

# An Investigation into Anxiety and Depression in Dream Imagery: The Issue of Co-Morbidity

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**Summary.** This study extended previous research by exploring the continuity hypothesis. Sixty-eight participants completed a day and dream journal for a total of 9 days. The results supported all the hypotheses proposed in the study. Previous findings that people with depression and anxiety exhibit similarities in their dream content was strongly supported and furthermore, comorbidity of the two is supported in day journals and dreams. The findings should be further used to provide this population with a treatment plan to lessen the amount of depression and anxiety felt in waking day, as well as in dream imagery.

**Keywords:** Co-morbidity, anxiety, depression, dream imagery

## 1. Introduction

Depression and anxiety are mental disorders that are very common and can either co-occur or have individual presentation. University students have been found to have a high level of comorbid depression and anxiety, posing a problem for this group in particular (King & DeCicco, 2007). Interestingly, research has also found dream imagery to be a viable measure of both depression and anxiety (Barrett & Loeffler, 1992; Schredl, Pallmer & Montasser, 1996) and as such, this will be examined in this study.

The focus of the proposed study is to evaluate how depression and anxiety in waking day present themselves in dreams. The goal is to see if self-reported day presentation of depression and anxiety can accurately predict the presentation of anxiety and depression in dream imagery and vice versa. This study can later be used to propose a technique to be used to mitigate these effects; if they are in fact found to be related. This study will also extend the finds from previous studies examining depression, anxiety and dream imagery (King & DeCicco, 2007; King & DeCicco 2009; Maggiolini, et al., 2010; Pesant & Zadra 2006; Schredl, Pallmer & Montasser, 1996; Schredl & Engelhardt, 2001; Zadra & Donderi, 2000; Zanasi, DeCicco, Murkar, and Testoni, 2010).

### 1.1. Depression

Major depression can be characterized as a loss of interest or depressed mood with additional symptoms lasting for longer than two weeks (American Psychiatric Association, 2013). People who have depression have difficulty in regulating mood and therefore, assistance with self-regulation would greatly increase quality of life.

### 1.2. Anxiety

People diagnosed with generalized anxiety disorder are characterized by feeling constant worry about things that others may, or may not find temporarily worrying (American Psychiatric Association, 2013). Miller and colleagues (2015), observed dream imagery categories containing animals, anxious emotion, and scene changes for individuals with anxiety and found a relationship between waking day anxiety and these dream categories. Interestingly, they also found that there is less negative dream emotion in dreams of people who are anxious most of the time, because negative emotion is their usual state.

### 1.3. Comorbidity of Depression and Anxiety

Depression and anxiety are often comorbid but both are not necessarily diagnosed. A patient may have a diagnosis of either, but also have symptoms of the other disorder without meeting the criteria for diagnosis. However, other times, the patient is diagnosed with both disorders. This comorbidity is important to evaluate to determine whether other diagnoses/ symptoms can interfere with the presentation in dreams.

It has been found that melancholic patients have a higher level of dream anxiety and more severe disturbances of sleep quality than non-melancholic patients (Bilici, Yazici, Özer, & Kavakçi, 2002). Dream anxiety was also found to be a result of the anxiety the patient felt during the day and continuing into their dreaming state. The authors found that the more severe the depression and anxiety the patient experienced, the higher the level of dream anxiety. This means that we could potentially use the level of dream anxiety in a patient to determine the severity of the mental disorder in patients.

### 1.4. Depression, Anxiety and Dreaming

One marker for evaluating both waking day depression and anxiety is imagery of sleep mentation or dream content. For people who are anxious or depressed there is specific imagery that appears to differentiate them from a healthy individual. One explanation for this is the continuity hypothesis, which states that waking thoughts are continuous through-

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out dream imagery (For examples see: DeCicco, 2009; King & DeCicco 2007; King & DeCicco, 2009; Miller et al., 2015; Schredl, Berger & Riemann, 2009). Miller and colleagues (2015) found that people who are anxious tend to change scenes frequently, whereas people with depression tend to have dark imagery. Experiences of nightmares have also been shown to be linked to psychopathology (Roberts & Lennings, 2006). Peasant and Zadra (2006) found that the more participants reported unpleasant moods in waking day, the more their dream contained aggressive content, negative emotions and misfortunes. This means that individuals with mental disorders can be identified through their dream content.

