How Dream Collection Procedures Affect Dream Report and Sleep Quality in Remote Settings

Robyn Cupido and Taidghan Wilmot

Department of Psychology, University of Cape Town

Supervisor: Dr. Gosia Lipinska

18 November 2021

This work is based on the research supported fully by the National Research Foundation of South Africa

Word count: 6,749

PLAGIARISM DECLARATION

1. We know that plagiarism is wrong. Plagiarism is using another's work and to pretend that it is one's own.
2. We have used the APA (7th edition) convention for citation and referencing. Each significant contribution to, and quotation in, this essay/report/project from the work, or works of other people has been attributed and has been cited and referenced.
3. This essay/report/project is our own work.
4. We have not allowed, and will not allow, anyone to copy our work with the intention of passing it off as their own work.
5. We acknowledge that copying someone else's assignment or essay, or part of it, is wrong, and declare that this is our own work

SIGNATURES: Robyn Cupido (CPDROB002), Taidghan Wilmot (WLMTAI001)

DATE: 18 November 2021

Acknowledgements

We would like to express our gratitude to our supervisor, Dr Gosia Lipinska, for her guidance, input, and encouragement during the completion of this research and throughout the year. Furthermore, we would like to express our gratitude to Liette Du Plessis, our master's research partner, for her guidance and support throughout the process. We also want to express our gratitude to Milton Gerring for his crucial advice and assistance with the statistical analysis of our data. Finally, we want to express our heartfelt gratitude to our friends and family for their ongoing support and assurances.

Abstract

Researchers compile dream reports to carryout analyses on dream content, which might lead to new research and discoveries. However, it's crucial to think about whether a specific method of dream collecting could unintentionally alter the content and characteristics of dream reports. Dream reports are heavily influenced by sleep stages and specific patterns of brain activity which typically describe sleep (rapid eye movement (REM) and non-Rapid eye movement (N-REM) sleep). Traditionally, laboratory sleep awakenings have been used to gather dream reports.. However, because of the covid-19 pandemic, a remote technique of dream collection may be used as an alternative methods for dream report investigations. Few studies have explored the role that such methods have on dream reports and sleep quality. In this study, dream reports were collected from a sample of healthy participants aged 18-40 across two conditions: Night-Awakenings and Morning-Awakenings. Data collected from both nights was using a repeated measures t-test and chi-squared analysis to investigate whether any significant differences between the conditions occurred. Findings showed that there were no significant differences across the two conditions. These findings imply that dream reports can be collected in either REM or NREM sleep. This therefore implies that remote dream collection procedures may be used as an alternative to laboratory studies. Given the limitations of this study, however, future research is needed.

Keywords: Dream Studies, Sleep Studies, REM, NREM, Night-Awakenings, Morning-Awakenings, Remote Settings

Sleep plays a crucial role in psychosocial adjustment and mental health across the human lifespan, including regulating emotion, memory, learning, and physical recovery (Palmer & Alfano, 2017; Vandekerckhove & Wang, 2017). Spanning the last twenty years, scholars have focused their attention on dreams and their interpretation, thus expanding knowledge on the role of sleep (Plane & Tuttle, 2014). Despite a lack of agreement regarding the role of dreaming, academics consider dreams to form a 'continuum of awareness' - a universal mental function that expresses itself in dreams (Plane & Tuttle, 2014). Researchers collect dream reports to conduct analytic studies on dream content, potentially opening new avenues for research and discovery (Schredl, 2020). It is, however, important to consider whether a particular method of dream collection may inadvertently affect the content and characteristic of dream reports, thus influencing the findings that emerge (Schredl, 2020).

Rapid-Eye Movement versus Non-Rapid Eye Movement Sleep

Sleep stages play an important role in the kinds of dream reports that are collected. Sleep is a heterogeneous state with distinct stages (defined by specific patterns of neural activity) that are generally divided into two categories: Rapid Eye Movement (REM) and Non-Rapid Eye Movement (NREM) sleep (Horton, 2017; Hutchison & Rathore, 2015). It was initially believed that dreams emerged from REM sleep (70-95% of participant awakenings in a REM state report dreaming), but recent literature demonstrates that dreams also emerge from NREM sleep (Hutchison & Rathore, 2015; Martin et al., 2020; Solms, 2000). While dreams vary in frequency and quality according to whether they are recalled from REM or NREM sleep, there is also great heterogeneity of findings (Martin et al., 2020). This may have an important influence on the dream collection methods used which collect dreams as they emerge from different stages of sleep (Martin et al., 2020).

Laboratory Versus Remote Dream Collection Methods

Traditionally, laboratory sleep awakenings have been used to collect dream reports and are typically favoured as it allows studies to be conducted under standardised

experimental conditions (Zadra & Domhoff, 2017). This involves monitoring an individual's sleep stages with polysomnography and waking them up in REM sleep stage to record their dreams before they are forgotten (Sikka et al., 2018). However, the laboratory setting can influence the dream content and quality of the dream report, possibly because participants know they are being monitored (Schredl, 2020). Thus, dreams collected in the laboratory may not reflect typical dream content experienced by an individual at home (Schredl, 2020).

Comparatively, the remote method of dream collection may be considered as an alternative approach to dream report studies. This alternative dream collection method overcomes some of the pitfalls of laboratory studies, such as altered dream content, and allows for large samples to be collected over brief periods of time, thereby potentially lowering research costs (Duffy et al., 2005; Eynon et al., 2013; Schredl, 2020). This method could be especially useful in pandemic conditions, as doing laboratory-based in-person dream research poses a risk to participants and researchers. However, remote dream reports yield lower dream report frequencies (Nielsen, 2000) because dreams are not only elicited from REM sleep – the dreamer may remember the dream while already awake or while awakening from one of NREM sleep stages or REM sleep.

Dream report collection methods had to be adapted because of the global COVID-19 pandemic. A few sleep studies have been conducted online since the wake of the pandemic, many of which focused on understanding the pandemic's role in dreaming during quarantine situations (Gorgoni et al., 2021; Mota et al., 2020). These dream reports were collected, after participants had woken up in the morning, through various online methods, such as google forms, questionnaires and smartphone applications (Gorgoni et al., 2021; Mota et al., 2020; Scarpelli et al., 2021; Wang et al., 2020). No literature was found regarding remote dream report collections during the night. This may be because of potential difficulties in monitoring participants REM sleep remotely. Some of the limitations of these online studies include the

use of small, often unbalanced and unrepresentative sample sizes and poor experimental designs that result in unreliable questionnaires that do not consider all possible confounds (Gorgoni et al., 2021; Mota et al., 2020).

Therefore, these two collection methods (REM dream reports collected in laboratory settings and morning/ NREM dream reports used in remote settings) can influence the dream report and sleep quality.

Dream Quality

Dream report quality is often measured in terms of the length of the dream report, the intensity of the emotions reported, and the number of dreams recalled.

One of the biggest differences found in dream report quality between REM and NREM sleep relates to the length of the reports gathered (Martin et al., 2020). Research has largely shown that dream reports collected during REM sleep are lengthier than those collected during NREM reports (Martin et al., 2020; Nielsen, 2004).

The qualitative character of REM dream reports are considered to be more emotionally intense, vivid and bizarre than NREM dream reports (Martin et al., 2020; Nielsen, 2004). Additionally, it was found that dream reports collected remotely contained higher emotional intensity than laboratory studies for REM dream reports (Sikka et al., 2018). Furthermore, Sikka et al. (2018) suggests that the overall differences in emotional intensity between remote and laboratory dream reports may be a result of the time that the dream report was collected.

A study by Nielsen (2000) showed that recall rates are considerably lower in NREM sleep (roughly 43%) compared to REM sleep (81.9%). However, the rate of recall for NREM sleep may be dependent on the sleep stage in which the dream report is collected (Martin et al., 2020). This is especially shown in laboratory sleep studies in which 90% of REM awakenings yielded dream reports (Schredl, 2020).

Sleep Quality

There is limited research examining sleep duration and frequency of awakenings in dream studies. However, research suggests that both sleep duration and frequency of awakenings affect the dream report quality, specifically recall rates and dream report length (Bottary et al., 2020; Schredl & Reinhard, 2008). There is an association between longer sleep duration and a higher chance of awakening from REM sleep (Schredl & Reinhard, 2008). This has important implications for laboratory dream studies as this method of dream collection typically relies on REM awakenings for dream reports. Thus, sleep duration is an important variable to assess in dream studies. Additionally, the probability of recalling a dream increases as the frequency of awakenings increases since more awakenings provide more opportunities to encode, rehearse and consolidate the dream content (Bottary et al., 2020). Therefore, the number of awakenings is also an important variable to assess in dream studies.

Rationale

There is a gap in the literature evaluating dream collection methods used during pandemic situations, and thus, little insight into how these methods affect the quality of the dream report and sleep. Furthermore, while the current consensus is that dreaming occurs in NREM sleep as well as REM sleep, few studies have compared dream reports emerging directly from sleep (with a high probability of recording a REM-related dream reports in the second half of the night) to those garnered via Morning-Awakenings (and therefore from any sleep stage or even just from waking).

Aims and Hypotheses

Therefore the overall aim of this study was to determine which dream collection method (during sleep versus morning dream collection) produced better dream reports and sleep quality. Additionally, this study looked at whether remote dream studies may be used as a viable alternative to laboratory studies as an implication of the overall aim. This is

significant in the current global situation for researchers who wish to study dream reports during situations where laboratory studies are either impossible or impractical and pose a risk to participants and/ or researchers.

