

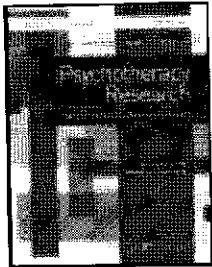
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Randomized control trial of an integrated therapy for comorbid anger and gambling

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Abstract

This study evaluated an integrated treatment for comorbid problem gambling, anger, and substance use. Problem gamblers with comorbid anger problems ($N=42$), half of whom also had substance use disorders, were randomized to either a 14-week integrated treatment targeting anger and addictions (i.e., both gambling and substance use) or a specialized treatment-as-usual (TAU) for gambling and substance use. Participants were assessed at baseline (T1), 14 weeks (T2), and 12 weeks follow-up (T3). Relative to the TAU, participants in the integrated anger and addictions treatment reported significantly less gambling at T2 and T3 and less trait anger and substance use at T3. Findings suggest that it is important to screen gambling clients for the presence of comorbid anger and substance use problems and that, when present, these problems need to be addressed concurrently in gambling treatment in order to optimize treatment outcomes.

Keywords: pathological gambling; problem gambling; anger; substance use; comorbid

Evidence suggests that anger, gambling, and substance use problems frequently co-occur (Collins, Skinner & Toneatto, 2005; Korman et al., in press). However, despite the co-occurrence of these problems, very little attention has been paid to developing and evaluating integrated anger and addiction treatments. Clinicians treating individuals with comorbid anger and addiction problems are also faced with the challenge of engaging these clients in treatment. Individuals with addictions are notoriously difficult to engage in treatment and once in treatment, attrition rates are high. The National Gambling Impact Study Commission (1999), for example, reported that less than 10% of pathological gamblers receive any treatment for gambling problems. Estimates of attrition in gambling studies have ranged from 11% to 83% (Westphal, 2007). The ability to engage and keep clients with comorbid anger, gambling, and substance use problems in treatment likely will be reflected in gambling treatment outcomes.

The purpose of this study was to evaluate an integrated emotion-oriented treatment targeting problem anger, gambling, and substance use. To

increase ecological validity, an existing specialized treatment service for clients with gambling and substance use problems was used as the comparison condition. All participants in this study had comorbid gambling and anger problems. We hypothesized that an integrated anger and addiction treatment focusing on emotion regulation would result in better treatment outcomes than a specialized gambling and substance use treatment-as-usual (TAU).

There is increasing awareness of the role of dysregulated emotion in gambling problems. Blaszczynski and Nower (2002) have hypothesized that problem gambling develops as the result of three distinct pathways, two of which involve emotional vulnerability and negative emotions. In Pathway 1, individuals with no premorbid biological or psychosocial vulnerabilities develop gambling problems as the result of operant and classic conditioning. In Pathway 2, emotionally vulnerable individuals with premorbid anxiety or depression, poor coping or problem-solving skills, and/or negative family, developmental, and life experiences develop gambling problems as a means to modulate negative affective states or meet specific psychological needs.

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In Pathway 3, individuals with similar biological and psychosocial vulnerabilities also exhibit impulsivity and features of antisocial personality disorder and attention deficit. In Pathway 3, negative emotions and environmental pressures are thought to exacerbate impulsivity and contribute to gambling and other impulsive behaviors.

The role of emotion in gambling has also been raised by Beaudoin and Cox (1999), who found that more than 80% of a sample of treatment-seeking problem gamblers reported gambling in order to relieve dysphoria or to escape from life stressors. Similarly, Griffiths (1995) observed that both problem and nonproblem gamblers reported experiencing depressive moods before engaging in gambling.

Ricketts and Macaskill (2003, 2004) conducted two studies aimed at examining the role of emotion in gambling. In their 2003 study, they analyzed themes from interviews, therapy sessions, and open-ended questionnaires with 14 treatment-seeking individuals who met criteria for pathological gambling. They concluded that these individuals gambled purposefully to manage unpleasant emotional states and described three particular emotion-altering effects (experiencing positive emotions and arousal, suppressing unpleasant emotions or worries, and feeling a sense of achievement). Ricketts and Macaskill followed the same procedure in their 2004 study with a sample of frequent gamblers who did not report experiencing associated problems or feeling a lack of control over gambling. The authors found that most of these nonpathological gamblers did not report using gambling to deal with negative emotions. They also noted that those who did manage emotional states through gambling also used a range of other emotion management strategies; they contrasted this finding to their 2003 sample of pathological gamblers who tended to use gambling as their primary emotion regulation strategy. Based on these two studies, Ricketts and Macaskill concluded that it is the use of gambling to manage negative emotions that differentiates normal and problem gambling.

