

Université de Montréal

**Dream Content and its Relationship to Trait Anxiety**

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## Résumé

Les études empiriques montrent que le contenu onirique est associé aux préoccupations et pensées présentes à l'état éveillé. Les recherches sur le lien entre le contenu onirique et différentes dimensions de la personnalité, par contre, ont généré des résultats mitigés. Bien que l'anxiété soit liée à plusieurs troubles du sommeil, tels l'insomnie et les cauchemars, on sait peu de choses sur le lien entre le contenu onirique (p.ex., teneur affective, nature d'interactions sociales) et les niveaux d'anxiété durant l'état de veille. L'objectif de cette thèse était d'explorer le lien entre l'anxiété en tant que trait de personnalité et le contenu des rêves de tous les jours auprès d'une population de femmes en bonne santé. Trente femmes (âge moyen:  $30.7 \pm 12.2$  ans) ont complété un questionnaire standardisé d'anxiété de trait et un agenda quotidien de rêves pendant 2 à 5 semaines consécutives. Au total, 502 rapports de rêves ont été recueillis (moyenne de  $16.7 \pm 9.2$  rêves par participante) et leurs contenus ont été codifiés selon un instrument de cotation standardisé. Les hypothèses que le niveau d'anxiété serait positivement associé à la présence d'éléments négatifs dans le contenu onirique (p.ex., interactions agressives, malchances, échecs, mauvais rêves) et à la longueur des rapports oniriques ont été émises. Les résultats suggèrent que le trait d'anxiété est positivement associé à la longueur du rapport onirique ( $\rho=.38$ ,  $p=.035$ ), mais ils ne démontrent aucune association significative entre le contenu onirique et les niveaux de trait d'anxiété. Ces résultats pourraient être expliqués de deux façons. La première serait que le trait d'anxiété n'a pas d'impact sur le contenu onirique auprès d'une population de femmes en santé. Une telle explication serait concordante avec des études suggérant qu'en général, les traits de personnalité n'ont pas ou peu d'impact sur le contenu onirique. La deuxième possibilité qui pourrait expliquer les résultats négatifs de cette étude est que la mesure d'anxiété utilisée n'était pas assez raffinée pour détecter l'impact de cette variable sur le contenu onirique. Des mesures sensibles à la nature multidimensionnelle de l'anxiété pourraient être nécessaires afin de mieux comprendre le lien entre l'anxiété et le contenu onirique. De futures études pourraient donc explorer le lien entre différents types d'anxiété (p.ex., anxiété liée aux situations sociales, aux situations ambiguës, au danger physique, aux routines quotidiennes) et le contenu onirique afin d'aider à élucider comment le trait d'anxiété influence les rêves.

**Mots clés :** contenu onirique, trait d'anxiété, cauchemars, mauvais rêves, hypothèse de la continuité des rêves, multidimensionnalité de l'anxiété

## **Abstract**

Empirical research suggests that dreams tend to reflect the contents of the dreamer's waking thoughts and concerns. Studies on the relationship between dream content and various measures of personality, however, have yielded mixed results. While anxiety has been associated with various sleep disorders, including bad dreams and nightmares, little is known about the relation between anxiety and dream content. The present thesis aimed to investigate the link between trait anxiety and dream content in a healthy female population. Thirty women (mean age =  $30.7 \pm 12.2$  years old) completed a standardized questionnaire measuring trait anxiety and completed a dream log over a 2-5 week period. In total, 502 dream reports were collected (mean number of dreams per participant =  $16.7 \pm 9.2$  dreams) and scored on various dream content scales of a standardised dream codification system. It was hypothesized that trait anxiety would be positively correlated with the presence of negative dream elements, including number of aggressive interactions, misfortunes and bad dreams. In addition, it was hypothesized that trait anxiety will be positively associated with dream recall length. While the results of this investigation confirm the existence of a positive correlation ( $\rho = .38$ ,  $p = .035$ ) between trait anxiety and dream recall length, they also suggest that the dream content in itself is unrelated to trait anxiety. Two possibilities may account for these negative results. First, it is possible that trait anxiety has no impact on the dream content in a healthy population. Such interpretation is in line with the research suggesting that personality traits may have no effect on the dream content. The second possibility that could account for the negative results of this study is that the measures of trait anxiety used in this study were not sufficiently refined to reflect the multidimensional nature of anxiety, which may be essential to capture the link between trait anxiety and dream content. In fact, it may be important to use tools that are sensitive to the different types of anxiety (e.g., anxiety associated with social evaluation, physical danger, ambiguous situations, daily routines) in order to understand how trait anxiety affects dream content.