Zadra and Donderi (2000) found that psychological well-being was significantly correlated with nightmare frequency more than bad-dream frequency. High levels of waking anxiety and related distress have been linked to frequent nightmares (Roberts & Lennings, 2006). Depression was also identified as having an association with frequent nightmares. Overall, anxiety was found to have a stronger correlation to feeling distress in nightmares. This poses a problem for people with depression and especially anxiety because most often nightmares wake the individual up. This is due to unresolved issues in waking day life so the dreamer gets woken up to stress importance of something wrong when awake. If these individuals are prone to nightmares, that means that they are also more likely to have disturbed sleep and frequent waking. This will furthermore impact their ability to deal with their illness in waking day life because they were unable to resolve issues in their sleep and had a low quality of sleep. This low quality of sleep will interfere with the individual's ability to cope with waking day life stressors, which will perpetuate their disorder.

### 1.5. Sleep Mentation

Research has found depressed individuals have low levels of recall when it comes to their dreams, as well as short dreams containing little emotion. (Armitage et al., 1995). More recently, it was found that individuals with depression displayed a great level of aggression and death, sadness, and scene changes (King & DeCicco, 2007), making a case that dreams of depressed people do contain a large amount of emotion. Miller and colleagues (2015), identified dream categories for depressed individuals as violence, negative emotion, and dark colours. According to Van De Castle (1994), almost everyone dreams primarily in colour but sometimes there is a lack of colour to portray a certain message to the dreamer. He believed that a dreamer may have depression if their dreams were predominantly black. To him this means that this type of depression was depriving them of colour and satisfaction in their own life. Barrett and Loeffler (1992) found individuals with depression had shorter dreams, less anger in their dreams, and fewer characters in their dreams than people without depression. This clearly identifies a major difference in dream content in those with and without depression.

According to the continuity hypothesis, waking day events and experiences influence dream imagery (King & DeCicco, 2007). Images that are prevalent in dreams are known to reflect the persons' waking day life circumstances (DeCicco, 2009). Schredl and Engelhardt (2001) found evidence that the continuity hypothesis is true considering their participants who had the highest levels of depression showed the most occurrence of depressed imagery in

their dreams. Maggiolini, Cagnin, Crippa, Persico, and Rizzi (2010) also found that there was continuity between waking life narrative and dreams relative to character and social interactions. Physical aggression however, was found to be more frequent in dream imagery than in waking life. Pesant and Zadra (2006) evaluated the effects that psychological well-being had on dream content in clinical and non-clinical populations. They found that those people with poor psychological well-being had dream content that was reflective of their waking day emotions. Non-clinical populations tended to not have as much emotional or negative dream content as those in clinical populations.

Recurrent dreams during adulthood is said to be associated with lower levels of psychological well-being and stress. A continuous absence of recurrent dreams in adults allows for there to be a positive increase in the individual's psychological well-being (Gauchat, Séguin, McSween-Cadieux, & Zadra, 2015). This finding suggests the benefit to getting treatment for dreams that contain anxious or depressive imagery, because there is a high chance that similar images will keep occurring.

To summarize, it is important to research the continuity of waking day into dream life and vice versa. If continuity is exhibited in a population with low well-being, then it is an important discovery so a potential treatment plan can be put into action. It is important that these populations get a break from their negative emotional thinking and that is not possible if the levels of illness are high in waking day and in dream content. Furthermore, university students can be considered a vulnerable population because most of them are still developing, and, they are under a lot of stress which can worsen their condition (Burns, Lee & Brown, 2011; DeRoma, Leach & Leverett, 2009). Therefore, it is important to treat university students who have anxiety and/ depression in order to better their quality of life and even potentially, increase their academic ability.

### 1.6. Hypotheses

**Hypothesis 1.** Based on previous research the continuity hypothesis states that there is continuation between waking day emotions and dream imagery (Schredl, Berger & Riemann, 2009). Given this, there will be a relationship between the depression and anxiety levels in waking day and the content of dream imagery. Specifically, those showing depression in waking day will have depression imagery in dreams.