In their retrospective and prospective study of gambling relapse, Hodgins and el-Guebaly (2004) included an examination of the role of emotions. Although they found that the most commonly identified predictors were cognitive (e.g., optimism about winning) and financial (e.g., needing money), they also observed that dealing with negative situations or emotions accounted for approximately 11% of relapses. Further, Hodgins and el-Guebaly stated that female participants reported gambling to regulate emotions more than male participants, a finding that they noted to be consistent with the

theories of Diskin and Hodgins (2001) and Marks and Lesieur (1992).

Overall, the gambling literature is beginning to provide support for the role of emotion regulation in understanding problem gambling. At present, research and theorizing in this area have primarily considered the emotions of depression and stress; the possible role of anger regulation in problem gambling has so far received little attention. In a recently completed study of 248 problem gamblers, Korman et al. (in press) found that 64.5% of their sample reported clinically significant anger problems. In this sample of problem gamblers, anger problems were associated with an increased risk of being both the perpetrator and victim of intimate partner violence (IPV). The majority of problem gamblers (62%) surveyed reported perpetrating or being the victims of IPV in the past year, with 25% reporting perpetrating severe IPV. This finding is consistent with earlier reports of physical violence among problem gamblers and their spouses (Bland, Newman, Orn, & Stebelsky, 1993; Lorenz & Shuttlesworth, 1983).

Although anger has received limited attention in gambling research, anger and aggression have been better studied in the substance use literature. Anger and aggressive behaviors have been reported to occur more often among substance users than among those in the general population (Miczek, 1987; Murphy & O'Farrell, 1996). Anger problems have been reported by about one third of clients seeking addictions treatment, with one fifth reporting engaging in violence while under the influence of substances (Korman, 2005). Substance use also frequently co-occurs with IPV. Brookoff, O'Brien, Cook, Thompson, and Williams (1997), for example, found that 92% of perpetrators of IPV used alcohol or drugs on the day of the assault and 74% had a prior arrest related to substance use. Substance use disorders also are frequently found among clients presenting for anger management and IPV treatments, with about half of male batterers having alcohol abuse problems (Tolman & Bennett, 1990).

Anger has been identified as a risk factor for substance use relapse and is commonly an issue in addiction treatment (Marlatt & Gordon, 1985). However, despite considerable evidence linking anger, violence, and substance use behaviors, most anger treatment programs and treatment research studies have excluded substance users (Korman, 2005). To our knowledge, only one integrated treatment for comorbid anger and addictions has been scientifically evaluated. Lin, Mack, Enright, Krahn, and Baskin (2004) evaluated forgiveness therapy with an inpatient sample of clients who were substance dependent. Forgiveness therapy was

found to be significantly better than standard alcohol and drug counseling in reducing anger and vulnerability to use substances. Because this was an inpatient treatment study, substance use was not measured.

Researchers in the areas of anger and violence (Dutton, 1995; Greenberg & Paivio, 1997) and substance use (Khantzian, 1997) have argued that dysregulated emotion may be a deficit contributing to each of these problems. Because deficits in emotion regulation have been identified separately in the anger, substance use, and gambling literatures, this study sought to examine the efficacy of a treatment for these comorbid problems that primarily targeted problems related to emotion dysregulation.

Method

Participants

Participants were treatment-seeking, angry problem gamblers recruited from community outpatient addiction and gambling treatment agencies as well as from ads placed in local newspapers from May 2002 to July 2004. Details of recruitment, screening, and assessments are presented in Figure 1. All interested potential participants underwent a phone screen to assess eligibility. As can be seen in Figure 1, 17 potential participants underwent a baseline study assessment and were eligible to participate in the study but were unable to be contacted after the baseline study assessment. There were no significant differences found in baseline data between these 17 individuals who could not be contacted and the participants who were randomized into the study. Forty-two participants were randomly assigned to either the experimental anger and addiction treatment (A&A) targeting anger, gambling, and substance use ($n=20$; 18 men and two women) or the comparison TAU targeting gambling and substance use ($n=22$; 18 men and four women). Randomization was stratified with substance dependence as the stratified variable to ensure that substance use severity was comparable in both treatment conditions.

Participants' mean age was 47.6 years (range = 24–70, $SD=11.13$). The average income of all participants was \$32,125 (range = \$2,000–90,000, $SD = \$21,129$). Twenty-eight percent of participants were married or living with a partner, ($n=12$ [5 participants in the A&A condition and 7 in the TAU condition]), 36% were single ($n=15$ [9 participants in the A&A condition and 6 participants in the TAU condition]), and 36% were divorced or separated ($n=15$ [6 participants in the A&A condition and 9

participants in the TAU]). With regard to employment status, 45.2% worked full time ($n=19$ [9 participants in the A&A condition and 10 participants in the TAU condition]) and 14.3% worked part time; ($n=4$ [2 participants in the A&A condition and 2 participants in the TAU condition]). With regard to education status, 19.1% did not complete high school ($n=8$ [2 participants in the A&A condition and 6 participants in the TAU condition]), 21.4% completed high school ($n=9$ [5 participants in the A&A condition and 4 participants in the TAU condition]), and 59.5% had some postsecondary education ($n=25$ [13 participants in the A&A condition and 12 participants in the TAU condition]). Participants' ethnocultural affiliations reflected the diversity of the study's large Canadian metropolitan area: 64.3% of participants reporting their primary ethnocultural affiliation being something other than Canadian, British, or French. Almost half of the participants met criteria for substance dependence or abuse at baseline ($n=19$ [10 participants in the A&A condition and nine in the TAU condition]). The most commonly reported substances of abuse were alcohol (84%), cannabis (42%), cocaine (32%), and opiates (26%).