To assess dream report and sleep quality in remote settings, the following hypotheses were tested:

- H1: Dream reports collected during the night (REM sleep/ Night-Awakening) are longer and more detailed than the reports collected in the morning (NREM sleep/ Morning-Awakening)
- H2: Dream reports collected during the night (REM sleep/ Night-Awakening) contain more emotional intensity
- H3: Dream collection procedures used during the night (REM sleep/ Night-Awakening) elicit more dreams.
- H4: Dream collection procedures used in the morning (NREM sleep/ Morning-Awakening) will produce better sleep quality

Method

Design and Setting

This study was part of a greater study investigating the relationship between affect in dreams and emotional memory recall accuracy. A quasi-experimental design was used to investigate whether dream collection procedures affect the quality of dream reports and the integrity of sleep. The independent variable is dream collection procedures (collecting dream reports in the second half of the night or the morning after), and the dependent variables are dream report quality and integrity of sleep. Dream report quality was measured by the length of the report (word count), emotional intensity ratings, and whether or not a dream report was elicited. Furthermore, sleep quality was measured by sleep duration as well as the number and length awakenings.

This study was conducted through virtual meetings, such as over zoom sessions and phone calls, which meant that participants completed all tasks remotely (at home).

Participants

To determine the number of participants needed for this study, a power analysis was conducted. A similar study conducted found effect sizes of 0.25, 0.23 and 0.55 (Schredl, 2020). Therefore, an average effect size of $f = 0.34$ was used in our power calculation. To achieve a statistical power of 0.8 and ensure that the predictors are significant ($p < 0.01$), at least 90 participants needed to be involved in the study.

A sample of 90 healthy participants from a university population were recruited. These participants needed to be aged 18-40 to control for the effects of age on sleep and memory (Cherdieu et al., 2014). Participants who suffered from the following conditions were excluded as these conditions negatively influenced dreaming: a neurological, sleep or psychiatric disorder such as PTSD, generalised anxiety disorder or major depression, are sleep deprived (not regularly sleeping between seven to nine hours per night), have significant sleep difficulties and take medication for sleep or psychiatric disorders (Putois et al., 2020). Furthermore, participants suffering from current or past substance or alcohol abuse were excluded as dreaming is affected by excessive use of alcohol or substances (Putois et al., 2020). Participants were required to have a device (e.g., a laptop) and a stable internet connection. Participants from the University of Cape Town (UCT) were recruited using convenience sampling via the psychology department's Student Research Participation Programme (SRPP) and UCT's mailing system (see appendix B).

Materials and Measures

Screening Measures

The Pittsburgh Sleep Quality Index (PSCI). The PSCI (Smyth, 2012; Appendix C) is a nine-item self-report questionnaire that evaluates a participant's sleep quality over the last

month using seven components of sleep (sleep latency, sleep disturbances, habitual sleep efficiency, sleep duration, sleeping medication, daytime dysfunction and subjective sleep quality) and has an internal consistency and reliability coefficient (Cronbach's alpha) of 0.83. The scores obtained for each of the seven components are added together, producing a 'global' score. A global score of more than five is considered poor sleep quality. As a result, only participants with a global score of five or less were included in this study.

The Patient Health Questionnaire for Depression (PHQ-9). The PHQ-9 (Kroenke et al., 2001; Appendix C) is a 9-item self-report questionnaire that screens for and measures the severity of depression of an individual, taking into consideration the depression diagnostic criteria of the DSM-IV. For the PHQ-9, a score between five to nine indicates minimal depressive symptoms, a score of 10-14 shows mild depression, a score of 15-19 signifies moderately severe depression, and a score above 20 indicates severe depression. For this study, participants with a score higher than nine were excluded as less than 10 has an 88% accuracy of specificity and sensitivity for depression (Kroenke et al., 2001). Furthermore, the PHQ-9 is considered a valid measurement for the South African population (Haas et al., 2020).

The 5-item Primary Care Post-Traumatic Stress Disorder Screen (PC-PTSD-5). The PC-PTSD-5 (Prins et al., 2016; Appendix C) is a questionnaire that screens for PTSD according to the DSM-5 criteria through five 'yes or no' questions. Relative to the DSM-5 criteria, the PC-PTSD-5 demonstrates high diagnostic accuracy and great face and content validity and has been used in several South African studies (Haas et al., 2020). For this study, participants were excluded if they answer 'yes' to three or more of the questions as this cut-off score provides the best maximum sensitivity (Prins et al., 2016).

Alcohol Use Disorders Identification Test - Concise (AUDIT-C). The AUDIT-C, (WHO, 2001; Appendix C), the shortened version of AUDIT, is a brief, practical and valid

three-item instrument that screens for alcohol use (or dependence) and heavy drinking (Bush et al., 1998) and has been used successfully in South African studies (Morojele et al., 2017). Scores on the AUDIT-C range between 0-12, with higher scores indicating a higher risk for dependent/heavy drinking behaviours. Since university students generally consume more alcohol, s cut-off score of 4 for men and 3 for women should ideally be relaxed (DeMartini & Carey, 2012). Therefore, for this study, a cut-off score of 7 for men and 5 for women was used.

The Drug Abuse Screening Test (DAST-10). The DAST-10 (Skinner, 1982; Appendix C) is a 10-item questionnaire that measures the severity of drug dependence using 'yes or no' questions has been shown to discriminate between non-current versus current drug users with a good range of internal consistency (0.86–0.94) (Yudko et al., 2007). An answer of 'yes' to three to five questions indicates moderate drug abuse problems, while six to eight questions indicate substantial problems, and a score of 9-10 indicates a severe drug abuse problem (Skinner, 1982). For this study, any participant that answered 'yes' to three or more questions were excluded from the study.

Demographic Information and Medical History Questionnaire. An online questionnaire (see appendix C) regarding the demographic (e.g., name, surname, sex, age, contact details, etc.), medical history (e.g., medical conditions, medication, head injury, etc.) and certain sleep details was sent out to participants for completion. The following conditions were controlled for: caffeine intake, smoking, age and sleep quality.

Experimental Measures

Sleep Diary. A sleep diary was used to assess the participants' sleep to track their sleep quality on the nights of the study (National Sleep Foundation, 2021; Appendix D). The information provided by the sleep diary includes the time the participant retired to bed, the

duration it took for the participant to fall asleep, and the frequency of awakenings experienced in the night.

Oral Dream Report Recording. Participants were asked to sign a consent form allowing for an audio recording of their dream report to be taken (see appendix E). Upon awakening, participants were asked (via a phone call) to give a report of their dreams, including a detailed account of the feelings they experienced in their dreams. If a participant struggled to recall a dream immediately, they were asked probing questions, such as "What was going through your mind before I woke you up?" (Cartwright et al., 1998).

Visual Analogue Mood Scales (VAMS). Emotional intensity was measured on a scale using the Visual Analogue Mood Scales (VAMS, Nyenhuis et al., 1997) to obtain a subjective rating of the affect experienced in their dreams. The scale includes seven affects based on Panksepp's theory of basic emotions (Panskepp, 1992): anger, sexual desire, grief, nurturance, joy, anticipation, and anxiety (Van Der Westhuizen & Solms, 2015) which participants reported verbally, ranking each emotion on a scale of 0 to 10. This scale is brief, demonstrate good validity in measuring mood states and are easily administered (Nyenhuis et al., 1997).

Procedure and Data Collection

Screening Phase

An email explaining the study was sent to participants through an online screening questionnaire via a google form (see appendix F). Participants then signed a consent form (see appendix G) agreeing to complete the screening questionnaire which consisted of demographic details, medical details, and the PSQI, PHQ-9, PC-PTSD-5, AUDIT-C and DAST-10 to ensure participants met the inclusion criteria. Eligible participants were then invited (via email) to partake in the two-night study.

Experimental Phase

Before participating, participants were required to sign a consent form (see appendices G, H and I). During the consenting procedures, the researchers arranged a date and time with each participant for a virtual meeting on the first night of the study. Participants where also required to complete a sleep diary seven days before the scheduled start date (including the two nights of the study) to check that their sleep quality had been regular and approximate their typical sleeping patterns. Participants were also asked to abstain from alcohol and more than one caffeinated drink in the morning (before 10 am) on the days of the study. During the meeting on the first night, a time was arranged for when participants needed to set their alarm.

Dream reports were collected from the participants on two separate nights. On one of the nights, participants were awoken in the night (REM sleep/ Night-Awakening) and asked to provide their dream report. On another night, participants were asked to provide their dream reports in the morning (NREM/ Morning-Awakening).

Night-Awakening. Participants were required to go to bed at their usual bedtime. An alarm was set based on a prearranged time, and participants were briefed about the nature of this awakening before they went to bed (i.e., they should return to sleep immediately after the report had been collected). The time of the alarm was calculated as the midpoint of the second half of the night. For example, if a participant went to sleep at 10 pm and woke up at 6 am, the second half of the night would fall between 2 am and 6 am. Therefore, in this case, the participant would set their alarm for 4 am. During this time, participants were likely to be experiencing REM sleep.

Researchers called participants just after their alarms had gone off to ensure interaction with the researchers. Participants were asked to recall any dreams they may have had, the feelings experienced in the dreams, and rate the dream's emotional intensity using the VAMS. Participants were then prompted to return to sleep after the call. The following morning, participants completed the sleep diary.

Upon completion of the first night, a date and time was set for the second night of the study, including what time participants should go to bed and wake up in the morning. Participants were reminded to complete a sleep diary for seven days before their scheduled date (including the night of the study).

