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An Examination of Psychoeducation and its Potential Modifying Influence on Alcohol Use Patterns Among Adults Reporting Co-Occurring Posttraumatic Stress Symptoms and Hazardous Alcohol Consumption

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by

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Abstract

Research has suggested that consumption of alcohol in the presence of elevated posttraumatic stress symptom (PTSS) may serve an avoidant function to cope with negative emotions. These coping-related motives for use are theorized to both maintain PTSS and relate to poorer prognoses in treatment for alcohol use disorders (AUDs). Treatments utilizing coping skills training, which typically also involves educating clients about the negative consequences of drinking alcohol to cope, suggest the utility of targeting coping behaviors to reduce alcohol use. These studies, however, have not attempted to isolate the effects of psychoeducation on alcohol-related factors. The current study investigated the utility of providing integrated psychoeducation to modify alcohol use outcomes and also examined, on an a priori basis, the potential moderating impact of biological sex on the effects of psychoeducation. Results demonstrated that psychoeducation addressing PTSS and alcohol use specifically was superior to a general health control condition in improving motivation to change alcohol use behaviors. Confidence to refrain from alcohol and coping-motivated drinking were not significantly influenced by psychoeducation. Finally, biological sex was not demonstrated to have a moderating influence on psychoeducation. Together, results suggest that educating individuals on the impact of PTSS and hazardous alcohol use on both mental and physical health may facilitate motivation to change their behavior; however, an additional component of psychoeducation (e.g., alternative coping strategies) may be necessary to modify coping-motivated use and enhance one's confidence to refrain from alcohol in the context of negative affect.

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Dedication

My sincerest gratitude to my family, friends, and colleagues for their unwavering support during my journey through graduate school. To my husband, my great motivator and inspirational speaker. To my parents for instilling in me the courage to never give up. And to my faculty mentor and lab mates for facilitating my growth as a professional. This dissertation is dedicated to all of you working behind the scenes to help me to shape my career.

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An Examination of Psychoeducation and its Potential Modifying Influence on Alcohol Use Patterns Among Adults Reporting Co-Occurring Posttraumatic Stress Symptoms and Hazardous Alcohol Consumption

Posttraumatic stress disorder (PTSD) and alcohol use disorders (AUDs) are common, costly, chronic and debilitating psychiatric disorders (Anderson et al., 1993; Edwards et al., 1994; Kessler, 2000; Kessler et al., 2005; World Health Organization, 2008; Zatzick et al., 1997). PTSD involves a failure to recover from initial symptomatic reactions to a traumatic event and is evidenced in a substantial minority of traumatic-event exposed people (Gilboa-Schechtman & Foa, 2001; Kessler et al., 1995). Evidence suggests that PTSD lies at the upper end of a continuum of posttraumatic stress symptom (PTSS) reactions to traumatic event exposure, as opposed to being a discrete category of psychopathology (Broman-Fulks et al., 2006; Ruscio et al., 2002), with recent research also demonstrating the clinical significance of relatively elevated posttraumatic stress symptoms that do not meet diagnostic thresholds—otherwise known as “subthreshold” or “subsyndromal” PTSD. For instance, one recent student demonstrated that impairments among individuals with subthreshold levels of PTSD experience impairments comparable to those with full PTSD and that these symptoms tend to be unremitting over time (Cukor, Wyka, Jayasinghe, & Difede, 2010).

Alcohol dependence is characterized by tolerance of, or withdrawal from, alcohol (American Psychiatric Association, 2000). Alcohol abuse is defined as alcohol use that causes psychosocial impairment, occurs in physically hazardous circumstances, or results in legal difficulties and is diagnosed only in the absence of alcohol dependence (APA, 2000). In addition to these diagnosable conditions, multiple other constructs have been employed to describe problematic patterns of alcohol misuse. Hazardous drinking describes a relatively broader pattern

of alcohol use that increases the risk of harmful consequences for the user and/or others (Babor et al., 1994). Indeed, hazardous patterns of drinking, including binge drinking, are considered to be a significant risk factor in the development of an AUD (Babor et al., 2001).

Emerging research suggests a common co-occurrence between PTSD and AUDs; more specifically, national estimates suggest AUDs co-occur with PTSD for as many as 52% of men and 28% of women (Kessler et al., 1995). Of great concern are the observations that comorbid PTSD-AUDs are frequently linked to greater problem severity and poor prognosis compared to individuals without this comorbidity. For instance, people suffering from comorbid PTSD-AUD report greater PTSD severity (Saladin et al., 1995), are at elevated risk for alcohol use relapse (Jacobsen et al., 2001), and experience higher rates of medical problems and inpatient treatment utilization (McCarthy & Petrakis, 2010). Quality of life also is negatively impacted by this comorbidity as evidenced by elevated risk of suicide (Pietrzak et al., 2010) and psychosocial impairments (e.g., unemployment, limited social support, less education; Riggs et al., 2003).

Treatment research also highlights the complexities associated with comorbid PTSD-AUDs and indicate this particular comorbidity is associated with: (1) poor adherence (Hien et al., 2000), (2) high attrition rates (Najavits et al., 1998), and (3) impaired functioning post-treatment (Oiumette et al., 1999) for people with comorbid PTSD-AUDs. Treatment of comorbid PTSD-AUDs has typically employed a sequential approach, in which abstinence from drinking is required prior to PTSD treatment initiation (Ham et al., 2011). Indeed, referral to substance use treatment prior to initiating trauma-focused interventions was traditionally the preferred approach due to the belief that successful treatment of an AUD would relate to greater emotional stability during subsequent PTSD treatment (Ham et al., 2011). Research supporting this approach has found that the continued use of alcohol during PTSD treatment relates to higher

attrition (van Minnen & Hagenaars, 2002). Treatment outcome research is available for two sequential treatment approaches for co-occurring substance use disorders (SUDs). Transcend is a 12-week, partial hospitalization program in which substance-focused skill development in the first 6 weeks is followed by trauma processing. Only one study has examined the efficacy of this approach and utilized a male Veteran sample. Results suggested a decrease in PTSD symptoms and significant decreases in alcohol consumption (Donovan, Padin-Rivera, & Kowaliw, 2001). Substance Dependence PTSD Therapy (SDPT; Triffleman, Carroll, & Kellogg, 1999) is another sequential, two-phase approach for treatment of comorbid PTSD-SUD. Phase I, or the "Trauma-Informed, Addictions Focused Treatment" phase, is 12 weeks in duration and focuses primarily on abstinence from substance use. Phase II, or the "Trauma-Focused Addictions Informed" phase, is the focus for the remaining 8 weeks of the treatment and emphasizes treatment of PTSD using SIT and in vivo exposure. During this phase, substance use is addressed only in terms of continued active monitoring of abstinence status. In a small open trial comparing SDPT to 12-step treatment, SDPT was not found to outperform the addiction-focused comparison group (Triffleman, 2000).