Treatment Conditions

In this study, the experimental and TAU conditions were offered at the same outpatient addiction and mental health treatment center. The primary investigator headed the service offering the integrated A&A treatment and a co-investigator headed the service offering the specialized gambling and substance use TAU. Therapists in the both conditions were clinicians working in one of two different clinics within a mental health and addiction service of a large metropolitan teaching and research hospital. The A&A treatment condition was delivered in a specialized clinic in which a modified dialectical behavior therapy (DBT; Linehan, 1993) approach is used to treat clients with comorbid anger and addiction problems. The TAU clinic specialized in treating clients with comorbid gambling and substance use problems using an eclectic, nonmanualized approach that included cognitive-behavioral therapy (CBT) relapse prevention strategies to help participants identify and correct distorted cognitions associated with problem gambling and identify stimulus control and other relapse prevention procedures to minimize gambling and substance use behaviors (e.g., avoiding gambling and substance use cues).

Therapists were nested in one of the two clinics, and each clinic was headed by one of two different investigators in this study. Therapists in both condi-

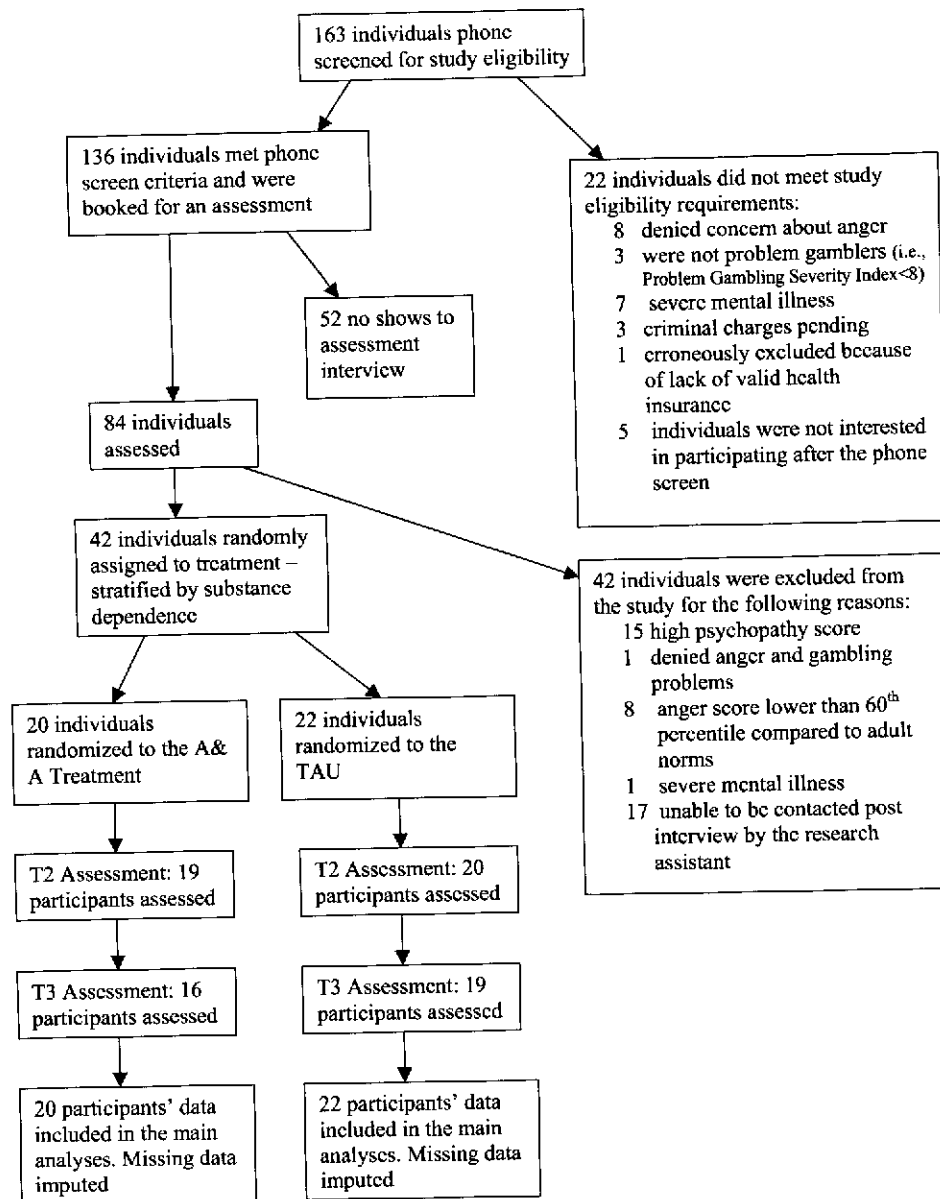


Figure 1. Flow chart of participants. (A&A = anger and addiction treatment; TAU = treatment-as usual.)

