Examining psychological inflexibility as a transdiagnostic process across psychological disorders

Michael E. Levin[a]*, Chelsea MacLane[b], Susan Daflos[b], John Seeley[c], Steven C. Hayes[b],

Anthony Biglan[c], and Jacqueline Pistorello[b]

[a]Utah State University, Department of Psychology, 2810 Old Main Hill, Logan, UT 84322, United States.

[b]University of Nevada, Reno, Department of Psychology, 1664 N. Virginia St., Reno, NV 89557, United States.

[c]Oregon Research Institute, 1776 Millrace Dr., Eugene, OR 97403, United States.

*Corresponding author. Utah State University, Department of Psychology, 2810 Old Main Hill, Logan, UT 84322-2810, United States. +001 (541) 531-3892. levinm2@gmail.com. Author email addresses: Chelsea MacLane, cmaclane@gmail.com; Susan Daflos, sdaflos@gmail.com; John Seeley, johns@ori.org; Steven C. Hayes, stevenchayes@gmail.com; Anthony Biglan, tony@ori.org; Jacqueline Pistorello, jacqueline.pistorello@gmail.com.

Acknowledgments

Highlights

- Relationship of inflexibility to DSM diagnoses tested with 972 college students

- Inflexibility was related to current and lifetime depressive and anxiety disorders

- Inflexibility was related to lifetime history of eating and substance use disorders

- Inflexibility related to comorbid depressive, anxiety and substance use disorders

Abstract

The current cross-sectional study examined psychological inflexibility, a process in which behavior is rigidly guided by psychological reactions rather than direct contingencies or personal values, as a transdiagnostic process relevant to a range of depressive, anxiety, substance use and eating disorders. A sample of 972 first-year college students between 17 and 20 years of age completed self-report measures of psychological inflexibility and psychological distress as well as a structured diagnostic interview. Psychological inflexibility was significantly higher across a range of current and lifetime depressive and anxiety disorders as well as lifetime history of eating disorders, relative to students with no disorder, even after controlling for general psychological distress. Findings were mixed for substance use disorders, with a more consistent pattern for lifetime history than for current disorders. Psychological inflexibility was also related to having comorbid depressive, anxiety, and substance use disorders relative to only having one of these diagnoses. Results are discussed in relation to research on psychological inflexibility as a transdiagnostic pathological process and target for interventions.

Keywords. Psychological Inflexibility; Experiential Avoidance; Acceptance and Commitment Therapy; Transdiagnostic

Examining psychological inflexibility as a transdiagnostic process across psychological disorders

There has been an emerging emphasis in clinical psychology on developing transdiagnostic models and interventions that apply to a range of disorders (Mansell, Harvey, Watkins & Shafran, 2009; Nolen-Hoeksema & Watkins, 2011). This focus is driven by a number of findings suggesting that commonalities across disorders can be important for assessment and treatment. Comorbidity is frequently found among psychological disorders (Kessler, Chiu, Demler & Walters, 2005), suggesting these problems may share common pathological processes. Treatment manuals often rely on a core set of intervention methods (Harvey et al., 2004) and improvements in one disorder commonly produce improvements in unaddressed disorders (e.g., Borkovec, Abel, & Newman, 1995; Tsao et al., 2002). Perhaps as a result, a number of explicitly transdiagnostic approaches have emerged that seek to explain and treat multiple disorders within a single approach (e.g., Barlow et al., 2010; Fairburn, Cooper & Shafran, 2003; Hayes, Strosahl & Wilson, 2011; Norton & Philipp, 2008).

The number of transdiagnostic factors that have been proposed to account for multiple symptom presentations are quite large, ranging across issues of attention, affect, memory, reasoning, thoughts, and behaviors (Nolen-Hoeksema & Watkins, 2011). Much of this research has focused on particular subsets of disorders, however, such as eating disorders (Fairburn et al., 2003) or anxiety disorders (Norton & Philipp, 2008). Some studies have focused on both mood and anxiety disorders (Farchione et al., 2012), but further research is needed in identifying theoretical processes that account for a broader range of disorders.

The current study took such an approach in examining psychological inflexibility, a transdiagnostic process that informs Acceptance and Commitment Therapy (ACT; Hayes, Strosahl et al., 2011) and that is arguably relevant to a number of contextual forms of Cognitive

Behavior Therapy (Hayes, Villatte, Levin & Hildebrandt, 2011). Psychological inflexibility involves "the rigid dominance of psychological reactions, over chosen values and contingencies, in guiding action" (Bond et al., 2011, p. 678). In other words, psychological inflexibility is a pattern in which behavior is excessively controlled by one's thoughts, feeling and other internal experiences, or to avoid these experiences, at the expense of more effective and meaningful actions. This higher order construct is composed of a set of core sub-processes including experiential avoidance, in which individuals seek to avoid, escape, or otherwise control the occurrence of difficult thoughts and feelings, despite the harmful consequences of doing so (Hayes et al., 1996). Psychological inflexibility and experiential avoidance are theorized to contribute to the development, maintenance and exacerbation of a broad range of psychological problems. Although the form of problematic behaviors differs across disorders, many of these can be conceptualized as sharing common psychological functions (Hayes et al., 1996). Avoidance of situations that evoke anxiety, withdrawing and isolating oneself when depressed, binge eating, and using substances can all be reinforced by the immediate (or at least expected) alleviation of aversive thoughts and feelings, for example. Struggling with unwanted thoughts and feelings at the expense of engaging in valued actions can characterize clinical features of both depression and panic disorder as well as many other disorders. Thus, the problematic behaviors associated with a range of disorders may develop initially as avoidant, psychologically inflexible strategies of adjustment, becoming more rigid and severe over time.

Consistent with this view, psychological inflexibility has been found to be functionally related to a range of problems including many of the major psychological disorders (Hayes et al., 2006), such as mood and anxiety disorders (e.g., Venta, Sharp & Hart, 2012), substance use disorders (e.g., Levin et al., 2012), eating disorders (e.g., Rawal, Park & Williams, 2010), and

psychotic disorders (e.g., Goldstone et al., 2011). Yet, the vast majority of these studies have focused on continuous self-report measures of symptoms, with very few testing the relationship of psychological inflexibility to specific diagnoses determined through clinical interviews. This is consistent with the emphasis in the psychological inflexibility model on a dimensional conceptualization of pathology and health (Hayes et al., 2011). From this perspective, inflexibility is conceptualized as a normal psychological processes that applies to psychopathology/behavioral issues, viewed along a continuum from healthy to more impaired levels of functioning that vary more with regards to degree of inflexibility rather than qualitative, categorical distinctions between those with and without disorders.

