QUALITATIVE AND QUANTITATIVE DIFFERENCES OF WORRY AMONG INDIVIDUALS WITH AND WITHOUT GENERALIZED ANXIETY DISORDER

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by

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INTRODUCTION

Worry is a common human phenomenon (Tallis, Davey, Cappuzzo, 1994). Everyone is concerned with “what if” questions from time to time, such as “what if I fail my exam?” or “what if I did not make the right choice?” Borkovec, Alcaine, and Behar (2004, p. 82) define worry as “phenomenologically experienced primarily as a negative, verbal linguistic (as opposed to imaginal) activity. When we worry, we are talking to ourselves in anxious ways.” Given its ubiquity to the human experience, worry resides along a continuum in terms of frequency, severity, and content (Barlow, 1988; Rapee, 1991). Excessive and uncontrollable worry is the defining feature of Generalized Anxiety Disorder (GAD; American Psychiatric Association, 1994). However, pathological worry is not confined to GAD and can be present in individuals with other anxiety (Barlow, 2002) and mood disorders (e.g., Chemelski & Zimmerman, 2003; Molina, Borkovec, Peasley, & Person, 1998). Thus, recent studies have turned their focus on determining whether worry content is specific to GAD in particular, or is characteristic to psychopathology in general.

Our understanding of pathological worry has increased significantly since worry became central to the GAD diagnosis in the revised third edition of the Diagnostic and Statistical Manual of Mental Health Disorders (DSM-III-R; American Psychological Association [APA], 1987). Although certain aspects of worry in GAD, such as function
and form, have been studied extensively since then, research examinations of the content of worry are limited (Dugas et al., 1998). Further, the few studies available in this line of research have focused primarily on comparisons between GAD groups and nonanxious controls. Recent studies have expanded their focus in other anxiety disorders, but the topic is still overlooked in relation to mood disorders. Given the significant overlap between GAD and Major Depressive Disorder (MDD) at the symptomatic and cognitive level, examining the content of worry in terms of GAD and MDD may shed light on the unique and shared underlying mechanisms and features of these disorders.

**Generalized Anxiety Disorder and Worry**

GAD is a chronic, prevalent, and debilitating disorder. In addition to the excessive and uncontrollable worry, the GAD diagnostic criteria include symptoms of restlessness, fatigue, irritability, difficulty concentrating, muscle tension, and sleep disturbance (DSM-IV; APA, 1994). Approximately 5.7% of the general population will suffer from GAD sometime in their lifetime (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). Furthermore, GAD results in significant functional impairment and low life satisfaction (e.g., Henning, Turk, Mennin, Fresco, & Heimberg, 2007; Wittchen, Carter, Pfister, Montgomery, & Kessler, 2000). The human burden in GAD is associated with substantial economic costs (Ninan, 2001). It is estimated that the annual cost of anxiety disorders, GAD included, was about $47 billion in 1990 (Wittchen, 2002). Finally, comorbidity, particularly with MDD, further increases disability and dysfunction (Wittchen, 2002).
Worry is a repetitive thought pattern believed to serve an avoidance function in GAD. Empirical findings indicate that worry involves a predominance of thought activity, as oppose to imagery, (e.g., Borkovec & Inz, 1990; Borkovec, Lyonfields, Wiser, & Diehl, 1993), which allows the person to eliminate physical and emotional arousal in response to aversive stimuli (e.g., Borkovec & Hu, 1990; Peasley-Milkus & Vrana, 2000). Given that individuals with GAD experience emotions with heightened intensity (e.g., Mennin, Holaway, Fresco, Moore, & Heimberg, 2007), using worry to cope with aversive emotional events may have a functional role. Indeed, individuals with GAD are more likely than nonanxious controls to report using worry to avoid more emotional issues (Borkovec & Roemer, 1995). However, because worry inhibits emotional processing of feared stimuli, extinction cannot occur, which in turn, results in the maintenance of anxiety and worry (Foa & Kozak, 1986). In addition to serving an avoidant function, worry is associated with another maladaptive aspect of the disorder, namely intolerance of uncertainty. Specifically, individuals with GAD tend to worry in response to uncertain events or situations in their environment (e.g., Dugas, Marchand & Ladouceur, 2005; Ladouceur, Gosselin, & Dugas, 2000). Finally, individuals with GAD tend to selectively attend to potentially threatening stimuli (e.g., Mogg, Bradley, Williams, & Matthews, 1993). Given that the perceived threat is usually unfounded, the person cannot avoid it behaviorally (e.g., use the “fight or flight response”) and thus attempts to avoid it cognitively by worrying (Borkovec et al., 2004).

Major depressive disorder, Rumination, and Worry
Major depressive disorder is defined as depressive mood or reduced interest or pleasure in usual activities accompanied by symptoms, such as fatigue, sleep disturbance, psychomotor retardation or agitation, lasting for at least 2 weeks (APA, 1994). MDD is a chronic and debilitating mental health problem. The lifetime prevalence of MDD is about 17% (Kessler at al., 2005) and costs in lost productivity due to depression reach an estimated $44 billion per year (Stewart, Ricci, Chee, Hahn, & Morganstein, 2003). MDD is highly comorbid with other mood (e.g., dysthymia) and anxiety disorders, such as GAD and social phobia (Kessler et al., 2005). MDD is a recurrent disorder and over 75% of depressed patients have more than one depressive episode in their lifetime (Keller & Boland, 1998).