The limited available treatment outcome research for sequential treatments suggests this approach may not be optimal for people suffering from both elevated PTSS and hazardous drinking as it fails to recognize the functional inter-dependence of the comorbid conditions (Najavits, 2004; Stewart & Conrod, 2003). For example, people with elevated PTSS report drinking to cope with posttraumatic stress-related negative affect (e.g., Dixon et al., 2009; Nishith et al., 2001; Waldrop et al., 2007) and this drinking motive is associated with the maintenance of both drinking problems (DeMartini & Carey, 2011) and PTSS severity (via avoidance that interferes with habituation to traumatic event cues; Back et al., 2006), which is

central to PTSS recovery (Foa & Kozak, 1986). This example further illustrates that drinking to reduce posttraumatic stress-related negative affect has been implicated in the maintenance of comorbid PTSD-AUD.

A growing recognition that attaining abstinence from substances in the absence of relief from PTSD symptoms can prove difficult for individuals with comorbid PTSD-AUD has resulted in the development of concurrent approaches to treatment. In this approach, target comorbid conditions simultaneously, but each condition is treated independently, often by different treatment providers entirely. This approach has the advantage of initiating treatment for both PTSD and an AUD at the same time. However, like sequential approaches, concurrent treatments do not necessarily target the mechanisms implicated in the comorbidity per se. Further, many concurrent approaches combine existing treatments demonstrated as effective for either PTSD (e.g., exposure) or AUDs (e.g., coping skills therapy) that result in cumbersome and lengthy treatment packages. A recent randomized controlled study examined the efficacy of a concurrent approach to PTSD-AUD treatment involving cognitive-behavioral treatment and medication management for alcohol dependence and prolonged exposure (PE; Foa, Hembree, Rothbaum, 2007) for PTSD. Outcomes suggested that this concurrent approach resulted in significant reductions in PTSD symptoms and reduced alcohol cravings in comparison to a control condition (Riggs & Foa, 2008). Although referred to as an integrated treatment in some cases, Concurrent Treatment of PTSD and Substance Use Disorders with Prolonged Exposure (COPE; see Back, 2010) this approach appears to blend both sequential and concurrent approaches. More specifically, sessions 1-4 focus on motivational enhancement and cognitive-behavioral therapy (CBT) for substance abuse with exposure not initiated until session 5, which is congruent with a sequential approach. However, in this treatment, psychoeducation about the

interplay of PTSD and SUD symptoms also occurs in sessions 1-4 and the entirety of the intervention occurs with one therapist, all of which is congruent with an integrated approach. Preliminary research suggests that COPE was effective at reducing PTSD symptom severity and severity of substance use in both an uncontrolled trial (N = 15; Brady et al., 2001) and, more recently, in a randomized controlled trial (N = 55; Mills et al, 2012).

On the forefront of new research targeting comorbid PTSD-AUDs, integrated treatment targets comorbid conditions simultaneously and aims to modify factors implicated in the maintenance of both conditions. Research is increasingly supporting integrated treatment approaches. First, studies suggest clients prefer integrated treatment over sequential and concurrent approaches (Brown et al., 1998). Also, integrated treatment for comorbid PTSD-nicotine dependence may outperform concurrent treatment by reducing the severity of both conditions, as opposed to only nicotine dependence (Feldner, Smith, et al., 2013; cf., McFall et al., 2010). Although integrated approaches are increasingly being studied, no empirically-established treatments for (subthreshold) PTSD and hazardous alcohol use exist (Foa & Williams, 2010). For example, a recent study examining a well-established theory-based (as opposed to evidence-based) integrated treatment (i.e., Seeking Safety; Najavits, 2002) found that Seeking Safety did not outperform a health information control group (Hien et al., 2009). Although Seeking Safety targets both PTSD and SUDs, it did not originally include an exposure component, despite research indicating that exposure is the gold-standard approach for PTSD symptom reduction (Institute of Medicine, 2008). Instead, Seeking Safety incorporates CBT for PTSD and CBT for SUDs and is considered a “first-stage” approach to treatment; in other words, it is conceptualized as a “safe” first step alternative for individuals exhibiting high-risk behaviors (e.g., suicidality) common to PTSD and SUDs who are not prepared (or unwilling) to engage in

exposure therapy. A recent review found that, of the eight studies examining the effectiveness of Seeking Safety, half were uncontrolled trials and half were randomized controlled trials (van Dam, Vedel, Ehring, & Emmelkamp, 2012). Results from both the uncontrolled and controlled trials suggest significant improvements in both PTSD and SUD symptom severity; however, controlled trials also suggested that although Seeking Safety resulted in symptom decreases it was not clearly superior to treatment as usual for SUDs (Hien et al., 2004). Taken together, reviews for current treatment approaches for comorbid PTSD-SUDs conclude that greater methodological rigor is necessary to elucidate the mechanisms involved in symptom improvement as well as the sustainability of changes (van Dam et al., 2012). Further, most treatment outcome studies include a wide variety of SUD diagnoses, creating uncertainty as to whether these approaches are equally effective for all substances. Finally, existing treatment outcome research spans a broad variety of populations and settings (e.g., women, Veterans, prisoners) which proves difficult in determining the generalizability of the intervention techniques.