**Hypothesis 2.** Miller et. al (2015) showed a relationship between waking day anxiety and anxiety dream imagery. Therefore, there will be a relationship between anxiety presentation in waking day and anxiety in dream content.

**Hypothesis 3** states that specific dream imagery will show depression in waking day. DeCicco (2007) found that dark colours in dream imagery is related to depression in waking day. Therefore, dark colours appearing in dreams, along with other known depression imagery categories such as violence, death, negative emotions, and sadness will correlate with measures of depression during the day.

**Hypothesis 4** states that specific dream imagery will predict anxiety in waking day. Zanasi and colleagues (2010) found that many scene changes in dreams correlated with anxiety in waking day. Therefore, scene changes and other anxiety imagery categories including nightmares, distress, anxiety, and escape in dream content will be correlated with a measure of anxiety during the day.

## 2. Method

### 2.1. Participants

The participants included 68 Trent University students, both male and female. The participants range in age from 18 to 25 or older. These participants include undergraduate students enrolled in one of the University's psychology courses and contained predominantly females at 85% of participants ( $N=57$ ). The majority of participants fell in the age range of 18 to 19 (72%,  $N=48$ ). Participants consisted of 75% Caucasian ( $N=50$ ), 10% Asian ( $N=7$ ), 10% Black ( $N=7$ ), 3% Aboriginal ( $N=3$ ), and 2% other ( $N=1$ ). The participants were mostly single at 58% ( $N=39$ ) of participants, 39% were in a committed relationship ( $N=26$ ), and 3% were married ( $N=2$ ). Majority of participants were heterosexual at 97% ( $N=65$ ) of participants, with homosexual and other being only 2% ( $N=1$ ). Lastly, most of the students were first years (69%,  $N=46$ ) and unemployed (57%,  $N=38$ ).

It is important to note that one participant did not provide any demographic information.

### 2.2. Measures

**Demographics.** Demographics of age, sex, year of university study, ethnicity, sexual orientation, relationship status, and employment status were collected. See Appendix A for the demographics sheet.

**Procedure.** Participants were provided a dream journal with instructions on how to record day events and dream imagery for 2 weeks. Each day of the study, participants were asked to record any waking day event that triggered a significant emotional reaction and to rate the emotional event on a scale of 1 (most negative) to 10 (most positive). For each sleep period that occurred, participants were asked to record any remembered dream images. Participants were instructed to provide as much detail as possible (See Appendix B).

### 2.3. Analyses

The journals were coded by the researcher for depression and anxiety content in waking day and in dream images. Coding of depression in waking day was evaluated by looking at instances of words or events occurring during the day journal eliciting such emotions as: sad, depressed, and tired. To code for anxiety in waking day, instances of anxiety, feeling jumpy, or catastrophizing were recorded. Coding for depression in dream imagery consisted of the following: dark colours, violence, death, negative emotions, and sadness. Anxiety in dream imagery was coded by looking for scene changes, nightmares, distress, anxiety, or escape. Coding is consistent with previous research and, scrutinized the data for novel categories.

Statistical analyses were computed using the program "R".

## 3. Results

### 3.1. Hypothesis 1

To test hypothesis 1, all depression categories for day events were combined to determine a total number for a measure of daytime depression, as well as depression categories or dream imagery were combined for a total measure

for dream depression. Among the 68 participants in total, there were 111 instances of daytime depression in the journals and 157 instances of depression dream imagery. Pearson's R was calculated to find the correlation between the total instances of waking day depression and depression dream content. The correlation between these categories was found to be statistically significant (see Table 1), and therefore supports hypothesis 1.

### 3.2. Hypothesis 2

All anxiety categories were combined for waking day to determine a total number of cases of anxiety in day time, and anxiety categories for dreams were combined to create a total number of instances of dream anxiety. In total, there were 98 cases of waking day anxiety and 85 instances of anxiety dream content. Pearson's R was calculated to find the correlation between day time anxiety and anxiety dream imagery. The correlation between these two categories was found to have statistical significance (See Table 1), thus confirming hypothesis 2.