Like GAD, individuals with MDD often engage in a repetitive thought pattern, often referred to as depressive rumination. Ruminative thoughts focus on one’s depressive symptoms and the possible causes and consequences of the symptoms (Nolen-Hoeksema, 1991). Nolen-Hoeksema (1998) theorized that the tendency to ruminate would exacerbate and prolong depression. Rumination is highly correlated with worry (Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; Segerstrom, Tsao, Alden, & Craske, 2000). A recent study conducted by Watkins, Moulds, and Mackintosh (2005) found that worry and rumination do not differ in terms of their processes, but do differ in relation to the temporal aspects of the thought content. Specifically, they found that worrisome thoughts are targeting primarily future events, whereas rumination focuses more on the past. Further, the authors suggested that rumination may interfere with emotional processing and thus serve an avoidant function, like worry.
Worry is not only related to rumination, but it has been found to elicit both depression and anxiety (e.g., Andrews & Borkovec, 1988). In terms of worry level in depression, Starcevic (1988) found equal levels of pathological worry defined by excessiveness and perceived uncontrollability in individuals with GAD and MDD. In a more recent study, however, individuals with GAD endorsed higher levels of pathological worry as compared to a GAD/MDD comorbid group and a group with other anxiety disorders (Chelminski, & Zimmerman, 2003).

_Worry Content, GAD, and MDD_

GAD and MDD are overlapping substantially at the symptomatic level. They have four diagnostic criteria in common, including restlessness, fatigue, difficulty concentrating, and sleep difficulties. Further, they are highly comorbid in clinical (e.g., Kessler et al., 2005) and community samples (e.g., Brown, Campbell, Lehman, Grisham, & Mancill, 2001). At the cognitive level, empirical findings indicate that GAD and MDD are associated with similar cognitive repetitive processes, worry and rumination respectively, but may differ in terms of the thought content.

Research addressing the question of worry content has primarily focused in GAD. Craske, Rapee, Jackel, and Barlow (1989) investigated the phenomenological differences and similarities of worry content among a group of patients with GAD. Worries reported during the diagnostic interview were categorized in five worry spheres, including family/home/interpersonal, finances, work/school, illness/health/injury, and miscellaneous matters (e.g., car transmission problems, being late for an appointment,
threat of a nuclear war). Results showed that worries about family/home/interpersonal issues were the most common, followed by miscellaneous, illness/health/injury, work/school, and finances. Further, the participants reported their first three significant worries over a 3-week period. In that case, illness/health/injury related worries were most prevalent, followed by family/home/interpersonal, miscellaneous, work/school, and finances. A nonanxious control group, which followed the same procedure, had more worries in the work/school category, followed by family/home/interpersonal, finances, miscellaneous, and illness/health/injury. Thus, the GAD patients endorsed more worries about illness/health/injury and miscellaneous issues, but less worries about finances as compared to the nonanxious group. In a study conducted by Roemer, Molina, and Borkovec (1997), worry content and the number of worry topics were examined in a clinical and analogue sample of individuals with GAD and controls. The clinical sample included patients with primary GAD and healthy controls, and the analogue sample included college students with self-reported GAD and controls. Worry themes for the clinical group were assessed with the revised Anxiety Disorders Interview Schedule-Revised (ADIS-R; DiNardo & Barlow, 1988) whereas the analogue group participants listed their most frequent worries in the GAD Questionnaire (GAD-Q; Roemer, Borkovec, Posa, & Borkovec, 1995). Worry topics were categorized into one of five categories, including family/home/interpersonal, finances, work/school, illness/health/injury, and miscellaneous. The miscellaneous category included 5 subcategories that referred to the future, successes/failure/perfectionism, travel-related worries, psychological/emotional, and minor/routine concerns. Results indicated that
individuals with GAD reported a greater number of worries as compared to the control participants. Further, the most frequent worries reported by participants of all groups were related to family/interpersonal issues. Individuals with GAD endorsed high frequencies of miscellaneous and work/school worries, whereas for the control groups, work/school worries were more prevalent as compared to the miscellaneous issues. Miscellaneous concerns reported by the GAD groups were focused primarily on minor/routine matters, such as time management and daily hassles. Overall, research suggests that worries about minor issues might differentiate individuals with GAD from nonanxious controls.

Examination of the content of worry in GAD compared to other anxiety disorders has lent some additional support for the cognitive specificity in GAD. For example, Sanderson and Barlow (1990) examined the prevalence of four worry domains, including family, finances, work, and personal illness among 22 patients with GAD. Excessive and/or unrealistic worry about family was endorsed by 79% of the GAD patients. Fifty percent of the patients reported worrying about finances, 43%, about work, and 14% about health/illness. Compared to patients with other anxiety disorders, such as social phobia and panic disorder, more patients with GAD responded affirmatively to the question “Do you worry excessively about minor things?” In a more recent study with direct comparisons among individuals with GAD and other anxiety disorders, individuals with GAD experienced future related worries more frequently as compared to the non-GAD group (Dugas et al., 1998). The non-GAD group comprised of participants with obsessive-compulsive disorder (OCD) social anxiety, panic disorder with or without
agoraphobia, specific phobia, and posttraumatic stress disorder (PTSD). Further, individuals with primary GAD worried about the future more than patients with secondary GAD (panic disorder, specific phobia, and OCD were the primary diagnoses), who worried more about the future as compared to the non-GAD group. Differences among the groups in terms of other worry domains were not revealed, as well as in terms of worry numbers. The authors argued that worrying about the future might be a defining feature of GAD, given that worrying about remote events, events that might never take place, can be rarely adaptive. One of the few studies in this area examined worry content specificity in GAD as compared to a single anxiety disorder. Specifically, Breitholtz, Johansson, and Öst (1999) found that patients with panic disorder endorsed significantly more worries related to physical danger, whereas patients with GAD reported more worries about interpersonal issues. Another study in this line of research showed that GAD patients worry more frequently about daily hassles as compared to individuals with social phobia as well as a group of healthy controls (Hoyer, Becker, & Roth, 2001). According to the authors, this finding might be a result of the GAD group’s proclivity to overestimate the impact of daily hassles in their lives or react with higher arousal to stimuli. The variability of the results across the studies is partly due to the inconsistency of the procedures and designs employed (e.g., method assessing for worry topics, criteria selected for diagnostic group assignment) by the investigators. However, most studies evidenced some worry content specificity in GAD in that worries about the future, interpersonal relationships, and minor issues were predominately endorsed by individuals with GAD.
Research examining the shared and unique features of worry content between GAD and MDD has been very limited. Empirical findings on cognitive content in general suggest that depressed individuals report more negative thoughts involving past failure and loss, whereas anxious individuals report more thoughts related to anticipated harm and danger (e.g., Clark, Beck, & Stewart, 1990; Jolly, Dyck, Kramer, & Wherry, 1994). To date, however, only two studies have specifically examined the worry content among individuals with GAD and mood disorders. Specifically, Diefenbach and colleagues (2001) compared a GAD group and a group of depressed patients on reported worry topics. Results evidenced that patients with GAD reported more worries associated with loss of control compared to the depressed group, whereas depressed patients endorsed more worries associated with aimless future, lack of confidence, relationships, and finances. The comorbid GAD/depressed group endorsed worries similar to both the GAD and depressed groups. The authors suggested that these findings offer support to the argument that worry is the factor that underlies the comorbidity between GAD and depression. Further, in a study of worry in a community sample of women in Germany, participants with GAD reported more worries related to work, family, and finances, but not daily hassles as compared to other mental health disorders, such as MDD, bipolar, social phobia, PD (Becker, Goodwin, Hölting, Hoyer, & Margraf, 2003). The authors suggested that the lack of predominance of daily hassles in the community sample reflected differences between this group and treatment-seeking individuals that should be further explored. The present study aimed to address these assumptions further.
The Present Study

