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Negative Mood Regulation (NMR) Expectancies, Mood, and Affect Intensity among Clients in

Substance Disorder Treatment Facilities

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Abstract

Negative mood regulation (NMR) expectancies, stress, anxiety, depression and affect intensity were examined by means of self-report questionnaires in 158 volunteers, including 99 clients enrolled in addiction treatment programs.  As expected, addicts reported significantly higher levels of stress, anxiety, depression and affect intensity and lower levels of NMR compared to non-addict controls. NMR was negatively correlated with stress, anxiety, depression and affect intensity. The findings indicate that mood self-regulation is impaired in addicts. Low NMR and high affect intensity may predispose to substance abuse and addiction, or alternatively may reflect chronic drug-induced affective dysregulation.

The notion that people drink alcohol or use drugs because they expect such substances to regulate the quality of their emotional experiences is widely accepted. Alcohol drinkers often say they use alcohol to reduce or manage dysphoria and enhance positive emotional experiences (Cooper, Froone, Russell & Mudar, 1995). According to Wills and Shiffman (1985), drinkers use alcohol to reduce distress when they are anxious or over-aroused and to increase positive affect when under-aroused or fatigued. Evans and Dunn (1995) found that positive expectancies about the effects of alcohol on mood were associated with increased alcohol consumption and alcohol related problems.  Woody, Urschel and Alterman (1992) reported that reducing negative affect is a commonly cited reason for drinking among clients undergoing treatment for alcohol use disorders. Such findings suggest that alcohol or other drugs are commonly used to regulate mood states, particularly negative moods.

Catanzaro and Mearns (1990) have defined the concept of generalized expectancies for negative mood regulation (NMR) as beliefs concerning one's ability to terminate or alleviate a negative mood state. Such beliefs vary across individuals and are associated with different strategies to cope with or alleviate bad moods (Catanzaro & Greenwood, 1994). Expectancies regarding emotional states appear to be relatively stable characteristics and are related to clinical and sub-clinical levels of distress. Kirsch, Mearns and Catanzaro (1990) found that strong NMR expectancies were positively related to active coping strategies and negatively related to physical and depressive symptoms.  Mearns and Mauch (1998) investigated coping among police officers, a population at high risk for stress related problems; officers with stronger beliefs about their mood regulation abilities correspondingly reported less anger and less physical and psychological distress. Catanzaro (1993) found that college students with low NMR expectancies reported high levels of distress and strong anxiety sensitivity. Subsequently Catanzaro (1996) administered his NMR Scale to a group of college students on the first day of the semester and later assessed their levels of anxiety and depressive symptoms just before the final exam at the end of semester; state anxiety was negatively

related to exam performance for individuals with low NMR, whereas for individuals with average NMR state anxiety was positively related to exam performance. In an assessment of how NMR expectancies predicted depressive symptoms and coping at the end of a relationship break-up, Mearns (1991) found that NMR expectancies were negatively related to depression and positively related to active coping responses. Similarly, Catanzaro and Horlock (1996) reported that NMR was negatively correlated with depressive symptoms and positively correlated with a number of active behavioral and cognitive coping responses. Other studies have yielded similar results indicating a negative association between NMR expectancies and depressive symptoms in a variety of different samples including female caregivers for Alzheimer's disease (Brashares & Catanzaro, 1994) and elderly people (Catanzaro, Horaney & Creasey, 1995).  NMR expectancies thus appear to be negatively related to anxiety and depression and positively related to active coping strategies.