However, despite this dimensional foundation, examining the relationship of psychological inflexibility to specific disorders has key advantages in furthering our understanding of it as a transdiagnostic process. Disorder diagnoses can be used to more precisely test whether psychological inflexibility is related to common symptom clusters at a clinically significant level of distress and impairment, rather than variability on continuous measures more generally which may or may not fall within the range of clinical significance. Furthermore, although psychological inflexibility is proposed to be applicable to a range of specific disorders, and in fact emphasizes that these disorders share common core functional processes, it is necessary to actually test this through precise clinical interviews rather than through continuous measures that assess more broad sets of symptoms. The few studies that have examined the relationship of psychological inflexibility to diagnosed disorders have focused on a relatively narrower set of disorders such as anxiety disorders (Venta et al., 2012) and this has not yet been examined in relation to a broad range of specific mental health problems.

Another key gap in the literature seeking to test psychological inflexibility as a transdiagnostic process is that only a few studies have examined comorbidity (de la Cruz et al., 2013; Kingston, Clarke & Remington, 2010). Theoretically, if a variety of disorders have common functions (such as avoiding unwanted thoughts and feelings), highly avoidant and inflexible modes of adjustment should be associated with co-occurring disorders. Although a cross-sectional study by Kingston and colleagues found that psychological inflexibility was related to a latent variable of problem behaviors, it did not specifically examine whether individuals with comorbid disorders were significantly higher in inflexibility. Another cross-sectional study found that psychological inflexibility was higher among individuals with comorbid hoarding disorder and OCD relative to hoarding without OCD (de la Cruz et al., 2013), but to our knowledge, no studies have yet examined this possibility across a range of psychological disorders.

Examining a broad range of disorders can best be achieved with a large community sample as this provides the necessary heterogeneity to examine whether transdiagnostic processes are elevated across different disorders relative to a healthier control group within the same population. Psychological disorders are prevalent among college students, with estimates as high as nearly 50% of students having a diagnosable disorder in a given year (Blanco et al., 2008). This represent an age group during which many psychological disorders develop (Kessler, Berglund et al., 2005) and students encounter a number of new stressors and challenges (Kadison & DiGeronimo, 2004). Thus, first-year college students may be a particularly useful population in examining transdiagnostic processes such as psychological inflexibility.

The current study sought to replicate and extend research on psychological inflexibility as a transdiagnostic process in psychological disorders through a cross sectional design using

diagnostic data from clinical interviews conducted with 972 first year college students. Analyses examined the relationship of psychological inflexibility to diagnosed (through structured clinical interview) depressive, anxiety, substance use and eating disorders, both in terms of current disorders and lifetime history of disorders. Additional analyses examined the relationship of psychological inflexibility to comorbidity among disorders. As psychological inflexibility may be higher among those with one or more disorders due simply to elevated levels of psychological distress rather than more unique features of inflexibility, analyses were repeated with an additional covariate controlling for general psychological distress. If psychological inflexibility was found to relate to a broad range of specific depressive, anxiety, substance use and eating disorders as well as comorbidity between disorders, even after controlling for general distress, this would provide further support for inflexibility being a transdiagnostic process.

Method

Participants and Procedure

Prospective participants were first-time, full-time freshmen aged 17-20 from a mid-size university in the western U.S. The current study examined baseline (i.e., pre-intervention) data from a randomized trial examining first-year experience classes designed to help students adjust to college and to prevent mental health problems. Between 2008 and 2010, all eligible and enrolled freshmen were sent an e-mail invitation to participate in a study seeking to evaluate classes designed to help with adjusting to college and other challenges that occur during the transition from high school to adulthood. Recruitment was conducted three times in the fall (2008, 2009, and 2010) and twice in the spring (2009, 2010). The spring 2010 differed in that participants were recruited for an assessment only control group as part of the larger outcome study, which was framed as a study on the lives of college students (including physical and

mental health). Pre-intervention baseline data across all recruitment cohorts were combined for the purposes of the current study.

Interested participants were asked to first complete a mass emailed screening measure of psychological inflexibility, the Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011). Since highly inflexible students may be less likely to participate in an intervention study, those students scoring higher (more inflexible) than the median on the AAQ-II were invited first, followed a few weeks later by invitations to others who completed the screening. This staged roll out of invitations was not used for the spring 2010 assessment only cohort as it did not involve participation in an intervention. In total, 1,057 invited freshmen who completed the initial AAQ-II screening subsequently consented to participate in the study proper.

The subsequent baseline assessment process for enrolled participants, which was conducted approximately 0 to 60 days after their initial screening, was completed in two parts: (1) Clinical interview, and (2) Computerized self-report survey. During the first appointment, participants completed a semi-structured diagnostic interview (Structured Clinical Interview for the DSM-IV-TR, Non Patient Edition) conducted by trained graduate students and post-doctoral fellows. During a second subsequent appointment, which was conducted approximately 0 to 65 days from the initial diagnostic interview, participants completed a supervised computerized battery of self-report questionnaires including a measure of psychological distress (General Health Questionnaire) and a second administration of the AAQ-II which was used for analyses in the current study. The initial screening AAQ-II was not the primary measure used in the current analyses given methodological issues related to its administration (e.g., the screening AAQ-II was done via the internet at home without control over the setting or the social context in which it was completed, such as parental scrutiny, and with the potential to "fake bad" in order to be

offered the free class). Participants were compensated for their time with a gift card. Eighty-five

students (8% of the original 1,057 consented participants) completed at least part of the

diagnostic interview but did not complete the computerized assessment. The total sample of

participants completing all assessment procedures was 972.

      The final sample of 972 students was 62.3% female and the modal age was 18 years old

($M = 18.14$, $SD = .49$). The distribution of racial backgrounds closely represented the University

at large, with 70.6% Caucasian, 7.4% Asian , 3.5% African American, 1.5% American Indian,

1.2% Hawaiian/Pacific Islander, 9.5% Multi-racial, and 6.2% Other. In addition, 13.5%

described their ethnicity as Hispanic or Latino. Approximately 58% reported living in on-campus

dormitories and 34% were currently working (7.4% on campus). The mean AAQ-II score was

18.71 ($SD = 7.70$) out of a possible range from 7 to 49 (higher scores indicating greater

inflexibility), which is comparable to AAQ-II scores found in other non-clinical and college

student samples (Bond et al., 2011). In terms of psychological disorders, 202 participants had a

current (in the past month) depressive, anxiety, substance use or eating disorder and 243 had a

past, but no current, disorder ($n = 445$ total with a past or current disorder or 46% of the sample;

see Tables 1 and 2 for prevalence rates of specific disorders).

Measures

      Structured Clinical Interview for the DSM-IV-TR, Non Patient Edition (SCID; First,

Spitzer, Gibbon, & Williams, 2002). The SCID, a widely used semi-structured clinical interview,

was administered at baseline by trained clinical interviewers. The non-patient version used in the

current study includes the same diagnostic sections as the patient version. In addition to the

general screening section, the sections for mood, psychotic screening, anxiety, substance use,

and eating disorders were included in each interview. Assessments examined current (defined as

in the past month) and lifetime presence of DSM-IV-TR Axis I diagnoses, with the primary data

used in the current study being absence versus presence of each disorder. Due to the low

prevalence rates of bipolar disorders (any current bipolar disorder $n = 2$; lifetime $n = 3$) and

psychotic disorders ($n = 0$), these diagnostic categories were not included in the analyses.