***Morning-Awakening*.** The same group of participants participated on the second night of the study. Participants were not woken during the night but instead, provided their dream reports the next morning in the same manner as the Night-Awakening condition.

Participants were debriefed on the study and thanked for their participation. They were reminded to contact the Student Wellness Service (SWS) for further help should they have felt the need.

To eliminate ordering effects, the conditions: Nights-Awakenings and Morning-Awakenings were counterbalanced, whereby some participants started with the Night-Awakening while other participants started with the Morning-Awakening.

Data Analysis

Data collected from the Night-Awakening and the Morning-Awakening was analysed to investigate whether any significant differences occurred between the conditions. As this was a within-subjects design, a repeated measures t-test was used for hypotheses one, two and four to compare the dream reports in terms of length measured, emotional intensity and sleep duration. Additionally, a chi-squared test was used for hypothesis three to compare dream recall rate across the conditions. The t-test and chi-squared test was conducted in R and Rstudio. α was set at .05 for all decisions regarding statistical significance between the two samples. This allowed the researchers to compare which condition produced superior dream reports and sleep quality.

Ethical Considerations

Ethical approval was provided by the University of Cape Town (see Appendix A).

Informed Consent

Participants needed to sign a consent form before participating. The consent form outlined the purpose of the study, the procedure and the possible benefits and risks of participating. It ensured that participants were aware that participation was voluntary and that they were allowed to withdraw from the study without explanation at any time. Participants received the contact details of the researchers, supervisor and department secretary (as an impartial party) if they had any questions regarding the study or their involvement.

Confidentiality

Participants' details such as names, surnames and contact details were only used to maintain contact throughout the study. To ensure anonymity, participants were not identifiable in the study as data was stored under a number rather than the participant's name. All participants were informed that their details were not shared with anyone besides the research team and were kept confidential as outlined in the data storage section.

Data Storage

All data collected was stored on a google drive that only the researchers were granted access to. Downloading the data onto laptops or computers was not allowed. The data will remain on the google drive until the study is completed and will be deleted after that.

Potential Harm

Since participants were woken up in the night, they might have experienced a poor night's sleep if they were unable to fall asleep again. Participants were informed of this, and they were reminded that withdrawal from the study was allowed if they wished to do so.

Benefits and Compensation

While there are were direct benefits to participation, participants who were psychology students at UCT earned four SRPP points upon completion of the screening questionnaire and participation in the study.

Debriefing

To minimise the risk of emotional distress, participants were screened for any psychopathologies before the study. All participants were debriefed at the end of the study by the researchers and given time to ask any questions. If required, participants who stated that they experienced distress as a result of the study procedure, as well as the participants that researchers felt needed further counselling services, were referred to SWS. Furthermore, participants were provided with contact details of the SWS.

Risk of Discrimination

There was a risk of discrimination as participants needed a device and a stable internet connection. Thus, students who did not have access to these items were accommodated as far as possible by the researchers (e.g., lending a device or purchasing data).

Results

Sample Characteristics and Pre-Experimental Sleep Quality

Potential participants were screened before the study to ensure only eligible participants who met the specific criteria were chosen for the study. Participants in the study were within the age range of 19–37, with most participants aged 19 to 26. The participants consisted of 5 males and 20 females. None of the participants had experienced a head injury, had a neuropsychological disorder, or took medication for depression and/ or anxiety. In terms of sleep quality measured 3 days prior to the start of the study, the descriptive results showed that on average, participants slept a rough total of 7 hours and 42 minutes per night and woke up at least once in the night for an average of 6 minutes.

For hypotheses 1, 3 and 4, the dream data for 3 participants had to be removed due to errors in procedure collections.

Testing Hypothesis 1

Table 1 below displays the descriptive statistics for hypothesis 1.

Table 1

Descriptive Statistics for Dream Report Length (n=22)

Conditions	*M*	*SD*	*Ci_Lower*	*Ci_Upper*
Morning-Awakening	121	180	46	196
Night-Awakening	89	178	15	163

Note. Dream report length was measured by word count. Only the dream description was included in the word count.

From this table, it can be seen that the morning dream report had the biggest average score for report length and that the mean difference in length between the two conditions is 32. This suggests that the dream report obtained in the morning produced slightly longer dream reports. The data is spread out over a large range of values as seen by the standard deviation scores and is therefore less reliable. The confidence intervals for the two groups are large (46 and 196; 15 and 163) which means that a large amount of uncertainty is expected for the estimates (121 and 89). Furthermore, as the confidence intervals overlap, there may be little to no significant differences between the two groups.

Examination of the assumptions of the t-test, statistics revealed that the data was not normally distributed and had outliers, hence a non-parametric test (the Paired Wilcoxon Signed Rank Test) was used. Results confirmed that there were no significant differences in the dream reports across the conditions, $p = 0.63$. This was done for hypotheses 1 and 2.

Testing Hypothesis 2

Table 2 below displays the descriptive statistics for hypothesis 2.

Table 2

Descriptive Statistics for Emotional Intensity (n= 25)

Condition	M	SD	Ci_Lower	Ci_Upper
Night-Awakening	18	12	14	23
Morning-Awakening	20	11	16	24

Note. The seven emotions were rated on a scale of 0 to 10. Each rating was added to make a total score for each participant.

From this table, it can be seen that the morning dream report had the biggest average score for emotional intensity and that the mean difference between these conditions is 2. This suggests that the dream report obtained in the morning was slightly more emotionally intense. However, this mean difference is too small for it to be of significance. The standard deviation scores are smaller than the mean scores and indicate that the data is spread out over a smaller range of values but is still far enough away from the mean that it cannot be considered completely reliable. The confidence intervals for the two groups is not very large which means that a small amount of uncertainty is expected for the estimates. Furthermore, as the confidence intervals overlap, there may be little to no significant differences between the two groups.

Examination of the assumptions of the t-test statistics revealed that the data was not normally distributed and had outliers, hence a non-parametric test used. Results from the Paired Wilcoxon Signed Rank test confirmed that there were no significant differences in the dream reports across the conditions, $p = 0.73$. We, therefore, disconfirmed our hypothesis.

Testing Hypothesis 3

This chi-squared test aimed to determine if the collection of dreams during the night generated more dreams than those collected in the morning. Results showed that the total number of dreams recalled in the Morning-Awakening was 14 while the Night-Awakening recall rate was 15. Therefore, with only a difference of 1, it can be seen that there are no significant differences in the number of dreams recalled across the two conditions. This is further illustrated through the *p*-value (0.85) in which there were no significant differences in dream recall rate across the two conditions. We, therefore, disconfirmed our hypothesis.

Testing Hypothesis 4

Sleep Duration

Table 4 below displays the descriptive statistics for hypothesis 4.

Table 4

Descriptive Statistics for Sleep Duration (n=22)

Conditions	M	SD	Ci_lower	Ci_Upper
Morning-Awakening	442	79	49	475
Night-Awakening	465	77	433	497

Note. Sleep duration was scored in minutes as the number of hours participants slept in each condition.

From this table, it can be seen that there is very little difference in the mean scores (25 points) for sleep duration as a condition of sleep quality between the night (roughly 8 hours and 15 minutes of sleep) and morning (roughly 7 hours and 36 minutes of sleep) report awakenings. Therefore, overall, participants slept an average of 40 minutes more during the Night-Awakening than in the Morning-Awakening. The standard deviation is much smaller than the mean values. This shows that the spread of the data is smaller and therefore more reliable. The confidence intervals for the two groups is large (49 and 475; 433 and 497) which

means that a large amount of uncertainty is expected for the estimates (442 and 465). Furthermore, as the confidence intervals overlap, there may be little to no significant differences between the two groups.

A paired t-test analysis was used and aimed to determine if dream collection procedures during the night resulted in better sleep quality, measured through the sleep duration of participants, than dream collections in the morning. Results indicated that there were no significant differences in the dream reports across the two conditions, $p = 0.88$. We, therefore, disconfirmed our hypothesis.

Sleep Awakenings

In terms of overall sleep quality before the study and during the study, it can be seen that for Night-Awakenings participants sleep duration was roughly 33 minutes longer than the average sleep duration experienced before the study began (8 hours and 15 minutes > 7 hours and 42 minutes). Comparatively, for the Morning-Awakening condition, the data showed that participants average sleep duration was roughly 6 minutes shorter than the average sleep duration experienced by participants before the study began (7 hours and 36 minutes < 7 hours and 42 minutes). However, 11 participants (in a sample size of 25) reported that they struggled to fall back asleep after the Night-Awakening. Furthermore, participants reported that their sleep was disturbed by the anticipation of the middle of the night call and anxiety over missing it.

Additionally, it was seen that, on average, participants woke up at least once in the night for roughly 8 minutes across both conditions. However, results from the descriptive statistics indicate that there were no differences in sleep awakening between the conditions (a mean of 1 for both conditions). Additionally, descriptive statistics showed little difference in awakening length across the two conditions (an average of 9 minutes for Night-Awakenings

and an average of 6 minutes for Morning-Awakenings). Based on these results, researchers felt a t-test was not required.

Discussion

This research aimed to investigate how dream collection procedures affect dream report quality and integrity of sleep. Furthermore, this research aimed to determine a whether remote dream collection procedure is a viable option for sleep studies compared to laboratory studies, which is especially relevant in the current pandemic global context. An examination of the status of the literature revealed that there was a lack of literature on remote dream collection methods. Therefore, this study served to bridge this gap.