Much of the research on worry content has been conducted in relation to GAD, because worry is the defining feature of the disorder. However, worry can occur in other anxiety and mood disorders. Recent research has examined the worry content in other anxiety disorders, such as panic disorder and social phobia, but little is known about the worry content in mood disorders in general and MDD in particular. Like GAD, MDD is a prevalent and debilitating disorder. Furthermore, GAD and MDD overlap substantially, which have led some investigators to propose recently that GAD should not be diagnosed independently of MDD in the DSM-IV (e.g., Watson, 2005). Thus, examining the content of worry between these two diagnostic groups has special theoretical and clinical value. With this in mind, the present study aimed to investigate the specificity of worry, both in terms of content and range, among individuals with GAD, MDD, and other anxiety disorders in a clinical and community sample. Specifically, the study groups included: 1) GAD group (without MDD), 2) MDD (without GAD), 3) GAD/MDD comorbid group, 4) ANX group (other anxiety disorders with no GAD or MDD comorbidity). The community sample also included a fifth group of healthy controls (i.e., no current diagnoses & no lifetime MDD or GAD). The main study hypotheses posited that 1) individuals in the GAD group would report more worry domains as compared to the ANX and control groups in both samples, 2) individuals in the GAD group will endorse more worries related to minor issues as compared to the ANX and control groups. The study had an explorative nature in terms of the comparisons among the GAD, MDD, and GAD/MDD comorbid group.
METHOD

Participants

Clinical sample: Participants consisted of 132 college students (90 females; 68.2%) who sought mental health treatment at a psychological clinic affiliated with a large, Midwestern university. On average, participants were 22.8 years old ($SD = 4.98$). The ethnic composition of this sample was 80.3% Caucasian, 8.3% African American, and 6.1% other. Ethnicity information was not provided for 5.3% of the participants.

Community sample: Participants consisted of 106 patients (88 females; 83%) recruited at a public hospital family medical center in a mid-sized Midwestern U.S. city. Participants were considered eligible to participate if they were over 18 years of age at the time of interview. The mean age of participants was 38.4 years, ranging from 18.8 to 79.6 years of age. The ethnic composition of this sample was 49.1% Caucasian, 40.6% African American, and with the remaining 10.3% of patients identifying as another ethnicity. The mean education level for participants was that of high school graduate, with a range of 8 to 18 years of formal education completed. Approximately 30% of participants were working outside of the home, 33% were unemployed, and 10% were disabled at the time of the study.
Procedure

_Clinic Sample:_ Participants completed the SCID prior to their first therapy session. The SCID was administered by clinical psychology graduate students who received practicum training in conducting the interview, and at least one year of weekly supervision. Interviewers were blind to participants’ self-report measure scores. Participants were assigned one or more DSM-IV Axis I diagnoses following this evaluation. The participants were divided into four groups. Specifically, the GAD group \((N = 30)\) consisted of individuals with a GAD diagnosis (e.g., primary, secondary) who did not diagnostic criteria for MDD. The MDD group \((N = 49)\) consisted of individuals with an MDD diagnosis (e.g., primary, secondary, past) without comorbid GAD. The GAD/MDD comorbid group \((N = 28)\) consisted of individuals with GAD and MDD comorbidity. The ANX group \((N = 25)\) included individuals diagnosed with anxiety disorders other than GAD (e.g., panic disorder, social phobia, PTSD, OCD, anxiety NOS) who did not receive an additional MDD diagnosis. Following their first therapy session, patients were asked by the therapist to participate in a study consisting in completing a packet of self-report measures. Participants provided informed consent and then demographic questions, the GAD-Q-IV, and other questionnaires not relevant to this study. The therapist was available to answer any questions that participants had regarding these questions.

_Community Sample:_ Participants were recruited from the waiting room of the family medical center prior to attending primary care appointments. Each participant was individually approached by a research assistant and screened for eligibility to participate.
Participants provided informed consent and then responded to demographic questions, the GAD-Q-IV, and other items not relevant to this study. Research assistants were available to answer any questions participants had regarding these questions. After completing the GAD-Q-IV, participants then elected to complete the SCID interview at that time, at a future appointment, or at a future time over the telephone. Participants were paid $25 for their time and effort. The participants were divided into five groups. The first four group assignments were similar to the group assignments in the clinical sample and included the GAD group ($N = 8$), the MDD group ($N = 19$), the GAD/MDD comorbid group ($N = 28$), and the ANX group ($N = 8$). The fifth group was a control group ($N = 43$) and consisted of individuals with no current mental health diagnosis or mental health history.