### 3.3. Hypothesis 3

Waking day depression was evaluated by looking for content including: sad ( $n=79$ ), depressed ( $n=13$ ), and tired ( $n=19$ ), whereas depression in dream content was evaluated by looking for: dark colours ( $n=32$ ), violence ( $n=37$ ), death ( $n=7$ ), negative emotions ( $n=68$ ), and sadness ( $n=13$ ). Pearson's R was calculated to determine if depression dream content can predict depression in waking day, and if so, which categories are significant. Dark colours in dream imagery was significantly correlated with sadness and depression in waking day. Negative emotions in dream content (Dark Colours, Violence, Death, Negative Emotions, Sadness) was also significantly correlated with sadness in waking day (See Table 1). The findings partially confirm hypothesis 3.

### 3.4. Hypothesis 4

Anxiety in waking day was evaluated by looking for content including: anxious ( $n=92$ ), jumpy ( $n=0$ ), and catastrophizing ( $n=6$ ), whereas anxiety in dream content was evaluated by looking at: scene changes ( $n=24$ ), nightmares ( $n=4$ ), distress ( $n=9$ ), anxiety ( $n=30$ ), and escape ( $n=18$ ). Pearson's R was calculated to determine if anxiety dream content can predict anxiety in waking day. Scene changes in dream content was significantly correlated with waking day catastrophizing. Anxiety in dream content was significantly correlated to anxiousness in waking day. Finally, escape was significantly correlated with catastrophizing in waking day (See Table 1). Therefore, hypothesis 4 is at least partially confirmed.

### 3.5. Additional Analyses

In addition to the above findings, Pearson's R was calculated to determine if comorbidity between anxiety and depression in waking day and in dream content, were comorbid. Strong relationships were found that suggest that there is comorbidity between anxiety and depression in waking day as well as in dream content (see Table 1).

Table 1. Correlation Between Daytime Variables and Dream Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Daytime Sad	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 Daytime Depressed	.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 Daytime Tired	.02	-.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4 Daytime Depression Total	.91***	.39**	.31**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5 Daytime Anxious	.34**	-.09	.16	.32**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 Daytime Catastrophizing	-.03	.08	.03	0	.03	-	-	-	-	-	-	-	-	-	-	-	-	-
7 Daytime Anxiety Total	.32**	-.07	.16	.31**	.98***	.03	-	-	-	-	-	-	-	-	-	-	-	-
8 Dream Dark Colours	.28**	.32**	-.08	.31**	.21*	.01	.20*	-	-	-	-	-	-	-	-	-	-	-
9 Dream Violence	-.08	-.04	.17	-.03	0	.20*	.04	-.01	-	-	-	-	-	-	-	-	-	-
10 Dream Death	.07	.16	-.19	.05	.02	.35**	.09	.05	.07	-	-	-	-	-	-	-	-	-
11 Dream Negative Emotions	.62***	.11	.16	.61***	.47***	.08	.48***	.20*	-.13	0	-	-	-	-	-	-	-	-
12 Dream Sadness	.20	-.10	.16	.19	.26**	.09	.27**	0	0	-.15	.38**	-	-	-	-	-	-	-
13 Dream Depression Total	.52***	.19	.15	.55***	.44***	.23*	.48***	.55***	.39**	.19	.73***	.45***	-	-	-	-	-	-
14 Dream Scene Changes	-.08	-.06	.42***	.05	.09	.33**	.16	0	.14	.10	.23*	-.03	.21*	-	-	-	-	-
15 Dream Nightmares	.02	.03	-.01	.02	.11	.12	.13	-.08	-.09	.12	-.06	.03	-.08	.05	-	-	-	-
16 Dream Distress	-.01	-.06	.04	-.02	-.01	.03	0	-.01	.22*	.01	.12	.13	.20*	.16	.09	-	-	-
17 Dream Anxiety	.60***	-.05	.15	.55***	.49***	.02	.48***	.17	-.09	0	.53***	.14	.39**	-.17	.07	.04	-	-
18 Dream Escape	0	.14	0	.04	.08	.27**	.14	.13	.43***	.27**	.12	.1	.40**	.19	-.12	.20*	.08	-
19 Dream Anxiety Total	.36**	-.02	.32**	.41***	.43***	.30**	.48***	.14	.20	.16	.54***	.15	.54***	.50***	.20*	.41***	.64***	.54***

Note. \*\*\*p &lt; .001, \*\*p &lt; .05, \*p &lt; .10.