**Keywords:** dream content, trait anxiety, nightmares, bad dreams, continuity hypothesis, multidimensionality of anxiety

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## **Abbreviation List**

BDI	Beck Depression Inventory
EMAS	Endler Multidimensional Anxiety Scales
HAN	High Anxiety Normals
H/V	Hall and Van de Castle
LAN	Low Anxiety Normals
STAI	State and Trait Anxiety Inventory
STAI-T	Trait Scale of the State and Trait Anxiety Inventory

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## **Introduction**

An ever-growing number of empirical studies on dreams have documented ways in which everyday dream content can be shown to be related to various dimensions of the dreamer's waking life, including concerns, interests, and psychological well-being (Bernstein & Roberts, 1995; Domhoff, 1996; King & DeCicco, 2007; Knudston, 2006; Pesant & Zadra, 2006; Schredl & Engelhardt, 2001; Schredl & Mathes, 2014; Zadra & Donderi, 2000). While dreams have been increasingly viewed as a legitimate object of scientific inquiry and methodological strategies for systematic study of dream content has been considerably improved in the last few decades (Amini, Sabourin & De Koninck, 2011; Bulkeley, 2009; Zadra & Domhoff, 2011), research on how everyday dream content relates to specific dimensions of psychological well-being remains limited.

Anxiety represents one of the areas that have been neglected by dream research, and this despite its well-established link to various sleep disorders (Levin & Nielsen, 2007; Marcks, Weisberg, Edelen, & Keller, 2010; Spoormaker & van den Bout, 2005; van Mill, Hoogendijk, Vogelzangs, van Dyck, & Penninx, 2010). In fact, little is known about how anxiety relates to dream content (Skancke, Holsen, & Schredl, 2014). The present thesis aims to fill this gap by exploring the relationship between trait anxiety (i.e., a stable individual tendency to experience anxiety across situations) and everyday dream content.

This thesis is organised in three sections. The first section presents a general introduction describing 1) the clinical use of dreams, 2) the continuity hypothesis of dreaming and research on what elements of waking life are most likely to be incorporated into everyday dreams, 3) studies exploring the way dream content may reflect various kinds of psychopathological symptoms associated with various clinical conditions. The second section consists of a research article presenting findings on the link between trait anxiety and dream content within a non-clinical population of adult women. The third and last section presents a discussion focusing on the main implications of the article's findings along with suggestions for future research.



## PART I – THEORETICAL CONTEXT

### Clinical Use of Dreams

Dream content and its relation to waking states and events has fascinated people for ages (Oppenheim, 1956; Robert, 2013). Some of the earliest records of dreams date to early Mesopotamian civilizations in the third millennium BC (Bulkeley, 2008; Oppenheim, 1956) where dream interpretation was used, among other things, to predict the future and to establish medical diagnoses (Van der Eijk, 2004). Similarly, dreams and their interpretation played an important role in many indigenous tribes and cultures of the Ancient Near East who perceived dreams as phenomena that may present divine manifestations or demonic attacks (Gnuse, 1996; Van de Castle, 1994). In modern-day society, people still attribute an important meaning to dreams with 73 to 81% of individuals from Eastern and Western cultures believing that dreams contain hidden truths and important information about themselves or the external world (King & DeCicco, 2009; Morewedge & Norton, 2009).