NMR expectancies also appear to be related to the subjective intensity of one's moods, or affect intensity. Flett, Blankstein and Obertinsky (1996) described associations between NMR expectancies, depressive symptoms, affect intensity and coping. NMR was negatively correlated with affect intensity and positively correlated with active coping. Interestingly, affect intensity seems to be independent of the hedonic quality of mood states. Diener, Larsen, Levine and Emmons (1985) found that across a number of examined populations the intensity of a person's positive emotions correlated about .70 with the intensity of their negative emotions. Thus some individuals tend to report more intense emotions whether these are positive or negative. Larsen and Diener (1987) described affect intensity as "...stable individual differences in the strength with which individuals experience their emotions" (p. 2). Affect intensity can be distinguished from personality constructs such as emotionality or neuroticism, which refer to the regular experience of negative emotion and the inclination to slip from a neutral or positive mental condition to a more negative state (Buss & Plomin, 1975; Guilford & Zimmerman, 1957; Thurstone, 1951).

Although a number of studies suggest that children and adolescents exhibiting anxiety or depression are at increased risk of developing substance problems (e.g., Cicchetti & Rogosch, 1999; Loeber, Southamer-Lober & White, 1999), only a few studies have examined the possible link between NMR expectancies and substance abuse or dependence. Catanzaro and Laurent (2004) found that in adolescents, NMR expectancies were negatively correlated with the use of drinking as a coping mechanism, which in turn was positively related to problematic drinking. Further, individuals with stronger NMR expectancies had weaker beliefs that alcohol has tension reducing effects - an expectancy related to greater and more problematic drinking. Similarly, Kassel, Jackson, Shannon and Unrod (2000) examined NMR expectancies and drinking behavior among college students and found that low NMR expectancies were associated with problem drinking.

Numerous studies have reported links between substance abuse/dependence, stress, anxiety, depression, anger and other affective symptoms (e.g., Cappell & Grealey, 1987; Chassin, Pillow, Curran, Molina & Barrera, 1993). Drug addicts typically experience more anxiety, irritability, moodiness, anger and egocentricity than non-addicts (Francis, 1996), and individuals with high neuroticism scores tend to exhibit heavier alcohol use than people with low scores (Prescott, Neale, Corey & Kendler, 1997; Rankin, Stockwell & Hodgson, 1982; Sieber & Angst, 1990). Evidence has also indicated that severe stress is a risk factor for the development and maintenance of alcoholism and drug abuse (Maltzman, 2000). Although many researchers have proposed a link between substance abuse and affective distress (Cloninger, 1987; Kasell et al., 2000; Nunes, McGrath & Quitkin, 1995), no study to date has assessed the potential relationship between substance disorders and affect intensity.

The purpose of the present exploratory study was to investigate NMR expectancies and affect intensity in clients undergoing treatment for substance problems in order to detect possible associations between substance abuse/dependence, NMR, affect intensity, and affective distress. Based on the previous work cited above, clients undergoing treatment for substance problems

(referred to below as "addicts" for ease of expression) were expected to report lower levels of

NMR, and higher levels of stress, anxiety, depression and affect intensity, compared to non-addict

controls. Further, negative associations were predicted between NMR expectancies and anxiety,

stress, depression and affect intensity.

<div align="center">Method</div>

*Participants*

The addict group consisted of 99 clients recruited from the Gold Coast Alcoholics Recovery

Project-Goldbridge, and the Salvation Army-Fairhaven and Logan House drug addiction treatment

centers. The sample included 59 men and 40 women with a mean age of 36 years ($SD$ = 10.2 yr).

Within the sample, 42 clients were being treated for alcoholism, 21 for opiate (heroin) addiction, 19

for stimulant (amphetamines/cocaine) addiction and 17 for cannabis abuse. The 59 subjects in the

control group (41 females and 18 males) had no self-reported history of substance problems and

included university students and full time workers recruited from the local community. The mean

age was 36.3 years ($SD$ = 13.4 yr). Participants had to be at least 18 years old. No incentive was

offered for participation. The study's protocol was approved by the Bond University Research

Ethics Committee prior to commencement of data collection.

*Materials*

Negative Mood Regulation (NMR) Scale

The NMR scale is a 30-item scale developed by Catanzaro and Mearns (1990) to measure

generalized expectancies to alleviate negative moods. Participants are asked to indicate the degree

to which they believe their use of various coping strategies can counteract a negative mood state.