Overall, the findings showed little variation in dream quality (length, emotional intensity and recall rate) and sleep quality on the night of dream collection between the two dream collection procedures. This implies that either method could be used to gather dream reports in sleep studies. Therefore, researchers can rest assured that when they take dream reports in remote settings (using Morning or Night-Awakenings), they are using a good dream collection method as this method has the lowest research cost associated with it.

Testing Hypothesis 1: Dream reports collected during the night are longer and more detailed than the reports collected in the morning.

Martin et al. (2020) found that dream reports collected during REM sleep were longer than those collected during NREM sleep. Considering this stage of sleep dominates the second half of the night (Van der Helm & Walker, 2011), Night-Awakenings in the second half of the night have a higher probability in capturing a REM associated dream recall. In contrast to this finding, our study found that there were no significant differences in dream report length collected during the second half of the night. Because researchers are unable to objectively monitor REM sleep in remote sleep studies, this means that regarding our findings, we cannot be sure that participants were in this stage of sleep at the time of

awakening at home. Our participants were likely to have been in either NREM stage 2 or REM sleep and having at least a fair (although unknown percentage) of participants woken from REM sleep did not impact the length of dream reports.

Testing Hypothesis 2: Dream reports collected during the night contained more emotional intensity.

Martin et al. (2020) state that dream reports collected in REM and NREM sleep differ in their qualitative character whereby REM reports are considered more intense, emotional and vivid than dreams collected during NREM sleep. Therefore, the quality of the dream reports, in terms of emotional intensity, gathered during NREM increased in the second half of the night as it does for REM reports (Nielsen, 2004). Therefore, while researchers would have expected a difference irrespective of the sleep stage, this was not shown in the data which suggests that dream reports gathered after REM sleep in the second half of the night are a sufficient alternative.

Furthermore, Sikka et al. (2018) suggest that differences in emotional intensity of dream reports collected in the home and laboratory may be due to the time of night effects and not the setting. While our study agrees with Sikka et al. (2018) that the setting does not affect the dream report quality, our study suggests that there were in fact no differences in time of night effects. Therefore, our conclusion is that the time of night that the dream report is collected will not affect the emotional intensity of the dream report. However, this should be explored further in future studies.

Testing Hypothesis 3: Dream collection procedures used during the night elicit more dreams.

A review of various studies by Nielsen (2000) demonstrated that dream recall rates are significantly higher in REM sleep (81.9%) than in NREM sleep (43%).

Although the distinction that Night-Awakenings results in a probable higher percentage of REM awakenings cannot be made for remote sleep settings, the unknown proportion of people caught in true REM awakenings did not make a difference which therefore suggests that having only true REM awakenings remains the gold standard for dream recall studies. Furthermore, studies show that percentage of dream recall increases for NREM in the second half of the night as well (Nielsen, 2004). In contrast, our findings show that whatever increase there may be, it is still surpassed, at least, according to the literature by true REM awakenings. Additionally, awakenings in the morning are also likely to yield dream reports coming from REM sleep and NREM in the second half of the night, but there will be greater variation depending on which stage the participant awoke from. It is therefore likely to represent a lower percentage of second half of the night true REM and NREM dream reports.

Furthermore, studies have shown that women have a higher dream recall rate than men (Nielsen, 2012; Zadra & Domhoff, 2017). As our study predominantly consisted of women (20 out of 25 participants), it may be that the higher dream recall frequency observed in our study may have been influenced by participant characteristics, such as gender.

Testing Hypothesis 4: Dream collection procedures used in the morning will produce better sleep quality.

This study found that there were no differences in sleep quality (measured by sleep duration and sleep awakenings) across the dream collection methods. Therefore, while there is little difference in sleep duration and awakening time across the two dream collection methods, the overall sleep quality of the participants can be considered less than ideal based on the self-reports and sleep diaries of the participants.

Implications of findings

Considering every research protocal needs to balance the quality of the data obtained with the cost (material and in time), the procedure which obtains the best data with minimal

cost should be favoured. In our case, the findings support the use of post-sleep dream recall collection and show that there is no advantage to waking participants up during the night.

Limitations and future recommendations

While this study aimed to develop an understanding of the usefulness of remote studies as a collection method as well as the collection procedures for dream reports, there are several limitations to be noted.

The first limitation of this study pertains to the sample size. According to the power analysis conducted, 90 participants were needed for the study. Approximately 197 individuals took the screening questionnaire, of which 61 people met the relevant criteria. However, only 25 people agreed to participate in the study. Additionally, 3 participants data had to be removed in order to test hypotheses 1, 3 and 4 due to incomplete data. This therefore impacts the generalisability of the study to the larger population and further undermines the statistical calculations. In order to make our findings more robust given this limited sample size, non-parametric tests were used to confirm our results.

Reasons for the limited sample may be that the study was too administratively intense for some participants in that there were several expectations and requirements placed on them. This may have intimidated potential participants from taking part in the study as many of the participants who qualified for the study did not respond to the invitation emails and calls. This was also evident across participants who did participate in that not all of them answered their calls on time or did not complete the sleep diary accurately. The fact that the sleep diaries were not filled in properly influenced the findings for hypothesis 4 which focused on sleep duration. In future, the administrative requirements placed on participants should be reduced as a way of encouraging more participation and reducing the study's reliability on participants. Additionally, the time of the year in which the study took place may have influenced the sample size as a number of the participants were recruited during the

university's exam period. This may have influenced their normal sleeping patterns, thus influencing the sleep quality of the data.

Furthermore, this study was very time specific regarding sleep times and wake up times. As this study largely relied on participant's schedules, researchers could not always be certain that participants went to bed at the required times. Therefore, researchers cannot be entirely certain that participants were awoken during the midpoint of their second half of the night.

Secondly, our findings may have been distorted by the quality of the phone calls in which participants shared their dream reports. This is because participants were still in a sleep-like state and thus were not always coherent in their speech. This may have limited the report lengths gathered. Furthermore, the dream report length may have been limited as a result of participants living spaces (student dormitories or married couples) in which they did not want to disturb other residents in their middle of the night calls.

Thirdly, as this study was conducted in an online capacity, the procedure of the study may have been affected by a lack of standardization. While participants were provided with detailed instructions, the time between each task was not uniform and thus may have affected the accuracy of the results.

Lastly, the sample consisted largely of women (20 out of 25) therefore this study may not be an accurate representative of the population. Therefore, studies should aim to have a more balanced sample regarding its participants.

Based on the above limitations, it can be seen that this study experienced the same shortfalls as earlier remote dream studies, such as Gorgoni et al. (2021) and Mota et al. (2020). These pitfalls would need to be addressed in future studies to avoid repeated errors as, despite these difficulties, dream reports garnered from home studies offer a possible safe

method that, with certain methodological considerations, could be successfully adopted during periods of uncertainty.

Conclusion

Despite having a small sample size, this study is still of relevance to understanding remote studies as a dream report collection method, especially because this proposed method would assist in overcoming the shortfalls of laboratory sleep studies, such as altered dream content. However, until more research has been conducted, this method should rather be used as an emergency procedure in certain situations, such as a pandemic context. Therefore, this study should rather be considered as a pilot study to a much larger study. Future researchers in possession of more resource and time as well as access to a larger sample size could use this study as a pilot to their research. Once more research has been gathered, future researchers could better compare laboratory report methods with those used in remote settings, to more accurately determine whether one procedure produces better dream reports. Additionally, this study was also stretched out in terms of how much it aimed to investigate in a short span of time. Therefore, the number of variables considered in future study should be reduced and the study design should be simplified.

Overall, this study has further shown that there is little difference between dream reports collected during REM sleep and NREM sleep. This is largely in contrast to past literature which states that REM sleep produces better quality dream reports. However, this will require further research.

References

Bottary, R., Simonelli, G., Cunningham, T. J., Kensinger, E. A., & Mantua, J. (2020). Sleep extension: An explanation for increased pandemic dream recall? Sleep, 43(11). https://doi.org/10.1093/sleep/zsaa131

Bush, K., Kivlahan, D. R., McDonell, M. B., Fihn, S. D., & Bradley, K. A. (1998). The AUDIT alcohol consumption questions (AUDIT-C): An effective brief screening test for problem drinking. *Archives of Internal Medicine*, *158*(16), 1789–1795. https://doi.org/10.1001/archinte.158.16.1789

Cartwright, R. D., Luten, A., Young, M., Mercer, P., & Bears, M. (1998). Role of REM sleep and dream affect in overnight mood regulation. *Psychiatry Research*, *81*(1), 1–8. https://doi.org/10.1016/S0165-178(98)00089-4

Cherdieu, M., Reynaud, E., Uhlrich, J., Versace, R., & Mazza, S. (2014). Does age worsen sleep-dependent memory consolidation?. *Journal of Sleep Research*, *23*(1), 53–60. https://doi.org/10.1111/jsr.12100

DeMartini, K. S., & Carey, K. B. (2012). Optimizing the use of the AUDIT for alcohol screening in college students. *Psychological Assessment*, *24*(4), 954–963. https://doi.org/10/1037/a0028519

Duffy, B., Smith, K., Terhanian, G., & Bremer, J. (2005). Comparing data from online and face-to-face surveys. *International Journal of Market Research*, *47*(6), 615–639. https://doi.org/10.1177/147078530504700602

Eynon, R., Fry, J., & Schroeder, R. (2013). The Ethics of Internet Research. In N. Fielding, R.M. Lee & G. Blank (Eds.), *The SAGE Handbook of Online Research Methods* (pp. 22-42). SAGE Publications, Ltd. https://dx.doi.org/10.4135/9780857020055.n2

