

Bond University
Research Repository



Alexithymia and aspects of dreaming: Differential associations of alexithymia facets with dream variables

Lyvers, Michael; Robinson, Morgana; Watt, Bruce; Thorberg, Fred Arne

Published in:
International Journal of Psychology

DOI:
[10.1002/ijop.12956](https://doi.org/10.1002/ijop.12956)

Licence:
CC BY-NC-ND

[Link to output in Bond University research repository.](#)

Recommended citation(APA):
Lyvers, M., Robinson, M., Watt, B., & Thorberg, F. A. (2023). Alexithymia and aspects of dreaming: Differential associations of alexithymia facets with dream variables. *International Journal of Psychology*, 1-11.
<https://doi.org/10.1002/ijop.12956>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

For more information, or if you believe that this document breaches copyright, please contact the Bond University research repository coordinator.

Alexithymia and aspects of dreaming: Differential associations of alexithymia facets with dream variables

Michael Lyvers^{ORCID}, Morgana Robinson, Bruce Watt, and Fred Arne Thorberg

School of Psychology, Bond University, QLD, Gold Coast, Australia

Research on aspects of dreaming associated with alexithymia has yielded mixed results. The present study recruited a young adult online sample of 577 participants who completed validated indices of alexithymia, emotion suppression, negative moods, and eight aspects of dreaming, with a focus on evaluating a counterintuitive previous finding that alexithymia and two of its core facets were associated with greater self-reported typical emotional intensity of dreams. Total alexithymia and facet scores showed differential relationships to aspects of dreaming including dream recall frequency, emotionality, meaningfulness, nightmare frequency, nightmare distress, usefulness of dreams in problem-solving and creativity, and learning about oneself through dreams. Planned hierarchical regression controlling for demographics, alcohol use, and dream recall frequency indicated that the difficulties identifying feelings (DIF) facet of alexithymia was a significant positive predictor of dream emotionality, whereas the externally oriented thinking (EOT) facet was a significant negative predictor. Stress, but not emotion suppression, mediated the positive relationship between DIF and dream emotionality. The likely role of dream emotionality in higher ratings of nightmare distress, dream meaningfulness, and learning about oneself through dreams among those with higher DIF scores is noted, along with other findings and the strengths and limitations of the study.

Keywords: Alexithymia; Emotion; Dreaming; Alcohol; Suppression; Stress.

Alexithymia is a multifaceted, transdiagnostic personality dimension characterised by difficulties identifying and describing feelings and an externally oriented thinking style (Bagby et al., 2020). A study of 8785 Danish twin pairs (Jørgensen et al., 2007) indicated relatively low heritability of 30–33% for alexithymia, with the remaining variance attributed to environmental factors—reinforcing the purported role of developmental factors in the aetiology of alexithymia. For example, some authors propose that early dysfunctional child-caregiver relationships may lead to persistent deficits of processing and labelling emotions (Lyvers et al., 2019; Thorberg et al., 2011), whereas others suggest a central role of childhood trauma (Bucci & Cornell, 2020). Alexithymia is implicated as a risk factor for a variety of excessive behaviours in adults including binge eating (Aloi et al., 2017; Lyvers et al., 2022) as well as substance (Cruise & Becerra, 2018; Thorberg et al., 2009) and behavioural addictions (Kandri et al., 2014; Lyvers et al., 2016, 2021; Mahapatra & Sharma, 2018; Marchetti et al., 2019; Toneatto et al., 2009; van Landeghem et al., 2019). Alexithymia is also commonly associated

with negative moods such as depression, anxiety, and stress (McGillivray et al., 2016), consistent with the notion that deficient mood regulation is characteristic of alexithymia and that excessive behaviours represent a maladaptive, externalised coping strategy for alleviating distress (Ghalehban & Besharat, 2011; Lyvers et al., 2020; Thorberg et al., 2009). Emotion suppression has also been implicated as a typical self-regulation strategy among those with alexithymia (Laloyaux et al., 2015).

Given the concrete thinking and deficient emotional self-awareness that define alexithymia, low levels of dream recall, dream content and meaningfulness, and dream emotionality were anticipated in previous work on aspects of dreaming in alexithymia. However, the outcomes of such research have been mixed. Some studies reported the expected finding of lower dream recall associated with alexithymia (Formica et al., 2013; Nielsen et al., 2011; Obrębska & Rohoza, 2021), whereas others reported no relationship (De Gennaro et al., 2003; Montebanarocci & Giovagnoli, 2019; Parker et al., 2000), and one study reported different results for different facets of alexithymia (Lumley & Bazydło, 2000). Alexithymia

Correspondence should be addressed to Michael Lyvers, Bond University, Gold Coast, QLD 4229 Australia. (E-mail: mlyvers@bond.edu.au).

Michael Lyvers designed the study, analysed the data, and wrote the manuscript. Morgana Robinson collected the data and conducted preliminary analysis. Bruce Watt and Fred Arne Thorberg contributed to the interpretation of the findings and edited the final version of the article.

has also been associated with reports of less imaginative or less meaningful dream content in some studies (Montebarocci & Giovagnoli, 2019; Parker et al., 2000), but no difference from controls in dream emotionality (De Gennaro et al., 2003; Parker et al., 2000). Other studies found greater self-reported nightmare distress in those with alexithymia (Formica et al., 2013; Nielsen et al., 2011), but no alexithymia-related difference in nightmare frequency (Montebarocci & Giovagnoli, 2019). Small sample sizes and methodological variations (e.g., self-report upon induced awakening from REM sleep vs. retrospective self-report), combined with lack of accounting for potential influences of demographic, substance use, or mood factors associated with alexithymia, could conceivably explain these conflicting results.

A recent exploratory study in a sample of 109 young adults (Lyvers et al., 2023) found no differences in retrospective dream recall or nightmare frequency between alexithymia and control groups; however, the alexithymia group reported greater typical emotional intensity of dreams, an unanticipated and counterintuitive finding. Further, the core difficulty identifying feelings (DIF) facet of alexithymia showed a significant positive correlation with dream emotionality. These unexpected findings were tentatively attributed to an ‘alexithymic’ emotion regulation strategy of suppression of emotions during waking (Laloyaux et al., 2015), and the subsequent emergence of such emotions during REM sleep when prefrontal inhibitory restraints on emotions are released. An advantage of the study was that it accounted for some factors associated with alexithymia that are also reported to influence aspects of dreaming, specifically negative moods and alcohol use (Montebarocci & Giovagnoli, 2019; Steinig et al., 2011).