Each item is scored on a five point Likert scale ranging from "Strongly disagree" to "Strongly

agree" with a statement completing the stem, " When I'm upset I believe that....". Examples of

items include "I can do something to feel better", "planning how I deal with things will help," and

"wallowing in it is all I can do." Factor analysis has shown that the NMR scale is unidimensional

(Catanzaro & Mearns, 1990). A high score indicates a strong belief that one can alleviate one's own negative moods through non-pharmacological means. The NMR scale correlates in theoretically predicted ways with instruments assessing anxiety, depression, emotional states and coping responses and has demonstrated discriminant validity from social desirability, depression and locus of control (Catanzaro, 1994; Catanzaro & Mearns, 1990; Mearns, 1991).

The Depression Anxiety Stress Scales (DASS)

The DASS (Lovibond & Lovibond, 2002) is a self-report questionnaire listing negative emotional symptoms divided into three subscales measuring depression, anxiety and stress. Participants rate the extent to which they have experienced each symptom over the past week on a four point Likert scale ranging from "Did not apply to me at all" to "Applied to me very much, or most of the time." The DASS comes in a long form consisting of 42 items and a short form consisting of 21 items. Antony, Bieling, Cox, Enns and Swinson (1998) claimed that the 21-item version has several advantages over the longer version in terms of fewer items, a cleaner factor structure and smaller interfactor correlations. The 21-item version was used in the present study.

The Affect Intensity Measure (AIM)

The AIM is a 40-item scale designed to measure the intensity with which individuals typically experience positive and negative emotions (Larsen, 1984). Participants respond on a 6-point Likert scale agreeing or disagreeing with statements such as "When I receive an award I become overjoyed", "I feel pretty bad when I lie", "When I do feel anxiety it is normally very strong," and "Sad movies deeply touch me." Test-retest reliabilities for the AIM at 1, 2 and 3 months were .80, .81 and .81 respectively (Larsen, 1984). Larsen and Diener (1987) obtained a test-retest correlation of .75 when subjects from a previous study filled out the scale again two years later. Evidence has attested to both the reliability and validity of this instrument (e.g., Flett, Blankstein, Bator & Pliner, 1989; Goldsmith & Walters, 1989; Larsen & Diener, 1987).

<u>Procedure</u>

At Goldbridge, Fairhaven and Logan House addiction treatment centers, prospective

subjects were brought into a room where only the student researcher and the treatment center

director were present. The study was described and clients were asked if they would like to

participate. They were told that their participation was entirely voluntary and that choosing not to

participate entailed no penalty of any kind. Those who said no then left the room, whereas those

who said yes completed the questionnaires in groups of approximately 20-40.  Prospective control

group subjects were recruited via door-to-door solicitation in the community and at Bond

University and the campus library.  Control group participants completed the questionnaires in the

privacy of their own homes and returned them in the provided self-addressed return envelope.

Instructions given to both groups specified that no identifying information was to be written on any

of the questionnaires, ensuring anonymity of all responses. Of 210 questionnaire packets

distributed, 146 (70 %) were returned with usable data. The questionnaires described above were

completed as part of a larger study.

<div align="center">Results</div>

<u>Correlational Analysis</u>

Initially the relationships between NMR expectancies, stress, anxiety, depression and affect

intensity were examined by means of Pearson product-moment correlation coefficients across all

participants. Preliminary analysis was conducted to ensure there was no violation of the

assumptions of normality, linearity and homoscedasticity. The expected relationships were

obtained, as shown in Table 1.

Table 1. Intercorrelations between Negative Mood Regulation (NMR) scale scores, Affect Intensity

Measure (AIM) scores, and scores on the Depression, Anxiety and Stress Scale (DASS).

|  | NMR | AIM | Stress | Anxiety | Depression |
|---|---|---|---|---|---|
| NMR |  | -.16* | -.47** | -.35** | -.48** |
| AIM |  |  | .31* | .25** | .17* |
| Stress |  |  |  | .83** | .80** |
| Anxiety |  |  |  |  | .83** |

*p < .05. ** p < .01.