Interviewers included graduate students and post-doctoral fellows who completed at least 20

hours of training as well as additional supervision and booster sessions throughout the course of

the study. Interrater reliability for diagnoses was examined by a second rater who reviewed the

interview recordings for 10% of cases (reliability of diagnosing absence versus presence of a

disorder is as follows: current depressive Kappa = .67, lifetime depressive Kappa = .80, current

anxiety Kappa = .64, lifetime anxiety Kappa = .63, current substance use Kappa = .81, lifetime

substance use Kappa = .84, current eating Kappa = 1.00, lifetime eating Kappa = 1.00). This

indicated adequate interrater reliability, comparable to reliability rates found in previous studies

using the SCID (e.g., Lobbestael et al., 2011).

Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011). The AAQ-II is a 7

item measure of psychological inflexibility and experiential avoidance. Items are rated on a 7-

point scale ranging from 1 ("never true") to 7 ("always true"). The AAQ-II was calculated such

that higher scores indicate greater psychological inflexibility. Example items include "Emotions

cause problems in my life" and "I'm afraid of my feelings." The AAQ-II has been found to have

adequate convergent/divergent validity in relation to variables including thought suppression,

personality traits and psychological symptoms (Bond et al., 2011; Gloster et al., 2012) and to

demonstrate incremental validity in predicting outcomes above and beyond anxiety sensitivity,

neuroticism and psychological symptoms (Gloster et al., 2012). The AAQ-II has also been found

to have adequate reliability with Cronbach's alpha coefficients in the range of .78 to .88 (α=.83

in the present sample) and 12-month test-retest reliability of .79 (Bond et al., 2011).

General Health Questionnaire (GHQ; Goldberg, 1972). The 12-item version of the GHQ

was used in the current study as a self-report measure of general psychological distress. This

measure was included as a covariate to test whether the relationship between psychological

inflexibility and specific disorders is accounted for by more general elevated distress across

diagnostic groups. Participants rate the severity of a range of symptoms over the past few weeks,

such as loss of sleep and feeling unhappy, using a 4-point scale. The GHQ was calculated such

that higher scores indicate greater psychological distress. The GHQ has been found in past

studies to have adequate internal consistency and validity (Banks, 1980) with a Cronbach's alpha

in the current sample of .85.

Data Analysis Plan

Analysis of variance (ANOVA) was used to test whether psychological inflexibility

(AAQ-II scores) were higher, relative to a no disorder control group, among students with a

current (defined as occurring in the past month) or lifetime (defined as any current or past

diagnosis) depressive, anxiety, substance use and eating disorder diagnosis. Analyses were

conducted separately comparing AAQ-II scores for each diagnostic group relative to the no

disorder control group. When examining current disorders, students with no current disorder

diagnosis were used as the comparison group ($n = 770$). When examining lifetime disorders,

students with no lifetime history of disorders (i.e., no current or past disorder) were used as the

comparison group ($n = 527$). A non-disorder control group subsample was used rather than the

entire sample, which would include other diagnoses, given the focus of the study on examining

psychological inflexibility as a transdiagnostic process rather than one specific to a subset of

disorders. Theoretically AAQ-II scores will be elevated across a range of disorders and thus

including them in a comparison to a specific diagnosis would obfuscate the primary results and

purpose (as AAQ-II scores would be then elevated in the control group due to the presence of

other disorders).

Follow up analysis of covariance (ANCOVA) tests examined differences on the AAQ-II

between those with and without a disorder, controlling for general psychological distress (GHQ)

as a covariate. This allowed examination of whether elevated psychological inflexibility scores

in a diagnostic group relative to the control group were accounted for by higher levels of distress

or were related above and beyond general distress.

Analyses compared the control group to those having any disorder within a general class

of diagnoses (e.g., having any anxiety disorder) as well as for specific disorder within each

diagnostic class (such as social anxiety, disorder, panic disorder, and so on). Lifetime diagnoses

of generalized anxiety disorder and dysthymia were not assessed based on recommended

procedures for the SCID (First et al., 2002). Analyses for eating disorders were conducted only

for those with a lifetime history due to the low rate of participants with a current eating disorder

($n = 3$). It is important to note that some other analyses were underpowered with the lowest

analyzed sample size being for current depressive disorder not otherwise specified (NOS) ($n = $

5). Partial η^2 effect sizes from ANOVA and ANCOVA analyses were interpreted using

conventions from Cohen (1988): small effect for $\eta^2_p = .01$, medium effect = .06, large effect =

.14. Findings at $p < .05$ were termed "significant"; those at only $p < .10$ were termed "marginally

significant."

An additional series of ANOVA and ANCOVA analyses examined differences in

psychological inflexibility among comorbid depressive, anxiety and substance use disorders. One

set of analyses tested whether AAQ-II scores differed among participants with only depressive

disorders, only anxiety disorders, or comorbid depressive and anxiety disorders. Post-hoc

analyses using Tukey least significant difference test further examined between group

differences on the AAQ-II between these diagnostic groups. A second set of analyses examined

differences on the AAQ-II between participants with substance use disorders only, depressive

and/or anxiety disorders only or comorbid substance use and depressive/anxiety disorders. Due

to the low prevalence of eating disorders, analyses did not examine comorbidity between those

with an eating disorder ($n = 5$) vs. depression/anxiety plus eating disorder ($n = 13$) or between an

eating disorder ($n = 11$) vs. eating plus substance use disorder ($n = 7$).

Results

Relationship of AAQ-II to Depressive, Anxiety, Substance Use and Eating Disorders

Descriptive statistics for AAQ-II scores by disorder as well as prevalence rates are

presented in in Tables 1 and 2. ANOVA analyses indicated significantly greater psychological

inflexibility (AAQ-II scores) for several current diagnostic groups relative to the no current

disorder control group including any current depressive or anxiety disorder, and specifically

current major depressive disorder, dysthymia, depressive disorder NOS, panic disorder, social

phobia, specific phobia, obsessive compulsive disorder, posttraumatic stress disorder,

generalized anxiety disorder, anxiety disorder NOS, and alcohol dependence (see Table 1).

Effect sizes were small to medium with partial η^2 values ranging from .01 to .07. The AAQ-II

was not significantly related to having any current substance use disorder or specifically alcohol

abuse, drug abuse, or drug dependence.

Follow up ANCOVA analyses examined differences on AAQ-II scores between current

diagnostic groups relative to the no current disorder control group, controlling for general

psychological distress (GHQ). ANCOVA results indicated significantly higher AAQ-II scores, after controlling for the GHQ, for the same psychological disorders, except depressive disorder NOS, panic disorder and alcohol dependence. Small effect sizes for diagnostic status effects ranged from partial η^2 values of .01 and .04 when controlling for the GHQ.