**Measures and Content Categorization**

Demographic information, including age, ethnicity, and education was assessed via self-report.

The *Structured Clinical Interview for DSM-IV-TR* (SCID; First, Spitzer, Gibbon, & Williams, 2002) is a clinician-administered diagnostic interview for Axis I disorders based on DSM-IV-TR criteria. The SCID is sensitive to both current and past mental health functioning and is well equipped to address issues of comorbidity and differential diagnosis. The length of the interview varies with individual differences, as a short screen of yes or no questions is used to determine for which modules a particular individual should be assessed. For the DSM-IV version of the SCID, Ventura, Liberman,
Green, Shaner, and Mintz (1998) reported high rate inter-rater agreement (kappa) for current diagnosis with an overall weighted kappa of .82 and a range between .71 and .90 for specific diagnoses.

The *Generalized Anxiety Disorder Questionnaire for DSM-IV* (GAD-Q-IV; Newman et al., 2002) is a 9-item self-report measure designed to reflect the diagnostic criteria for GAD as outlined in the DSM-IV (APA, 1994). Only the fifth item was relevant to the present study: “Please list the most frequent topics about which you worry excessively or uncontrollably”. This free-recall question allows the respondent to provide up to six worry topics. Using a free-recall method to assess for worry topics, as oppose to a structured measure (e.g., the person is provided with a list of worry topics and is asked to indicate which are relevant to his or her case) has a number of advantages. For example, they can assess for unsuggested, idiosyncratic worries and may be more appropriate when the research of worry content is explorative in nature (Dugas, Freeston, Doucet, Lachance, & Ladouceur, 1995). A shortcoming that needs to be considered, however, is that they are not easy to score (lack of standardized scoring method) and may fail to capture the person’s salient worries if for some reason they are not readily accessible at the time of reporting.

All worry topics reported on the GAD-Q-IV by the study participants were categorized in one of seven worry domains by two independent judges and the principal investigator. The worry domains used were as follows: 1) work/school, 2) interpersonal, 3) finances, 4) illness/health/injury of self, 5) illness/health/injury of others, 6) the future, and 7) miscellaneous. The “miscellaneous” domain was further subcategorized in four
domains including, “minor” issues (e.g., punctuality, house repairs, traffic), “psychological” (e.g., self-esteem, appearance, worry, sanity), “existential” (e.g., death, life), “community/world-affairs” (e.g., global warming, terrorist attacks), and “success/failure/perfectionism” (e.g., doing things right, not messing up). This form of worry categorization was adapted from Roemer and colleagues (1997). The principal investigator added the worry domains of “existential”, “community/world-affairs” issues to the original categories used by Roemer and colleagues. These two worry domains are included in the Anxiety Disorders Inventory Schedule for DSM-IV (ADIS-IV; Brown, Di Nardo, & Barlow, 1994) and were added in this study to capture a greater range of worry themes. For the same reason, the domain of “illness/health/injury” was subdivided to two domains; one referring to worries about one’s own health issues and the other reflecting worries concerning the health of others (e.g., family members, friends). The domains of “work/school”, “family/interpersonal”, “finances”, and “future” are included in the Worry Domain Questionnaire (WDQ; Tallis, Eysenck, & Mathews, 1992) a measure developed to assess nonpathological worry and thus were retained in the present study. The “miscellaneous” category (includes the “minor/routine” related worries) was also retained in the current study because prior research shows that this category may be specific to GAD (e.g., Craske et al., 1989; Hoyer, Becker, & Roth, 2001). The “success/failure/perfectionism” domain was retained in this study because empirical findings suggest that worry is related to perfectionism (e.g., Stöber & Joormann, 2001).

Inter-rater reliability for the worry topic categorization was estimated by using the Kappa statistic. Kappa is an index, which measures the degree of agreement between
raters while correcting for the agreement expected to result from chance alone (Cohen, 1960). For the clinical sample, agreement in categorization on 401 worries was 90.8%. For the community sample, agreement on categorization on 196 worries was 93.2%. Any worry topics that could not be classified by any one of the judges (5 worries in the clinical and 7 in the community sample) were subsequently categorized by consensus of the three judges.
RESULTS

A one-way analysis of variance (ANOVA) with Tukey post-hoc tests was conducted to investigate the relationship between diagnostic status and the number of worry domains reported by the participants. In the clinical sample, mean level differences were found on number of domains reported $F(3, 128) = 11.96, p < 0.01$ in that the GAD group ($M = 3.20, SD = 1.16$) and the GAD/MDD group ($M = 3.5, SD = 1.11$) reported more domains as compared to MDD ($M = 2.35, SD = 1.47$) and the ANX group ($M = 1.60, SD = 1.35$). In the community sample, mean level differences were also found on number of domains reported $F(4, 101) = 5.49, p < 0.01$. Specifically, the GAD/MDD group ($M = 2.03, SD = 0.88$) report more worry domains than the control group ($M = 0.95, SD = 1.00$).

Count data reflect the expected number of times an event will happen in a specified time period (Long & Freese, 2006). Count variables have unique properties in that they include nonnegative integers, they are often zero inflated, and tend to produce positively skewed distributions. Long and Freese (2006) have described four regression models appropriate for the analysis of count data, including the Poisson, Negative Binomial (NB), Zero-Inflated Poisson (ZIP), and Zero-Inflated Negative Binomial (ZINB). The NB model is utilized in cases in which the count data are overdispersed (e.g., conditional variance is significantly greater than the conditional mean). The NB reduces to the Poisson model if the conditional mean and variance are equal.
The ZIP and ZINB models are modified versions of the Poisson and NB respectively and are used to address zero-inflated data.