## Group Comparisons

A two way multivariate analysis of covariance (MANCOVA) was performed with the

independent variables of group (addicts, controls) and gender and the dependent variables of NMR

expectancy, affect intensity, and DASS anxiety, depression and stress. Education level (1-7, year 8

to university) was included as a covariate given the greater number of university students in the

control sample, however, the effect of education level was not significant in the MANCOVA. An

additional multivariate analysis broke down the addict group into subgroups (alcoholics, opiate

addicts, stimulant addicts, cannabis abusers) but did not yield substantial differences among

subgroups, thus for the sake of brevity only the findings of the main analysis are reported here. The

overall multivariate effect of group was significant, $\underline{F}(5, 147) = 6.74$, $\underline{p} < .0001$. There was no effect

of gender and no interaction. Univariate main effects of group were significant for NMR, $\underline{F}(1, 151)$

$= 8.33$, $\underline{p} < .01$; DASS Stress, $\underline{F}(1, 151) = 19.04$, $\underline{p} < .0001$; DASS Anxiety, $\underline{F}(1, 151) = 19.45$, $\underline{p} <$

$.0001$; DASS Depression, $\underline{F}(1, 151) = 26.28$, $\underline{p} < .0001$; and Affect Intensity, $\underline{F}(1, 151) = 8.83$, $\underline{p} <$

$.01$. As shown in Table 2, addicts scored lower on NMR, and higher on Affect Intensity as well as

each DASS scale, than controls. There were no univariate effects of gender on any variable, nor any

gender X group interactions.

Table 2. Group/subgroup means and standard deviations on the Negative Mood Regulation (NMR) scale, Depression Anxiety and Stress Scales (DASS), and the Affect Intensity Measure (AIM).

| | Controls (n = 59) | Alcoholics (n = 42) | Opiate Addicts (n = 21) | Cannabis Abusers (n = 17) | Stimulant Addicts (n = 19) |
|---|---|---|---|---|---|
| NMR | 109.67 (13.35) | 98.51 (16.98) | 89.71 (22.32) | 97.50 (14.78) | 95.41 (18.84) |
| Stress | 9.59 (7.80) | 20.44 (11.27) | 24.10 (12.55) | 22.78 (10.65) | 23.06 (11.51) |
| Anxiety | 3.71 (4.22) | 14.98 (12.63) | 18.57 (12.57) | 17.33 (12.02) | 17.65 (10.71) |
| Depression | 5.63 (6.17) | 19.22 (12.18) | 22.57 (12.98) | 17.78 (11.56) | 16.82 (12.43) |
| AIM | 141.55 (22.97) | 155.59 (19.38) | 153.10 (28.39) | 157.61 (18.99) | 153.00 (20.73) |

Discussion

As predicted, addicts reported higher levels of stress, anxiety, depression and affect intensity and lower levels of NMR compared to controls. Because all addicts in the present study were more than two weeks abstinent at the time of testing (as confirmed by regular urine tests at the treatment centers), the observed group differences are not likely attributable to residual drug effects or withdrawal effects. NMR was significantly negatively correlated with stress, anxiety, depression and affect intensity, as expected.