When examining lifetime history of disorders (any current or past disorder), participants were significantly more psychologically inflexible relative to the no lifetime disorder control group for any lifetime depressive, anxiety, substance use or eating disorder, and specifically major depressive disorder, depressive disorder NOS, panic disorder, social phobia, specific phobia, obsessive compulsive disorder, posttraumatic stress disorder, anxiety disorder NOS, alcohol dependence, drug dependence, drug abuse and anorexia nervosa (See Table 2). Small to medium effect sizes ranged from partial η^2 values of .01 and .12. There was also marginally significantly greater psychological inflexibility among participants with a lifetime alcohol abuse disorder relative to the control group ($p = .09$).

Follow up ANCOVA analyses examined differences on AAQ-II scores between lifetime diagnostic groups relative to the no disorder control group, controlling for the GHQ as a covariate. ANCOVA indicated significantly higher AAQ-II scores, after controlling for the GHQ, for the same psychological disorders except drug abuse and alcohol abuse. Small effect sizes for diagnostic status effects ranged from partial η^2 values of .01 and .08 when controlling for the GHQ.

Relationship of the AAQ-II to Comorbid Depressive and Anxiety Disorders

ANOVA examined differences on the AAQ-II between students with a current depressive disorder only, current anxiety disorder only or comorbid current depressive and anxiety disorders (see Table 3). There was an overall significant effect for diagnostic status on the AAQ-II (F(2,

153) = 5.95, p = .003, partial η^2 = .07). Post hoc analyses indicated that participants with comorbid current depressive and anxiety disorders were significantly more psychologically inflexible than participants with only a current anxiety disorder (M_{diff} = 8.76, SE = 2.73, p = .002); this same comorbid group was marginally significantly more psychologically inflexible relative to those having only a current depressive disorder (M_{diff} = 5.45, SE = 3.23, p = .09).

A follow up ANCOVA analysis compared AAQ-II scores between these diagnostic groups controlling for the GHQ. There was no significant effect for current comorbidity status after controlling for general psychological distress as a covariate (p = .37).

Another ANOVA analysis examined differences on the AAQ-II between students with a lifetime depressive disorder only, lifetime anxiety disorder only or comorbid lifetime depressive and anxiety disorders. There was an overall significant effect for diagnostic status on the AAQ-II (F(2, 382) = 8.15, p < .001, partial η^2 = .04). Post hoc analyses indicated that participants with comorbid lifetime depressive and anxiety disorders were significantly more psychologically inflexible relative to participants with only a lifetime anxiety disorder history alone (M_{diff} = 4.14, SE = 1.13, p < .001) and relative to those with only a lifetime depressive disorder history alone (M_{diff} = 2.97, SE = .97, p = .002).

A follow up ANCOVA analysis also found, when controlling for the GHQ as a covariate, a main effect for lifetime diagnostic status on the AAQ-II (F(2, 379) = 7.54, p = .001, partial η^2 = .04). After controlling for the GHQ, participants with comorbid lifetime depressive and anxiety disorders continued to be significantly more psychologically inflexible relative to participants with only a lifetime anxiety disorder history alone (M_{diff} = 3.47, SE = .90, p < .001) and relative to those with only a lifetime depressive disorder history alone (M_{diff} = 2.06, SE = .78, p = .009). After controlling for the GHQ, participants with a lifetime depressive disorder only were also

marginally significantly more psychologically inflexible than participants with an anxiety disorder only ($M_{\text{diff}} = 1.42$, $SE = .79$, $p = .07$).

Relationship of the AAQ-II to Comorbid Substance Use and Depressive/Anxiety Disorders

ANOVA analyses examined differences on the AAQ-II between students with a current substance use disorder only, current depressive and/or anxiety disorders only, or a current substance use disorder with a comorbid current depressive and/or anxiety disorder (see Table 3). There was an overall significant effect for diagnostic status on the AAQ-II ($F(2, 193) = 8.62$, $p < .001$, partial $\eta^2 = .08$). Participants with a current substance use disorder only reported significantly lower psychological inflexibility relative to participants with a comorbid current substance use and depressive/anxiety disorder ($M_{\text{diff}} = 7.37$, $SE = 2.97$, $p = .01$) and relative to participants with a current depressive/anxiety disorder only ($M_{\text{diff}} = 6.32$, $SE = 1.56$, $p < .001$). There was no significant difference on AAQ-II scores between participants with a current depressive/anxiety disorder alone vs. comorbid substance use and depressive/anxiety ($p = .70$).

A follow up ANCOVA found, when controlling for the GHQ as a covariate, a main effect for diagnostic status on the AAQ-II ($F(2, 191) = 8.26$, $p < .001$, partial $\eta^2 = .08$). After controlling for the GHQ, participants with a current substance use disorder only continued to report significantly lower psychological inflexibility relative to participants with a depression/anxiety disorder only ($M_{\text{diff}} = 4.37$, $SE = 1.09$, $p < .001$). However, there was no significant difference on AAQ-II scores between participants with a substance use disorder alone vs. comorbid substance use and depressive/anxiety disorder ($p = .32$).

Another ANOVA analysis compared students with a lifetime history of substance use disorders only, lifetime history of depressive and/or anxiety disorders only, or a lifetime history of substance use disorder and depressive/anxiety disorders. There was an overall significant

effect for diagnostic status on the AAQ-II ($F(2, 437) = 7.43$, $p = .001$, partial $\eta^2 = .03$).

Participants with a lifetime substance use disorder only reported significantly lower

psychological inflexibility relative to participants with a comorbid lifetime substance use and

depressive/anxiety disorder ($M_{\text{diff}} = 4.89$, $SE = 1.45$, $p = .001$) and relative to participants with a

lifetime depressive/anxiety disorder alone ($M_{\text{diff}} = 4.33$, $SE = 1.18$, $p < .001$).

A follow up ANCOVA analysis also found, when controlling for the GHQ as a covariate,

a main effect for diagnostic status on the AAQ-II ($F(2, 434) = 5.94$, $p = .003$, partial $\eta^2 = .03$).

After controlling for the GHQ, participants with a lifetime substance use disorder alone

continued to report significantly lower psychological inflexibility relative to participants with a

comorbid lifetime substance use and depressive/anxiety disorder ($M_{\text{diff}} = 3.15$, $SE = 1.15$, $p =$

.006) and relative to participants with a lifetime depressive/anxiety disorder alone ($M_{\text{diff}} = 3.15$,

$SE = .93$, $p = .001$).

Relationships between the Screening AAQ-II and Psychological Disorders

Although diagnostic interview data was collected before the baseline AAQ-II,

methodological concerns led to use of the baseline AAQ-II rather than the earlier administered

screening AAQ-II. As a check against the possibility that the clinical interview itself might have

led to the observed relations, a final set of analyses were repeated using the screening AAQ-II

that was collected prior to the diagnostic interview. Statistically significant or at least marginally

significant results were still found for most of the observed relationships between the AAQ-II

and specific current and lifetime psychological disorders identified using baseline data, both with

and without the GHQ as a covariate. The only exceptions were that the AAQ-II was no longer

significantly related to lifetime alcohol abuse, life time drug dependence or lifetime anorexia

nervosa when using the screening AAQ-II instead. In addition, when controlling for the GHQ, the screening AAQ-II was now significantly related to current depression NOS.