The present research recruited a larger sample than previous studies and controlled for additional factors that might potentially influence retrospective assessments of dream variables in examining the potential roles of emotion suppression and mood in the association of the core DIF facet of alexithymia with greater dream emotionality. Alexithymia and its facets—DIF, difficulty describing feelings (DDF), and externally oriented thinking (EOT)—were examined in relation to eight aspects of dreaming: dream recall frequency, nightmare frequency, dream emotionality, nightmare distress, dream meaningfulness, the ability to learn about oneself from dreams, and dream usefulness for problem-solving and creativity. The hypothesized roles of emotion suppression and negative moods in the association of DIF with greater dream emotionality were evaluated while taking into account potential influences of alcohol or tobacco use, age, sex, education level, student status, and dream recall frequency. Participants who indicated past head trauma, current use of psychiatric medication, or past-month illicit drug use were excluded from the sample, as these factors

could potentially influence aspects of dreaming. Further, the sample was restricted to young adults to minimise potential age and cohort effects as sources of variability in responses. The project aimed to help resolve some of the conflicting outcomes of previous work described earlier, as well as contribute novel results on previously unexamined aspects of dreaming in relation to alexithymia and its facets.

METHOD

Participants

After obtaining approval from the university ethics committee, an initial sample of 586 participants was recruited via Qualtrics Panels, an online survey hosting service that can provide a proprietary online sample meeting requirements specified by researchers. The survey was set up with quotas for age (18–30 years), gender (male/female balance), and regions within Australia (proportional to state populations). Exclusion criteria specified in advance included the presence of a psychological or neurological disorder necessitating medication; previous head trauma; or use of illicit drugs within the last month. Participants were remunerated by Qualtrics via a points-based system for their participation in the survey. Qualtrics screened for perseverative, incomplete, or otherwise invalid responses before providing the data set. After identification and removal of multivariate outliers (Mahalanobis Distance $p < .001$), the final sample of 577 cases was obtained. In the final sample, participants were aged between 18 and 30 years ($M = 24.01$, $SD = 3.68$); there were 247 males (43%) and 330 females (57%). Within this sample, 217 participants (37.6%) identified as a current student, 447 (77.5%) reported current alcohol use, and 113 (19.6%) indicated they were current tobacco smokers. There were 28 participants (4.9%) who reported that their highest completed education level was before grade 12, and 215 (37.3%) who had completed only grade 12, 241 (41.8%) who reported completing an undergraduate or trade school degree, and 93 (16.1%) who reported completing a postgraduate degree.

Measures

Participants completed the following battery of self-report scales, beginning with a demographics questionnaire consisting of questions assessing age, gender, education level, student status, smoker status, and inclusion/exclusion criteria. After completion of the demographics questionnaire, if the respondent met the criteria for inclusion they then completed the following scales in uniquely randomised orders per participant.

Toronto Alexithymia Scale 20 (TAS-20); Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994). The

TAS-20 is the most widely used measure of alexithymia and was the scale used in the studies on aspects of dreaming in alexithymia cited earlier. There are 20 items rated on a five point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The TAS-20 has three subscales measuring the facets of alexithymia: Difficulty Identifying Feelings (DIF; seven items, e.g., ‘When I am upset, I don’t know if I am sad, frightened, or angry’), Difficulty Describing Feelings (DDF; five items, e.g., ‘It is difficult for me to find the right words for my feelings’), and Externally Oriented Thinking (EOT; eight items, e.g., ‘I prefer to just let things happen rather than to understand why they turned out that way’). In scoring, responses to five items are reversed, after which the responses to all 20 items are summed for the total score. Scores of 61 or higher indicate definite or high alexithymia, 52–60 indicate borderline alexithymia, and scores of 51 and below indicate low or no alexithymia. The Cronbach alpha index of internal consistency for the total TAS-20 score in the present sample was acceptable at 0.83.

Depression Anxiety Stress Scales 21 (DASS-21; Lovibond & Lovibond, 1995). The 21 item DASS-21 is the short form of the original DASS-42, which was designed to measure levels of depression, anxiety, and stress over the previous week. Using a four-point Likert scale, respondents rate how well a statement applied to them over the last week, with response options ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). There are seven questions assessing stress (e.g., ‘I found it hard to wind down’), anxiety (e.g., ‘I was aware of dryness of my mouth’), and depression (e.g., ‘I couldn’t seem to experience any positive feeling at all’). Item responses are summed and then doubled to yield individual scores for each subscale. A total score is obtained by summing subscale scores. The Cronbach alpha indices of internal consistency for the DASS-21 subscales in the present sample were acceptable at 0.89 for stress, 0.87 for anxiety, and 0.91 for depression.

Emotion Regulation Scale (ERQ; Gross & John, 2003). The 10-item ERQ assesses emotional self-regulation via two strategies assessed by two subscales, Reappraisal (six items; e.g., ‘When I want to feel less negative emotion, I change the way I’m thinking about the situation’) and Suppression (four items; e.g., ‘When I am feeling negative emotions, I make sure not to express them’), of which the latter subscale was of interest in the present context. Items are rated on a seven-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). Emotional reappraisal is the antecedent-focused strategy of changing the way one thinks about an event, whereas suppression primarily modifies the emotional response (Laloyaux et al., 2015). Items are summed to yield scores on each subscale. In the present sample the Cronbach alpha internal consistency indices were acceptable at 0.87 and 0.77 for reappraisal and suppression, respectively.

Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993). The 10-item AUDIT was designed to screen for alcohol-related risk or harm via items assessing alcohol consumption (e.g., ‘How often do you have a drink containing alcohol?’), alcohol dependence (e.g., ‘How often during the last year have you found that you were not able to stop drinking once you had started?’), and alcohol related problems (e.g., ‘How often during the last year have you had a feeling of guilt or remorse after drinking?’). Responses are scored from 0 to 4 via Likert scales with different anchors depending on the question, and are summed to yield an overall score ranging from 0 to 40. In the present sample the Cronbach alpha index of internal consistency of the total AUDIT score was acceptable at 0.86.

Mannheim Dream Questionnaire (MADRE; Schredl et al., 2014). The MADRE contains 28 questions assessing aspects of and attitudes toward dreaming, with Likert scale response options ranging from two to eight choices where anchors vary depending on the question. Items of interest in the present context included dream recall frequency (‘How often have you recalled your dreams recently (in the past several months)?’) with seven response options ranging from ‘never’ to ‘almost every morning’; dream emotionality (‘How intense are your dreams emotionally?’) with five response options ranging from ‘not at all intense’ to ‘very intense’; nightmare frequency (‘How often have you experienced nightmares recently (in the past several months)?’) with eight response options ranging from ‘never’ to ‘several times a week’; nightmare distress (‘If you currently experience nightmares, how distressing are they to you?’) with five response options from ‘not at all distressing’ to ‘very distressing’; dream meaningfulness (‘How much meaning do you attribute to your dreams?’) with five response options ranging from ‘not at all’ to ‘totally’; the ability of dreams to help one learn about oneself (‘A person who reflects on her/his dreams is certainly able to learn more about her/himself’) with five response options ranging from ‘not at all’ to ‘totally’; the ability of dreams to assist in problem-solving (‘How often do your dreams help you to identify and solve your problems?’) with eight response options ranging from ‘never’ to ‘several times a week’; and creativity in dreams (‘How often do your dreams give you creative ideas?’) with eight response options ranging from ‘never’ to ‘several times a week.’ There is no total score for the MADRE, however the eight-item Attitude Toward Dreams subscale showed good internal consistency in the present sample with a Cronbach alpha of 0.91.

Procedure

After obtaining ethics approval, participant recruitment was conducted by Qualtrics using the parameters specified earlier. Prospective participants received a link to

an explanatory statement describing the general nature of the study as an investigation of personality, mood and dreaming, and which specified inclusion/exclusion criteria as well as the strict anonymity and confidentiality of all responses. The demographics questions were presented first; if the participant did not meet inclusion criteria a 'thank you' page appeared and the survey was terminated. Those who met inclusion criteria had to tick 'yes' to a consent statement and were then directed to the various scales in uniquely randomised orders per participant. All items on each scale had to be completed before proceeding to the next scale. The names of the scales were removed to reduce the risk of bias. On completion, contact details for psychological resources were provided in case any questions induced distress, as per ethics requirements. The average time taken to complete the survey was ~10 minutes according to Qualtrics, which conducted speed checking and exclusion of any cases that completed the battery in <5 minutes. Data were analysed with IBM SPSS Statistics 28 and JASP 0.14.1. The analytic plan included correlations, regression, and path analysis.

RESULTS

Descriptive statistics

Although the DASS-21 is not a standalone diagnostic tool (Lovibond & Lovibond, 1995), the guidelines indicated that the mean doubled (i.e., out of a maximum of 42) scores for Depression ($M = 16.79$, $SD = 11.51$), Anxiety ($M = 15.15$, $SD = 10.60$), and Stress ($M = 17.99$, $SD = 10.79$) were in the low to moderate range. Guidelines for interpreting AUDIT scores (Saunders et al., 1993) indicated that in the present sample, 301 participants (52.2%) were 'low risk' drinkers, 167 (29%) were drinking at a 'hazardous' level, and 109 (18.9%) were drinking at a 'harmful' level. The established TAS-20 cutoff score for alexithymia indicated that 246 participants (42.5%) had alexithymia in the current sample, which is high for population-based samples (McGillivray et al., 2016) but not unusual for young adult samples recruited via the internet given high levels of internet use among young adults with alexithymia, especially in the recent years of the COVID-19 pandemic (e.g., Lyvers et al., 2021, 2022). Means and standard deviations for all variables of interest are presented in the far right-hand column of Table 1 (note that the different MADRE dream variable measures use different Likert scales ranging from 5 to 8 response options as detailed in Materials).

Pearson correlations were conducted on all continuous measures and are presented in Table 1. Given the large sample, a conservative alpha level of 0.01 was used to minimise the number of weak relationships reaching significance. TAS-20 total and subscale (DIF, DDF, EOT) scores were included because facets of alexithymia

had reportedly shown differential associations with dream variables in previous work (Formica et al., 2013; Lumley & Bazydlo, 2000; Lyvers et al., 2023). As can be seen in the table, TAS-20 total and all three subscale scores were significantly positively correlated with emotion suppression in line with predictions. Consistent with previous work cited earlier, neither TAS-20 total scores nor subscale scores were significantly correlated with dream recall frequency. By contrast, TAS-20 total scores and subscales DIF and DDF were significantly positively correlated with typical emotional intensity of dreams, whereas EOT showed a significant negative relationship. TAS-20 total, DIF, and DDF subscales were significantly positively correlated with nightmare frequency, nightmare distress, and meaningfulness of dreams, whereas EOT showed a significant negative correlation with meaningfulness of dreams. DIF and DDF were significantly positively correlated with the belief that reflecting on dreams can help one learn about oneself, whereas EOT showed a significant negative relationship. TAS-20 total and DIF were significantly positively correlated with problem-solving from dreams and dreams as a source of creative ideas. TAS-20 total and all subscale scores were significantly positively correlated with DASS-21 negative mood scores, as expected based on previous work cited earlier. Also expected from previous work, TAS-20 total, DIF, and EOT scores were significantly positively correlated with alcohol-related risk as measured by AUDIT.