tions were part of their respective regular clinic service and were not specifically recruited to be study therapists. Rather, they were the therapists working within each clinic and were assigned study clients as per routine service procedures. There were four therapists in the A&A condition and five in the TAU condition.

There were no significant differences between conditions in the therapists' years of formal clinical training (TAU 4.5 years vs. A&A 6.5 years), years of experience treating clients with problem anger (TAU 6.75 years vs. A&A 6 years), or problem substance use (TAU 7.75 years vs. A&A 6 years). Therapists in the TAU had significantly more clinical experience

treating clients with gambling problems (4.25 vs. 0.25 years), $t(6) = -4.496$, $p < .004$, 95% CI = $-6.177, -1.823$) than therapists in the A&A condition.

Experimental condition. The integrated A&A treatment involved individual sessions that combined functional analyses, skills training, exposure, response prevention, and rehearsal to concurrently treat problem anger, gambling, and substance use. The A&A condition combined a modified DBT (Linehan, 1993) approach with a specific skill set designed to address anger and addiction problems (Korman, 2005). DBT is a behavioral treatment

designed to treat individuals with borderline personality disorder, focusing on problems related to emotion dysregulation. The A&A treatment was delivered in individual sessions and was designed to include two sessions devoted to treatment engagement and orientation followed by 12 individual sessions. The treatment protocol in the integrated A&A condition involved the use of an integrated anger and addiction diary card in each session. For each week's session, participants recorded anger, gambling, and substance use behaviors they engaged in during the preceding week, noting skills use and emotions they experienced each day. The first 30 to 40 minutes of each treatment session was devoted to functional analyses of anger, gambling, and substance use behaviors reported during the preceding week. The functional analyses were prioritized according to a behavioral target hierarchy described below. The last 20 to 30 minutes of each treatment session were spent teaching participants appropriate skills and, as indicated, engaging them in skills rehearsal and exposure interventions. Skills taught were selected from the anger awareness skills set developed to treat anger (Korman, 2005) and from DBT skills (Linehan, 1993).

Treatment adherence in the A&A condition was measured by evaluating the degree to which therapists adhered to the A&A treatment target hierarchy (life threatening, treatment interfering, gambling, substance use and problem anger, other quality-of-life problems), adapted from DBT, in choosing which behaviors to address in sessions. The therapy session note template used in the A&A condition prompted the therapist to record whether or not each target behavior occurred since the last session and whether or not the therapist targeted the behavior in that session. The skills taught during each session were also noted.

A research analyst who was unaffiliated with the study reviewed all session notes. The research analyst recorded whether or not any of the target behaviors had been reported and whether or not therapists addressed the behaviors in session. For each therapy session, therapists in the A&A condition were deemed adherent if they targeted the highest priority occurring behavior and nonadherent if they did not target the highest priority occurring behavior. In addition, to assess interrater reliability of the adherence ratings, one of the study investigators randomly selected eight of the 17 participants in the A&A condition who attended treatment and rated all therapy session notes for adherence (68 notes in total for the eight participants).

The research analyst also reviewed every session note for the A&A condition and recorded whether or not therapists indicated they had conducted func-

tional analyses and skills training in each session. A&A therapists were rated by the research analyst as having adhered to the treatment target hierarchy in 90.1% of all sessions. Functional analysis, an integral component in the A&A condition, was conducted in all treatment sessions, and skills training was conducted in 99% of treatment sessions. The investigator's ratings of adherence were slightly higher, with 95% of selected sessions rated as being adherent. Agreement between the research analyst and investigator was good ($\kappa = .65$). The behaviors that were targeted during session in the A&A condition reflect the integrated nature of the treatment. Problem anger was targeted in 37% of sessions. Problem gambling was targeted in 24% of sessions. Treatment-interfering behaviors were targeted in 19% of sessions. Substance use behaviors were targeted in 3.6% of sessions, reflecting the fact that only half of the participants had substance use disorders and the relatively low rates of continued substance use by participants in the A&A condition.

Comparison condition. The TAU was a well-established specialized outpatient gambling and substance use treatment provided to treatment-seeking problem gamblers (with or without substance use disorders) in the large metropolitan area in which this study was conducted. The TAU was not artificially designed for this study but rather was the existing specialized gambling and substance use treatment providing services to problem gamblers. This treatment used an eclectic, nonmanualized approach that included CBT relapse prevention strategies to help participants identify and correct distorted cognitions associated with problem gambling and identify stimulus control and other relapse prevention procedures to minimize gambling and substance use behaviors (e.g., avoiding gambling and substance use cues). The TAU consisted of individual sessions of variable duration and frequency as determined by the TAU therapist based on clients' needs.