### 3.6. Discussion

Many participants recalled dreams during most of their periods of sleep, however some participants remembered few dreams, if any at all. There are different reasons why this could have taken place. For one, the participants may have had a dream they awoke from in the middle of the night and waited to record it when they woke in the morning and by then they had forgotten the dream. Another reason why some participants did not have many dreams recorded is because they consumed alcohol. Most participants who reported drinking alcohol, were unable to recall their dreams that night. Carskadon and Dement (2005) state that alcohol consumption results in an increase in slow wave sleep and a decrease in REM sleep early in the night. Since most dreaming occurs in REM sleep, it is logical to conclude that there would be less dream occurrence for these individuals. Individuals who have consumed alcohol still have some dreams during the subsequent sleep period, however they are likely to be unable to recall these dreams. The consumption of alcohol interferes with the functioning of semantic memory, resulting in the consumer having difficulty remembering any dreams upon awakening (Parker, Birnbaum & Noble, 1976). Finally, participants who show depression symptomology are less likely to recall their dreams (Armitage et al., 1995) which likely accounts for at least some of the lack of dreams reported. Often participants also remembered the sensation of having a dream, but were unable to recall if they did in fact have a dream or what the dream was.

### 3.7. Comorbidity of Depression and Anxiety

The comorbidity of depression and anxiety was something of importance that was evaluated. Previously it was found that patients who were melancholic had dream anxiety of a higher level than patients who were non-melancholic (Bilici, Yazici, Özer, & Kavakçi, 2002). That study also found that there was a higher level of dream anxiety in patients with more severe depression and anxiety. This would suggest that dream anxiety can be used to determine a mental disorder in a participant.

In this study, comorbidity of anxiety and depression was evaluated during day events, and during dream content. As shown in table 5, comorbidity of anxiety and depression was found in waking day and in dream content. When comparing daytime depression and daytime anxiety, a significant correlation arose ( $r=.31$ ,  $p<.05$ ). The correlation between dream depression and dream anxiety was also found to be significant ( $r=.54$ ,  $p<.001$ ). When evaluating the relationship between daytime depression and dream anxiety, another significant correlation was found ( $r=.41$ ,  $p<.001$ ). Finally, when comparing daytime anxiety and dream depression, a significant correlation was found ( $r=.48$ ,  $p<.001$ ). All of these significant correlations suggest that there is comorbidity between depression and anxiety in waking day and in dream content and that dream anxiety is present in both individuals with depression and with anxiety. These findings suggest further examinations are warranted.

### 3.8. Depression, Anxiety and Dreaming

**Depression and Dreaming.** Depression in waking day was significantly correlated with depression in dream content ( $r=.55$ ,  $p<.001$ ). This correlation supports hypothesis 1 and is consistent with the Continuity Hypothesis. (Schredl et al., 2009).

**Anxiety and Dreaming.** Waking day anxiety was significantly correlated with anxiety in dream content ( $r=.48$ ,  $p<.001$ ). This correlation provides support for hypothesis 1 and is consistent with the Continuity Hypothesis (Schredl et al., 2009).

**Depression Dream Content.** Significant correlations exist between depression dream categories and depression day time categories. Dark colours in dream imagery can be said to correlate with depression in the form of being sad ( $r=.28$ ,  $p<.05$ ) and being depressed ( $r=.32$ ,  $p<.05$ ). Negative emotions in dream content was also found to correlate with feeling sad in waking day ( $r=.62$ ,  $p<.001$ ). From this data, it seems that negative emotions in dream content, reveals the strongest relationship to depression in waking day, at least in terms of sadness. Therefore hypothesis 3 was somewhat supported but also warrants further examination.

**Anxiety Dream Content.** There were significant correlations between anxiety dream categories and anxiety day categories. Scene changes can be said to correlate with waking day anxiety, at least in the form of catastrophizing ( $r=.33$ ,  $p<.05$ ). Anxiety in dream content can be said to be correlated with anxiousness in waking day ( $r=.49$ ,  $p<.001$ ). Finally, escape in dream content can be said to correlate with catastrophizing in waking day ( $r=.27$ ,  $p<.05$ ). Through the evaluation of these correlations, it seems that anxiety in dream content shows the strongest relationship to anxiety in waking day. This information as used to provide partial support for hypothesis 4.