There were some additional significant correlations of interest beyond those linked to the alexithymia measures. DASS-21 negative mood was significantly positively correlated with dream emotionality, nightmare frequency, nightmare distress, dream meaningfulness, learning about oneself from dreams, problem-solving from dreams, and dreams as a source of creative ideas, as well as with emotion suppression and alcohol use; however, DASS-21 was unrelated to dream recall frequency. Further, emotion suppression was significantly positively correlated with nightmare distress, alcohol use, and dreams as a source of problem-solving. Dream recall frequency was significantly positively correlated with dream emotionality (hence its inclusion in the regression on the latter variable), nightmare frequency, creativity and problem-solving from dreams, dream meaningfulness, and learning about oneself from dreams. Dream emotionality was significantly positively correlated with nightmare frequency, nightmare distress, dream meaningfulness, learning about oneself from dreams, creative ideas from dreams, and problem-solving from dreams. Nightmare distress was significantly positively correlated with dream meaningfulness, learning about oneself from dreams, creative ideas from dreams, and problem-solving from dreams. Dream meaningfulness showed substantial positive correlations with learning about oneself from dreams and creativity and problem-solving from dreams. Learning about oneself from dreams was significantly

TABLE 1
Correlations among continuous measures ($n = 577$).

Variable	TAS total	DIF	DDF	EOT	DASS	SUPP	AUD	Recall	Emotion	Nmares	Distress	Meaning	Learn	Create	M (SD)
TAS total	—														57.38 (10.97)
DIF	0.90**	—													19.93 (6.23)
DDF	0.83**	0.67**	—												15.15 (3.96)
EOT	0.58**	0.26**	0.28**	—											22.29 (3.60)
DASS	0.56**	0.59**	0.44**	0.18**	—										31.97 (15.34)
SUPP	0.47**	0.38**	0.48**	0.23**	0.36**	—									16.59 (11.51)
AUDIT	0.21**	0.23**	0.07	0.16**	0.34**	0.18**	—								8.79 (7.48)
Recall	0.00	0.06	-0.01	-0.09	0.06	-0.03	0.05	—							3.34 (1.63)
Emotion	0.15**	0.23**	0.17**	-0.13*	0.30**	0.04	0.14**	0.28**	—						2.82 (0.96)
Nmares	0.24**	0.29**	0.20**	0.03	0.38**	0.08	0.23**	0.38**	0.45**	—					5.15 (2.33)
Distress	0.26**	0.31**	0.22**	0.00	0.39**	0.12*	0.21**	0.09	0.41**	0.50**	—				2.81 (1.05)
Meaning	0.15**	0.22**	0.19**	-0.12*	0.27**	0.09	0.17**	0.23**	0.41**	0.28**	0.28**	—			2.88 (1.04)
Learn	0.08	0.16**	0.14**	-0.20**	0.19**	0.08	0.02	0.24**	0.33**	0.20**	0.18**	0.48**	—		3.30 (1.10)
Create	0.16**	0.20**	0.07	0.07	0.24**	0.10	0.24**	0.27**	0.18**	0.30**	0.18**	0.27**	0.20**	—	5.43 (2.15)
Solve	0.19**	0.24**	0.08	0.06	0.28**	0.11*	0.26**	0.22**	0.18**	0.31**	0.20**	0.32**	0.25**	0.71**	5.79 (2.18)

Abbreviations: Create = dreams provide creative ideas; DASS = Depression Anxiety Stress Scales 21 total score; DDF = Difficulty describing feelings; DIF = Difficulty identifying feelings; Distress = nightmare distress; EOT = Externally oriented thinking; Learn = learning about oneself from dreams; Meaning = meaningfulness of dreams; Nmares = nightmare frequency; Recall = dream recall frequency; Solve = dreams help solve problems; SUPP = emotion suppression; TAS = Toronto Alexithymia Scale 20. * $p < .01$; ** $p < .001$.

TABLE 2
Hierarchical regression on emotional intensity of dreams, showing variables entered at each step.

Predictor	ΔR^2	β	<i>B</i>	<i>SE B</i>	95% CI for <i>B</i>
Step 1	.13**				
Age		-0.01	-0.00	0.01	[-0.03, 0.02]
Gender		0.18**	0.35	0.08	[0.20, 0.50]
Student status		0.01	0.02	0.09	[-0.15, 0.19]
Education		-0.03	-0.03	0.05	[-0.13, 0.07]
Smoker status		-0.09	-0.23	0.10	[-0.43, -0.02]
AUDIT		0.11*	0.01	0.01	[0.00, 0.03]
Dream recall freq.		0.25**	0.15	0.02	[0.10, 0.19]
Step 2	.06**				
DIF		0.17*	0.03	0.01	[0.01, 0.04]
DDF		0.09	0.02	0.01	[-0.0, 0.05]
EOT		-0.18**	-0.05	0.01	[-0.07, -0.03]
Step 3	.00				
Emotion suppression		-0.05	-0.01	0.01	[-0.03, 0.01]
Step 4	.04**				
Depression		-0.03	-0.01	0.01	[-0.03, 0.02]
Anxiety		0.02	0.00	0.01	[-0.02, 0.03]
Stress		0.25**	0.05	0.01	[0.02, 0.07]

Abbreviations: AUDIT = Alcohol Use Disorders Identification Test; CI = confidence interval; Freq. = frequency; SE B = standard error of unstandardized coefficient. * $p < .01$; ** $p < .001$.

positively correlated with the latter two variables. Finally, creative ideas from dreams and problem-solving from dreams showed a very strong positive intercorrelation (see Table 1).

Hierarchical regression on typical emotional intensity of dreams

A planned hierarchical multiple regression was conducted on typical emotional intensity of dreams, with control variables of age, gender, education level, student status, alcohol use, smoker status, and dream recall frequency as covariates at step 1, the three TAS-20 alexithymia subscales DIF, DDF, and EOT at step 2, the ERQ emotion suppression variable at step 3, and the DASS-21 subscales Depression, Anxiety, and Stress at step 4. Step 1 was significant, $F(7, 569) = 12.04$, $p < .001$, accounting for 13% of the variance; gender, alcohol use (measured by AUDIT scores), and dream recall frequency were significant positive predictors ($p < .001$), whereas tobacco use approached significance as a negative predictor ($p = .03$). Male gender was associated with more emotional dreams. Step 2 was also significant, $Fchange(3, 566) = 13.05$, $p < .001$, with the TAS-20 subscales accounting for an additional 5.6% of variance; DIF was a positive predictor whereas EOT was a negative predictor (both $p < .001$), while gender and dream recall frequency remained significant but alcohol use ($p = .03$) and smoking ($p = .04$) only approached significance (conservatively defined for current purposes as $p < .01$). Step 3 was not significant, $Fchange(1, 565) = 1.14$, $p = .29$, accounting for 0% additional variance; ERQ emotion suppression scores did not explain any variance, whereas DIF, EOT, and dream

recall frequency were again significant as before, with alcohol use and smoking again approaching significance. Step 4 was significant, $Fchange(3, 562) = 9.08$, $p < .001$, accounting for 4% of additional variance; Stress and dream recall were significant positive predictors, whereas EOT remained significant as a negative predictor (all $p < .001$). The relevant regression statistics are presented in Table 2, which for brevity shows only the variables added at each step.