Similarly, the results of the comorbidity analyses were nearly identical when using the screening AAQ-II as compared to the baseline AAQ. The only exceptions were that the screening AAQ-II was now significantly related to having a current anxiety disorder vs. anxiety/depression comorbidity when controlling for the GHQ, the screening AAQ-II was not related to lifetime depression versus lifetime comorbid anxiety/depression, and the screening AAQ-II was not related to current substance use vs. comorbid substance use and depression/anxiety disorder. Thus, while screening AAQ-II had slightly stronger and weaker relationships to psychopathology in specific areas as compared to the baseline measure, the pattern of results was similar, suggesting that the temporal relationship between the diagnostic interview and self-report session was not a major source of the relationships observed.

Discussion

The current cross-sectional study, although not without methodological limitations, is the first of which we are aware that has examined the relationship of any well-researched transdiagnostic factor to a range of psychological disorders in a large non-clinical sample, using a reliable clinical interview. Self-reported psychological inflexibility was related to a range of both current and lifetime depressive and anxiety disorders, assessed using the SCID, even after controlling for general psychological distress. Although the sample was too small to examine current eating disorders, psychological inflexibility was related to lifetime history of having any eating disorder and anorexia nervosa specifically. Findings were mixed for substance use with the AAQ-II being more strongly related to lifetime history of substance use disorders and substance dependence diagnoses. The AAQ-II was significantly related to having a comorbid

depressive, anxiety or substance use disorder relative to only having one of these diagnoses. However, psychological inflexibility did not distinguish between individuals with both depressive/anxiety disorders and comorbid substance use relative to depressive/anxiety disorder alone.

Transdiagnostic research thus far has tended to focus primarily on depressive, anxiety and eating disorders, though usually not including all three of these diagnostic groups in a single study. Expanding transdiagnostic models to account for more problem areas could increase their utility in developing broadly applicable interventions that can treat heterogeneous clinical populations. Given the high rates of comorbidity between substance use disorders and depressive and anxiety disorders (Hasin, Stinson, Ogbum, & Grant, 2007) and the difficulty in treating these comorbid presentations (Beaulieu et al., 2012), substance use disorders seem to be a particularly important area to include in the development of transdiagnostic models.

Previous research has indicated that psychological inflexibility and experiential avoidance relate to problematic substance use (e.g., Bricker, Schiff & Comstock, 2011; Levin et al., 2012) as well as a variety of other addictive behaviors (e.g., Kingston et al., 2010), but few studies have specifically examined substance use diagnoses of abuse or dependence. Results suggested that psychological inflexibility is more related to substance dependence than abuse. Dependence is characterized by difficulty controlling use while abuse is characterized by problems related to use. People presenting with abuse may be using substances for a wide variety of reasons as it is socially acceptable to a degree, however, those meeting criteria for dependence may be more likely to be using substances to avoid difficult thoughts and emotions. It is also worth noting that the sample consisted of students in their late teens who were just beginning their college careers. It may be that the role of experiential avoidance and psychological

inflexibility in substance use is overshadowed during this period by other more salient contextual factors such as family and peer influence, as well as availability of drugs and alcohol.

Research has also previously found a relationship between eating disorders and psychological inflexibility (e.g., Rawal, Park & Williams, 2010). Given the low number of participants meeting criteria for an eating disorder, the lack of relationship between bulimia nervosa and psychological inflexibility may be attributable in part to low statistical power. There has been less research on psychological inflexibility and eating disorders relative to depression/anxiety and the current results highlight the need for further research examining these disorders.

The results indicating that psychological inflexibility is related to comorbidity across classes of disorders, particularly depression and anxiety, provides preliminary evidence suggesting this process may be functionally important in some multi-problem clinical presentations. This is consistent with cross-sectional research indicating psychological inflexibility is related to the covariance of various problem behaviors (Kingston et al., 2010). Considering that comorbid presentations tend to be linked to more severe impairment (Kessler, Chiu et al., 2005) and are more difficult to treat (Beaulieu et al., 2012), this has potential implications for treatment development and suggests targeting psychological inflexibility may be particularly important for those who are experiencing comorbid problems. Consistent with this, research suggests that acceptance and mindfulness approaches, which target psychological inflexibility processes, may be particularly efficacious in treating patients with comorbid mood and anxiety disorders (Arch et al., 2013; Wolitzky-Taylor et al., 2012).

Levels of psychological inflexibility did not differ between individuals with depressive and anxiety disorders alone relative to those with comorbid substance use disorders, although

they did differ between substance use disorders alone relative to those with comorbid depressive/anxiety disorders. This finding suggests that comorbid depression/anxiety may account for the higher levels of psychological inflexibility observed in some individuals with substance use disorders. It may be the case that psychological inflexibility is a functionally important process for a subgroup of individuals who engage in substance use as a means of attempting to avoid co-occurring depression and anxiety symptoms, while others without these comorbid symptoms are more likely to engage in substance use for other reasons.

Theoretically, the problematic behaviors underlying a broad range of psychological disorders share a similar avoidant function (i.e., avoiding situations that elicit anxiety, social isolation, ruminating, worrying, restricting food intake, binge eating, using substances to cope). These disorders share a similar pattern of inflexibly reacting to difficult thoughts and feelings (i.e., fear, sadness, worry, self-criticism, cravings) at the cost of more effective and values-based actions. The results from the current study provide preliminary support for this transdiagnostic theoretical model, particularly in the domain of depression and anxiety disorders, by demonstrating that individuals with a variety of specific psychological disorders report similarly elevated levels of psychological inflexibility. Furthermore, psychological inflexibility continued to relate to disorders even after controlling for general psychological distress. This is important as it suggests elevated levels of inflexibility in students with disorders relative to those without disorders is not simply attributable to greater distress, but rather to more unique features of psychological inflexibility (i.e., how they inflexibly respond to distress).

Although the psychological inflexibility model represents a dimensional approach to conceptualizing psychopathology and health (Hayes et al., 2011), these research results provide further support to the theory that psychological inflexibility is relevant to a variety of more

specific symptom clusters that may share similar psychological functions. Furthermore, these results extend previous research by demonstrating that psychological inflexibility is specifically elevated among individuals falling within a category defined by clinically significant distress and impairment. This is one of very few studies (although see Venta et al., 2012) that have examined inflexibility with regards to a range of specific categorical diagnoses, with preliminary results suggesting these various disorders may share similar functional processes.