The worry topics assessed in this study represented the most frequent worries endorsed by the participants during the last six months. Thus, the worry topics are count data and the worry topic domains are considered count variables. As such, the count variables (e.g., worries about finances, the future, minor issues) in the present study consisted of nonnegative integers and the majority of the variables produced positively skewed distributions (skewness ranging from 2.35 to 4.04 for the clinical sample and from 3.02 to 10.30 for the community sample) with a preponderance of zeros (e.g., 77.3% of the clinical participants and 94.3% of the community participants did not endorse any future related worries). The Kolmogorov-Smirnov Z test (Massey, 1951), which tests whether a given distribution is not significantly different from the hypothesized one, was conducted for all the worry domain variables. The distributions for both the clinical and community sample conformed to the hypothesized Poisson distribution ($p = 1.00$), but did not conform to a hypothesized normal distribution ($p = 0.00$). These findings further indicate that the worry domain variables are not normally distributed and suggest that a distribution, such as the Poisson, might fit the data more accurately.

Analyses for the count variables were conducted using STATA 7 (StataCorp, 2001) on a Macintosh personal computer running OS X 10.4.9. The methodological procedure described by Karazsia and van Dulmen (in press) was used to determine which regression model provided the best fit for the data in the present study. First, the Likelihood-ratio (LR) chi square test, which tests the null hypothesis that the dispersion
parameter is zero, was reviewed to determine whether the Poisson or the NB model better fits the data. The LR test was not significant ($p > .05$) for all count variables in both the clinical and community sample indicating that the data are not overdispersed. Thus, the Poisson model predicts the observed data more accurately than the NB model. Second, the Vuong (1989) test, which assesses the null hypothesis that the two models under investigation are equally similar to the observed distribution, was reviewed to compare the ZIP and the Poisson model. Vuong values greater than +1.96 favor the zero-inflated model, whereas values less than -1.96 reject the zero-inflated model. In the clinical sample, the Vuong test results were inconclusive (values were $< +1.96$ or $> -1.96$) for all the count variables and thus the Poisson model was selected on the basis of parsimony. Similarly, the Poisson model provided the most appropriate fit for all but two variables in the community sample. The variables representing the worry domains of “minor issues” and “miscellaneous” were associated with a large, positive ($> 1.96$) and significant ($p < .05$) Vuong test. As a result, predictions about these variables were based on the ZIP model.

In the clinical sample, the GAD/MDD comorbid group was found to be a significant predictor of work/school related worries, such that individuals with GAD/MDD comorbidity endorsed more work/school related worries compared to individuals with MDD as indicated by the significant $\chi^2(1) = 4.70, p < .05$. Additionally, individuals with GAD/MDD comorbidity reported more worries concerning work/school issues than individuals with other anxiety disorders. These findings are summarized in Table 1.
Table 1.

Summary of Poisson Analysis Predicting Work/School Worries in a Clinical Sample

(N = 132)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>p</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAD</td>
<td>0.39</td>
<td>.35</td>
<td>.26</td>
<td>0.77&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.63</td>
</tr>
<tr>
<td>MDD</td>
<td>0.29</td>
<td>.33</td>
<td>.38</td>
<td>0.69&lt;sup&gt;b,c&lt;/sup&gt;</td>
<td>.68</td>
</tr>
<tr>
<td>GAD/MDD</td>
<td>0.82*</td>
<td>.33</td>
<td>.01</td>
<td>1.18&lt;sup&gt;c,d&lt;/sup&gt;</td>
<td>.77</td>
</tr>
<tr>
<td>ANX</td>
<td>-0.65*</td>
<td>.28</td>
<td>.02</td>
<td>0.52&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.72</td>
</tr>
</tbody>
</table>

\( \chi^2(3) = 7.87, p < 0.05 \)

Note. Regression coefficients (\( B \)) represent contrasts between each study group and the reference group (ANX group) with *\( p < .05 \), **\( p < .01 \) indicating significant differences. The second and third letter superscripts indicate significant mean worry differences among the various diagnostic groups as indicated by single paired contrasts performed with \( \chi^2(1) \).

In terms of the interpersonal related worries, the GAD and comorbid group assignment significantly predicted worries in this particular domain. Specifically, individuals with GAD and GAD/MDD comorbidity endorsed more interpersonal related worries as compared to individuals with other anxiety disorders (see Table 2).
### Table 2.

**Summary of Poisson Analysis Predicting Interpersonal Worries in a Clinical Sample**

*(N = 132)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>P</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAD</td>
<td>0.75*</td>
<td>.30</td>
<td>.01</td>
<td>1.27&lt;sup&gt;a,d&lt;/sup&gt;</td>
<td>1.11</td>
</tr>
<tr>
<td>MDD</td>
<td>0.47</td>
<td>.30</td>
<td>.11</td>
<td>0.96&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.00</td>
</tr>
<tr>
<td>GAD/MDD</td>
<td>0.79**</td>
<td>.31</td>
<td>.01</td>
<td>1.32&lt;sup&gt;c,d&lt;/sup&gt;</td>
<td>0.90</td>
</tr>
<tr>
<td>ANX</td>
<td>-0.51*</td>
<td>.26</td>
<td>.05</td>
<td>0.60&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.91</td>
</tr>
</tbody>
</table>

\[ \chi^2(3) = 9.16, p < 0.05 \]

*Note.* Regression coefficients (B) represent contrasts between each study group and the reference group (ANX group) with *p* < .05, **p* < .01 indicating significant differences. The second and third letter superscripts indicate significant mean worry differences among the various diagnostic groups as indicated by single paired contrasts performed with \( \chi^2(1) \).