Mediation of DIF to dream emotionality by stress

As the DIF facet of alexithymia became nonsignificant after the DASS-21 scales were added to the regression model, and Stress was the only significant added predictor, a mediation analysis was conducted to test whether the Stress variable explained the positive relationship between DIF and typical emotionality of dreams. JASP 0.14.1 was used with 1000 bias-corrected replications while controlling for all demographic and substance use variables, the EOT subscale, and dream recall frequency (as both the latter variables had remained significant predictors in the final regression model). As shown in Table 3 and Figure 1, the indirect effect of DIF through Stress was highly significant, indicating mediation; the direct effect was only slightly smaller in value but did not reach the $p < .01$ level of significance.

Additional mediation tests

The possibility that higher frequency of nightmares associated with DIF might account for the positive

TABLE 3
Mediation of the relationship between alexithymia and emotionality of dreams by stress.

	Estimate	SE	z-value	p	95% confidence interval	
					Lower	Upper
<i>Direct effects</i>						
TAS20_DIF → DreamEmotionality	0.105	0.046	2.29	.022	0.015	0.194
<i>Indirect effects</i>						
TAS20_DIF → Stress → DreamEmotionality	0.118	0.024	4.92	<.001	0.071	0.164
<i>Total effects</i>						
TAS20_DIF → DreamEmotionality	0.222	0.041	5.44	<.001	0.142	0.302

Note: Delta method standard errors, bias-corrected percentile bootstrap confidence intervals, ML estimator.

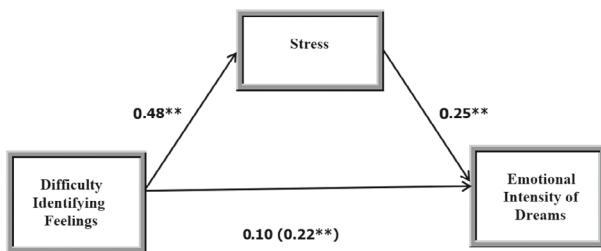


Figure 1. Path model controlling for age, gender, education, student status, alcohol use, tobacco use, externally oriented thinking and dream recall frequency. The positive association between the Difficulty Identifying Feelings facet of alexithymia and emotional intensity of dreams shows evidence of mediation through stress. The unmediated path coefficient is shown in parentheses. ** $p < .001$.

relationship between DIF and typical dream emotionality was explored via path analysis. Again JASP 0.14.1 was used with 1000 bias-corrected replications while controlling for the other variables as before. As shown in Table 4, results indicated that nightmare frequency only partially mediated the association between DIF and typical dream emotionality, with the direct effect explaining nearly twice as much variance.

The potential role of higher typical dream emotionality in the positive associations of DIF with nightmare distress, dream meaningfulness, learning about oneself through dreams, and dreams as a source of creativity and problem-solving was explored by path analysis, again using JASP 0.14.1 with 1000 bias-corrected replications while controlling for the other variables as before. As can be seen in Table 5, both direct and indirect effects were significant and positive for nightmare distress, dream meaningfulness, and learning about oneself through dreams; by contrast, direct effects were significant and positive for creativity and problem-solving from dreams, and indirect effects were nonsignificant.

DISCUSSION

Although the present results replicated the previous finding of an exploratory study (Lyvers et al., 2023) that the core DIF facet of alexithymia was associated with

retrospective ratings of greater typical emotional intensity of dreams, and results were consistent with the prediction that all three facets of alexithymia would be significantly positively correlated with emotion suppression, results did not support the hypothesis that emotion suppression as an ‘alexithymic’ mood regulation strategy (Laloyaux et al., 2015) could explain the association of DIF with greater dream emotionality. Instead, present results point to the role of elevated stress associated with DIF as a mediator. DIF and DDF are arguably the most fundamental facets of alexithymia—the term itself meaning ‘no words for emotions’—hence the counter-intuitive positive correlations of both with typical emotional intensity of dreams would seem to demand an explanation. One potential clue is that in the present sample, total TAS-20 alexithymia and its DIF and DDF facets showed moderate to strong positive correlations with the total DASS-21 negative mood index, in contrast to the EOT facet which showed a much weaker relationship. In the regression model, of the three DASS-21 subscales only Stress was significant as a predictor of greater dream emotionality. Heightened stress associated with the core DIF facet of alexithymia may lead to emotionally arousing dreams—including but not limited to nightmares—that are likely to provoke awakenings from REM sleep and thus bias retrospective dream recall toward dreams with intense emotions. This interpretation of retrospective dream ratings does not contradict Parker et al.’s (2000) sleep lab results—where alexithymic and non-alexithymic participants were acutely awakened by the researchers during REM sleep, and showed no difference in self-reported dream emotionality—because recalled aspects of dreams are likely to differ between forced REM awakenings in a sleep lab and spontaneous awakenings from normal sleep. For example, the latter would likely be biased toward dreams that were arousing enough to induce awakening, whereas the former would not because the cause of awakening was an external stimulus.

In contrast to the present findings for DIF and DDF, the EOT facet of alexithymia showed a negative relationship with typical emotional intensity of dreams in the present study. This seemingly paradoxical result might explain

TABLE 4
Nightmare frequency only partially mediates TAS-20 DIF to dream emotionality.