### 3.9. Sleep Mentation

There were no significant correlations between death, violence, or sadness in dream content to depression categories in waking day. This finding is not in accordance with what was found in a previous study done by King and DeCicco (2007). However, there was a significant correlation between negative emotions ( $r=.62$ ,  $p<.001$ ), and dark colours ( $r=.28$ ,  $p<.05$ ;  $r=.32$ ,  $p<.05$ ), occurring in dreams with depression categories in waking day. This is in accordance with what Miller and colleagues (2015) found in their study.

No significant correlation was found between nightmares or distress in anxiety dream content in relation to anxiety categories in waking day. This finding is not in accordance with what Roberts and Lennings (2006) found in their study. However, significant correlations did exist between scene changes ( $r=.33$ ,  $p<.05$ ) anxiety ( $r=.49$ ,  $p<.001$ ) and escape ( $r=.27$ ,  $p<.05$ ) in dreams and anxiety waking day categories. These significant correlations are in accordance with what Miller and colleagues (2015) identified in their study.

### 3.10. Continuity Hypothesis

The continuity hypothesis suggests that waking day experiences and events have an influence on dream imagery (King & DeCicco, 2007). Images that are noteworthy occurring in dreams have been known to reflect that person's waking day life events or feelings (DeCicco, 2009). Previous studies, such as one done by Schredl and Engelhardt (2001), have found evidence supporting the continuity hypothesis in conjunction with participants who exhibited depression. The participants that had the highest levels of depression had the most depressed dream imagery.

This current study has found support for the idea that depression and anxiety in waking day will continue to present in dreams. Significant correlations were found between

daytime depression and dream depression ( $r=.55$ ,  $p<.001$ ), as well as daytime anxiety and dream anxiety ( $r=p<.001$ ). This would provide support to the claim that dreams are a continuation of waking day circumstances suggested in previous studies. Since it seems that depression and anxiety are constantly cycling throughout the day and night in these individuals, this allows for the continuation in either state to perpetuate the continuation in the opposite state.

### 3.11. Limitations

A limitation of this study is that journals were content analyzed for depression and anxiety in waking day by evaluation word choice and feelings. While this is a useful way to determine if there is an essence of depression or anxiety, it would perhaps be more conclusive to use an inventory assessment or questionnaire as well to determine the varying levels of depression and anxiety in the individuals.

The method of data collection created another limitation. Hand written journals may have made people want to disclose less if they thought they could potentially be identified by their hand writing, or the fact that they had to physically hand the journals in. Perhaps some people would have disclosed more about their daily events and dreams as well as how they made them feel, if they were given an opportunity to fill out this journal online and hand it in via an online medium. Filling out the journal on a computer would have also made it easier to read the journal entries, as some participants had writing that was quite challenging to read.

To add to the previous limitation, participants who did not describe in detail their day events or how they made them feel made it difficult to extract any data from their journals. Some participants simply wrote down events that happened without describing how they felt about it or what kind of an impact that made on their day. The participants were also given the opportunity to give an emotional rating to the day events and many participants neglected to do so, providing even less information where there could have been more. Similarly, some participants briefly described their dream and with such few words it is extremely difficult to extract any usable data.

Another limitation that affected the amount of data collected was the amount of dreams that the participants actually recalled. There were various factors for why some people had trouble recalling their dreams. One such reason which was found throughout many journals, was the consumption of alcohol. Alcohol seems to in some ways affect the ability to recall dreams, but it does not mean that a dream did not occur that night. Another common reason why participants claimed to have not remembered their dream was lack of sleep. Those participants reporting having slept a few hours overnight, tended to not recall their dreams. Lastly, some participants struggled to remember their dreams for no particular mentioned reason. It is possible that some participants remembered few or no dreams because they have a high prevalence of depression (Armitage et al., 1995). Alternatively, participants may have forgotten their dreams upon waking up, especially if they awoke from a dream in the night and did not immediately write it down. Together these factors make it more difficult to truly assess the dream content in these individuals.