Procedure

All assessments and treatments were carried out at the same outpatient addiction and mental health treatment center. In an effort to enhance treatment engagement, once a participant was randomized, the first appointment was arranged by the study research assistant in the same manner for all participants in both conditions. The study research assistant contacted the therapist and arranged the initial meeting between therapist and participant. Once the initial study treatment appointment was arranged, the study research assistant's contact with participants

from both conditions was limited to monthly follow-up calls to confirm contact information, to book study assessments, and to do the assessments. Therapists in both conditions were responsible for the scheduling of all treatment sessions following their respective treatment protocols.

Participants were assessed at three different time periods: a pretreatment baseline assessment (T1), a second assessment 14 weeks later (T2) intended to coincide with the end of treatment in the A&A condition, and a third assessment (T3) 12 weeks after that. This study used an intention-to-treat design in which all randomized participants were followed in the same manner to be assessed regardless of treatment status. The study research assistant was not naive to participant assignment. To minimize any possible bias, all outcome measures were collected via participant-entered self-report. Participants were paid \$20 per assessment.

Measures

Gambling, substance use, and anger measures were collected at all time periods. A therapeutic alliance measure was collected at T2 from all participants who received any treatment in order to assess whether there were any systematic differences on therapeutic alliance between conditions that might account for any observed difference in outcome.

Gambling. The Canadian Problem Gambling Inventory (CPGI) is a 31-item self-report measure designed to be consistent with the *Diagnostic and Statistical Manual of Mental Disorders* (fourth edition [DSM-IV]; American Psychiatric Association, 1994) criteria for pathological gambling (Ferris & Wynne, 2001). The CPGI asks questions about the frequency and types of gambling activities and yields a nine-item subscale, the Problem Gambling Severity Index (PGSI), examining gambling behaviors and the negative consequences of gambling. The nine PGSI items are rated by respondents on a 4-point Likert scale (i.e., 0 = *never*, 1 = *sometimes*, 2 = *most of the time*, 3 = *almost always*). The PGSI is calculated by summing responses across the nine items, with scores of 0 indicating nonproblem gambling, 1 to 2 low-risk gambling, 3 to 7 moderate-risk gambling, and 8 to 27 problem gambling. An example of an item that contributes to the PGSI score is "How often have you needed to gamble with larger amounts of money to get the same feeling of excitement?"

The CPGI has been demonstrated to be reliable: Estimates of both internal consistency (Cronbach $\alpha = .84$) and test-retest reliability (.78, with the test-retest interval of 3-4 weeks) are high. The authors also provide evidence of the convergent validity of

the CPGI as demonstrated by the high correlation between CPGI classification, the South Oaks Gambling Scale, and DSM-IV diagnosis (i.e., correctly identifying individuals with gambling problems).

Substance use. The Drug History Questionnaire (DHQ) was used to assess substance use in the 3 months preceding the interview period. It provides detailed information about the type, frequency, and amount of substances used in the last 3 months for the following substance categories: alcohol, cocaine/crack, amphetamines/other stimulants, cannabis, benzodiazepines, barbiturates, heroin, prescription opioids, over-the-counter opioids, hallucinogens, inhalants, tobacco, and other psychoactive drugs. For each substance category, respondents are asked whether or not they used the substance, the number of days of use in the last 90 days, how long since last used, and the typical amount used on each day of use. The DHQ has demonstrated good test-retest reliability with moderate to high correlations (range = .49-.85) for test-retest reliability (mean test-retest interval was 19.5 days) of the number of days used for each substance (Sobell, Kwan, & Sobell, 1995).

Anger. The State-Trait Anger Expression Inventory (STAXI) is a 44-item self-report measure that has demonstrated high internal consistency and convergent validity (Spielberger, 1988). The STAXI yields two main scales: the Trait Anger scale and the Anger Expression scale, which are used to measure, respectively, disposition to experience and express anger. Internal consistency (alpha coefficients) for both these scales (.93 for Trait Anger and .86 for Anger Expression) has been shown to be high (Spielberger, 1988). With regard to construct validity, the Trait Anger scale has been shown to be highly correlated (.66-.73) with the total score on the Buss-Durkee Inventory (Spielberger, Jacobs, Russell, & Crane, 1983).