Gorgoni, M., Scarpelli, S., Alfonsi, V., Annarumma, L., Cordone, S., Stravolo, S., & Gennaro, L. (2021). Pandemic dreams: Quantitative and qualitative features of the oneiric activity

during the lockdown due to COVID-19 in Italy. *Sleep Medicine*, *81*, 20–32. https://doi.org/10.1016/j.sleep.2021.02.006

Haas, A. D., Technau, K. G., Pahad, S., Braithwaite, K., Madzivhandila, M., Sorour, G., Sawry, S., Maxwell, N., Groote, P., Tlali, M., Davies, M. A., & Egger, M. (2020). Mental health, substance use and viral suppression in adolescents receiving ART at a paediatric HIV clinic in South Africa. *Journal of the International AIDS Society*, *23*(12), 1–12. https://doi.org/10.1002/jia2.25644

Horton, C. L. (2017). Consciousness across sleep and wake: Discontinuity and continuity of memory experiences as a reflection of consolidation processes. *Frontiers in Psychiatry*, *8*(159), 1–10. https://doi.org/10.3389/fpsyt.2017.00159

Hutchison, I. C., & Rathore, S. (2015). The role of REM sleep theta activity in emotional memory. *Frontiers in Psychology*, *6*(1439), 1–15. https://doi.org/10.3389/fpsyg.2015.01439

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, *16*(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Martin, J. M., Andriano, D. Q., Mota, N. B., Mota-Rolim, S. A., Araujo, J. F., Solms, M., & Ribeiro, S. (2020). Structural differences between REM and non-REM dream reports assessed by graph analysis. *PLoS ONE*, *15*(7), 1–18. https://doi.org/10.1371/journal.pone.0228903

Morojele, N. K., Nkosi, S., Kekwaletswe, C., Schuper, P., Manda, S., Meyers, B., & Parry, C. (2017). Utility of brief versions of the Alcohol Use Disorders Identification Test (AUDIT) to identify excessive drinking among patients in HIV care in South Africa. *Journal of Studies on Alcohol and Drugs*, *78*(1), 88–96. https://doi.org/10/15288/jsad.2017.78.88

Mota, N. B., Weissheimer, J., Ribeiro, M., de Paiva, M., D'Avilla, J., Simabucuru, G., Chaves, M. F., Cecchi, L., Cirne, J., Cecchi, G., Rodrigues, C., Copelli, M., & Ribeiro, S. (2020). Dreaming during the Covid-19 pandemic: Computational assessment of dream reports reveals mental suffering associated with negative feelings and contagion fear. *medRxiv*, 1–18. https://doi.org/10.1101/2020.05.19.20107078

National Sleep Foundation. (2021). *Sleep diary*. 1-8. https://doi.org/10.32388/5xp5mh

Nielsen, T. (2012). Variations in dream recall frequency and dream theme diversity by age and sex. *Frontiers in Neurology*, *3*, 106. https://doi.org/10.3389/fneur.2012.00106

Nielsen, T. A. (2000). A review of mentation in REM and NREM sleep: "Covert" REM sleep as a possible reconciliation of two opposing models. *Behavioral and Brain Sciences*, *23*(6), 851–866. https://doi.org/10.1017/s0140525x0000399x

Nielsen, T. A. (2004). Chronobiological features of dream production. Sleep Medicine Reviews, 8, 403–424. https://doi.org/10.1016/j.smrv.2004.06.005

Nyenhuis, D. L., Stern, R. A., Yamamoto, C., Luchetta, T., & Arruda, J. E. (1997). Standardization and validation of the Visual Analog Mood Scales. *Clinical Neuropsychologist*, *11*(4), 407–415. https://doi.org/10.1080/13854049708400470

Palmer, C., & Alfano, C. A. (2017). Sleep and emotion regulation: An organizing, integrative review. *Sleep Medicine Reviews*, *31*, 6–16. https://doi.org/10.1016/j.smrv.2015.12.006

Panskepp, J. (1992). A critical role for "affective neuroscience" in resolving what is basic about basic emotions. *Psychological Review*, *99*(3), 554–560. https://doi.org/10.1037/0033-295X.99.3.554

Plane, A. M., & Tuttle, L. (2014). Dreams and dreaming in the early modern world. *Renaissance Quarterly*, *67*(3), 917–931. https://www.jstor.org/stable/10.1086/678778

Prins, A., Bovin, M. J., Smolenski, D. J., Marx, B. P., Kimerling, R., Jenkins-Guarnieri, M. A., Kaloupek, D. G., Schnurr, P. P., Kaiser, A. P., Leyva, Y. E., & Tiet, Q. Q. (2016). The

Primary Care PTSD Screen for DSM-5 (PC-PTSD-5): Development and Evaluation Within a Veteran Primary Care Sample. *Journal of General Internal Medicine*, *31*(10), 1206–1211. https://doi.org/10.1007/s11606-016-3703-5

Putois, B., Leslie, W., Asfeld, C., Sierro, C., Higgins, S., & Ruby, P. (2020). Methodological recommendations to control for factors influencing dream and nightmare recall in clinical and experimental studies of dreaming. *Frontiers in Neurology*, *11*. https://doi.org/10.3389/fneur.2020.00724

Scarpelli, S., Alfonsi, V., Mangiaruga, A., Musetti, A., Quattropani, M. C., Lenzo, V., Freda, M. F., Lemmo, D., Vegni, E., Borghi, L., Saita, E., Cattivelli, R., Castelnuovo, G., Plazzi, G., De Gennaro, L., & Franceschini, C. (2021). Pandemic nightmares: Effects on dream activity of the COVID-19 lockdown in Italy. *Journal of Sleep Research*, 1–10. https://doi.org/10.1111/jsr.13300

Schredl, M. (2020). Most recent dreams vs. diary dreams: A methodological note. *International Journal of Dream Research*, *13*, 293–296. https://doi.org/10.11588/jodr.2020.2.73639

Schredl, M., & Reinhard, I. (2008). Dream Recall, Dream Length, and Sleep Duration: State or Trait Factor. *Perceptual and Motor Skills*, *106*(2), 633–636. https://doi.org/10.2466/pms.106.2.633-636

Sikka, P., Revonsuo, A., Sandman, N., Tuominen, J., & Valli, K. (2018). Dream emotions: A comparison of home dream reports with laboratory early and late REM dream reports. *Journal of Sleep Research*, *27*, 206–214. https://doi.org/10.1111/jsr.12555

Skinner, H. A. (1982). The drug abuse screening test. *Addictive Behaviors*, *7*(4), 363–371. https://doi.org/10.1016/0306-4603(82)90005-3

Smyth, C. (2012). The Pittsburgh sleep quality index. *Medsurg Nursing*, *6*(1), 261–262.

Solms, M. (2000). Dreaming and REM sleep are controlled by different brain mechanisms. *Behavioral and Brain Sciences*, *24*, 793–1121. https://doi.org/10.1017/S0140525X00003988

Vandekerckhove, M., & Wang, Y. (2017). Emotion, emotion regulation and sleep: An intimate relationship. *Neuroscience*, *5*(1), 1–17. https://doi.org/10.3934/Neuroscience.2018.1.1

Van der Helm, E., & Walker, M. P. (2011). Sleep and emotional memory processing. Sleep Medicine Clinics, 6(1), 31–43. https://doi.org/10.1016/j.jsmc.2010.12.010

Van Der Westhuizen, D., & Solms, M. (2015). Basic emotional foundations of social dominance in relation to Panksepp's affective taxonomy. *Neuropsychoanalysis*, *17*(1), 19–37. https://doi.org/10.1080/15294145.2015.1021371

Wang, J., Zemmelman, S., Hong, D., Feng, X., & Shen, H. (2020). Does COVID-19 impact the frequency of threatening events in dreams? An exploration of pandemic dreaming in light of contemporary dream theories. *Consciousness and Cognition*, 87. https://doi.org/10.1016/j.concog.2020.103051

World Health Organization. (2001). AUDIT: The alcohol use disorders identification test: Guidelines for use in primary health care. Retrieved from https://www.who.int/publications/i/item/audit-the-alcohol-use-disorders-identification-test-guidelines-for-use-in-primary-health-care

Yudko, E., Lozhkina, O., & Fouts, A. (2007). A comprehensive review of the psychometric properties of the Drug Abuse Screening Test. *Journal of Substance Abuse Treatment*, *32*(2), 189–198. https://doi.org/10.1016/j.jsat.2006.08.002

Zadra, A., & Domhoff, G. W. (2017). Dream content: Quantitative findings. In *Principles and Practice of Sleep Medicine* (6th ed.), 515–522. https://doi.org/10.1016/b978-0-323-24288-2.00049-0

Appendix A: UCT Ethical Clearance

UNIVERSITY OF CAPE TOWN

Department of Psychology

University of Cape Town Rondebosch 7701 South Africa
Telephone (021) 650 3417
Fax No. (021) 650 4104

28 May 2021

Liette Du Plessis
Department of
Psychology
University of Cape
Town
Rondebosch 7701

Dear Liette

I am pleased to inform you that ethical clearance has been given by an Ethics Review Committee of the Faculty of Humanities for your study, *The Relationship Between Affect in Dreams and Emotional Memory Consolidation.* The reference number is PSY2021-018.