In various psychotherapeutic approaches, dreams play an important role and different techniques have been proposed to link their contents to the dreamer's personality, psyche and general well-being (e.g., see Freud, 1953; Pesant & Zadra, 2004). Psychotherapists have been using dreams as a therapeutic tool for over a hundred years (Skancke et al., 2014). Historically, the use of dreams in therapy has been dominated by the Freudian approach which distinguished between the dream's *manifest content* – i.e., actual dream as experienced and reported by the dreamer – and its *latent content* – i.e., the dream's intentionally hidden and presumably “true” meaning (Knudston, 2006; Pesant & Zadra, 2004). Following this approach, therapists interpret a client's given dream by retracing the various distortions that produced the manifest dream content through the defense mechanisms of condensation, displacement, symbolization and secondary elaborations, back to their sources in the latent dream thoughts (i.e., infantile wishes). While this kind of approach may have suffered from a high degree of interpretative subjectivity as illustrated by the fact that interpretations of a given dream tend to differ substantially from therapist to therapist (Fosshage & Loew, 1987), they highlighted the potential usefulness of dreams as a therapeutic tool and opened the door to research on how working with dreams can contribute to the therapeutic progress.

A more contemporary conception of dream therapy views the meaning of dreams through the experience of the dreamer whereby it is the client, with the guidance of a therapist, who forges links between the manifest content of the dream and various aspects of their waking life (see Pesant & Zadra, 2004 for a thorough review of research on using dream interpretation in therapy). Recently, there has been a surge in empirical research exploring how dreams, when viewed through the lens of the dreamer's experience, can benefit the therapeutic process. Creating ground for a more evidence-based practice, this research shows that dreams can be helpful in establishing a diagnosis (Ishida et al., 2010), in treatment considerations (Gilchrist, 2013; Knudston, 2006; Widen, 2000), as a tool to monitor therapy progression (Kramer & Glucksman, 2006) as well for prognosis (Cartwright, Young, Mercer, & Bears, 1998; Kramer & Roth, 2000).

Of note are some methodological issues that make it difficult to assess the specificity of the effects of dream work in clinical settings (Pesant & Zadra, 2004). For instance, it may be difficult to disentangle whether the therapeutic effects result from dream interpretation or from other factors that occur in therapy. In addition, when the therapeutic progress is clearly linked to dream interpretation, identifying *what* exactly in the dream interpretation led to this outcome may be difficult. Nonetheless, evidence suggests that there are no specific elements that are necessary for dream work to be beneficial (Pesant & Zadra, 2004).

The potential benefits of using dreams in therapy are multiple, including helping clients gain insights about themselves, facilitating their access to central problems, providing them with a safe environment for self-exploration and helping the therapist gain a better understanding of the client (Pesant & Zadra, 2004). Although dream content might not be used as a diagnostic tool, it may allow therapists to generate and explore hypotheses about important dimensions of their clients' lives. For example, one study showed that the objective analysis of nightmare content can help identify a history of childhood sexual abuse with about 70% accuracy (DeDonato, Belicki, & Cuddy, 1996). Dream content, moreover, may reflect the severity and evolution of psychologically relevant symptomatology (Schredl & Engelhardt, 2001). Improvements in therapy are sometimes associated with increased positive affect in

clients' dreams, suggesting that dreams can reflect a client's progression in therapy (Kramer & Glucksman, 2006). Nonetheless, to date no link between specific combinations of dream elements and the severity of symptomatology have been identified; thereby, the judgement of the clinician with regard to the severity of the client's condition and his progression in therapy based on dream content remains subjective (Pesant & Zadra, 2004). A better understanding of how dream content relates to waking life affect may contribute to an evidence-based use of dreams in therapy and thereby enhance the quality of psychological treatment.