Therapeutic alliance. The Working Alliance Inventory (Horvath & Greenberg, 1989) 12-item client short form (WAI-C) is a widely used self-report measure of therapeutic alliance. The WAI-C is designed to be used with diverse therapeutic orientations and yields an overall score for the working alliance between client and therapist (WAI total score) as well as a Goal subscale score representing the agreement between client and therapist on the aims of the treatment, a Task subscale score measuring the degree of agreement on tasks necessary to achieve treatment goals, and a Bond subscale score measuring the quality of the therapeutic bond. Confirmatory factor analyses of the short form of the WAI support

its bilevel factor structure, with a general alliance factor and secondary goal, task, and bond factors (Tracey & Kokotovic, 1989). Meta-analyses of studies of the WAI indicate that reliability estimates are robust, ranging from .79 to .97, with modal estimates of .92 (Hanson, Curry, & Bandalos, 2002).

Results

Data Analysis

Most gambling treatment studies have measured outcomes only among participants who have engaged in treatment or who have completed treatment. Westphal (2007) argues that limiting analyses to those who have completed treatment likely has resulted in overestimates of the effects of gambling interventions. In addition to overestimating the effects of gambling interventions, limiting the analyses to participants who have engaged in treatment or who have completed treatment also results in questions about the generalizability of the results (Hodgins & Holub, 2007). To address these concerns, intention-to-treat analyses were used in this study.

Baseline group differences were evaluated using chi-square tests for categorical data (for data points with minimum cell counts of five observations and group differences greater than 10%) and multivariate general linear model (GLM) analyses on the following variables: age, income, PGSI scores, percentage of monthly income spent gambling, number of substance use days, and Trait Anger and Anger Expression. Preliminary analyses revealed that the distributions of income and percentage of monthly income spent were skewed. Therefore, for all GLM analyses, income and percentage of monthly income spent gambling were log transformed. SPSS for Windows (Release 12.01) was used to perform all analyses. All baseline analyses were conducted using a two-tailed α of .05. There were no significant differences at baseline between groups for participant demographics or on any of the outcome measures.

Group means and standard deviations for gambling, substance use, and anger outcome measures at T1, T2, and T3 are presented in Table I. Differences between groups (PGSI scores, percentage of monthly income spent gambling, number of substance use days, STAXI Trait, STAXI Expression) were evaluated using a repeated measures GLM with the number of treatment sessions as the covariate using a one-tailed α of .05. The Bonferroni step-down (Holms) procedure was used to adjust alpha values for multiple comparisons (Holms, 1979). This procedure was chosen because it is less conservative and has higher power than the Bonfer-

roni correction. Using this procedure, the p values of each test are ranked from smallest to largest. The first p value is multiplied by the number of tests and if the corrected p value is less than .05, then the comparison is significant. For the second comparison, the p value is multiplied by the number of tests minus one; for the third comparison, the p value is multiplied by the number of tests minus two. This sequence continues until a corrected p value is found to be greater than .05. A summary of the significant results from GLM analyses is presented in Table II. For all GLM analyses, the number of treatment sessions was a covariate.

Data were missing from three participants at T2 (one A&A, two TAU) and from eight participants at T3 (five A&A, three TAU). Multiple imputation (Streiner, 2002) was used to impute missing data using the data from all participants (i.e., the intention-to-treat sample). Multiple imputation preserves the estimates of means and standard deviations even when up to 50% of the data are missing (Schafer & Graham, 2002). To preserve interaction between treatment condition and other variables, the data set was split and separate imputations were computed for each treatment condition. The NORM statistical program, version 2.03, was used to impute missing data (Schafer, 1999). The program uses multiple imputation of incomplete multivariate data to impute missing data values.

Number of Treatment Sessions Attended

Group differences on number of sessions attended were evaluated using a t test with a two-tailed α of .05. Participants randomized to the A&A condition attended significantly more sessions than TAU participants, $t(40) = 2.591$, $p = .013$, 95% confidence interval (CI) = 1.056, 8.544. Participants in the A&A condition attended, on average, 9.76 sessions ($SD = 5.506$) compared with 5.92 sessions ($SD = 6.601$) for TAU participants. More participants randomized to the A&A condition attended at least one therapy session (17 of 20) than participants in the TAU (13 of 22). There were no significant between-group differences in the number of sessions attended for those participants who attended one or more treatment sessions, $t(28) = 1.738$, $p = .093$, 95% CI = -0.687, 8.370.

Session Duration

Group differences on the average session duration were evaluated using a t test with a two-tailed α of .05. The groups did not differ significantly on the average session duration, $t(28) = -1.607$, $p = .11$. In the A&A condition, the average session duration was