	Estimate	SE	z-value	p	95% confidence interval	
					Lower	Upper
<i>Direct effects</i>						
TAS20_DIF → DreamEmotionality	0.145	0.040	3.66	<.001	0.068	0.223
<i>Indirect effects</i>						
TAS20_DIF → NmareFreq → DreamEmotionality	0.077	0.016	4.73	<.001	0.045	0.109
<i>Total effects</i>						
TAS20_DIF → DreamEmotionality	0.222	0.041	5.44	<.001	0.142	0.302

Note: Delta method standard errors, bias-corrected percentile bootstrap confidence intervals, ML estimator.

TABLE 5
Mediation of DIF to other dream variables by dream emotionality

	Estimate	SE	z-value	p	95% Confidence Interval	
					Lower	Upper
<i>Direct effects</i>						
DIF → Nightmare Distress	0.207	0.040	5.167	<.001	0.129	0.286
DIF → Meaning	0.130	0.041	3.193	.001	0.050	0.210
DIF → Learning	0.147	0.042	3.516	<.001	0.065	0.229
DIF → Create	0.043	0.015	2.921	.003	0.014	0.071
DIF → Solve	0.062	0.015	4.193	<.001	0.033	0.091
<i>Indirect effects</i>						
DIF → DreamEmotionality → NmareDistress	0.076	0.017	4.602	<.001	0.044	0.109
DIF → DreamEmotionality → Meaning	0.069	0.016	4.432	<.001	0.038	0.099
DIF → DreamEmotionality → Learning	0.049	0.013	3.805	<.001	0.024	0.074
DIF → DreamEmotionality → Create	0.006	0.003	1.84	.066	0.000	0.001
DIF → DreamEmotionality → Solve	0.006	0.003	1.78	.074	−0.000	0.013
<i>Total effects</i>						
DIF → NmareDistress	0.284	0.042	6.825	<.001	0.202	0.365
DIF → Meaning	0.199	0.042	4.768	<.001	0.117	0.281
DIF → Learning	0.196	0.042	4.698	<.001	0.114	0.278
DIF → Create	0.049	0.014	3.426	<.001	0.021	0.077
DIF → Solve	0.068	0.014	4.712	<.001	0.040	0.096

Note: Delta method standard errors, bias-corrected percentile bootstrap confidence intervals, ML estimator.

some of the contradictory findings of previous research on alexithymia and dreaming that used the total TAS-20 score instead of examining its facets separately. This finding also suggests that there may be different variants of alexithymia, with one characterised by higher levels of DIF/DDF and negative moods, and another characterised by higher levels of EOT. As can be seen in Table 1, there was a strong intercorrelation between the DIF and DDF facets compared with the much weaker correlations of either with EOT, consistent with this idea.

Neither the total alexithymia score nor any facets of alexithymia were correlated with retrospective dream recall in the present sample, consistent with previous work cited earlier. However, total alexithymia and the DIF and DDF facets were significantly positively correlated with nightmare frequency and nightmare distress, paralleling the significant positive correlations of DIF and DDF with typical dream emotionality. Yet frequency of nightmares could not explain the positive relationship between DIF and typical dream emotionality according

to mediation test. DIF and DDF also showed significant positive relationships with meaningfulness of dreams and learning about oneself through dreams, whereas EOT showed significant negative relationships with the latter variables, a similar dissociation of alexithymia facets as was found for dream emotionality. DIF was also significantly positively correlated with problem-solving and creative ideas from dreams. The overall pattern of results, including the mediations depicted in Table 5, points to a central role of dream emotionality in the higher ratings of nightmare distress, dream meaningfulness, and learning about oneself through dreams, though not creativity and problem-solving from dreams, among those with higher levels of DIF. Despite the difficulties such individuals report in identifying and describing their emotional feelings during waking, present results indicate that they tend to recall their dreams as emotional, meaningful and valuable for learning about self. This finding appears suggestive of an unconscious Freudian repression mechanism rather than a conscious emotion regulation strategy

of suppression as originally hypothesized, with repressed emotions emerging during dreaming. On the other hand, the mediating role of stress suggests that, consistent with Multiple Code Theory (Bucci & Cornell, 2020), childhood trauma—and/or perhaps dysfunctional early relationships with caregivers (Lyvers et al., 2019)—may lead to a degree of dissociation between somatic, sensory and motoric components of emotions, manifesting during waking as undifferentiated and poorly regulated arousal responses to emotion-inducing stimuli. During REM sleep when there is increased functional connectivity between cortical and limbic regions (Mariani et al., 2023), a temporary integration of such components may occur to the extent that the individual with high levels of DIF is later able to retrospectively report having had dreams featuring strong emotions and providing meaningful insights into themselves. This necessarily tentative interpretation may point to the potential value of discussion of dream experiences during treatment of psychotherapy clients with high levels of DIF.

Overall associations among the present measures beyond those involving alexithymia appeared to make theoretical or intuitive sense. For example, the total DASS-21 index of negative mood was positively correlated with emotion suppression, alcohol use, dream emotionality, nightmare frequency, nightmare distress, dream meaningfulness, learning about oneself through dreams, and creativity and problem-solving from dreams. Dream recall frequency was positively correlated with nightmare frequency (but not distress), dream emotionality, dream meaningfulness, learning about oneself through dreams, and creativity and problem-solving from dreams, perhaps reflecting the general subjective value attributed to recalled dreams and/or the increased likelihood of waking from (and thus remembering) dreams with more arousing or subjectively interesting content. Nightmare frequency was likewise positively associated with dream emotionality, nightmare distress, dream meaningfulness, learning about oneself through dreams, and creativity and problem-solving from dreams. Dream emotionality showed positive relationships with nightmare distress, dream meaningfulness, learning about oneself through dreams, and dreams as a source of creativity and problem-solving. Nightmare distress was similarly positively associated with dream meaningfulness, learning about oneself through dreams, and creativity and problem-solving from dreams. The overall pattern of results for these variables suggests that those who recalled more dreams and nightmares had dreams they considered more emotional, meaningful, and useful for learning about oneself as well as creativity and problem-solving. Again, this may point to the likelihood of dreams with more arousing or subjectively interesting content being more likely to be retrospectively recalled by those who tend to have such dreams.