The present results are consistent with the notion that addicts suffer from impaired affect regulation and have lower confidence in their own ability to self-regulate their negative moods. However, the role (if any) of NMR in the development and maintenance of substance problems is unclear. One possibility is that low NMR may promote substance abuse as a means of coping with affective distress (Catanzaro & Laurent, 2004). Reduction of negative affect is a major reason cited for using alcohol and drugs (Johnston & O'Malley, 1986; Newcomb et al., 1988) and high negative affect is related to consuming greater amounts of drugs and alcohol (Colder & Chassin, 1993; Krueger et al., 1996; Wills et al., 1999). Much previous research has also found significantly higher

levels of stress (e.g., Blume, Marlatt & Schmaling, 2000; Gorman, 1988; Horowitz & Davies, 1994; Shoal & Giancola, 2001), anxiety disorders (e.g., Compton et al., 2000; Schuckit et al., 1997; Weiss & Rosenberg, 1985) and mood disorders (Raimo & Schuckit, 1998; Swendsen & Merikangas, 2000; Tomasson & Vaglum, 1995) among those with substance problems compared to non-addict control samples. A number of different theories and models have been offered to explain the co-occurrence of substance disorders and other Axis I disorders, particularly anxiety disorders and mood disorders (e.g., Doris et al, 1999; Kobb & LeMoal, 1997, 2001). For example, individuals who already have an Axis I disorder may start drinking heavily to self-medicate and regulate the quality of their emotional states, in accordance with evidence suggesting that alcohol is sometimes used to reduce anxiety or panic symptoms (Kusher et al., 1990, 1996). Further, since the famous 19th century case of Phineas Gage the prefrontal cortex has been known to play a fundamental role in affective self-regulation, and a variety of evidence indicates that substance problems are often associated with physiological and neuropsychological signs of prefrontal cortex dysfunction (Giancola, 2000; Lyvers, 2000). Such deficits in executive cognitive functioning and affective self-regulation may predispose to substance problems, result from chronic neurotoxic effects of alcohol or other drugs, or perhaps both (see Lyvers, 2000).  The present findings do not allow any conclusions to be drawn as to whether the low NMR reported by the addict sample was a cause or effect of substance abuse or whether it is in any way related to dysfunction of the prefrontal cortex, but these ideas perhaps merit further investigation.

In the present study, NMR was negatively related to levels of stress, anxiety, and depression, replicating previous findings (Brashares & Catanzaro, 1994; Catanzaro, 1993; Catanzaro & Greenwood, 1994; Catanzaro, Horaney & Creasey, 1995; Kirsch, Mearns & Catanzaro, 1990; Mearns, 1991; Mearns & Mauch, 1998; Surman, 1999). Further, stress, anxiety and depression were positively related to affect intensity, in line with previous research (Basso, Scheft & Hoffmann,

1994; Dance, Kuiper & Martin, 1990; Flett et al., 1986). Present results also indicate a substantial relationship between stress, anxiety and depression, as reported previously (Kessler, 1997).

As expected, addicts reported significantly higher levels of affect intensity compared to non-addict controls. Flett et al. (1988, 1989) found that affect intensity is related to a relative absence of emotional control and Westen (1994) reported a positive association between affect intensity and the venting of emotions. Thus the present results for affect intensity, as for NMR, suggest that addicts have less emotional control than non-addicts. Affect intensity was also positively correlated with depression, anxiety and stress scores in the present study. Similarly, Larsen and Diener (1987) reported that affect intensity was related to emotional temperament and various distress indicators such as anxiety and mood fluctuation. The present investigation found a small but significant negative correlation between NMR expectancies and affect intensity, consistent with previous research (Catanzaro, 1997; Flett et al., 1996).

The present study has indicated potentially important links between substance problems, NMR expectancies, stress, anxiety, depression and affect intensity, although the precise nature of those links remains to be determined. Further research on these associations appears warranted. Low NMR expectancies and/or high affect intensity may in some cases reflect the effects of chronic substance abuse, possibly involving impairment or dysfunction of the "executive" prefrontal cortex, thus the relationship between these traits and executive cognitive functioning should be examined. Alternatively, low NMR may be a contributing factor in the onset and maintenance of addictions, in which case cognitive therapies that specifically target NMR might conceivably improve relapse rates of addicts. However, the nature of the association is unclear at present. In conclusion, NMR and affect intensity can be added to the growing list of traits associated with substance abuse/dependence and thus merit further investigation in that context.

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