The comorbid group also endorsed more minor worries than the MDD group [$\chi^2(1) = 4.22 \ p < .05$] and ANX group (see Table 3).
Table 3.

Summary of Poisson Analysis Predicting Minor Related Worries in a Clinical Sample
(N = 132)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>P</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAD</td>
<td>0.99</td>
<td>.57</td>
<td>.08</td>
<td>0.43a</td>
<td>0.63</td>
</tr>
<tr>
<td>MDD</td>
<td>0.51</td>
<td>.57</td>
<td>.38</td>
<td>0.27bc</td>
<td>0.49</td>
</tr>
<tr>
<td>GAD/MDD</td>
<td>1.27*</td>
<td>.56</td>
<td>.02</td>
<td>0.57cd</td>
<td>0.79</td>
</tr>
<tr>
<td>ANX</td>
<td>-1.83**</td>
<td>.50</td>
<td>.00</td>
<td>0.16d</td>
<td>0.47</td>
</tr>
</tbody>
</table>

$X^2(3) = 8.15, p < 0.05$

Note. Regression coefficients (B) represent contrasts between each study group and the reference group (ANX group) with *p < .05, **p < .01 indicating significant differences. The second and third letter superscripts indicate significant mean worry differences among the various diagnostic groups as indicated by single paired contrasts performed with $\chi^2(1)$.

Differences were also observed in terms of psychological and miscellaneous worries in this sample. Specifically, the GAD group reported more psychological worries than the MDD [$\chi^2(1) = 11.27 \ p < .01$] and comorbid group [$\chi^2(1) = 4.56 \ p < .05$] respectively (see Table 4).
Table 4.

**Summary of Poisson Analysis Predicting Psychological Worries in a Clinical Sample**

*(N = 132)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>P</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAD</td>
<td>0.51</td>
<td>.43</td>
<td>.24</td>
<td>0.53</td>
<td>0.78</td>
</tr>
<tr>
<td>MDD</td>
<td>-1.37*</td>
<td>.61</td>
<td>.03</td>
<td>0.08</td>
<td>0.28</td>
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<tr>
<td>GAD/MDD</td>
<td>-0.58</td>
<td>.57</td>
<td>.31</td>
<td>0.18</td>
<td>0.39</td>
</tr>
<tr>
<td>ANX</td>
<td>-1.14*</td>
<td>.35</td>
<td>.00</td>
<td>0.32</td>
<td>0.69</td>
</tr>
</tbody>
</table>

\[X^2(3) = 15.88, p < 0.01\]

*Note.* Regression coefficients (B) represent contrasts between each study group and the reference group (ANX group) with *p < .05, **p < .01 indicating significant differences. The second and third letter superscripts indicate significant mean worry differences among the various diagnostic groups as indicated by single paired contrasts performed with \(\chi^2(1)\).

GAD participants also reported more miscellaneous worries than participants with MDD [\(\chi^2(1) = 10.86 p < .01\)] and other anxiety disorders [\(\chi^2(1) = 6.00 p < .05\)] (see Table 5).
Table 5.
*Summary of Poisson Analysis Predicting Miscellaneous Worries in a Clinical Sample (N = 132)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>P</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAD</td>
<td>0.79*</td>
<td>.31</td>
<td>.01</td>
<td>1.23 ab,d</td>
<td>1.25</td>
</tr>
<tr>
<td>MDD</td>
<td>-0.05</td>
<td>.33</td>
<td>.07</td>
<td>0.53 bc</td>
<td>0.74</td>
</tr>
<tr>
<td>GAD/MDD</td>
<td>0.64*</td>
<td>.32</td>
<td>.05</td>
<td>1.07 cd</td>
<td>0.90</td>
</tr>
<tr>
<td>ANX</td>
<td>-0.58*</td>
<td>.28</td>
<td>.03</td>
<td>0.56 d</td>
<td>0.82</td>
</tr>
</tbody>
</table>

\[ \chi^2(3) = 15.40, p < 0.01 \]

*Note.* Regression coefficients (B) represent contrasts between each study group and the reference group (ANX group) with *p < .05, **p < .01 indicating significant differences. The second and third letter superscripts indicate significant mean worry differences among the various diagnostic groups as indicated by single paired contrasts performed with \( \chi^2(1) \).

The comorbid GAD/MDD group also reported more worries in the miscellaneous domain than the MDD \( [\chi^2(1) = 6.88 p < .01] \) and ANX group \( [\chi^2(1) = 4.73 p < .05] \). Differences among the diagnostic groups did not emerge for the rest of the worry domains in this sample.

In the community sample, three diagnostic groups emerged as significant predictors of the interpersonal related worries (see Table 6).
Table 6.

Summary of Poisson Analysis Predicting Interpersonal Worries in a Community Sample

(N = 106)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>P</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAD</td>
<td>1.55**</td>
<td>.52</td>
<td>.00</td>
<td>.88</td>
<td>.64</td>
</tr>
<tr>
<td>MDD</td>
<td>1.45**</td>
<td>.44</td>
<td>.00</td>
<td>.79</td>
<td>.98</td>
</tr>
<tr>
<td>GAD/MDD</td>
<td>1.61**</td>
<td>.40</td>
<td>.00</td>
<td>.93</td>
<td>.90</td>
</tr>
<tr>
<td>ANX</td>
<td>0.70</td>
<td>.68</td>
<td>.30</td>
<td>.38</td>
<td>.52</td>
</tr>
<tr>
<td>Control</td>
<td>-1.68**</td>
<td>.35</td>
<td>.00</td>
<td>.19</td>
<td>.39</td>
</tr>
</tbody>
</table>

\[ \chi^2(4) = 23.53, p < 0.01 \]

Note. Regression coefficients (B) represent contrasts between each study group and the reference group (Control group) with *p < .05, **p < .01 indicating significant differences. The second and third letter superscripts indicate significant mean worry differences among the various diagnostic groups as indicated by single paired contrasts performed with \( \chi^2(1) \).