### **Continuity Hypothesis of Dreaming: Evidence and Limitations**

The continuity hypothesis of dreaming stipulates that dreams are generally continuous with our waking thoughts and interest whereby they dramatize or embody our existing and most important conceptions and concerns (Domhoff, 1996, 2003; for a critical review of the continuity hypothesis see Domhoff, 2011, 2017). In a review of multiple laboratory dream reports and personal dream diaries, Domhoff (1996) noted a surprising consistency between dreaming and waking life in the types of characters, social interactions, objects and activities depicted in people's dreams. He documented how dream content captures people's sex-related, cultural and inter-individual differences. In fact, most dreams occur in commonplace settings, contain mostly familiar characters and are centred around the love interests of the dreamers, their family and personal concerns, and the activities in which they engage during their waking lives (Domhoff, 2000; Domhoff, Meyer-Gomes, & Schredl, 2006; Foulkes, 1985; Hall, 1951; Schredl, Funkhouser, & Arn, 2006). Further supporting the continuity hypothesis, research suggests that examining a series of dream reports from the same individual may allow one to identify or infer central waking life conflicts or concerns currently experienced by the dreamer (Domhoff, 1996, 2003; Hall, 1947). In fact, the frequency of appearance of a specific dream element over time is an indicator of how much importance the dreamer attributes to that element or of their emotional preoccupation for which this element stands as a metaphor (Domhoff, 2000).

Although general levels of continuity between dimensions of waking life and dream content are well documented (Domhoff, 2000; Erlacher & Schredl, 2010; King & DeCicco, 2007; Pesant & Zadra, 2006; Schredl, Desch, Röming, & Spachmann, 2009; Schredl et al.,

2006; Schredl, Funkhouser, & Arn, 2009), it is important to note that dreams do not systematically reflect all experiences of the dreamer and that the concept of continuity needs to be qualified (Zadra & Domhoff, 2011). First, continuity manifests itself with general concerns as opposed to day-to-day events (Domhoff, 2005). Studies suggest that blind judges are unable to accurately match the individual dream content to the daily events that preceded the dream in question (Roussy, 1998; Roussy, Brunette, et al., 2000; Roussy et al., 1996). Converging with these findings, research shows that instances of episodic memory – i.e., the memory for discrete episodes or events – are exceedingly rare in dreams (Baylor & Cavallero, 2001; Fosse, Fosse, Hobson, & Stickgold, 2003; Malinowski & Horton, 2014b). Second, although dreams are usually continuous with both waking thought and behaviour, at times they are only continuous with waking thought (Domhoff, 2005). For example, erotic dream content is usually associated with the amount of time that the dreamer spends engaging in sexual fantasies during daytime, but not with the amount of time that they spend engaging in intercourse or masturbation activities (Schredl, Desch, et al., 2009). Finally, some dream elements are not continuous with any waking thought or behaviour (Domhoff, 2005; Malinowski, 2012). For example, whereas an analysis of 3118 dream reports of a woman collected over a period of 22 years, reveals many dreams where cats have been underfed, lost or deformed, the interview with that woman suggests the absence of waking concerns in regard to her great affect for cats (Domhoff, 2005).

### **Incorporation Hypothesis of Dreaming**

In the past years, some researchers have extrapolated the continuity hypothesis to a broader incorporation hypothesis, according to which *daily* events and concerns, as well as episodic daily interests may also penetrate our dreams (Domhoff, 2017). Multiple studies have examined the incorporation hypothesis by investigating how variables such as daily events, personality traits, and well-being relate to dream content (e.g., Malinowski & Horton, 2014a; Roussy, Brunette, et al., 2000; Sándor, Szakadát, & Bódizs, 2016; Schredl & Engelhardt, 2001; Schredl & Hofmann, 2003). While findings from these studies have produced mixed results, they seem to suggest that emotional waking life events such as an accident, quarrelling with a partner, or a stressful commute seem to be continuous with the emotional tone of the dreams (Malinowski, Fylan, & Horton, 2014; Malinowski & Horton, 2014a; Schredl, 2006).

The following section presents a review of empirical studies having explored the link between psychopathological symptoms and dream content.