I wish you all the best for

your study.Yours sincerely

Lauren Wild
(PhD)
Associate
Professor
Chair: Ethics Review Committee

Appendix B: DSA Ethical Clearance

	RESEARCH ACCESS TO STUDENTS	DSA 100

NOTES

1. This form must be **FULLY** completed by all applicants who want to access UCT students for the purpose of research or surveys.
2. Return the fully completed **(a) DSA 100** application form **by email**, in **the same word format**, together with **your: (b) research proposal inclusive of your survey, (c) copy of your ethics approval letter / proof (d) informed consent letter** to: Nadierah.Pienaar@uct.ac.za. You application will be attended to by the Executive Director, Department of Student Affairs (DSA), UCT.
3. The turnaround time for a reply is **approximately 10 working days.**
4. NB: It is the responsibility of the researcher/s to apply for and to obtain **ethics approval and to comply with amendments that may be requested;** as well as **to obtain** approval to access UCT staff and/or UCT students, from the following, at UCT, respectively: (a) **Ethics**: Chairperson, Faculty Research Ethics Committee' (FREC) for ethics approval, (b) **Staff access:** Executive Director: HR for approval to access UCT staff, and (c) **Student access:** Executive Director: Student Affairs for approval to access UCT students.
5. **Note:** UCT Senate Research Protocols requires compliance to the above, **even if prior approval has been obtained from any other institution/agency. UCT's research protocol requirements applies to *all* persons, institutions and agencies from UCT and external to UCT who want to conduct research on human subjects for academic, marketing or service related reasons at UCT.**
6. **Should approval be granted to access UCT students for this research study, such approval is effective for a period of one year from the date of approval (as stated in Section D of this form), and the approval expires automatically on the last day.**
7. **The approving authority reserves the right to revoke an approval based on reasonable grounds and/or new information.**

SECTION A: RESEARCH APPLICANT/S DETAILS

Position	Staff / Student No	Title and Name	Contact Details (Email / Cell / land line)
A.1 Student Number	DPLLIE002	Miss Liëtte du Plessis	liettedp@gmail.com / 072 576 9773 / DPLLIE002@myuct.ac.za
A.2 Academic / PASS Staff No.			
A.3 Visitor/ Researcher ID No.			
A.4 University at which a student or employee	UCT	Address if *not* UCT:	
A.5 Faculty/ Department/School	Humanities Faculty, Psychology Department		
A.6 APPLICANTS DETAILS If different from above	Title and Name	Tel.	Email

SECTION B: RESEARCHER/S SUPERVISOR/S DETAILS

Position	Title and Name	Tel.	Email
B.1 Supervisor	Dr Gosia Lipinska	+2721 650 3417	Gosia.lipinska@uct.ac.za
B.2 Co-Supervisor/s			

SECTION C: APPLICANT'S RESEARCH STUDY FIELD AND APPROVAL STATUS

C.1 Degree – if applicable	MA Neuropsychology
C.2 Research Project Title	The Relationship Between Affect in Dreams and Emotional Memory Consolidation
C.3 Research Proposal	Attached: Yes ■ No ☐
C.4 Target population	UCT Students ages 18-40
C.5 Lead Researcher details	If different from applicant:
C6. Will use research assistant/s	Yes ☐ No ■ If yes- provide a list of names, contact details :
C.7 Research Methodology and Informed consent	**Research methodology:** Online questionnaire and virtual (Zoom) interviews **Informed consent:** Yes, advised for both online questionnaire and interviews for participation consent.
C.8 Ethics clearance status from UCT's Faculty Ethics in Research Committee /Chair (EiRC)	Approved by the UCT EiRC: Yes ■ With amendments: Yes ■ No ☐ (a) Attach copy of your UCT ethics approval. Attached: Yes ■ No ☐ (b) State date / Ref. No / Faculty of your UCT ethics approval: 28/05/2021 Ref. / Faculty: PSY2021-018

SECTION D: APPLICANT/S APPROVAL STATUS FOR ACCESS TO STUDENTS FOR RESEARCH PURPOSE

(To be completed by the ED, DSA or NOMINEE)

	Approved / With Terms / Not	* Conditional approval with terms	Applicant/s Ref. No.:
D.1 APPROVAL STATUS	(i) Approved ■ ~~(ii) With terms~~ ~~(iii) Not approved~~	a) Access to students for this research study must only be undertaken after written ethics approval has been obtained. *b)* In event any ethics conditions are attached, these must be complied with before access to students.	DPLLIE002 / Miss Liëtte du Plessis

	Designation	Name	Signature	Date of Approval
D.2 PREPARED BY:	Personal Assistant	*Nadierah Pienaar*	Pienaar	19/10/2021
D.3 APPROVED BY:	Executive Director Department of Student Affairs	*Mr Pura Mgolombane*		*19/10/2021*

Appendix C: Screening Questionnaire

Demographic Information:

1. Full name and surname
2. Student number
3. Course code (If applicable)
4. Contact details (email and phone number)
5. Highest level of education
6. Sex: Male Female Nonbinary Other
7. Date of birth
8. What is your country of origin?
9. What is your preferred language?
10. Do you have access to a phone, laptop and stable internet connection?

Medical information:

1. Are you currently on any medication? If yes, please list ALL medications.
2. Have you ever had a head injury? If yes, did you lose consciousness?
3. Please list all past and current medical conditions.
4. Have you ever been diagnosed with a psychiatric condition? If yes, please list the condition(s).
5. Have you ever been diagnosed with a sleep disorder? If yes, which disorder?
6. If there are any other details about your medical history, that you have not mentioned yet, please add them here:

Sleep Details:

1. If you wake up in the night, do you find it easy to fall asleep again?
2. How many hours of sleep do you get regularly?

Sleep quality screening (PSQI):

PITTSBURGH SLEEP QUALITY INDEX (PSQI)

INSTRUCTIONS: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, when have you usually gone to bed at night?

   USUAL BED TIME _____

2. During the past month, how long (in minutes) has it usually take you to fall asleep each night?

   NUMBER OF MINUTES _____

3. During the past month, when have you usually gotten up in the morning?

   USUAL GETTING UP TIME _____

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spend in bed.)

   HOURS OF SLEEP PER NIGHT _____

INSTRUCTIONS: For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you...

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
(a) ...cannot get to sleep within 30 minutes	☐	☐	☐	☐
(b) ...wake up in the middle of the night or early morning	☐	☐	☐	☐
(c) ...have to get up to use the bathroom	☐	☐	☐	☐
(d ...cannot breathe comfortably	☐	☐	☐	☐
(e) ...cough or snore loudly	☐	☐	☐	☐
(f) ...feel too cold	☐	☐	☐	☐
(g) ...feel too hot	☐	☐	☐	☐
(h) ...had bad dreams	☐	☐	☐	☐
(i) ...have pain	☐	☐	☐	☐
(j) Other reason(s), please describe _____ _____				
How often during the past month have you had trouble sleeping because of this?	☐	☐	☐	☐

	Very good	Fairly good	Fairly bad	very bad
6. During the past month, how would you rate your sleep quality overall?	☐	☐	☐	☐

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
7. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?	☐	☐	☐	☐
8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?	☐	☐	☐	☐

	No problem at all	Only a very slight problem	Somewhat of a problem	A very big problem
9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?	☐	☐	☐	☐

	No bed partner or roommate	Partner/ roommate in other room	Partner in same room, but not same bed	Partner in same bed
10. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?	☐	☐	☐	☐

If you have a roommate or bed partner, ask him/her how often in the past month you have had...

	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
(a) ...loud snoring	☐	☐	☐	☐
(b) ...long pauses between breaths while asleep	☐	☐	☐	☐
(c) ...legs twitching or jerking while you sleep	☐	☐	☐	☐
(d) ...episodes of disorientation or confusion during sleep	☐	☐	☐	☐
(e) Other restlessness while you sleep; please describe	☐	☐	☐	☐

_____

_____

Depression Screening (PHQ-9):

Patient Health Questionnaire (PHQ-9)

Patient name: _____ Date: _____

1. Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all (0)	Several days (1)	More than half the days (2)	Nearly every day (3)
a. Little interest or pleasure in doing things.	❒	❒	❒	❒
b. Feeling down, depressed, or hopeless.	❒	❒	❒	❒
c. Trouble falling/staying asleep, sleeping too much.	❒	❒	❒	❒
d. Feeling tired or having little energy.	❒	❒	❒	❒
e. Poor appetite or overeating.	❒	❒	❒	❒
f. Feeling bad about yourself, or that you are a failure, or have let yourself or your family down.	❒	❒	❒	❒
g. Trouble concentrating on things, such as reading the newspaper or watching TV.	❒	❒	❒	❒
h. Moving or speaking so slowly that other people could have noticed. Or the opposite; being so fidgety or restless that you have been moving around more than usual.	❒	❒	❒	❒
i. Thoughts that you would be better off dead or of hurting yourself in some way.	❒	❒	❒	❒

2. If you checked off any problem on this questionnaire so far, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

❒ Not difficult at all ❒ Somewhat difficult ❒ Very difficult ❒ Extremely difficult

TOTAL SCORE _____

PTSD Screening (PC-PTSD-5):

ID # _____

PC-PTSD-5

Sometimes things happen to people that are unusually or especially frightening, horrible, or traumatic. For example:

- a serious accident or fire
- a physical or sexual assault or abuse
- an earthquake or flood
- a war
- seeing someone be killed or seriously injured
- having a loved one die through homicide or suicide.

Have you ever experienced this kind of event?

YES NO

If no, screen total = 0. Please stop here.

If yes, please answer the questions below.

In the past month, have you…

1. had nightmares about the event(s) or thought about the event(s) when you did not want to?

   YES NO

2. tried hard not to think about the event(s) or went out of your way to avoid situations that reminded you of the event(s)?

   YES NO

3. been constantly on guard, watchful, or easily startled?