Psychological inflexibility is a promising transdiagnostic process to focus on because there already exist a number of methods that serve to reduce this process. Contextual Cognitive Behavioral Therapies including ACT, Dialectical Behavior Therapy, mindfulness-based therapies, and certain types of exposure-based therapies have been found to impact a variety of clinical problems by reducing psychological inflexibility (Berking et al., 2009; Bowen et al., 2007; Hayes, Villatte et al., 2011; Sauer-Zavala, Boswell, Gallagher, Bentley, Ametaj, & Barlow, 2012). The findings from the current study, albeit preliminary and limited by the cross-sectional design, lend some further support to developing and applying methods that target psychological inflexibility to a range of disorders.

One limitation of this study is the use of a sample of first-year college students participating in a randomized prevention trial at a single institution. Participants were included based on a screening procedure to reduce the potential for oversampling higher functioning students and were self-selected based on their interest in a classroom-based wellness study. It is unclear the extent to which these findings generalize to other populations, such as college students more generally and treatment seeking clinical populations. The mean AAQ-II score obtained in this study was similar to other non-clinical college student samples and significantly lower than what has been observed in clinical samples (Bond et al., 2011), suggesting this

sample may be somewhat comparable to other college student samples. The sample also demonstrated similar prevalence rates of DSM-IV Axis I disorders relative to other studies of the general college student population (Blanco et al., 2008). On a related note, the sample had a high proportion of Caucasian students and further research is needed to examine whether findings generalize to other ethnic groups.

Given the use of a non-clinical sample, there was a fairly low prevalence of some disorders and thus some of the analyses were underpowered. The very low prevalence of some disorders (i.e., current eating disorder, bipolar disorder, psychosis) further limited the disorders that could be examined in the sample. Research has shown that psychological inflexibility is relevant to an even broader range of problem areas beyond depressive, anxiety, eating and substance use disorders, including psychosis (Goldstone et al., 2011) and borderline personality disorder (Chapman, Specht & Cellucci, 2005). Thus, future research would benefit from examining the relationship of psychological inflexibility to a broader range of diagnoses. Given the primary focus on internalizing disorders and the more mixed findings with substance use disorders in the present study, it would be particularly important to examine whether psychological inflexibility is a transdiagnostic risk factor with other externalizing disorders.

There are significant limitations in using a cross sectional design to examine transdiagnostic risk factors. Ideally, one would examine psychological inflexibility as a predictor of the development and exacerbation of psychological disorders over time. Relationships of this kind have been found. For example, when psychological inflexibility was measured before a campus shooting, it prospectively predicted the longitudinal development of psychological problems (Kumpula, Orcutt, Bardeen, & Varkovitzky, 2011).The temporal relationship between psychological inflexibility and psychological disorders cannot be examined in the current study

and in fact psychological inflexibility was measured after the diagnostic interview, although similar results were found when using a screening AAQ-II administered prior to the diagnostic interview. However, the earlier screening AAQ-II assessment did not include necessary quality control features to reduce error due to factors including random responding, answering under parental or others' scrutiny, and attempting to manipulate responses to increase the potential to participate in the study. With the current design, it may be the case that psychopathology led to increases in psychological inflexibility, rather than it being inflexibility that contributed to psychopathology. However, these cross sectional analyses do provide preliminary data suggesting that psychological inflexibility is functionally relevant to a variety of psychological disorders.

The study was also limited with regards to its reliance on a self-report measure of psychological inflexibility. Such a self-report measure may be affected by variables including social desirability, defensiveness and lack of awareness, which might reduce the strength of the observed relations to psychological disorders. Furthermore, although research has supported the validity of the AAQ-II as a measure of psychological inflexibility (Bond et al., 2011), this measure may not provide a balanced measurement of all aspects of the construct, with a greater overall focus on experiential avoidance. Additional features such as cognitive fusion, low awareness of the present moment, and lack of contact with personal values are not as emphasized in the AAQ-II items. Future research might benefit from combining the AAQ-II with measures that capture other key aspects of psychological inflexibility such as the Cognitive Fusion Questionnaire (Gillanders et al., 2014) as well as exploring the development of behavioral and implicit measures of psychological inflexibility (Hooper et al., 2010).

The current study adds to the literature suggesting that psychological inflexibility is an important transdiagnostic process for a range of psychological disorders as well as comorbidity across disorders. Future longitudinal research with treatment-seeking and non-college populations are needed to further build on and test the generalizability of these findings. These preliminary findings help highlight a promising process to focus on for the further development of transdiagnostic models and treatments for a broad range of psychological disorders.

References

Arch, J.J., Ayers, C.R., Baker, A., Almklov, E., Dean, D.J. & Craske, M.G. (2013). Randomized clinical trial of adapted mindfulness-based stress reduction versus group cognitive behavioral therapy for heterogeneous anxiety disorders. *Behaviour Research and Therapy, 51*, 185-196.

Banks, M.H. (1980). The use of the general health questionnaire as an indicator of mental health in occupational studies. *Journal of Occupational Psychology, 53*, 187–194.

Barlow, D.H., Farchione, T.J., Fairholme, C.P., Ellard, K.K., Boisseau, C.L., Allen, L.B., & May, J.T.E. (2010). *Unified Protocol for Transdiagnostic Treatment of Emotional Disorders: Therapist Guide*. Oxford University Press, USA.

Berking, M., Neacsiu, A., Comtois, K. & Linehan, M. (2009). The impact of experiential avoidance on the reduction of depression in treatment for borderline personality disorder. *Behaviour Research and Therapy, 47*, 663 – 670.

Blanco, C., Okuda, M., Wright, C., Hasin, D.S., Grant, B.F., et al. (2008). Mental health of college students and their non-college-attending peers: Results from the national epidemiologic study on alcohol related conditions. *Archives of General Psychiatry, 65*, 1429-1437.

Bond, F.W., Hayes, S.C., Baer, R.A., Carpenter, K., Orcutt, H.K., Waltz, T., et al. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire-II: A revised measure of psychological flexibility and acceptance. *Behavior Therapy, 42*, 676–688.

Borkovec, T.D., Abel, J.L., & Newman, H. (1995). Effects of psychotherapy on comorbid conditions in generalized anxiety disorder. *Journal of Consulting and Clinical Psychology*, *63*(3), 479–483.

Bowen, S., Witkiewitz, K,. Dillworth, T.M. & Marlatt, G.A. (2007). The role of thought suppression in the relationship between mindfulness meditation and alcohol use. *Addictive Behaviors, 32*, 2324–2328.

Bricker, J.B., Schiff, L. & Comstock, B.A. (2011). Does avoidant coping influence young adults' smoking? A ten-year longitudinal study. *Nicotine & Tobacco Research, 13*, 998-1002.

Chapman, A. L., Specht, M. W., & Cellucci, T. (2005). Borderline personality disorder and deliberate self-harm: Does experiential avoidance play a role? *Suicide & Life-Threatening Behavior, 35*, 388–399.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

de la Cruz, L.F., Landau, D., Iervolino, A.C., Santo, S., Pertusa, A., Singh, S. & Mataix-Cols, D. (2013). Experiential avoidance and emotion regulation difficulties in hoarding disorder. *Journal of Anxiety Disorders, 27*, 204-209.