Table I. Means and Standard Deviations for Dependent Variables

Variable	T1		T2		T3	
	M	SD	M	SD	M	SD
A&A condition (n=20)						
Gambling						
PGSI score	14.90	5.29	4.85	4.99	2.25	2.61
Intention-to-treat sample	14.82	5.51	4.71	5.11	2.06	2.59
Attended ≥ 1 therapy session						
Percentage of monthly income spent on gambling	84.89	111.09	14.89	18.16	5.34	8.17
Intention-to-treat sample	73.44	99.09	16.60	19.25	6.03	8.66
Attended ≥ 1 therapy session						
Substance use						
No. days used	30.10	36.76	13.95	27.76	7.75	11.32
Intention-to-treat sample	33.29	38.45	16.41	29.53	7.65	9.34
Attended ≥ 1 therapy session						
Anger (t scores)						
Trait Anger	59.45	9.81	50.25	6.93	43.75	8.37
Intention-to-treat sample	59.29	10.53	50.53	7.43	44.88	7.21
Attended ≥ 1 therapy session						
Expression	68.75	7.57	60.10	9.60	54.25	13.23
Intention-to-treat sample	69.29	7.71	60.76	8.32	53.76	11.91
Attended ≥ 1 therapy session						
TAU condition (n=22)						
Gambling						
PGSI score	15.59	3.90	8.45	7.24	8.86	6.12
Intention-to-treat sample	14.77	4.15	8.31	6.47	8.31	6.59
Attended ≥ 1 therapy session						
Percentage of monthly income spent on gambling	80.11	68.54	37.01	47.01	35.32	54.17
Intention-to-treat sample	66.41	56.65	34.55	35.19	31.05	29.29
Attended ≥ 1 therapy session						
Substance use						
No. days used	33.86	40.99	26.95	36.44	37.14	42.92
Intention-to-treat sample	35.15	42.19	23.46	35.34	38.92	44.44
Attended ≥ 1 therapy session						
Anger (t scores)						
Trait Anger	62.25	8.05	50.00	13.79	54.00	11.25
Intention-to-treat sample	58.54	9.05	50.38	12.25	52.00	11.17
Attended ≥ 1 therapy session						
Expression	62.86	9.74	54.36	14.75	56.14	13.02
Intention-to-treat sample	65.23	9.48	55.92	15.71	58.00	13.95
Attended ≥ 1 therapy session						

Note. A&A = anger and addiction treatment condition; PGSI = Problem Gambling Severity Index; TAU = treatment-as-usual condition.

60.5 min (SD=2.74) compared with 66.8 min (SD=13.93) in the TAU. Variability in session durations both within and between conditions was due to a number of factors, including participants arriving late for sessions, occasional crises, the decision of some therapists to extend sessions, and the absence of a standardized treatment protocol in the TAU condition. Compared with the A&A condition, there was more variability in treatment session duration in the TAU.

Therapeutic Alliance

Group differences on WAI-C (short form) Goal, Task, and Bond scores were evaluated using a

multivariate GLM with a two-tailed α of .05. No significant group differences were found, $F(3, 26) = 2.503, p = .081$. Cronbach's $\alpha = .78$ for each of the Goal, Task, and Bond subscales.

Gambling, Substance Use, and Anger

Gambling. There was a significant decrease in the PGSI scores and percentage of monthly income spent gambling in both the A&A and TAU conditions over time and a significant Treatment \times Time interaction for PGSI scores. The reduction in gambling was clinically significant. At T2, 14 of 20 (70%) participants in the A&A condition and 10 of 22 (45.5%) participants in the TAU condition no

days = 1.02; trait anger = 0.71 and anger expression = 0.86) and the intention-to-treat sample (Cohen's *d* for PGSI = 1.01; percentage of income gambled = 0.4; substance use days = 1; trait anger = 0.76, anger expression = 0.89).

Discussion

The results of the present study provide preliminary evidence for the benefit of an integrated approach for treating comorbid anger, gambling, and substance use problems. To our knowledge, this is one of the first randomized control trials evaluating an integrated treatment for anger, gambling, and substance use problems. In both the A&A and the TAU conditions, there were significant reductions in anger and gambling over the course of treatment. However, unlike the A&A condition, there were no reductions in substance use in the TAU condition. As hypothesized, participants in the integrated A&A condition showed significant reductions in anger, gambling, and substance use in comparison to those in the TAU.

The reductions in gambling and substance use observed in the A&A condition were both statistically and clinically meaningful. Participants in this condition reported gambling 84.9% of their income at baseline but only 5.3% of their income at T3. None of the participants randomized to the A&A condition met criteria for problem gambling at T3. In contrast, the reductions in gambling observed in the TAU were more modest. Reductions in anger were found for both the A&A and TAU conditions, with greater reductions found in the A&A condition. Reductions in reported substance use among participants in the A&A condition were also substantial: A&A participants reported substance use on 30 of the last 90 days at T1 and on 7.75 of the last 90 days at T3. In contrast, participants in the TAU did not reduce their substance use from T1 to T3.

Because gamblers are difficult to engage in treatment and generally attend few, if any, sessions, this study used an intention-to-treat design to increase ecological validity. An important clinical outcome in this study was the observed group difference in treatment engagement. The integrated A&A condition was superior to the TAU in engaging angry problem gamblers in treatment. The A&A condition used active treatment engagement strategies to engage clients in treatment. Active engagement strategies may be an important part of effective treatments for treating difficult-to-treat populations like problem gamblers. In poststudy debriefings, TAU therapists reported that they tended to call participants two or three times if participants cancelled or missed their first appointment. Beyond this,

however, TAU therapists reported that they generally held the view that clients would engage in treatment only when they were ready. In contrast, in the A&A condition, active engagement, retention, and compliance-enhancing strategies were used. These strategies included repeatedly calling or sending cards to clients who missed appointments and using commitment strategies to increase motivation and commitment to engage in treatment (Linehan, 1993).