One factor posited to be implicated in the maintenance of comorbid PTSD-AUDs, coping motives for substance use, is a theoretically-relevant target for integrated treatment approaches. Indeed, a leading hypothesis forwarded to explain PTSD-AUD comorbidity is the Self-Medication Hypothesis (Khantzian, 1985), which posits that alcohol use is aimed at the reduction of aversive mood states. In particular, this model suggests that people who drink to reduce negative affect are likely to drink to cope with (or self-medicate) PTSD symptoms. Among people with PTSD, alcohol use tends to be situation-specific, occurring in contexts previously associated with alcohol's tension-reduction effects (Sharkansky et al., 1999; Stewart et al., 2000). Further, coping motivations for use are hypothesized to negatively reinforce the use of

alcohol to manage PTSS (Cooper, 1994; Stewart, 1997). This negative reinforcement (i.e., reduction of negative affect) motive for alcohol use is associated with more drinking-related problems than positively reinforced motives for use (e.g., social motives; Cooper, 1994). Moreover people with elevated PTSS endorse greater motivation to use alcohol to reduce general negative affect and aspects of the PTSD syndrome. Treatment outcome literature has supported the self-medication theory of comorbid PTSD-SUD by demonstrating that a decrease in PTSD symptoms is not only associated with a decrease in substance use but that a worsening of PTSD symptoms is associated with increased substance use (Back, 2010). Furthermore, people with elevated PTSS endorse greater negative affect reduction motives for drinking (Dixon et al., 2009; Waldrop et al., 2007) and report drinking to cope with sleep problems (Keane et al., 1988; Nishith et al., 2001), which are central to the PTSS syndrome (Spoormaker & Montgomery, 2008).

Importantly, drinking is likely to maintain PTSS in the long term, rather than alleviate it as drinking prevents the type of habituation necessary for recovery from traumatic event exposure (Back et al., 2006; Foa & Kozak, 1986). Further, elevated PTSS is likely to maintain drinking via short-term negative reinforcement associated with drinking to reduce negative affect (e.g., Kaplan & Pokorny, 1978). Moreover, epidemiological studies indicate that people with anxiety disorders who drink to self-medicate are at elevated risk for developing alcohol dependence (Menary et al., 2011). Taken together, research has outlined a vicious cycle wherein drinking to reduce PTSS results in alcohol dependence, which is likely to maintain PTSS, and so on.

Although there are clear links among PTSS, coping motives for drinking, hazardous drinking, and the functional inter-relations among these factors, there are at least two significant

limitations to extant research that preclude directly informing treatment development with existing evidence. First, no research has directly manipulated negative affect reduction motives for use among individuals with co-occurring elevations in PTSS and hazardous alcohol use and therefore the effects of doing so remain unclear. Second, coping skills training has been included in treatments for comorbid PTSD and alcohol misuse, which typically also involves educating clients about the negative consequences of drinking alcohol to cope with PTSS (e.g., Donovan et al., 2001). These studies, however, have not attempted to isolate the effects of psychoeducation on alcohol-related factors, and do not report evidence for the efficacy of this specific intervention component. Developing our understanding of the effects of psychoeducation regarding the interplay between elevated PTSS and hazardous drinking is critical for understanding if such a component should be included in treatment protocols or if it only unnecessarily extends treatment duration. Moreover, understanding if different approaches to such psychoeducation (e.g., integrated versus concurrent) differentially impact these targets also is necessary to inform how such psychoeducation should be delivered.

It is also important that no research on PTSS-hazardous drinking interventions has examined sex as a moderator of the effects of psychoeducation targeting motives for alcohol use. This is noteworthy as women report greater motivation to drink to reduce negative affect (Norberg et al., 2010) and they are more vulnerable to PTSD development (Tolin & Foa, 2006), whereas men are more likely to report an AUD in the context of PTSD than women (Kessler et al., 1995). Related research suggests that biological sex may influence the relation between negative affect reduction motives for alcohol use and frequency of alcohol use (DeMartini & Carey, 2011), with these motives for use associated with higher rates of alcohol consumption (Stewart et al., 1999). Taken together, this work suggests that men and women are likely to

differentially respond to interventions targeting negative affect reduction motives underlying comorbid PTSD-AUD.

The current study had two primary aims. The first aim was related to investigating the utility of an integrated psychoeducation approach focused on reducing coping motivated alcohol use in comparison to both a general health information approach and a concurrent approach. It was hypothesized that integrated psychoeducation will be associated with: 1a) increased confidence to refrain from alcohol, 2a) increased motivation to change drinking behaviors, and 3a) reductions in reported coping motives for use. A key aspect of this aim was to examine the effect of psychoeducation on drinking-related outcomes in the presence of PTSS and alcohol-related cues, utilizing the script-driven imagery procedure. More specifically, participants were presented with a 45 second, ideographic script containing both trauma-relevant and alcohol-relevant content. These types of cues can trigger cravings for alcohol use (Childress et al., 1986 a,b), particularly among people who drink to reduce negative affect (Saladin et al., 2003). Presentation of these cues will increase the external validity of the design by modeling high risk drinking scenarios for hazardous drinkers with at least subthreshold PTSD.

The second aim of this project was to examine the impact of sex on the relation between the psychoeducation conditions and confidence to refrain from alcohol, motivation to quit, and reductions in reported coping motives for use on an a priori basis. Due to the absence of any existing research examining potential sex differences in relation to psychoeducation effects on these alcohol-related outcomes this is considered an exploratory aim. An interaction between sex and condition will be examined: in terms of: 1b) confidence to refrain, 2b) motivation to change, and, 3b) changes in reported coping-motives for use, to explore possible influences of sex on psychoeducation.

Method

Participants

Participants for the current study were adults recruited from the University of Arkansas-Fayetteville and the local Northwest Arkansas community. Inclusion criteria included meeting criteria for at least subthreshold PTSD and hazardous drinking patterns. Subthreshold PTSD was defined, consistent with prior research (e.g., Stein et al., 1997), as meeting DSM-IV-TR (APA, 2000) criteria A for PTSD, having a minimum of 1 symptom in each of the clusters B (i.e., re-experiencing symptoms), C (i.e., avoidance/numbing), and D (i.e., hyperarousal), and meeting criteria E (i.e., duration of symptoms > one month) and F (i.e., clinically significant distress or impairment). Hazardous drinking was defined as a score of 8 or higher on the AUDIT (Alcohol Use Disorder Identification Test; Babor et al., 2001) consistent with previous studies (e.g., McDevitt-Murphy et al., 2010).