Specifically, the GAD \( \chi^2(1) = 16.23 p < .01 \), MDD \( \chi^2(1) = 17.26 p < .01 \), and GAD/MDD comorbid group \( \chi^2(1) = 20.09 p < .01 \) endorsed more worries concerning interpersonal relationships as compared to the control group. With regard to financial related worries, participants with MDD \( \chi^2(1) = 16.30 p < .01 \) and GAD/MDD comorbidity \( \chi^2(1) = 12.65 p < .01 \) reported more worries about financial matters than the controls (see Table 7).
Table 7.

Summary of Poisson Analysis Predicting Financial Worries in the Community Sample

\((N = 106)\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>P</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAD</td>
<td>1.12</td>
<td>.63</td>
<td>.07</td>
<td>.50(^a)</td>
<td>.53</td>
</tr>
<tr>
<td>MDD</td>
<td>1.44(^**)</td>
<td>.47</td>
<td>.00</td>
<td>.68(^b,c)</td>
<td>.75</td>
</tr>
<tr>
<td>GAD/MDD</td>
<td>1.05(^*)</td>
<td>.47</td>
<td>.03</td>
<td>.46(^c,e)</td>
<td>.51</td>
</tr>
<tr>
<td>ANX</td>
<td>0.43</td>
<td>.80</td>
<td>.59</td>
<td>.25(^d)</td>
<td>.46</td>
</tr>
<tr>
<td>Control</td>
<td>-1.82(^**)</td>
<td>.38</td>
<td>.00</td>
<td>.16(^e)</td>
<td>.43</td>
</tr>
</tbody>
</table>

\(\chi^2(4) = 11.67, p < 0.05\)

Note. Regression coefficients (B) represent contrasts between each study group and the reference group (Control group) with \(*p < .05, **p < .01\) indicating significant differences. The second and third letter superscripts indicate significant mean worry differences among the various diagnostic groups as indicated by single paired contrasts performed with \(\chi^2(1)\).

Differences among the study groups in relation to the rest of the worry domains did not emerge in this sample.
DISCUSSION

The present study examined the similarities and differences of worry, both in terms of thematic range and content, among individuals with GAD, MDD, and other anxiety disorders. The first hypothesis concerning the range of worry domains was supported in the clinical sample, but only partially in the community sample. Specifically, participants with GAD endorsed more worry domains compared to participants with MDD or other anxiety disorders in the clinical sample. Individuals with GAD are continuously scanning their environment for threatening related stimuli and interpret ambiguous situations as dangerous (e.g., Matthews & McLeod, 1994). In addition to these attentional biases, individuals with GAD have difficulties tolerating uncertainty in their environment (e.g., Dugas, Gagnon, Ladouceur, & Freeston, 1998). In contrast, MDD is associated with memory biases towards mood-congruent events and a sense of certainty that negative events will take place (e.g., Miranda & Mennin, 2007; Watkins, Vache, Verney, & Mathews, 1996). Taken together, these different approaches to information processing may explain why individuals with GAD worry about multiple events and situations compared to individuals with MDD whose worry content may be less pervasive. The GAD/MDD comorbid group was also associated with more worry domains compared to MDD and ANX group in this sample. This finding further suggests that worrying about various life domains may be characteristic of GAD irrespective of
comorbid conditions. Although the comorbid GAD/MDD group endorsed more worry domains than the controls, similar differences did not emerge for the GAD group in the community sample.

The second hypothesis stating that participants with GAD would endorse more minor related worries compared to controls and other anxiety disorders was only partially supported in the present study. Prior studies have shown, although not consistently, that worries related to minor issues may differentiate patients with GAD from other anxiety disorders and controls (e.g., Craske et al., 1989). Roemer and colleagues (1997) have postulated that worrying about minor, everyday issues may allow individuals with GAD to destruct themselves form more emotional topics. In the present study, the comorbid GAD/MDD group, but not the GAD group, reported more worries than the MDD and ANX groups in the clinical sample. In a recent study, however, individuals with comorbid GAD/MDD endorsed more cognitive avoidance (assessed by strategies such as destruction and transformation of verbal images to thoughts) than individuals with GAD (Dupuy & Ladouceur, 2007). It is plausible that individuals with comorbid GAD/MDD worry about minor issues not only to avoid emotions associated with their anxiety but to also avoid depressive feelings and emotions. Rumination, the potential counterpart of worry in depression, also has an avoidant function. However, the ruminative process focuses on the depressive symptoms and consequences. Given that individuals with GAD experience emotions with heightened intensity (e.g., Mennin et al, 2007), rumination might not be the most appropriate avoidant strategy for these individuals. Thus, individuals with GAD may primarily rely on worry, rather than rumination, to cope with
aversive stimuli. Future studies assessing both worry and rumination in these populations may shed more light on worry content specificity.