### **Linking Psychopathology to Dream Content**

As suggested earlier, dream content can help clinicians to gain insight about the psychological functioning of their clients (e.g., symptoms, worries, events that trigger negative emotional reactions). Moreover, the majority of empirical studies that have investigated the sensitivity of dreams to different psychopathologies suggest that the dream content of patients is generally reflective of the psychopathological symptoms that they experience during waking life (Schredl, 2015; Skancke et al., 2014). Findings on dream content in patients suffering from schizophrenia, for example, suggest that their tendency to expect hostility from others is reflected in their dreams that are characterised by increased levels of hostility (Skancke et al., 2014). In addition, patients suffering from schizophrenia have an increased proportion of strangers in their dreams, which may reflect their tendency to be socially withdrawn as well as the decreased activity in the social brain network of these patients (Lusignan et al., 2009). Likewise, consistent with the symptomatology associated with depression (e.g., feeling down, having morbid thoughts or sentiment of loneliness) the dreams of depressed patients contain a larger proportion of negative moods and death instances, as well as fewer characters than dreams of healthy individuals (Barrett & Loeffler, 1992; King & DeCicco, 2007; Kramer, 2010).

Dream content may also be sensitive to differences in symptomatology of psychopathologies that fall within the same spectrum of disorders, such as eating disorders (Knudston, 2006). Whereas dreams of individuals suffering from bulimia are more centered around food and eating, and are characterized by their negative tone, the dreams of individuals who suffer from anorexia are characterized by a large number of food rejection, lack of interpersonal relationships and rejection of the feminine role in women (Schredl & Montasser, 1999).

Despite the numerous and replicated results on the general continuity between dream content and key dimensions of people's lives, it is important to note that the nature of this

relation in various clinical populations remains unclear and the findings are at times contradictory with some studies suggesting marked incongruities between dream content and psychopathology (Skancke et al., 2014). For instance, depressed people can experience dreams with less negative affect than do healthy controls (Cartwright, Agargun, Kirkby, & Friedman, 2006) and their dreams may be no different in terms of emotional tone from those of healthy individuals (Schredl & Engelhardt, 2001). Furthermore, findings suggesting that there are more family members in the dreams of depressed patients may be a sign of discontinuity given that depressed individuals do not seem to interact more with their families than healthy individuals (Skancke et al., 2014). Such apparent discontinuity, however, may also reflect the desire of depressed individuals to have more interactions with their family and thereby could be continuous with their thoughts (Domhoff, 2005).

Despite the converging evidence indicating the presence of associations between dream content and various indices of psychopathology, the research on anxiety and dream content has remained scarce and little is known about how anxiety relates to dream content (Skancke et al., 2014). The following section is comprised of a research article investigating the link between trait anxiety and dream content in a non-clinical population.

**PART II – ARTICLE :**  
**DREAM CONTENT AND ITS RELATIONSHIP TO TRAIT ANXIETY**

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**Running Head: DREAM CONTENT AND ANXIETY**

**DREAM CONTENT AND ITS RELATIONSHIP TO TRAIT ANXIETY**

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## **Abstract**

Although findings from different populations are consistent with the view that dreams tend to reflect the contents of the dreamer's waking thoughts and concerns, research on the relation between dream content and various personality dimensions has yielded mixed results. The present study investigated the relationship between trait anxiety and everyday dream content in a population of healthy women. Thirty adult women completed a standardized measure of trait anxiety and kept a home dream log for two to three weeks. A total of 502 dream reports were collected (mean =  $16.7 \pm 9.2$ ) and scored on various content scales, including aggressive interactions, failures, misfortune, and dream report length. Convergent with previous results, our findings showed a positive correlation ( $r=.38$ ,  $p=.035$ ) between trait anxiety and dream recall length within a healthy population of women. These findings may reflect the impact that moderate levels of anxiety may have on increased performance. Additionally, these findings may suggest that higher levels of trait anxiety may be associated with more vivid dreams in a healthy population of women. However, our findings revealed no significant relationship between trait anxiety and any of the dream content variables. While broadly consistent with some of the existing literature, these findings suggest that trait anxiety in adult women does not have a significant impact on everyday dream content but more refined measures of anxiety may be required to better capture the multidimensional nature of anxiety and its potential relation to dream content.