Exclusionary criteria included: (1) current or past suicidal intent or psychotic symptoms; (2) limited mental competency and the inability to give informed, voluntary, written consent; (3) current use of substances with a high risk of overdose (operationalized as a safety ratio < 10; i.e., heroin, methamphetamine); and (4) score of 15 or greater on the AUDIT (Babor et al., 2001), which serves to exclude drinkers that likely need intensive treatment for an AUD (Babor et al., 2001). Participants also were excluded from participation in the study if they report experiencing any DSM-IV-TR-defined traumatic event during the past month.

Inclusion and exclusion criteria resulted in 14 individuals screening out of the study following completion of Part I of the protocol. The final sample consisted of 76 adults (M_{age} = 26.85, *SD* = 7.57; 59.2% female). The majority of the sample reported Caucasian ethnicity (78.7%) with the remainder reporting “Other” (6.7%), Asian (5.3%), American Indian/Alaskan

Native (5.3%), African-American (2.7%), and Multiracial (1.3%). A total of 20 participants (27.4%) met full criteria for PTSD, 47 participants (64.4%) met criteria for alcohol dependence, and 10 participants (13.7%) met criteria for alcohol abuse.

Measures

Clinician-Administered PTSD Scale (CAPS). The CAPS (Blake et al., 1995) was used to index history of DSM-IV-TR-defined traumatic event exposure (APA, 2000), including most distressing event, time since exposure, and total number of exposures, as well as frequency and severity of PTSS and related impairment and distress. The CAPS has excellent psychometric properties, including high inter-rater reliability, strong convergent validity, and robust diagnostic specificity, and is considered one of the gold standard interviews in posttraumatic stress symptom assessment (Weathers et al., 2001). The "1,2" criteria, defined by a symptom reported to have occurred at least once in the past month and result in at least moderate distress or impairment, was utilized to assess criteria for subthreshold or full PTSD. A total severity score was used to evaluate baseline equivalency of symptoms across psychoeducation groups and was computed by summing the frequency and intensity of the 17 symptoms of PTSD, resulting in a range of 0-136.

Alcohol Use Disorders Identification Test (AUDIT). The AUDIT (Babor et al., 2001) is a widely used, well-established, and psychometrically sound questionnaire that measures both frequency and amount of alcohol use and impairments resulting from use. A recent systematic review found that the AUDIT demonstrates high internal consistency, high test-retest reliability, and excellent sensitivity and specificity (de Meneses-Gaya, Zuardi, Loureiro, & Crippa, 2009). The measure was used in the current study to index hazardous drinking, defined as a score of 8

or above on the measure (Babor et al., 2001). Individuals scoring greater than 15 on the AUDIT were excluded from participation, resulting in a range of 8-15 for this measure.

MINI-International Neuropsychiatric Interview (MINI). The M.I.N.I (Sheehan et al., 1998) is a structured clinical interview that was used to identify current and lifetime histories of Axis I diagnoses, including AUDs. This instrument also was used to identify the presence of past or current suicidality. The MINI has demonstrated high specificity for each evaluated disorders, as well as excellent inter-rater reliability (Sheehan et al., 1998).

Drinking Motives Questionnaire (DMQ). The well-established, 15-item DMQ (Cooper et al., 1992) evaluates three distinct motives for alcohol use (i.e., coping, social, and enhancement). This version of the DMQ has demonstrated high internal consistency and confirmatory factor analyses suggest the 3-factor model provides a better fit than a 2-factor or unidimensional model (Stewart, Zeitlin, & Samoluk, 1996). The coping subscale was utilized in the current study to measure changes in reported alcohol use as a negative-affect reduction strategy and has a possible range of 0-20, with higher scores representing a higher likelihood of coping-motivated use. A modified version of this subscale was administered after the imagery procedure that focuses on likelihood of future drinking to cope. For instance, participants rated the likelihood that they *will* drink "to forget…worries." The DMQ was utilized as a dependent variable to assess motives for alcohol use and was administered both during Part I of the study and following the psychoeducation procedure in Party II of the study.

Alcohol Abstinence Self-Efficacy Scale (AASES). The AASES is a 20-item measure that demonstrates high internal consistency, convergent validity, and divergent validity (DiClemente et al., 1994). This measure includes 4 subscales (negative affect, social positive, physical and other concerns, and withdrawal and urges) to measure self-efficacy to abstain from

alcohol across a variety of situations. The total score was used to measure confidence to refrain from alcohol and was administered both during Part I of the study and following the psychoeducation procedure in Party II of the study. The total score has a possible range of 0-100 with higher scores representing greater confidence to refrain from alcohol.

The University of Rhode Island Change Assessment Scale (URICA). The URICA (DiClemente & Hughes, 1990) is a 24-item measure of readiness to abstain from alcohol. Validation analyses indicate a replicable four-factor structure (Precontemplation, Contemplation, Action, and Maintenance) with adequate internal consistency as well as predictive validity among alcohol treatment completers (Pantalon, Nich, Frankforter, & Carroll, 2002). This measure allows calculation of a single readiness to change score, which was utilized in the current study as a measure of motivation to change alcohol use and was administered both during Part I of the study and following the psychoeducation procedure in Party II of the study. The readiness to change score is calculated by, 1) summing items from each subscale and dividing by 6 to obtain means for each subscale and 2) summing the means from the Contemplation, Action, and Maintenance subscales and subtracting the Precontemplation mean. Thus, higher scores indicate a greater readiness to change.

Procedure

Interested individuals who contacted the laboratory were first administered a standardized phone screening interview, which involved assessment of the presence of a potentially-traumatic event as well as hazardous use of alcohol. Individuals meeting both the traumatic event exposure and alcohol use criteria were invited to the laboratory to complete Part I of the study. Upon arrival, informed consent was obtained prior to participating in the following procedures, which have been approved by the University of Arkansas's Institutional Review Board (IRB). All

participants were given the option to withdraw at any point during the study. No participants opted to discontinue or withdraw from the study.