In the clinical sample, differences among the groups emerged in terms of other worry domains as well. Specifically, participants with GAD and comorbid GAD/MDD endorsed more miscellaneous worries compared to participants with MDD and other anxiety disorders. Perhaps worrying about many different life domains allows individuals with GAD to diminish aversive reactions associated with their perception of the world as a dangerous and threatening place. Further, the GAD group reported more psychological worries as compared to the MDD, GAD/MDD, and ANX group. By definition, psychological worries were primarily concerned with self-image and self-esteem issues in this study (e.g., appearance, weight). As a result, this type of worries is closely associated with a person’s perception of their interpersonal skills and interpersonal relationships. Participants with GAD and GAD/MDD comorbidity also reported more interpersonal worries than participants with other anxiety disorders. Thus, both psychological and interpersonal related worries appear to be important in individuals with GAD. Breitholtz and colleagues (1999) found that compared to participants with panic disorders participants with GAD reported more interpersonal worries. This finding is not surprising given that individuals with GAD endorse substantial difficulties in the interpersonal realm (e.g., Borkovec, Newman, Pincus, & Lytle, 2002; Eng & Heimberg, 2006). More specifically, GAD has been associated with marital dissatisfaction (Whisman, Sheldon, & Goering, 2000), separation and divorce (Hunt, Issakidis, & Andres, 2002), and low satisfaction in terms of relationships with friends and relatives (Henning, Turk, Mennin,
Fresco, & Heimberg, 2007). Experiencing emotions with heightened intensity may also affect the interpersonal relationships of those who suffer from GAD. Newman, Castonguay, Borkovec, and Molnar (2004), for example, suggested that to avoid emotional distress individuals with GAD not only worry, but also refrain from expressing their feelings and expectations in the relationship. In the community sample, the GAD, MDD, and GAD/MDD groups reported more worries in the interpersonal domain as compared to the control participants. Thus, although interpersonal worries might be associated with psychopathology in general, they might be more prevalent in individuals with GAD who seek treatment.

In the community sample, differences were not observed in relation to the miscellaneous, minor, or psychological categories. Roemer and colleagues (1997) did not find differences in the psychological related worries between individuals with GAD and controls in both an analogue and a clinical sample. However, they noted that overall, the analogue sample, which was comprised by college students, had relatively more worries in the psychological category than participants in the clinical sample which mostly included adults in their middle adulthood. Given that the psychological subcategory includes worries related to one’s self-image and self-esteem, it might be more relevant to younger populations than populations comprised of older adults. This explanation might account for the lack of differences in psychological related worries among the participants in the community sample in the present study. Differences among the community and the clinical sample emerged in terms of other worry domains as well. Specifically, although differences in minor worries were observed among the study
groups in the clinical sample, the study groups in the community sample did not differ in terms of minor worries. This difference between the two samples may be attributed to different characteristics among treatment seeking patients and primary care patients. This finding is consistent with a recent study conducted by Becker and colleagues (2003). Specifically, the investigators found that individuals with GAD in a community sample did not differ from individuals with other anxiety and mood disorders in terms of minor related worries. An important area of future research will be to further examine which specific characteristics of the disorder (e.g., symptom severity, chronicity) influence worry content.

In terms of work/school related worries, the GAD/MDD group reported more worries compared to the MDD and ANX group in the clinical sample. This worry domain is highly relevant to this sample, which is comprised by college students. Thus, all of the participants in this sample are expected to worry about work/school to some degree. Research has shown that the use of worry in GAD is associated with positive beliefs, such as that worry helps one get motivated, problem solve, and prevent negative events from happening in the future (e.g., Borkovec and Roemer, 1995; Dugas et al., 1998). Perhaps rumination about past school failures increases the use of worry as a means to motivate the person to deal with current and future school related problems and improve their ability to resolve them. In the community sample, differences in terms of work/school did not emerge. However, the MDD and the GAD/MDD group endorsed more financial related worries than the controls. Similarly to the work/school worries in
the clinical sample, financial worries are highly relevant to this group given that 34% of the sample reported being unemployed and 11.3% reported being disabled.

Findings from the current study must be considered in light of some limitations. First, the sample size for some of the groups in the community sample (e.g., GAD and other anxiety disorders) was small, which limits the generalizability of the study’s results. Thus, replication of the present study with a larger, more balanced community sample would be important. Second, the clinical sample did not include a nonpathological control group and it was primarily comprised of high functioning college students. Replicating the findings from the present study with diverse clinical populations will expand our understanding of worry content specificity. Third, the assessment of worry content was based on a free-recall measure that could generate up to six worries. Although this approach generates ideographic responses, it may fail to assess a wide range of worries experienced by the participant at the time of the study and limits the number of reported worries to six. Thus, a combination of a free recall and a structured measure might provide a more accurate assessment of worry content.

The present study was the first to examine the common and distinguishing features of worry content between GAD and MDD in both a clinical and a community sample. Results suggested that worry content is specific to GAD as compared to MDD and this specificity might explain some of the unique features of worry content associated with the comorbid GAD/MDD condition. Given the substantial overlap between GAD and MDD at the cognitive level, identifying the research in this area will further enhance
our understanding of the mechanisms responsible for the development and maintenance of these chronic and debilitating mental health problems
REFERENCES


APPENDIX: SCALES

The Generalized Anxiety Disorder Questionnaire for DSM-IV
(GAD-Q-IV; Newman, Zuellig, Kachin, Constantino, Przeworski, Erickson, & Cashman McGrath2001)

Yes     No

1. Do you experience excessive worry?
   o      o

2. Is your worry excessive in intensity, frequency, or amount of distress it causes?
   o      o

3. Do you find it difficult to control the worry (or stop worrying) once it starts?
   o      o

4. Do you worry excessively or uncontrollably about minor things such as being late
   for an appointment, minor repairs, homework, etc.?
   o      o

5. Please list the most frequent topics about which you worry excessively or
   uncontrollably (darken the circle in front of each worry you list):

   o ___________________________ o ___________________________

   o ___________________________ o ___________________________

   o ___________________________ o ___________________________

   o ___________________________ o ___________________________

44
6. During the past 6 months have you been bothered by excessive worries more days than not?  

7. During the past 6 months have you often been bothered by any of the following symptoms?
   - restlessness or feeling keyed up or on the edge
   - irritability
   - difficulty falling/staying asleep or restless/unsatisfying sleep
   - being easily fatigued
   - difficulty concentrating or mind going blank
   - muscle tension

8. How much worry and physical symptoms interfere with your life, work, social activities, family, etc.?
   - None
   - Moderate
   - Mild
   - Severe
   - Very Severe

9. How much are you bothered by worry and physical symptoms (how much distress does it cause you)?
   - None
   - Moderate
   - Mild
   - Severe
   - Very Severe