## **Dream Content and its Relationship to Trait Anxiety**

### 1. Introduction

Although a growing number of studies have documented ways in which dream content relates to the dreamer's waking life concerns, thoughts, and activities (e.g., Bernstein & Roberts, 1995; De Koninck, Bradshaw, Lafreniere, Amini, & Lortie-Lussier, 2016; Domhoff, 1996; Germain et al., 2013; King & DeCicco, 2007; Knudston, 2006; Malinowski & Horton, 2014b; Pesant & Zadra, 2006; Schredl & Engelhardt, 2001; Schredl & Hofmann, 2003; Schredl & Mathes, 2014; Schredl & Spachmann, 2009; Wright et al., 2014), research on how everyday dream content relates to specific measures of psychological well-being remains limited. In particular, although anxiety has been linked to a range of sleep disorders (Levin & Nielsen, 2007; Marcks et al., 2010; Spoormaker & van den Bout, 2005; van Mill et al., 2010), little is known about its relation to dream content (Skancke et al., 2014). The present article aims to help fill this gap by exploring the relationship between trait anxiety (i.e., a stable tendency to experience anxiety across situations) and everyday dream content in adults.

#### 1.1. Experiential Influences on Dream Content

The continuity hypothesis of dreaming stipulates that dreams are generally continuous with our waking thoughts in that they often dramatize or embody our existing conceptions and concerns (Domhoff, 1996, 2003; for a critical review of the continuity hypothesis see Domhoff, 2011, 2017). Studies of large samples of dreams show that a majority of dreams occur in commonplace settings, contain mostly familiar characters and are centred around the love interests of the dreamers, their family and personal concerns, as well as the activities in which they engage during their waking lives (Bulkeley, 2012; Coy, 2015; Domhoff, 1996; Domhoff, 2000; Domhoff et al., 2006; Foulkes, 1985; Hall, 1951; Malinowski et al., 2014; Schredl et al., 2006; Vogelsang, Anold, Schormann, Wübbelmann, & Schredl, 2016). Furthermore, evidence indicates that the daytime experiences that evoke strong emotional responses in individuals are the most likely to find their way into dreams (Schredl, 2006), that dream content is reactive to the experience of naturalistic and experimental stressors (De Koninck & Koulack, 1975; Duke & Davidson, 2002), and that everyday dream content shows significant correlations to scores on measures of psychological well-being both at fixed points

in time and over several years (Pesant & Zadra, 2006). Finally, although sometimes contradictory in their conclusions, studies of dream content in relation to different psychopathologies (e.g., schizophrenia, depression) generally indicate that dream content is reflective of the psychopathological symptoms experienced by the dreamer during wakefulness (Kramer, 2000; Schredl, 2015; Skancke et al., 2014). Hence, dream content appears to be sensitive to the emotional well-being of the dreamer.

## 1.2. Dream Content and Anxiety

One dimension of well-being that has received surprisingly little attention in the field of dream research is anxiety, often defined as an unpleasant emotional state involving the feeling of tension, apprehension and worry that is accompanied by hypervigilance and hyperarousal (Lewis, 1967; Spielberger, 1972; Sylvers, Lilienfeld, & LaPrairie, 2011). As proposed by Spielberger (1966, 1972), anxiety can be divided into state- and trait- anxiety – a conceptual distinction that has gained empirical support (Norman S Endler & Kocovski, 2001; Spielberger, 1993; Spielberger, Vagg, Barker, Donham, & Westberry, 1980). *State anxiety* refers to the transitory feeling of worry and apprehension that occurs when an individual is facing an ambiguous and uncertain threat, while *trait anxiety* refers to stable individual differences in the tendency to experience anxiety across situations in a persistent and pervasive manner (Spielberger, 1972; Spielberger & Spielberger, 1966; Sylvers et al., 2011). As such, trait anxiety is reflective of the frequency with which one experiences anxiety states and one may expect individuals scoring higher on trait anxiety to react with high anxiety to a larger range of stressful situations than individuals scoring lower on trait anxiety.