Subsequent to the informed consent process, participants completed a brief battery of self-report measures that included demographics and baseline assessment of drinking motives (DMQ), abstinence self-efficacy (AASES), and motivation to change alcohol use (URICA). The CAPS was then administered by the primary investigator, during which participants were interviewed regarding their index traumatic event (i.e., the traumatic event they have experienced which has caused them the greatest amount of distress or impairment). The MINI was administered following the CAPS interview. Following completion of these baseline measures and structured interviews, participants were informed whether they were eligible to participate in Part II of the study. Participants who 1) did not meet subthreshold criteria for PTSD as indexed by the CAPS interview, or 2) reported current or past suicidality or psychotic symptoms during the MINI were not eligible to participate in Part II of the study. These participants were asked to complete a second battery of questionnaires (to facilitate comparisons between Part I-only and Part I & II completers), compensated $10, debriefed, and thanked for their participation.

Participants eligible to participate in Part II of the study were given the option to complete the second questionnaire battery in the laboratory or on their own time before their second appointment at the laboratory. Part II-eligible participants were then provided instructions to write three ideographic scripts which were utilized during the second appointment for the script-driven imagery procedure. Participants were asked to write a neutral event script (e.g., going to the grocery story), a traumatic event-relevant script (i.e., the event discussed during the CAPS interview), and an alcohol-relevant script (e.g., a situation or place in which they had an urge to consume alcohol). Following completion of the writing portion, participants were

compensated $10, given the opportunity to ask questions, and scheduled for their second appointment.

The second appointment involved first completing a short battery of questionnaires, including baseline ratings of a variety of affective states (e.g., anxiety, anger, sadness). Participants were then randomly assigned to 1 of 4 psychoeducation conditions: 1) general health information (i.e., healthy nutrition, exercise, and sleep strategies), 2) PTSD followed by AUD information (i.e., avoidance symptoms of PTSD/physical and mental health consequences of hazardous alcohol use), 3) AUD followed by PTSD information (i.e., the same information provided in group two, presented in reverse order) and 4) integrated PTSD-AUD information (i.e., drinking to cope as a factor maintaining PTSD and AUD symptoms). Each group presentation was of comparable duration, lasting approximately 30-40 minutes. Subsequent to the psychoeducation presentation, participants engaged in the script-driven imagery procedure. This involved: 1) a 5-minute baseline period during which participants were instructed to relax, 2) a 30-second neutral script, 3) a 30-second imaginal rehearsal period, 4) a 30-second relaxation period, 5) an integrated 45-second traumatic event and alcohol use script. Affect ratings as well as ratings of craving for alcohol were assessed before and after the neutral script as well as before and after the integrated traumatic event/alcohol script. Participants then completed the DMQ, AASES, and URICA for the second time. Finally, participants were asked to select and view one of three positively-valenced video clips, each lasting approximately 5 minutes, and provided affect ratings post-video. Finally, participants were provided an NIAAA-brochure targeting alcohol use reduction and the information outline from the integrated psychoeducation condition as part of a thorough debriefing interview. They were then compensated $30 and thanked for their participation.

Data Analytic Strategy

Condition equivalence with regard to baseline characteristics was tested using one-way analyses of variance (ANOVA) tests to validate the efficacy of random assignment. This involved condition comparisons on demographic (e.g., age, ethnicity, SES) and other (e.g., posttraumatic stress symptoms, AUDs, motives for use) characteristics. Zero-order correlations were examined among all primary dependent variables and inclusion variables (i.e., posttraumatic stress symptoms and alcohol use).

A series of mixed-factorial analyses of variance (ANOVA) were used to test the hypotheses that integrated psychoeducation will be associated with: 1a) increased confidence to refrain from alcohol, 2a) increased motivation to quit drinking, and 3a) reductions in reported coping motives for use, compared to the general health and concurrent conditions. Each analysis tested for differences in the repeated measurement of each of the primary dependent variables (i.e., DMM, AASES, and URICA) across conditions. This approach yielded a 3 separate 4 (condition) by 2 (repeated measure: pre-education, post-script) repeated measures ANOVAs.

The exploratory analysis of the impact of sex on the relation between psychoeducation conditions and confidence to refrain, motivation to quit, and changes in coping-related motives for alcohol use was examined by repeating the analyses above with sex entered as a second grouping variable.

Results

In support of the effectiveness of random assignment, one-way ANOVAs demonstrated no between-group differences on variables of interest, with the exception of CAPS severity scores, which significantly differed (F (3, 75) = 2.94, $p < .05$) between groups 1 (M = 34.94) and

3 (M = 26.36) and groups 2 (M = 37.47) and 3 (M = 26.36). As a result, CAPS severity scores were included as a covariate in all between-groups comparisons.

Refer to Table 1 for zero-order correlations between variables of interest. Notably, posttraumatic stress symptom severity was significantly positively associated with coping-motivated drinking at baseline (r = .36, p < .01) and significantly negatively associated with abstinence self-efficacy at baseline (r = -.25, p < .05). Results also demonstrated a significant negative association between coping-motivated drinking and abstinence self-efficacy at baseline (r = -.43, p < .01).

Prior to conducting mixed-factorial ANOVAs to test the primary hypotheses, the data were analyzed for missing data and univariate outliers. Three participants (one each in groups 1, 3, and 4) were found to have extreme scores on at least one dependent variable (defined as z-scores with absolute values greater than 2.5; Stevens, 2009). The decision to remove these participants was made for two reasons: 1) removal of outliers will increase power and thus provide a more accurate test of null effects (Myers, Well, & Lorch, 2010), and 2) removal of these outliers reduced the skewness of the dependent variables. The assumptions of normality and homoscedasticity were met.

Contrary to the hypothesis, repeated measure ANOVAs covarying for observed group differences in CAPS severity scores demonstrated non-significant psychoeducation condition differences in changes in self-reported coping-motivated drinking (F (3, 68) = .22, p > .05) and confidence to refrain from alcohol use (F (3, 68) = .56, p > .05) from baseline to post-script.

Consistent with hypotheses, repeated measure ANOVAs covarying for CAPS severity scores demonstrated significant differences between psychoeducation conditions in changes in URICA-readiness scores from baseline to post-script (F (3, 68) = 3.46, p < .05). Post-hoc

specialty contrasts between: 1) group 1 vs. groups 2, 3, 4, and 2) groups 2, 3 vs. group 4, were used to further examine whether active (i.e., symptom-focused) psychoeducation outperformed general health information and whether the integrated group improved more on URICA scores than concurrent education, respectively. Results demonstrated that the symptom-focused psychoeducation outperformed the control group, such that those in groups 2, 3, and 4 reported significant increases in readiness to change alcohol use, measured by the URICA (F (1, 71) = 8.11, $p < .01$).