   YES NO

4. felt numb or detached from people, activities, or your surroundings?

   YES NO

5. felt guilty or unable to stop blaming yourself or others for the event(s) or any problems the event(s) may have caused?

   YES NO

Alcohol Use Screening (AUDIT-C)

Alcohol Use Disorders Identification Test-Concise (AUDIT-C)

General Instructions

The Alcohol Use Disorders Identification Test-Concise (AUDIT-C) is a brief alcohol screening instrument. Please give a response for each question.

Segment: _ _

Visit Number: _ _

1. **How often do you have a drink containing alcohol?**
   - ☐ Never
   - ☐ Monthly or less
   - ☐ 2-4 times a month
   - ☐ 2-3 times a week
   - ☐ 4 or more times a week
2. **How many standard drinks containing alcohol do you have on a typical day?**
   - ☐ 1 or 2
   - ☐ 3 to 4
   - ☐ 5 to 6
   - ☐ 7 to 9
   - ☐ 10 or more
3. **How often do you have six or more drinks on one occasion?**
   - ☐ Daily or almost daily
   - ☐ Weekly
   - ☐ Monthly
   - ☐ Less than monthly
   - ☐ Never

Drug Use Screening (DAST-10)

Drug Abuse Screening Test, DAST-10

The following questions concern information about your possible involvement with drugs *not including alcoholic beverages* during the past 12 months.

"Drug abuse" refers to (1) the use of prescribed or over-the-counter drugs in excess of the directions, and (2) any nonmedical use of drugs.

The various classes of drugs may include cannabis (marijuana, hashish), solvents (e.g., paint thinner), tranquilizers (e.g., Valium), barbiturates, cocaine, stimulants (e.g., speed), hallucinogens (e.g., LSD) or narcotics (e.g., heroin). Remember that the questions *do not* include alcoholic beverages.

Please answer every question. If you have difficulty with a statement, then choose the response that is mostly right.

In the past 12 months...		**Circle**	
1.	Have you used drugs other than those required for medical reasons?	Yes	No
2.	Do you abuse more than one drug at a time?	Yes	No
3.	Are you unable to stop abusing drugs when you want to?	Yes	No
4.	Have you ever had blackouts or flashbacks as a result of drug use?	Yes	No
5.	Do you ever feel bad or guilty about your drug use?	Yes	No
6.	Does your spouse (or parents) ever complain about your involvement with drugs?	Yes	No
7.	Have you neglected your family because of your use of drugs?	Yes	No
8.	Have you engaged in illegal activities in order to obtain drugs?	Yes	No
9.	Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?	Yes	No
10.	Have you had medical problems as a result of your drug use (e.g. memory loss, hepatitis, convulsions, bleeding)?	Yes	No
Scoring: Score 1 point for each question answered "Yes," except for question 3 for which a "No" receives 1 point.		**Score:**	

Appendix D: Sleep Diary

WEEK 1 Start date: _____/_____/_____

COMPLETE WHEN YOU WAKE UP						
Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**	**Day 7**
I went to bed at: (Enter the time and circle am or pm)						
am/pm	am/pm	am/pm	am/pm	am/pm	am/pm	am/pm
When I went to bed, I fell asleep: (Circle one) **1** = With difficulty; **2** = After some time; **3** = Easily						
1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3
I woke up during my sleep: (Enter # of times and # of minutes)						
# times_____ # mins _____	# times_____ # mins _____	# times_____ # mins _____	# times_____ # mins _____	# times_____ # mins _____	# times_____ # mins _____	# times_____ # mins _____
I got out of bed at: (Enter the time and circle am or pm)						
am/pm	am/pm	am/pm	am/pm	am/pm	am/pm	am/pm
I slept a total of: (Enter approximate hours/minutes)						
My sleep was disturbed by: (List any factors that made it hard to sleep including noise, lights, pets, allergies, temperature, pain, stress, medication, etc.)						
When I woke up, I felt: (Circle one) **1** = Still tired; **2** = Somewhat awake; **3** = Wide awake						
1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3	1 2 3

Complete at Bed Time

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
I exercised at least 30 minutes at: (Circle all that apply) = Morning; = Afternoon; = Evening						
Medications I used today:						
I took a nap today (Circle YES or NO. If YES, enter how long you napped).						
YES_____ NO	YES_____ NO	YES_____ NO	YES_____ NO	YES_____ NO	YES_____ NO	YES_____ NO
How likely was I to doze off while doing daily activities today: (Circle one) **1** = Not at all likely; **2** = Not very likely; **3** = Somewhat likely; **4** = Very likely						
1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
My mood today was: (Circle one) ☹ = Bad; 😐 = Okay; ☺ = Good						
☹ 😐 ☺	☹ 😐 ☺	☹ 😐 ☺	☹ 😐 ☺	☹ 😐 ☺	☹ 😐 ☺	☹ 😐 ☺
Approximately 2-3 hours before going to bed I drank/ate: (Circle all that apply) = Alcohol; = Heavy meal; = Caffeine						
I drank/ate something with caffeine at: (Circle all that apply) = Morning; = Afternoon; = Evening						
In the hour before going to sleep, my bedtime routine included: (e.g. read book; used electronics; took bath; did relaxation exercises; etc.)						

Appendix E: Audio Recording Consent Form

In light of the COVID-19 pandemic, this study will be conducted virtually. The dream recall will happen telephonically and/or during a virtual Zoom meeting. Therefore, this serves as a consent form to audio record sour phone calls and virtual meetings during the study. This means that your dream reports that you will be giving will be recorded for research purposes. The recordings may be transcribed and used in our research; however, your personal information and identity will not be included in the research at all. We will maintain confidentiality at all times.

All recordings will be deleted after the research is completed and you can request access to the recordings if you wish to listen to them.

To request a recording, please feel free to contact one of us:

Liëtte du Plessis (Researcher): DPLLIE002@myuct.ac.za

Taidghan Wilmot (Researcher): WLMTAI001@myuct.ac.za

Robyn Cupido (Researcher): CPDROB002@myuct.ac.za

By ticking “I agree” you agree to have your dream reports audio-recorded and transcribed. You are also agreeing that you have read and understood this consent form.

☐ I agree

_____ _____

Name and Surname Signature

Appendix F: Participant Recruitment Email

Dear Student,

I am currently completing a Master's in Neuropsychology and would like to ask you to participate in my study that aims to better understand the role that our dreams play in our emotional memories.

What will be expected of you?

- If you decide to participate in this study, you will be required to be available for two nights and the two mornings following.
- On the first night, you will be asked to complete an emotional memory task which entails looking at a series of pictures (online).
    - Some of the pictures will be unpleasant to look at. Pictures might be triggering or disturbing, for example, some violence or nudity will be present.
- You will then be expected to set an alarm for a prearranged time (in the middle of the night) and then go to sleep. A researcher will contact you just after your alarm goes off. You will be asked to recall any dreams you might have had and rate the emotional intensity of your dream(s).
- The following morning, you will look at a series of pictures again, and comment on whether you saw them the previous night or not.
- On a second night of the study (a convenient time will be arranged), you will do the same procedure as the first night, except this time you will not have to wake up in the middle of the night.

- A researcher will contact you in the morning and you will be asked to recall any dreams you might have had and rate the emotional intensity of your dream(s). You will again look at a series of pictures, and comment on whether you saw them the previous night or not.

What makes you eligible to participate?

- Anyone between the ages of 18 and 40
- UCT student
- You are not diagnosed with PTSD, major depression, or other psychiatric or sleep disorders.
- You do not abuse alcohol or drugs.
- You do not take sleeping medication.
- You do not sleep very irregular hours.
- You are comfortable with conversing and completing tasks in English
- You can see well when working on a screen

If you would like to participate, and you think that you meet the criteria, please click on the link below to complete the screening questionnaire to determine whether you are an eligible candidate. The questionnaire should take you about 10 minutes to complete.

If you meet the criteria to be a participant, you will be contacted via email.

Thank you for considering participating in our study!

Kind regards,

Liëtte du Plessis

DPLLIE002@myuct.ac.za

Robyn Cupido

CPDROB002@myuct.ac.za

Taidghan Wilmot

WLMTAI001@myuct.ac.za

Appendix G: Consent Form for Screening Questionnaire

Title: The Relationship Between Affect in Dreams and Emotional Memory Consolidation.

Note: Part of the data obtained in the study will be used for an Honours study testing the relationship between procedures used to collect dream reports and how it affects the quality of the dream report and the integrity of sleep.

Dear Student,

Thank you for taking the time to complete the screening questionnaire. The purpose of this questionnaire is to determine whether you meet the criteria to participate in the rest of the study.

During this questionnaire you will be asked questions regarding your medical history, your sleeping habits, your mental health (i.e., questions about depression and anxiety), and questions about your alcohol and drug use. All information will be kept confidential and will not be shared with anyone outside the research team.

Participating in this screening questionnaire is completely voluntary and you are welcome to withdraw from the questionnaire at any time if you wish to do so. You will receive 1 SRPP point for completing the questionnaire.

By clicking “I agree”, you agree to voluntarily participate in this screening questionnaire, and that you have read and understood this consent form.

Appendix H: SRPP Consent Form

Title: The Relationship Between Affect in Dreams and Emotional Memory Consolidation.

Dear Student,

We are currently psychology Master's and Honours students at the Department of Psychology at the University of Cape Town (UCT) and would like to ask you to participate in our study that aims to better understand the role that our dreams play in our emotional memories.

