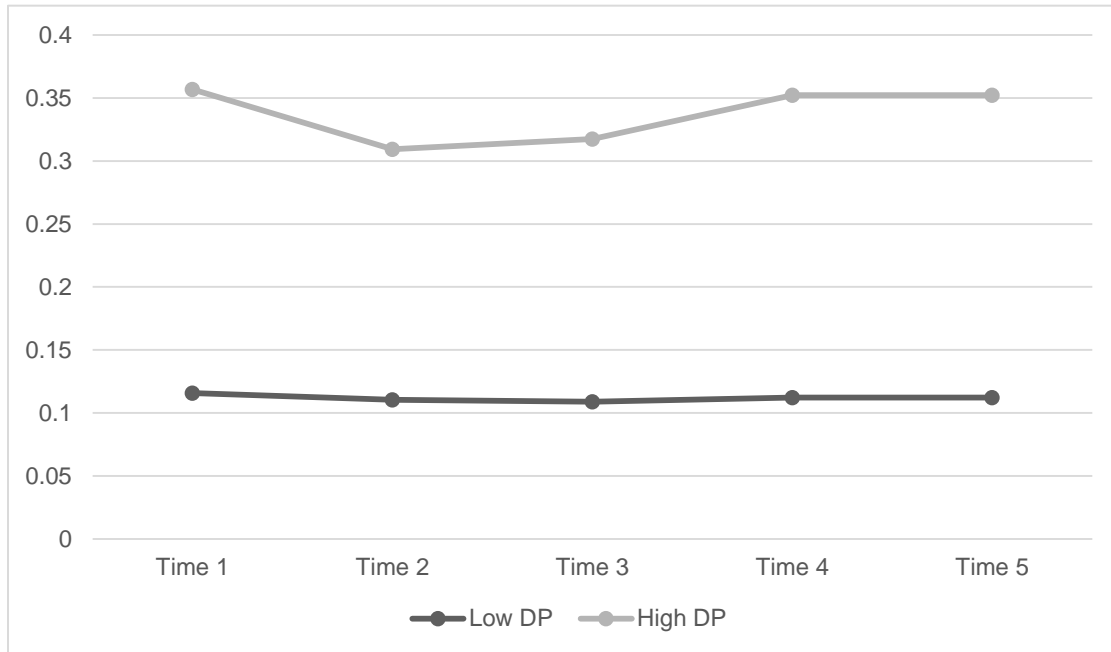


Figure 11. Prevalence rates (for all five waves) of having binge eating in the previous 12 months for the high and low dysfunctional groups

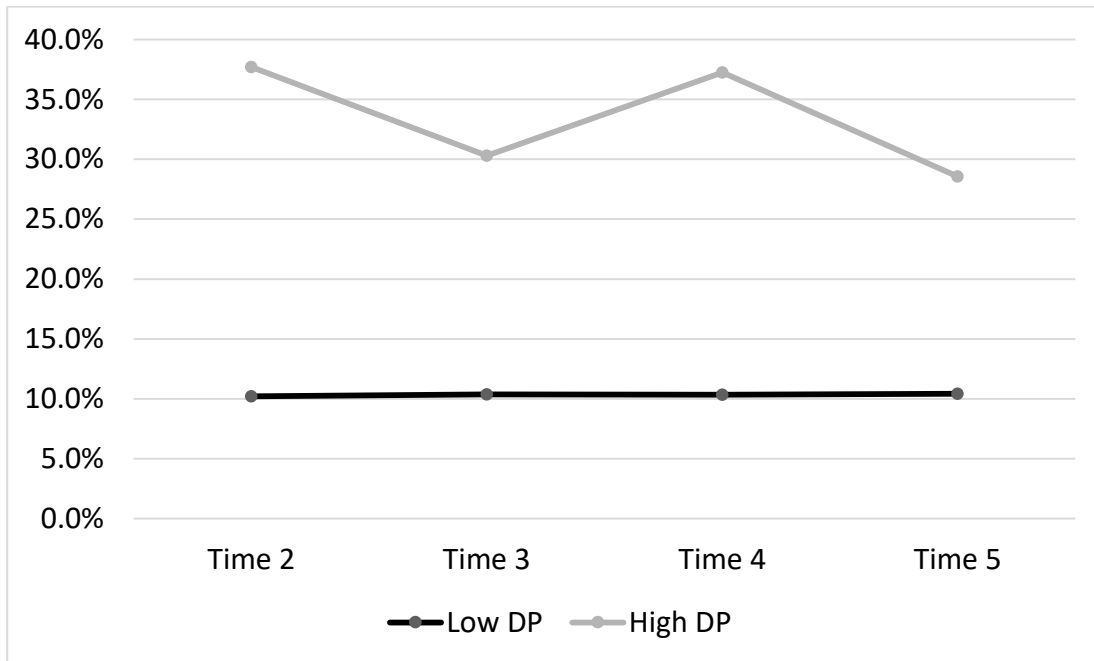


Figure 12. Mean prevalence rates (across the five waves of data) by high and low dysfunctional preoccupation (DP) groups for the disorders with the strongest empirical relationship with dysfunctional preoccupation. MD = major depression, GAD = generalized anxiety, P&A = panic and agoraphobia, PTSD = post-traumatic stress disorder, and SAD = substance abuse and dependency