Exploratory repeated measures ANOVAs conducted to determine whether psychoeducation had differential effects on males or females demonstrated non-significant interactions between sex and group condition for self-reported coping-motivated drinking (F (3, 64) = .86, $p > .05$), confidence to refrain from alcohol (F (3, 64) = .21, $p > .05$), and motivation to change alcohol use (F (3, 64) = 2.15, $p > .05$) after covarying for CAPS severity scores.

Discussion

The current study sought to examine whether varying approaches to psychoeducation have a potentially modifying influence on factors posited to be related to co-occurring posttraumatic stress and hazardous alcohol use. In particular, it was hypothesized that integrated approaches would be superior to traditional approaches to psychoeducation (e.g., concurrent approaches) in decreasing self-reported coping motives for alcohol use, increasing confidence to refrain from alcohol use in the context of negative affect, and increasing motivation to change alcohol use. This hypothesis was grounded in emerging research suggesting that patients report a preference for an integrated approach to treatment which addresses the relations between symptoms of PTSD and AUDs (Brown et al. 1998), as well as theories of self-medication which posits that alcohol use is a reinforcing behavior that may maintain anxiety symptoms over time.

Contrary to hypotheses, integrated psychoeducation was not superior to either a general health control or concurrent psychoeducation in regards to increasing confidence to refrain from alcohol use or decreasing self-reported coping motives for drinking. Given that a significant negative correlation was observed between coping-motivated drinking and confidence to refrain, this suggests that coping-motivated drinking and one's self-efficacy to refrain from drinking in high-risk situations (i.e., situations with high temptation and low confidence; Velasquez, Maurer, Crouch, & DiClemente, 2001) are inter-related constructs. It may be posited that increasing one's confidence to refrain from use by providing alternative coping behaviors (e.g., exercising, assertiveness training to facilitate "saying no") may result in a subsequent decrease in utilizing alcohol to cope. Relatedly, a limitation of the current psychoeduation approaches was a lack of alternative behaviors to utilize in high-risk drinking situations. Indeed, research in the domain of alcohol misuse treatment has reliably demonstrated the efficacy of coping-skills training in reducing alcohol consumption (Longabaugh & Morgenstern, 1999). Thus, future research should evaluate whether including alternative behaviors that can be utilized in place of alcohol use is an efficacious component of psychoeducation, as opposed to information focused primarily on the risks of alcohol use in the context of negative affect, as presented in the current study.

An additional consideration in regards to a lack of improvement in confidence to refrain from alcohol and coping-motivated drinking lies in the effectiveness of the script-driven imagery procedure to simulate a high-risk drinking situation (i.e., eliciting trauma-relevant negative affect in the context of drinking cues). It may be posited that being confronted with a high-risk drinking situation following the psychoeducation presentation resulted in nullifying any positive effects on confidence to refrain and, in turn, coping-motivated use. This would be consistent with learning theories of psychopathology, particularly in the context of treatments that utilize

exposure techniques to decrease reactivity to anxiety-relevant cues. More specifically, learning theories posit that in order for learning to generalize to new, real-life situations outside of the treatment setting, individuals must be exposed to anxiety-relevant cues across a variety of contexts (e.g., Ghosh & Marks, 1987). Future research would benefit from elucidating whether confidence to refrain and coping motives for use can be modified more effectively when psychoeducation is presented within the context of real-life drinking scenarios. This may include adding the aforementioned alternative coping strategies to provided psychoeducation and asking participants to conduct "behavioral experiments" whereby they attempt to implement new coping strategies in the context of high-risk situations in which they would typically use alcohol.

Consistent with hypotheses, psychoeducation was associated with increased motivation to change alcohol use behaviors, as measured by an indicator of "readiness to change." Results further indicated that symptom-specific psychoeducation that provided both information about posttraumatic stress symptoms and hazardous alcohol use was superior to non-symptom specific, general health information. While results did not indicate that an integrated psychoeducation approach was superior to concurrent approaches, it is nonetheless notable that psychoeducation relevant to the symptoms reported by participants in this study appeared to increase their motivation to change their alcohol use behaviors. Thus, although this particular psychoeducation approach did not provide sufficient information on *how* to change the behavior, participants reported motivation to attempt to change. This finding speaks to the importance of providing individuals presenting with posttraumatic stress symptoms with additional information regarding the risks associated with hazardous drinking. Finally, this finding supports the utility of well-supported treatment approaches that seek to enhance motivation (e.g., motivational interviewing) and, in particular, the Stages of Change model. This model posits that providing symptom-

specific information is an important strategy in building awareness of the presence and consequences associated with a particular problem, which can facilitate moving from the early stages of change (i.e., Precontemplation, Contemplation) to more action-focused stages of change (i.e., Preparation, Action). Future research would benefit from examining the use of psychoeducation in the context of comorbid symptom presentations to determine which components are necessary to enhance motivation to change a target behavior. Further, a limitation of the current study was a lack of follow-up to determine whether participants did progress to later stages of change. Anecdotally, it was interesting to note that two individuals were confirmed as treatment-seekers after participating in the study.

Finally, despite research that supports differential rates of comorbid PTSD-AUDs and reported coping-motivated use for alcohol between males and females, the current study did not demonstrate a moderating effect of biological sex on psychoeducation. However, despite attempts to equally recruit males and females, the current study was approximately 60% female. Future research would benefit from additional examinations of potential sex differences in responses to psychoeducation, including whether males or females are more likely to seek treatment following the provision of symptom-specific information.

Additional limitations of the current study are worth noting and would be valuable to address in future research. While alcohol was the only substance directly addressed by the psychoeducation in the current study, emerging research suggests that marijuana is also frequently utilized as a negative-affect reduction strategy among individuals with PTSD (Bonn-Miller, Vujanovic, Feldner, Bernstein, & Zvolensky, 2007). In fact, 52% of participants in the current study endorsed marijuana use. Thus, future research would benefit from evaluating whether psychoeducation must specifically address only one substance or could meaningfully

facilitate change by providing concise information regarding the risks of using any substance to modify perceived negative affect.