Fairburn, C.G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: A "transdiagnostic" theory and treatment. *Behaviour Research and Therapy, 41*, 509-528.

Farchione, T.J., Fairholme, C.P., Ellard, K.K., Boisseau, C.L., Thompson-Hollands, J., Carl, J.R., Gallagher, M. W., David H. Barlow, D.H. (2012). Unified Protocol for Transdiagnostic Treatment of Emotional Disorders: A Randomized Controlled Trial. *Behavior Therapy, 43* (3), 666-678.

Fehlinger, T., Stumpenhorst, M., Stenzel, N., Beisel, S., & Rief, W. (2013). On the relevance of improvements in skills for therapy outcome: A transdiagnostic examination. *Zeitschrift fur Psychiatrie Psychologie und Psychotherapie, 61,* 37-44 DOI: 10.1024/1661-4747/a000138.

First, M.B., Spitzer, R.L., Gibbon, M. & Williams, J.B.W. (2002). *Structured clinical interview for DSM-IV-TR axis I disorders, research version, non-patient edition (SCID-I/NP)*. New York: Biometrics Research, New York State Psychiatric Institute.

Gillanders, D.T., Bolderston, H., Bond, F.W., Dempster, M., Flaxman, P.E., Campbell, L., … Remington, B. (2014). The development and initial validation of the cognitive fusion questionnaire. *Behavior Therapy. 45*, 83-101.

Gloster, A. T., Klotsche, J., Chaker, S., Hummel, K.V., & Hoyer, J. (2011). Assessing psychological flexibility: What does it add above and beyond existing constructs? *Psychological Assessment*, *23*(4), 970–982.

Goldberg, D.P. (1972). *The Detection of Psychiatric Illness by Questionnaire*. London, UK: Oxford University Press.

Goldstone, E., Farhall, J. & Ong, B. (2011). Life hassles, experiential avoidance and distressing delusional experiences. *Behaviour Research and Therapy, 40*, 260-266.

Harvey, A., Watkins, E., Mansell, W., & Shafran, R. (2004). *Cognitive Behavioural Processes across Psychological Disorders: A transdiagnostic approach to research and treatment*. OUP Oxford.

Hasin, D.S., Stinson, F.S., Ogburn, E., Grant, B.F. (2007). Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States: results from

the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry*, *64*, 830-842.

Hayes, S.C., Luoma, J.B., Bond, F.W., Masuda, A., & Lillis, J. (2006). Acceptance and Commitment Therapy: Model, processes and outcomes. *Behavior Research and Therapy, 44*, 1–25.

Hayes, S.C., Strosahl, K.D.,&Wilson, K.G. (2011). *Acceptance and Commitment Therapy: The process and practice of mindful change*. New York, NY: The Guilford Press.

Hayes, S.C., Villatte, M., Levin, M.E., & Hildebrandt, M. (2011). Open, aware, and active: Contextual approaches as an emerging trend in the behavioral and cognitive therapies. *Annual Review of Clinical Psychology, 7*, 141–168.

Hayes, S.C., Wilson, K.G., Gifford, E.V., Follette, V.M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, *64*(6), 1152–1168.

Hooper, N., Villatte, M., Neofotistou, E., & McHugh, L. (2010). The effects of mindfulness versus thought suppression on implicit and explicit measures of experiential avoidance. *International Journal of Behavior Consultation and Therapy, 6*, 233-244.

Kadison, R., & DiGeronimo, T. F. (2004). *College of the overwhelmed: The campus mental health crisis and what to do about it*. San Francisco, CA: Jossey-Bass

Kessler, R.C., Berglund, P., Demler, O., Jin, R., Merikangas, K.R. & Walters, E.E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidtity survey replication. *Archives of General Psychiatry, 62*, 593-602.

Kessler, R., Chiu, W., Demler, O., & Walters, E. (2005). Prevalence, severity, and comorbidity

of 12-month DSM-IV disorders in the National Comorbidity Survey Replication.

Archives of General Psychiatry, *62*, 617–627.

Kingston, J., Clarke, S. Remington, B. (2010). Experiential avoidance and problem behavior: A

mediational analysis. *Behavior Modification, 34*, 145-163.

Kumpula, M.J., Orcutt, H.K., Bardeen, J.R., & Varkovitzky, R.L. (2011). Peritraumatic

dissociation and experiential avoidance as prospective predictors of posttraumatic stress

symptoms. *Journal of Abnormal Psychology, 120,* 617-627.

Levin, M.E., Lillis, J., Seeley, J., Hayes, S.C., Pistorello, J. & Biglan, A. (2012). Exploring the

relationship between experiential avoidance, alcohol use disorders and alcohol-related

problems among first-year college students. *The Journal of American College Health, 60*,

443-448.

Lobbestael, J., Leurgans, M. & Arntz, A. (2011). Inter-rater reliability of the Structured Clinical

Interview for DSM-IV Axis I Disorders (SCID I) and Axis II Disorders (SCID II)**.**

Clinical Psychology & Psychotherapy, 18, 75-79.

Mansell, W., Harvey, A., Watkins, E., & Shafran, R. (2009). Conceptual foundations of the

transdiagnostic approach to CBT. *Journal of Cognitive Psychotherapy, 23*, 6–19.

Nolen-Hoeksema, S. & Watkins, E.R. (2011). A heuristic for developing transdiagnostic models

of psychopathology: Explaining multifinality and divergent trajectories. *Perspective on

Psychological Science, 6*, 589-609.

Norton, P.J., & Philipp, L.M. (2008). Transdiagnostic approaches to the treatment of anxiety

disorders: A meta-analytic review. *Psychotherapy: Theory, Research, Practice, Training,

45*, 214-226.

Podsakoff, P.M., MacKenzie, S.B., Lee, J., & Podsakoff, N.P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal Of Applied Psychology*, *88*(5), 879-903.

Rawal, A., Park, R.J. & Williams, M.G. (2010). Rumination, experiential avoidance, and dysfunctional thinking in eating disorders. *Behaviour Research and Therapy, 48*, 851-859.

Sauer-Zavala, S., Boswell, J. F., Gallagher, M. W., Bentley, K. H., Ametaj, A., & Barlow, D. H. (2012). The role of negative affectivity and negative reactivity to emotions in predicting outcomes in the unified protocol for the transdiagnostic treatment of emotional disorders. *Behaviour Research and Therapy, 50*, 551–557.

Tsao, J.C.I., Mystkowski, J.L., Zucker, B.G., & Craske, M.G. (2002). Effects of cognitive-behavioral therapy for panic disorder on comorbid conditions: Replication and extension. *Behavior Therapy*, *33*(4), 493–509.

Venta, A., Sharp, C. & Hart, J. (2012). The relation between anxiety disorder and experiential avoidance in inpatient adolescents. *Psychological Assessment, 24*, 240-248.