Purpose:

This study aims to investigate what role dreams, specifically the emotions we experience while dreaming, play in the consolidation of recent emotional memories. Few studies have looked at the relationship between dreams and emotional memory consolidation, therefore, this study will help us to understand this possible relationship better.

Procedure:

If you decide to participate in this study, you will be required to be available for an introductory meeting, as well as two nights and the two following mornings. On one of the nights, you will be asked to complete an emotional memory task which entails looking at a series of pictures (online). Some of the pictures will be unpleasant to look at. Pictures might be triggering or disturbing, for example, some violence or nudity will be present. You will then be expected to set an alarm for a prearranged time (in the middle of the night) and then go to sleep. A researcher will contact you just after your alarm goes off. You will be asked to recall any dreams you might have had and rate the emotional intensity of your dream(s). The following morning, you will complete the emotional memory task again. On another night of the study (a convenient

time will be arranged), you will do the same procedure as the first night, except this time you will not have to wake up in the middle of the night. A researcher will contact you in the morning, and you will be asked to recall any dreams you might have had and rate the emotional intensity of your dream(s). You will again complete the emotional memory task.

Possible Risks:

Some of the pictures might elicit strong emotions or will be unpleasant to look at. You might experience some uncomfortability. Pictures might be triggering or disturbing, for example, some violence or nudity will be present. You are welcome to withdraw from the study at any time, without providing an explanation, if any feelings of distress or discomfort are overwhelming. You are welcome to contact UCT's Student Wellness Services (021 650 1017) for a debriefing. You might experience a poor night's sleep on Night 1 of the study if you are not able to fall asleep again after the phone call.

Possible Benefits/Compensation:

There are no direct benefits for participating in this study. Your participation will, however, be contributing to current research on understanding the role that dreams play in emotional memory consolidation. If you are a psychology student, you will earn 4 SRPP points for participating in this study.

Voluntary Participation:

Participating in this study is completely voluntary. As mentioned previously, you are welcome to withdraw from the study at any time, without explaining.

Confidentiality:

All personal information will be kept confidential, and all dream reports will be kept anonymous. No participant will be personally identifiable, and all data will be stored on a password-protected laptop. Only the researchers and supervisor involved will have access to this data.

Contact Details:

If you have any questions regarding the study, please feel free to contact any of the following:

Liëtte du Plessis (Researcher): DPLLIE002@myuct.ac.za

Taidghan Wilmot (Researcher): WLMTAI001@myuct.ac.za

Robyn Cupido (Researcher): CPDROB002@myuct.ac.za

Dr Gosia Lipinska (Supervisor): gosia.lipinska@uct.ac.za

If you have any questions about your rights as a research participant, you may contact Rosalind Adams at the Psychology Department (021 650 3417) or email (rosalind.adams@uct.ac.za).

By ticking “I agree”, you agree to voluntarily participate in this research study, and that you have read and understood this consent form.

☐ I agree

_____ _____

Name and Surname Signature

Appendix I: Social Media Consent Form

Title: The Relationship Between Affect in Dreams and Emotional Memory Consolidation.

Dear Participant,

We are currently psychology Master's and Honours students at the Department of Psychology at the University of Cape Town (UCT) and would like to ask you to participate in our study that aims to better understand the role that our dreams play in our emotional memories.

Purpose:

This study aims to investigate what role dreams, specifically the emotions we experience while dreaming, play in the consolidation of recent emotional memories. Few studies have looked at the relationship between dreams and emotional memory consolidation, therefore, this study will help us to understand this possible relationship better.

Procedure:

If you decide to participate in this study, you will be required to be available for an introductory meeting, as well as two nights and the two following mornings. On one of the nights, you will be asked to complete an emotional memory task which entails looking at a series of pictures (online). Some of the pictures will be unpleasant to look at. Pictures might be triggering or disturbing, for example, some violence or nudity will be present. You will then be expected to set an alarm for a prearranged time (in the middle of the night) and then go to sleep. A researcher will contact you just after your alarm goes off. You will be asked to recall any dreams you might have had and rate the emotional intensity of your dream(s). The following morning, you will complete the emotional memory task again. On another night of the study (a convenient

time will be arranged), you will do the same procedure as the first night, except this time you will not have to wake up in the middle of the night. A researcher will contact you in the morning, and you will be asked to recall any dreams you might have had and rate the emotional intensity of your dream(s). You will again complete the emotional memory task.

Possible Risks:

Some of the pictures might elicit strong emotions or will be unpleasant to look at. You might experience some uncomfortability. Pictures might be triggering or disturbing, for example, some violence or nudity will be present. You are welcome to withdraw from the study at any time, without providing an explanation, if any feelings of distress or discomfort are overwhelming. You are welcome to contact UCT's Student Wellness Services (021 650 1017) for a debriefing. You might experience a poor night's sleep on Night 1 of the study if you are not able to fall asleep again after the phone call.

Possible Benefits/Compensation:

There are no direct benefits for participating in this study. Your participation will, however, be contributing to current research on understanding the role that dreams play in emotional memory consolidation. All participants who complete the two nights of study will also stand a chance to win one of four vouchers (R200 Pick n Pay voucher, R300 Woolworths voucher, R400 Takealot voucher, or R500 Takealot voucher).

Voluntary Participation:

Participating in this study is completely voluntary. As mentioned previously, you are welcome to withdraw from the study at any time, without explaining.

Confidentiality:

All personal information will be kept confidential, and all dream reports will be kept anonymous. No participant will be personally identifiable, and all data will be stored on a password-protected laptop. Only the researchers and supervisor involved will have access to this data.

Contact Details:

If you have any questions regarding the study, please feel free to contact any of the following:

Liëtte du Plessis (Researcher): DPLLIE002@myuct.ac.za

Taidghan Wilmot (Researcher): WLMTAI001@myuct.ac.za

Robyn Cupido (Researcher): CPDROB002@myuct.ac.za

Dr Gosia Lipinska (Supervisor): gosia.lipinska@uct.ac.za

If you have any questions about your rights as a research participant, you may contact Rosalind Adams at the Psychology Department (021 650 3417) or email (rosalind.adams@uct.ac.za).

By ticking “I agree”, you agree to voluntarily participate in this research study, and that you have read and understood this consent form.

☐ I agree

_____ _____

Name and Surname Signature

Appendix J: DSA Consent Form

Title: The Relationship Between Affect in Dreams and Emotional Memory Consolidation.

Dear Student,

I am currently a Neuropsychology Master's student at the Department of Psychology at the University of Cape Town (UCT) and would like to ask you to participate in my study that aims to better understand the role that our dreams play in our emotional memories.

Purpose:

This study aims to investigate what role dreams, specifically the emotions we experience while dreaming, play in the consolidation of recent emotional memories. Few studies have looked at the relationship between dreams and emotional memory consolidation, therefore, this study will help us to understand this possible relationship better.

Procedure:

If you decide to participate in this study, you will be required to be available for an introductory meeting, as well as two nights and the two following mornings. Everything will be conducted online via Zoom. On one of the nights, you will be asked to complete an emotional memory task which entails looking at a series of pictures (online). Some of the pictures will be unpleasant to look at. Pictures might be triggering or disturbing, for example, some violence or nudity will be present. You will then be expected to set an alarm for a prearranged time (in the middle of the night) and then go to sleep. A researcher will contact you just after your alarm goes off. You will be asked to recall any dreams you might have had and rate the emotional intensity of your dream(s). The following morning, you will complete

the emotional memory task again. On another night of the study (a convenient time will be arranged), you will do the same procedure as the first night, except this time you will not have to wake up in the middle of the night. A researcher will contact you in the morning, and you will be asked to recall any dreams you might have had and rate the emotional intensity of your dream(s). You will again complete the emotional memory task.

Possible Risks:

Some of the pictures might elicit strong emotions or will be unpleasant to look at. You might experience some uncomfortability. Pictures might be triggering or disturbing, for example, some violence or nudity will be present. You are welcome to withdraw from the study at any time, without providing an explanation, if any feelings of distress or discomfort are overwhelming. You are welcome to contact UCT's Student Wellness Services (021 650 1017) for a debriefing. You might experience a poor night's sleep on Night 1 of the study if you are not able to fall asleep again after the phone call.

Possible Benefits/Compensation:

There are no direct benefits for participating in this study. Your participation will, however, be contributing to current research on understanding the role that dreams play in emotional memory consolidation. All participants who complete the two nights of study will also stand a chance to win one of four vouchers (R200 Pick n Pay voucher, R300 Woolworths voucher, R400 Takealot voucher, or R500 Takealot voucher).

Voluntary Participation:

Participating in this study is completely voluntary. As mentioned previously, you are welcome to withdraw from the study at any time, without explaining.

Confidentiality:

All personal information will be kept confidential, and all dream reports will be kept anonymous. No participant will be personally identifiable, and all data will be stored on a password-protected laptop. Only the researchers and supervisor involved will have access to this data.

Contact Details:

If you have any questions regarding the study, please feel free to contact any of the following:

Liëtte du Plessis (Researcher): DPLLIE002@myuct.ac.za

Taidghan Wilmot (Researcher): WLMTAI001@myuct.ac.za

Robyn Cupido (Researcher): CPDROB002@myuct.ac.za

Dr Gosia Lipinska (Supervisor): gosia.lipinska@uct.ac.za

If you have any questions about your rights as a research participant, you may contact Rosalind Adams at the Psychology Department (021 650 3417) or email (rosalind.adams@uct.ac.za).

By ticking “I agree”, you agree to voluntarily participate in this research study, and that you have read and understood this consent form.

☐ I agree

_____ _____

Name and Surname Signature