### 3.12. Future Directions

Past research has determined that anxiety and depression

in waking day have carryover effects into dream imagery. While this study evaluated the crossover between characteristics of depression and anxiety and content included in individual dreams who have depression and anxiety, more research needs to be done. Future research should be done by evaluating the levels of depression and anxiety in the population being studied through the use of a questionnaire or inventory that can assess the severity of the disorders. This would allow for testing the influence the severity of the disorder has on the amount of presentation of depression and anxiety in dreams. Clearer distinctions may be made on amount of imagery present in particular cases of severity. While scrutinizing dreams, the intensity of the anxiety and depression dream categories should be evaluated, so a future study should add a measure of that.

Future research should also be done on how to treat this depression and anxiety in waking day and in dreams. As suggested by the continuity hypothesis, waking day effects dream imagery and vice versa. In order to break the cycle some sort of tool needs to be used to be able to lower the levels of anxiety and depression. One such tool could be meditation as it has been used in other studies done on depression and anxiety in waking day and dream imagery (Miller et al., 2015). It is important to evaluate whether or not this tool, or any other tool is effective in lessening the severity of the disorders. A future study should include a pre and post condition with a treatment and control group to determine the effectiveness of 'treatment'.

Given the results of this study, future studies expanding on this research are warranted. In a future study, a control group of healthy participants should be compared using similar criteria as the sample group. In this study, hand written reports were used because the researcher had no way of knowing who the participants were as a code system was utilized for all the documents. Therefore, the researcher was completely removed from the participants. However, to ensure further anonymity in the future, an online system such as 'SONA' can be used for data input. This would include the dream diaries, and in addition have a waking day emotional assessment. Furthermore, questionnaires about everyday life, as well as assessments of anxiety and depression can be added into the system.

### 3.13. Conclusion

This study aimed to evaluate the relationship between depression and anxiety in waking day and in dream content. The findings were similar to previous research in that depression and anxiety were both found to have carryover effects from waking day to dream life and vice versa. This not only suggests that the continuity hypothesis is accurate, but that it particularly shows an effect when engaging the well-being of the participant. This study found support for depression categories in waking day having a significant relationship with depression characteristics in dream content. It also found support for anxiety categories in waking day being significantly related to anxiety in dream content. Finally, support was found for a relationship between depression imagery and depression characteristics in waking day, and anxiety imagery and anxiety characteristics in waking day. It is important that future research be done to provide more evidence for these ideas, as well as possible treatment options to lessen the degree of disorder in waking day and in dreams.

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## Appendix A

## Demographics Sheet

What is your age?

- 18-19  
 20-21  
 22-24  
 25 +

Are you currently employed?

- Part-time  
 Full-time  
 No

What sex/gender do you self-identify as?

- Male  
 Female  
 Transgender  
 Prefer not to answer

Race/Ethnicity

- White  
 Black  
 Aboriginal (First Nations, Métis, Inuk)  
 Latin American  
 Asian  
 Other

What is your current relationship status?

- Single  
 In a committed relationship  
 Married  
 Divorced  
 Widowed

What is your sexual orientation?

- Primarily heterosexual  
 Primarily bisexual  
 Primarily Homosexual  
 Other

Have you been clinically diagnosed with a mental disorder?

- Yes  
 No

What class level best describes you?

- First Year  
 Second Year  
 Third Year  
 Fourth Year

## Appendix B

### Day and Dream Journals Instructions

Each page in the journal will represent one day, please use the front of the page for day events and the back of the page for your dreams.

#### DAY EVENTS

Please record and date all events that occur that trigger significant emotions. For example, you won a large sum of money or a fight with your boyfriend or girlfriend. Please include as much detail as you feel comfortable doing. After recording the event please take a minute and reflect on the event and the emotions you feel. Rate the emotions from 1 (most negative) to 10 (most positive).

Please make sure to record the date of the event and the rated emotion.

#### DREAMS

Each time after awakening from sleep, please record and date all dreams. Please include as much detail as possible such as colours, sounds, surroundings, and emotions. You can start a new paragraph for each dream.

Please make sure to record and date the dream, and include as much detail as possible.