Strengths of the present study included the large sample of young adults and the use of known and validated measures for all variables of interest. Limitations included the use of an online sample, as previous research has indicated that young adult participants recruited online tend to show higher levels of alexithymia than the population average (Lyvers et al., 2021, 2022; McGillivray et al., 2016); however given the nature of the present study as an investigation of alexithymia in relation to dream variables, this could also be considered a strength of the study, as a broad range of alexithymia scores was obtained. Another potential limitation was the use of retrospective self-ratings for the dream variables, which were potentially susceptible to issues of memory or bias. An approach such as that of Parker et al. (2000), where alexithymic and non-alexithymic participants in a sleep lab were awakened during REM sleep and asked about aspects of the dreams they were having, may prove informative in future research on these issues, especially if large enough samples are recruited to allow accounting for multiple variables associated with alexithymia that may influence aspects of dreaming such as stress. Sleep lab research could also assess alexithymia and its facets in relation to whether awakening typically occurs from REM sleep or from non-REM sleep, which might pertain to the extent to which more emotionally arousing dreams tend to be recalled by those with higher levels of DIF. Finally, the current data were collected during the waning phase of the COVID-19 pandemic when many Australians were recovering from extended lockdowns, restrictions on travel, and job-related stress. Despite this, the current sample was not characterised by high levels of depression, anxiety or stress according to guidelines for interpreting the corresponding scales of the DASS-21.

In conclusion, results of the present study suggest that the facets of alexithymia merit examination in relation to dream variables given that the DIF and EOT facets often showed differential relationships with such variables. Because of this, use of the total TAS-20 score may yield inconsistent or contradictory findings in studies on aspects of dreaming in alexithymia. Future research on these issues should also account for other variables associated with alexithymia and its facets that may influence aspects of dreaming, for example, negative moods such as stress, as well as alcohol or other substance use, as such factors may act as mediators or confounds. Finally, the counterintuitive finding that the core DIF facet of alexithymia was associated with greater self-reported typical dream emotionality suggests that clinicians working with clients who have high levels of DIF might want to explore such clients' dream experiences, as these may provide a pathway to integration of dissociated components of emotional responding.

ETHICS STATEMENT

The research involved human participants and was approved by the Bond University Human Research Ethics committee (approval MK03480) before data collection. The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments. Informed consent was obtained from all individuals included in this study.

DATA AVAILABILITY STATEMENT

The data for this study are available from the corresponding author Michael Lyvers on request.

Manuscript received December 2022
Revised manuscript accepted October 2023

REFERENCES

- Aloi, M., Rania, M., Caroleo, M., de Fazio, P., & Segura-García, C. (2017). Social cognition and emotional functioning in patients with binge eating disorder. *European Eating Disorders Review*, *25*, 172–178. <https://doi.org/10.1002/erv.2504>
- Bagby, R. M., Parker, J., & Taylor, G. (1994). The twenty-item Toronto alexithymia scale—I. Item selection and cross-validation of the factor structure. *Journal of Psychosomatic Research*, *38*, 23–32. [https://doi.org/10.1016/0022-3999\(94\)90005-1](https://doi.org/10.1016/0022-3999(94)90005-1)
- Bagby, R. M., Parker, J. D. A., & Taylor, G. J. (2020). Twenty-five years with the 20-item Toronto alexithymia scale. *Journal of Psychosomatic Research*, *131*, 109940. <https://doi.org/10.1016/j.jpsychores.2020.109940>
- Bagby, R. M., Taylor, G., & Parker, J. (1994). The twenty-item Toronto alexithymia scale—II. Convergent, discriminant, and concurrent validity. *Journal of Psychosomatic Research*, *38*, 33–40. [https://doi.org/10.1016/0022-3999\(94\)90006-x](https://doi.org/10.1016/0022-3999(94)90006-x)
- Bucci, W., & Cornell, W. F. (2020). *Emotional communication and therapeutic change: Understanding psychotherapy through multiple code theory*. Routledge.
- Cruise, K., & Becerra, R. (2018). Alexithymia and problematic alcohol use: A critical update. *Addictive Behaviors*, *77*, 232–246. <https://doi.org/10.1016/j.addbeh.2017.09.025>
- De Gennaro, L., Ferrara, M., Cristiani, R., Curcio, G., Martiradonna, V., & Bertini, M. (2003). Alexithymia and dream recall upon spontaneous morning awakening. *Psychosomatic Medicine*, *65*, 301–306. <https://doi.org/10.1097/01.psy.0000058373.50240.71>
- Formica, I., Barbàra, F., & Trotta, A. (2013). The association between alexithymia and impoverishment of dreaming: An empirical research amongst undergraduate students. *Mediterranean Journal of Clinical Psychology*, *1*, 1–13. <https://doi.org/10.6092/2282-1619/2013.2.919>
- Ghalehban, M., & Besharat, M. (2011). Examination and comparison of alexithymia and self regulation in patients with substance abuse disorder and normal individuals. *Procedia – Social and Behavioral Sciences*, *30*, 38–42. <https://doi.org/10.1016/j.sbspro.2011.10.008>
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*, 348–362. <https://doi.org/10.1037/0022-3514.85.2.348>
- Jørgensen, M. M., Zachariae, R., Skytthe, A., & Kyvik, K. (2007). Genetic and environmental factors in alexithymia: A population-based study of 8,785 Danish twin pairs. *Psychotherapy and Psychosomatics*, *76*, 369–375. <https://doi.org/10.1159/000107565>
- Kandri, T., Bonotis, K., Floros, G., & Zafiropoulou, M. (2014). Alexithymia components in excessive internet users: A multi-factorial analysis. *Psychiatry Research*, *220*, 348–355. <https://doi.org/10.1016/j.psychres.2014.07.066>
- Laloyaux, J., Fantini, C., Lemaire, M., Luminet, O., & Larøi, F. (2015). Evidence of contrasting patterns for suppression and reappraisal emotion regulation strategies in alexithymia. *Journal of Nervous and Mental Disease*, *203*, 709–717. <https://doi.org/10.1097/NMD.0000000000000353>
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the depression anxiety stress scales* (2nd ed.). Psychology Foundation.
- Lumley, M. A., & Bazydlo, R. A. (2000). The relationship of alexithymia characteristics to dreaming. *Journal of Psychosomatic Research*, *48*, 561–567. [https://doi.org/10.1016/S0022-3999\(00\)00096-9](https://doi.org/10.1016/S0022-3999(00)00096-9)
- Lyvers, M., Cutinho, D., & Thorberg, F. A. (2020). Alexithymia, impulsivity, disordered social media use, mood and alcohol use in relation to Facebook self-disclosure. *Computers in Human Behavior*, *103*, 174–180. <https://doi.org/10.1016/j.chb.2019.09.004>
- Lyvers, M., Goldberg, O., & Thorberg, F. A. (2023). Alexithymia and emotionality of dreams. *International Journal of Dream Research*, *16*, 15–20. <https://doi.org/10.11588/ijodr.2023.1.89134>
- Lyvers, M., Karantonis, J., Edwards, M. S., & Thorberg, F. A. (2016). Traits associated with internet addiction in young adults: Potential risk factors. *Addictive Behaviors Reports*, *3*, 56–60. <https://doi.org/10.1016/j.abrep.2016.04.001>
- Lyvers, M., Kelahroodi, M., Udodzik, E., Stapleton, P., & Thorberg, F. A. (2022). Alexithymia and binge eating: Maladaptive emotion regulation strategy or deficient interoception? *Appetite*, *175*, 106073. <https://doi.org/10.1016/j.appet.2022.106073>
- Lyvers, M., Mayer, K., Needham, K., & Thorberg, F. A. (2019). Parental bonding, adult attachment, and theory of mind: A developmental model of alexithymia and alcohol-related risk. *Journal of Clinical Psychology*, *75*, 1288–1304. <https://doi.org/10.1002/jclp.22772>
- Lyvers, M., Sweetnam, T., & Thorberg, F. A. (2021). Alexithymia, rash impulsiveness, and reward sensitivity in relation to symptoms of exercise dependence in physically active young adults. *Australian Journal of Psychology*, *73*, 475–485. <https://doi.org/10.1080/00049530.2021.1981747>
- Mahapatra, A., & Sharma, P. (2018). Association of internet addiction and alexithymia – A scoping review. *Addictive Behaviors*, *81*, 175–182. <https://doi.org/10.1016/j.addbeh.2018.02.004>
- Marchetti, D., Verrocchio, M., & Porcelli, P. (2019). Gambling problems and alexithymia: A systematic review. *Brain Sciences*, *9*, 191. <https://doi.org/10.3390/brainsci9080191>