The active engagement strategies used in the A&A condition were based on the assumption that clients who are behaviorally and emotionally dysregulated are likely to have difficulties making it into treatment. Thus, these strategies are considered to be an important part of treatment. In examining the WAI-C scores of clients who attended treatment, there were no significant differences in working alliance between treatment conditions, and thus observed differences in outcome between the two groups are not attributable to group differences in the therapeutic alliance.

It might be argued that the participants who did not attend any treatment sessions influenced the observed group differences because more participants in the TAU (9 of 22) than in the A&A condition (3 of 20) did not attend any treatment sessions. However, although the sample size of participants who attended treatment sessions resulted in insufficient power for meaningful statistical analyses, the patterns of change observed among participants in the intention-to-treat sample were similar to those observed among participants who attended treatment. Therefore, the observed treatment differences do not appear to be an artifact of group differences in the number of participants who did not attend any sessions.

The findings suggest that there is significant benefit in targeting anger among clients who have comorbid anger and gambling problems. This is particularly relevant given our finding that almost two thirds of problem gamblers surveyed have comorbid anger problems (Korman et al., 2008). One of the main differences between the treatments was that the A&A condition targeted anger and emotion regulation, whereas the TAU did not. For angry and emotionally dysregulated clients, the absence of effective strategies to regulate anger and other emotions may limit their ability to process new information, thereby reducing treatment effectiveness.

Another difference between the two treatments was that the A&A condition targeted problem anger, gambling, and substance use in an integrated manner, whereas the TAU did not. For example, in the A&A treatment, behavioral analyses and diary cards

were used to explore functional relationships among clients' anger, gambling, and substance use. Clients were explicitly queried about the presence of anger and substance use during therapeutic explorations of problem gambling episodes and the possible role of gambling in modulating their emotions. Similarly, clients were queried about whether or not their anger or substance use followed episodes of gambling or were associated with the negative consequences associated with gambling (e.g., domestic conflict). For clients who may be gambling or engaging in substance use to regulate anger and other emotions, a singular focus on addictions alone may limit treatment effectiveness. It may be that modest incremental improvements in clients' abilities to regulate anger may result in substantial reductions in gambling and substance use. Future research is recommended to explore the possible factors mediating the relationships among comorbid anger, gambling, and substance use problems with a larger sample.

There are a number of limitations in this study, including the absence of measures of participant treatment expectancies, the relatively short follow-up time period (3 months), and the fact that the research assistant was not naive to study assignment. Treatment expectancies on the part of participants were not examined in this study. Given that the A&A condition targeted anger and the TAU did not, it is possible that participants randomized to the A&A condition had greater expectancies for reducing their anger than those randomized to the TAU condition. It is also conceivable that participants randomized to the TAU condition had greater expectancies to reduce their gambling than those randomized to the A&A condition, given that the TAU was an established specialized gambling treatment and the A&A was not. We recommend treatment expectancies be examined in future gambling research.

The study research assistant was not naive to participant assignment, and this may have resulted in undetected bias being introduced into the study. However, procedures were used to minimize any possible bias: All outcome measures were collected via participant-entered self-report; the research assistant followed a standard procedure to make and confirm initial therapy appointments directly with therapists and clients in both conditions; and monthly confirmation calls were made to participants in both conditions following the same study script.

This study provides preliminary evidence supporting the effectiveness of an integrated emotion-oriented approach to treat comorbid anger, gambling, and substance use problems. The results of this study suggest that it is important to screen

gambling clients for the presence of comorbid anger and substance use problems. When present, anger and substance use problems need to be addressed concurrently in gambling treatment to optimize treatment outcomes. We also consider it important to assess the functional relationships among anger, gambling, and substance use. Anecdotally, therapists in the A&A condition reported that analyses of their clients' anger, gambling, or substance use behaviors frequently revealed functional relationships between them. For example, gambling often served to reduce the intensity of clients' anger, and anger was sometimes a result of gambling losses or of relationship conflict associated with gambling. In the case of the former, interventions to reduce gambling involved helping clients to become aware of and regulate their anger.

Although there is increasing awareness in the gambling literature of the possible role of emotions in gambling, emotion-oriented interventions have not yet found their way into gambling treatments. Although this study focused specifically on gamblers who had comorbid anger problems, future research is needed to evaluate whether emotion-oriented interventions are also effective for non-angry problem gamblers, gamblers who have comorbid depression and anxiety, and angry individuals with other comorbid addictions.

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