Another limitation of the current study lies in the use of the DMQ-coping subscale as an assessment of posttraumatic stress symptom-specific coping. Indeed, the concurrent psychoeducation groups discussed the negative consequences associated with drinking to reduce general negative affect, which is captured by the DMQ-coping subscale; however, the integrated psychoeducation group discussed the negative consequences associated with drinking specifically in response to trauma-related anxiety. A novel self-report assessment measure aimed to directly assess drinking to cope in the context of PTSS is currently being validated to allow for more specific measurement of this motive for drinking. In addition, participants in the current study were not seeking treatment and were informed that they would not be provided diagnoses in the context of the research study and should therefore view the information as educational information only. It may be that individuals presenting to treatment are already sufficiently motivated to change problematic behavior and may benefit less from this aspect of psychoeducation. However, it also is possible that individuals with co-occurring disorders may be unaware of relations between symptoms and would benefit from information that would motivate them to address each disorder in treatment. Further, the current study was relatively small, which precludes the ability to examine whether trauma type differentially impacts either coping-motivated drinking or responses to psychoeducation. Finally, the cross-sectional nature of the current study precludes assumptions of causality regarding whether hazardous alcohol use emerged subsequent to traumatic-event exposure.

Amidst an emerging domain of research investigating the utility of integrated treatment approaches for comorbid PTSD-AUDs the current study was the first to experimentally

manipulate psychoeducation, a factor typically present in all psychotherapy interventions. Indeed, despite the widespread use of psychoeducation in interventions empirical research had not been previously been conducted to determine whether it is a beneficial component of treatment and, if so, what the nature of the information should be. Despite randomized controlled trials that support the efficacy of integrated approaches (McFall et al., 2010) other studies have demonstrated that some integrated treatments do not outperform general health education controls (Hien et al., 2009). Finally, although integrated treatments are theoretically designed to target maintenance factors, or common mechanisms, associated with comorbid disorders, some concurrent treatments also contain an element of this approach. This has resulted in some confusion in regards to distinguishing between concurrent and integrated treatments which may contribute to some of the mixed findings in treatment outcome research. Taken together, it can be concluded from the current study that psychoeducation may indeed enhance motivation or readiness for treatment, but may need an additional behavioral element to provide stand-alone change in coping-motivated drinking and confidence to refrain from alcohol. Finally, psychoeducation would ideally be symptom-specific and address symptoms of all presenting concerns, rather than providing non-specific information related to improving one's overall health.

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Table 1.

Correlations among Inclusion and Dependent Variables

	1	2	3	4	5	6	7	8
1. DMQ-Coping-Pre	-	.51**	-.43**	-.33**	-.01	.14	.36**	.01
2. DMQ-Coping-Post	-	-	-.22	-.42**	-.06	.06	.08	-.08
3. AASES-Pre	-	-	-	.73**	-.02	-.09	-.25*	-.27*
4. AASES-Post	-	-	-	-	-.00	-.10	-.13	-.29**
5. URICA Readiness-Pre	-	-	-	-	-	.83**	.06	.15
6. URICA Readiness-Post	-	-	-	-	-	-	.11	.07
7. Posttraumatic Stress Symptoms	-	-	-	-	-	-	-	-.08
8. AUDIT Score	-	-	-	-	-	-	-	-

Note. $N = 76$. DMQ: Drinking Motives Questionnaire. AASES: Alcohol Abstinence Self-Efficacy. URICA: University of Rhode Island Change Assessment Scale. AUDIT: Alcohol Use Disorders Identification Test. * $p < .05$; ** $p < .01$.

Table 2.
Descriptive Data by Psychoeducation Group

	M	*SD*	Range
Group 1: General Health			
AUDIT Score	10.26	2.23	8-14
Posttraumatic Stress Symptoms	34.94	16.52	15-70
DMQ-Coping Motives-Pre	11.15	3.09	6-16
DMQ-Coping Motives-Post	10.47	3.20	7-17
URICA-Readiness-Pre	5.92	2.99	1.5-10.5
URICA-Readiness-Post	5.17	3.57	0-10.3
AASES-Pre	68.00	15.11	41-93
AASES-Post	71.21	14.24	53-100
Group 2: PTSS--Hazardous Alcohol Use			
AUDIT Score	10.36	1.86	8-13
Posttraumatic Stress Symptoms	37.47	14.29	15-59
DMQ-Coping Motives-Pre	12.10	4.13	6-20
DMQ-Coping Motives-Post	11.10	3.24	6-18
URICA-Readiness-Pre	7.19	2.62	2.50-13.50
URICA-Readiness-Post	7.04	2.98	1.83-13.17
AASES-Pre	64.68	17.40	41-95
AASES-Post	68.89	15.37	47-91
Group 3: Hazardous Alcohol Use—PTSS			
AUDIT Score	10.10	2.15	8-14
Posttraumatic Stress Symptoms	26.36	10.39	12-56
DMQ-Coping Motives-Pre	10.63	2.56	6-17
DMQ-Coping Motives-Post	11.36	3.40	5-17
URICA-Readiness-Pre	6.93	1.97	2.50-10.50
URICA-Readiness-Post	7.45	1.44	4.67-9.67
AASES-Pre	73.05	10.04	55-90
AASES-Post	72.00	13.40	50-100
Group 4: Integrated Coping Motives for Use			
AUDIT Score	10.16	2.00	8-14
Posttraumatic Stress Symptoms	29.05	9.73	18-54
DMQ-Coping Motives-Pre	10.36	2.45	7-15
DMQ-Coping Motives-Post	11.21	2.69	7-18
URICA-Readiness-Pre	6.13	2.69	.6-9.8
URICA-Readiness-Post	6.69	2.54	1.5-9.8
AASES-Pre	67.26	13.91	24-87
AASES-Post	64.63	14.94	22-92

Note. $N = 76$; M = mean; SD = standard deviation.