- Mariani, R., Monaco, S., Fiorini Bincoletto, A., Di Trani, M., Lingiardi, V., & Giovanardi, G. (2023). Referential processes in dreams: A brief report from a COVID-19 dreams analysis. *Psychoanalytic Psychology, 40*, 109–114. <https://doi.org/10.1037/pap0000420>
- McGillivray, L., Becerra, R., & Harms, C. (2016). Prevalence and demographic correlates of alexithymia: A comparison between Australian psychiatric and community samples. *Journal of Clinical Psychology, 73*, 76–87. <https://doi.org/10.1002/jclp.22314>
- Montebarocci, O., & Giovagnoli, S. (2019). Alexithymia, depression, trait-anxiety and their relation to self-reported retrospective dream experience. *American Journal of Applied Psychology, 8*, 129–140. <https://doi.org/10.11648/j.ajap.20190806.13>
- Nielsen, T., Levrier, K., & Montplaisir, J. (2011). Dreaming correlates of alexithymia among sleep-disordered patients. *Dreaming, 21*, 16–31. <https://doi.org/10.1037/a0022861>
- Obrebska, M., & Rohoza, K. (2021). Stress as a moderator of the relationship between alexithymia and dreaming: Research findings. *Dreaming, 31*, 186–194. <https://doi.org/10.1037/drm0000167>
- Parker, J. D. A., Bauermann, T. M., & Smith, C. T. (2000). Alexithymia and impoverished dream content: Evidence from rapid eye movement sleep awakenings. *Psychosomatic Medicine, 62*, 486–491. <https://doi.org/10.1097/00006842-200007000-00006>
- Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption. *Addiction, 88*, 791–804. <https://doi.org/10.1111/j.1360-0443.1993.tb02093.x>
- Schredl, M., Berres, S., Klingauf, A., Schellhaas, S., & Göritz, A. S. (2014). The Mannheim Dream Questionnaire (MADRE): Retest reliability, age and gender effects. *International Journal of Dream Research, 7*, 141–147. <https://doi.org/10.11588/IJODR.2014.2.16675>
- Steinig, J., Foraita, R., Happe, S., & Heinze, M. (2011). Perception of sleep and dreams in alcohol-dependent patients during detoxication and abstinence. *Alcohol and Alcoholism, 46*, 143–147. <https://doi.org/10.1093/alcalc/agg087>
- Thorberg, F. A., Young, R. M., Sullivan, K. A., & Lyvers, M. (2009). Alexithymia and alcohol use disorders: A critical review. *Addictive Behaviors, 34*, 237–245. <https://doi.org/10.1016/j.addbeh.2008.10.016>
- Thorberg, F. A., Young, R. M., Sullivan, K. A., & Lyvers, M. (2011). Parental bonding and alexithymia: A meta-analysis. *European Psychiatry, 3*, 187–193. <https://doi.org/10.1016/j.eurpsy.2010.09.010>
- Toneatto, T., Lecce, J., & Bagby, M. (2009). Alexithymia and pathological gambling. *Journal of Addictive Diseases, 28*, 193–198. <https://doi.org/10.1080/10550880903014775>
- van Landeghem, C., Jakobson, L. S., & Keough, M. T. (2019). Risk of exercise dependence in university students: A subtyping study utilizing latent profile analysis. *Psychology of Sport and Exercise, 45*, 101575. <https://doi.org/10.1016/j.psychsport.2019.101575>