Empirical research suggests a close link between elevated levels of anxiety and sleep disorders, including insomnia (van Mill et al., 2010) and dysphoric dreams (Levin & Nielsen, 2007; Nielsen et al., 2000; Spoormaker & van den Bout, 2005), with up to 74% of primary care patients suffering from anxiety disorders also reporting sleep disturbances (Marcks et al., 2010). Taken as a whole, however, the literature on the relation between anxiety and nightmares has yielded inconsistent results, partly due to methodological issues (Robert & Zadra, 2008; Wood & Bootzin, 1990; Zadra & Donderi, 2000). For example, anxiety may be more strongly related to levels of nightmare-related distress than to nightmare frequency *per se* (Belicki, 1992; Levin & Fireman, 2002a, 2002b; Levin & Nielsen, 2007). Other than its

potential relation to highly negatively-toned dreams such as nightmares, little is known about how anxiety relates to everyday dream content (Skancke et al., 2014).

The only empirical study to have examined the relationship between anxiety and dream content is that of Gentil and Lader (1978) who investigated how the dream content of female outpatients diagnosed with chronic anxiety disorders (n=20) differed from the dream content of healthy women (n=25). The women's levels of anxiety were measured with the State and Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970) and the control group was subdivided into High Anxious Normals (HAN, n= 13) and Low Anxious Normals (LAN, n=12) based on their scores on the STAI. The authors coded the first three dreams reported by participants in a five-day dream diary using the content categories from the Hall and Van de Castle (H/V; 1966) coding system (e.g., fortunes, misfortunes, success, failure, aggressive interactions, characters). Among the few significant differences found between the dream content of patients versus the control groups, the patient group was found to report more negative affect and a higher frequency of failures, of overall social interactions, and of aggressive interactions than both the HAN and LAN groups. The dreams of anxious patients also included fewer successes and friendly interactions than did the dreams of both control groups. Only two differences, however, were found between dream content and the varying levels of trait anxiety across the three groups. First, the length of dream reports (i.e., the mean number of words per dream report) was longer in the HAN group than in both the LAN and the patient group, suggesting that trait anxiety is associated with longer dream reports within a healthy population but with shorter dream reports in this clinical population. Second, across the three groups, scores on the STAI-T were positively associated with a greater proportion of aggression interactions being directed toward the dreamer (0%, 46% and 60% in the LAN, HAN and patient group, respectively). Taken together, these results suggest that whereas dream content may be reactive to clinical levels of trait anxiety, it appears to be only minimally impacted by normal or sub-clinical variations in trait anxiety within healthy female participants.

The study of Gentil and Lader (1978) has four important limitations. First, the number of dream reports collected per participant was low (between 2 and 7) whereas Schredl (2002)

has shown that it is preferable to have approximately 20 dream reports per participant in order to obtain reliable measures of dream content. Second, participants completed a dream diary over a period of only five days, resulting in a very time-restricted sampling of dream material. Third, while there were inter-individual differences in the number of dreams reported by participants, the authors disregarded these differences and opted to only focus on the first three dreams provided by each participant. In doing so, the authors failed to take into the account the possibility that trait anxiety may be associated to differences in dream recall frequency above and beyond any effects on content. Fourth, the emotions in dream reports were scored by judges as opposed to the participants themselves, which may cast doubt as to the accuracy and validity of the identified emotions (Roussy, Raymond, & De Koninck, 2000; Schredl & Doll, 1998; Sikka, Valli, Virta, & Revonsuo, 2014).

The aim of the present study was to investigate the relationship between trait anxiety and dream content within a non-patient population while addressing the limitations of Gentil and Lader's (1978) investigation. Based on the literature on experiential influences on dream content, we hypothesized that when compared to the dreams of people with low levels of trait anxiety, dreams of anxious individuals would reflect their tendencies to experience negative affect, apprehend the possibility of threat, and experience helplessness (Chorpita & Barlow, 1998; Sylvers et al., 2011; Sylvester et al., 2012). Specifically, we predicted that higher scores on trait anxiety would be associated with the following in participants' dream reports:

- 1) Greater occurrence of aggressive interactions, including aggression directed toward the dreamer;
- 2) Greater occurrences of failures and misfortunes;
- 3) Greater occurrence of negative affect

In addition, whether or not levels of trait anxiety were related to dream recall (as measured by the number of dreams recalled per week as well as by mean number of words per dream report) and to bad dream and nightmare frequency was also investigated.