Figure 1.
Pre-Post Changes in Coping-Motivated Alcohol Use Measured by the Drinking Motives Questionnaire

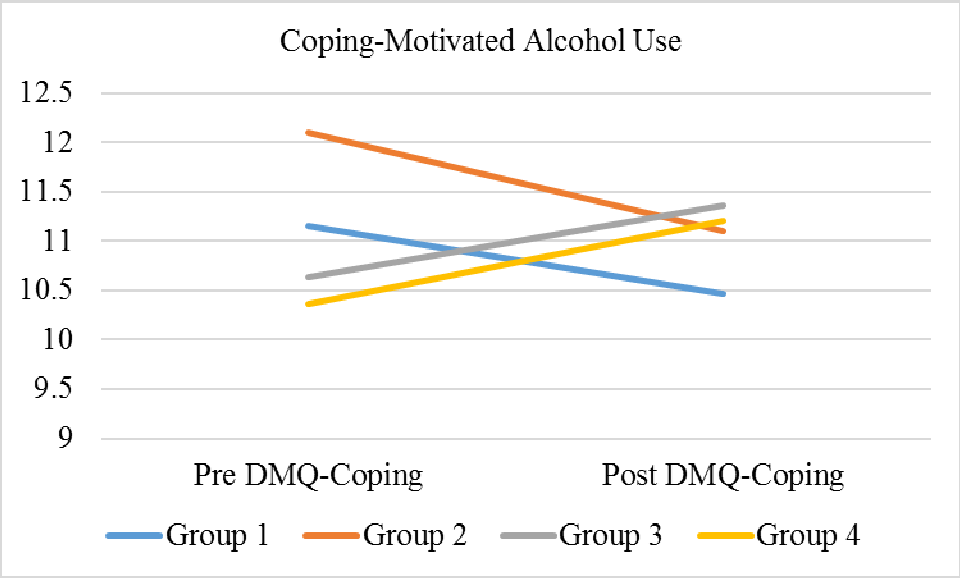


Figure 2.
Pre-Post Changes in Readiness to Change Alcohol Use Measured by the University of Rhode Island Change Assessment Scale

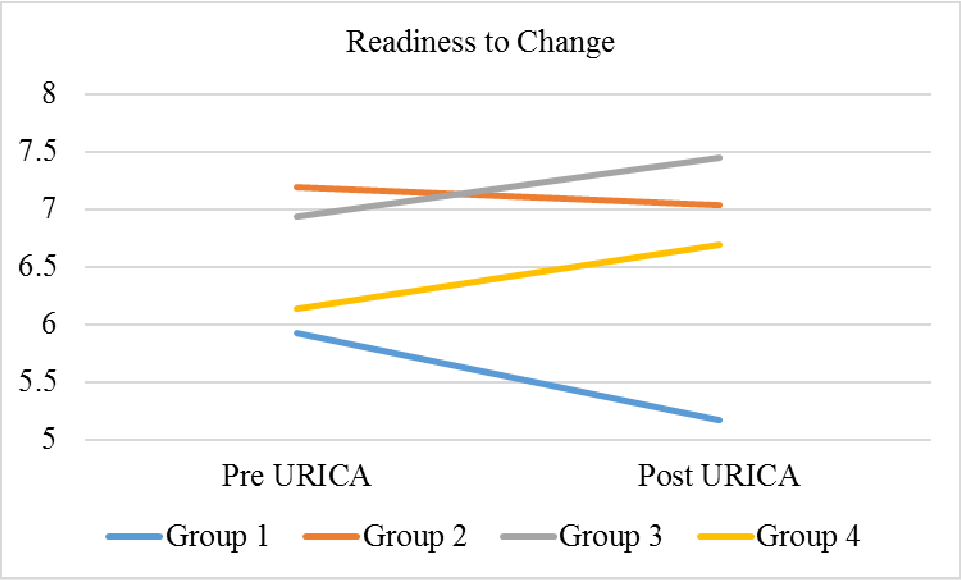
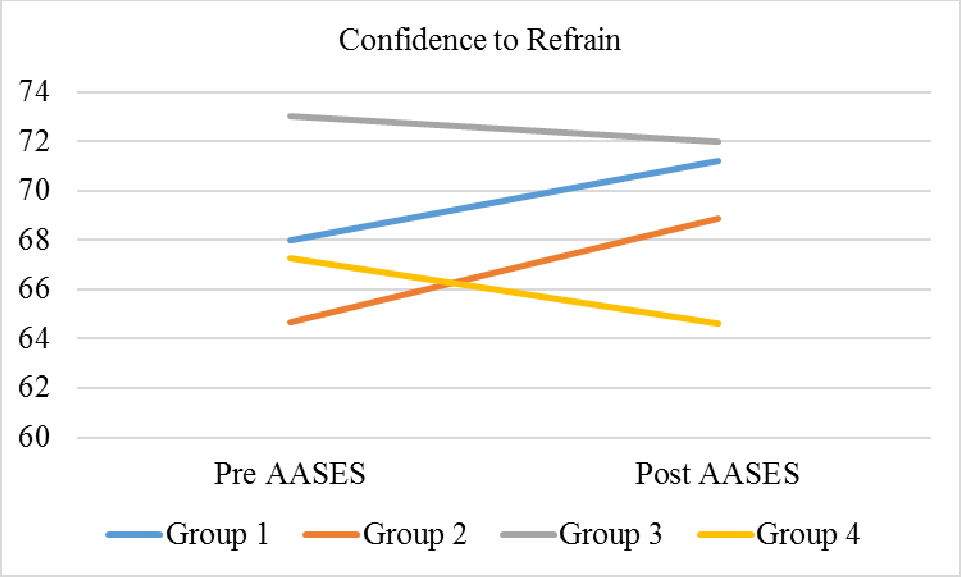


Figure 3.
Pre-Post Changes in Confidence to Refrain from Alcohol Use Measured by the Alcohol Abstinence Self-Efficacy Scale



UNIVERSITY OF ARKANSAS

August 1, 2011

MEMORANDUM

TO: Sarah Bujarski
Matthew Feldner

FROM: Ro Windwalker
IRB Coordinator
RE: New Protocol Approval

IRB Protocol #: 11-07-034

Protocol Title: *Stressful Life Events and Alcohol Use*

Review Type: ☐ EXEMPT ☐ EXPEDITED ☒ FULL IRB

Approved Project Period: Start Date: 08/01/2011 Expiration Date: 07/28/2012

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (http://vpred.uark.edu/210.php). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.
This protocol has been approved for 76 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.
The IRB determined and documented that the risk is no greater than minimal and this protocol may be reviewed under expedited review procedure for future continuing reviews.
If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.