Wade, T.D., Bergin, J.L., Martin, N.G., Gillespie, N.A., & Fairburn, C.G. (2006). A transdiagnostic approach to understanding eating disorders. *Journal of Nervous and Mental Disease, 194*, 510-517.

Wolitzky-Taylor, K.B., Arch, J.J., Rosenfield, D. & Craske, M.G. (2012). Moderators and non-specific predictors of treatment outcome for anxiety disorders: A comparison of cognitive behavioral therapy to acceptance and commitment therapy. *Journal of Consulting and Clinical Psychology, 80*, 786-799.

Table 1. *Descriptive statistics and ANOVA/ANCOVA results comparing AAQ-II scores between those with and without a current disorder.*

	Current Disorder Descriptive Statistics		Diagnosis effect (without covariate)		Diagnosis effect (with covariate)	
Disorder	AAQ *M* (*SD*)	*N* (%)	*F*	η^2_p	*F*	η^2_p
Any Depressive Disorder	27.29 (9.83)	34 (3.5%)	64.21***	.07	24.93***	.03
Major Depressive Disorder	26.70 (9.55)	20 (2.1%)	31.75***	.04	14.23***	.02
Dysthymia	32.14 (10.65)	7 (0.7%)	29.46***	.04	11.46**	.02
Depression NOS	27.20 (9.50)	5 (0.5%)	9.17**	.01	2.37	.00
Any Anxiety Disorder	23.50 (8.87)	135 (13.9%)	72.36***	.07	40.27***	.04
Panic Disorder	22.18 (10.84)	11 (1.1%)	4.37*	.01	2.23	.00
Social Phobia	24.00 (9.87)	43 (4.4%)	31.48***	.04	14.15***	.02
Specific Phobia	22.03 (7.51)	39 (4.0%)	14.09***	.02	12.33***	.02
Obsessive Compulsive Dis.	29.18 (9.04)	11 (1.1%)	29.14***	.04	17.10***	.02
Posttraumatic Stress Dis.	24.40 (6.01)	15 (1.5%)	13.61***	.02	6.51*	.01
Generalized Anxiety Dis.	27.91 (8.40)	23 (2.4%)	47.27***	.06	23.61***	.03
Anxiety NOS	23.42 (9.91)	19 (2.0%)	12.15**	.02	7.62**	.01
Any Substance Use Dis.	19.04 (8.61)	51 (5.2%)	1.66	.00	.01	.00
Alcohol Abuse	16.36 (8.26)	14 (1.4%)	.52	.00	1.09	.00
Alcohol Dependence	22.83 (8.24)	18 (1.9%)	9.40**	.01	2.40	.00
Drug Abuse	18.67 (9.40)	12 (1.2%)	.22	.00	.53	.00
Drug Dependence	18.50 (8.70)	16 (1.6%)	.19	.00	.00	.00
No Current Disorder						
Control Group	17.72 (6.96)	770 (79.2%)				

*p < .05; **p < .01; ***p < .001. Diagnosis effect refers to statistical tests for differences on AAQ-II scores between those with each diagnosis relative to the no current disorder control group. With covariate refers to diagnosis effects after controlling for the GHQ. Analyses were not conducted for current eating disorders (*n* = 3) due to low sample size.

Table 2. *Descriptive statistics and ANOVA/ANCOVA results comparing AAQ-II scores between those with and without a lifetime disorder.*

	Lifetime Disorder Descriptive Statistics		Diagnosis effect (without covariate)		Diagnosis effect (with covariate)	
Disorder	AAQ *M* (*SD*)	*N* (%)	*F*	η^2_p	*F*	η^2_p
Any Depressive Disorder	22.17 (8.16)	292 (30.0%)	107.62***	.12	59.88***	.07
Major Depressive Disorder	22.55 (8.09)	212 (21.8%)	101.84***	.12	59.67***	.08
Depression NOS	20.61 (7.41)	62 (6.4%)	18.45***	.03	12.50***	.02
Any Anxiety Disorder	22.01 (8.37)	194 (20.0%)	77.26***	.10	37.28***	.05
Panic Disorder	23.14 (8.42)	22 (2.3%)	19.28***	.03	12.46***	.02
Social Phobia	22.03 (8.81)	71 (7.3%)	36.59***	.06	16.91***	.03
Specific Phobia	21.21 (7.61)	58 (6.0%)	23.03***	.04	16.31***	.03
Obsessive Compulsive Dis.	25.25 (8.45)	20 (2.1%)	31.23***	.05	17.76***	.03
Posttraumatic Stress Dis.	21.59 (6.46)	27 (2.8%)	13.83***	.02	6.50*	.01
Anxiety NOS	22.59 (9.84)	22 (2.3%)	15.77***	.03	9.21**	.02
Any Substance Use Dis.	19.90 (8.34)	124 (12.8%)	20.52***	.03	6.65*	.01
Alcohol Abuse	18.51 (9.04)	49 (5.0%)	2.95†	.01	.10	.00
Alcohol Dependence	21.57 (7.96)	46 (4.7%)	21.70***	.04	6.63*	.01
Drug Abuse	20.17 (8.48)	47 (4.8%)	10.98**	.02	1.78	.00
Drug Dependence	20.00 (8.28)	48 (4.9%)	10.16**	.02	5.01*	.01
Any Eating Disorder	21.00 (8.70)	18 (1.9%)	7.04**	.01	6.33*	.01
Anorexia Nervosa	22.18 (9.37)	11 (1.1%)	7.15**	.01	5.19*	.01
Bulimia Nervosa	19.14 (7.86)	7 (.7%)	.90	.00	1.50	.00
No Lifetime Disorder						
Control Group	16.76 (6.60)	527 (54.2%)				

†*p* < .10; *p* < .05; **p* < .01; ***p* < .001.

Table 3. *AAQ-II scores for individual and comorbid diagnoses.*

	Depression only		Anxiety only		Depression & Anxiety	
	M (*SD*)	*N*	*M* (*SD*)	*N*	*M* (*SD*)	*N*
Current Disorder	26.10 (9.44) [a]	21	22.78 (8.47) [a]	124	31.55 (9.66) [b]	11
Lifetime Disorder	21.20 (7.62) [a]	191	19.76 (7.23) [a]	95	24.17 (8.85) [b]	99

	SUD only		Dep./Anx. only		SUD & Dep./Anx.	
	M (*SD*)	*N*	*M* (*SD*)	*N*	*M* (*SD*)	*N*
Current Disorder	17.45 (7.64) [a]	40	23.77 (8.92) [b]	145	24.82 (9.83) [b]	11
Lifetime Disorder	17.18 (8.21) [a]	55	21.51 (8.06) [b]	316	22.07 (7.84) [b]	69

[a, b] superscripts indicate statistical differences between diagnostic groups ($p < .10$). SUD = Substance Use Disorder; Dep./Anx. = Depression and/or anxiety disorder.