## 2. Method

### 2.1. Procedure

Participants first completed a series of questionnaires including measures of personality and well-being as part of a separate program of research. They were then required to provide, upon awakening, a complete written description of each remembered dream in a daily log for two to three consecutive weeks. In addition to each recalled dream's narrative, participants had to report the date, the main emotions present (if any), and the emotions' intensity on a 5-point Likert scale. The protocol was accepted by the university's Ethics Committee and a signed consent was obtained from each participant.

### 2.2. Measures

#### *Trait Anxiety*

All participants completed the STAI-T questionnaire (Spielberger et al., 1970). This scale includes 20 statements rated on a 4-point scale. The trait scale is a sensitive measure of anxiety that has high test–retest reliability and concurrent validity with other anxiety questionnaires, both ranging from 0.7– 0.9 (Marteau & Bekker, 1992; Spielberger, 1983).

#### *Dream Emotions*

Whenever present, self-reported emotions in dreams were classified by participants as being positive, negative, neutral or mixed, and an overall rating of the dream's overall emotional tone provided for each report. Dreams described as containing predominantly negative emotions whose intensity was rated by participants as being “very strong” or “intense” were coded as “bad dreams/nightmares.”

#### *Dream Content Variables*

The following variables were used from the H/V coding system, the most frequently used and the best validated dream content coding system (Domhoff, 1996, 2003; Hall & Van de Castle, 1966; Schredl, 2010; Winget & Kramer, 1979):

1. *Friendly and aggressive interactions*. This scale measures the frequency of emotionally-toned social interactions. Friendly social interactions involve a deliberate, purposeful act or covert expression of support, help, kindness, or giving while aggressive interactions are defined in terms of a deliberate, purposeful act or covert expression of aggression.
2. *Success and failure*. These variables measure the successful handling of some difficulty encountered by a character or incapacity of the character to achieve a desired goal because of personal limitations and inadequacies.
3. *Good fortune and misfortune*. Good fortune is scored when something beneficial happens to a character that is completely adventitious while misfortunes refer to any mishap, adversity, harm, danger, or threat that happens to a character as a result of circumstances over which they have no control.

All dream content variables were scored independently by two extensively trained raters. Since kappa coefficients are unreliable when applied to variables with infrequent occurrences, inter-judge reliability was assessed with Gwet's AC1 statistic (Gwet, 2008). Results showed a good to excellent agreement across all dream content categories with AC1 values ranging from .78 to .98.

### 2.3. Participants

Thirty participants were selected from a larger database of subjects recruited through newspaper announcements as non-paid volunteers as part of a larger program of research investigating the relationship between dream content, personality and psychological well-being. Specifically, ten participants were randomly selected among participants whose scores on the STAI-T placed them in the lowest, middle, or highest tertile on this instrument. For the purpose of this study, only female participants were selected as the database contained too few male participants and to allow for comparison with the women-based results reported by Gentil and Lader (1978).

### 2.4. Data Analyses

Statistical analyses were computed with the Statistical Package for the Social Sciences Software release 2013 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM

Corp.). Descriptive statistics and the exploration of distributions were done. Outliers were identified as data points situated at  $\pm 3SD$ . None of the dream content variables had more than one outlier with outliers being present in the following variables: aggressive interactions, aggression directed towards the dreamer, failures, misfortunes. All analyses were performed with outliers without transformations as well as with the outliers being recoded to fit the 95% of the distribution; the results of the analyses did not differ between the two methods of analyses. To normalize the distribution of failures, the log transformation was used and analyses were performed with and without the transformation; results between the two methods of analyses were similar. Pearson and Spearman correlational analyses were performed to assess the relationship between scores on the STAI-T and measures of dream content. All dreams reported by participants in their home logs were included in the analyses in order to take into account inter-individual differences in dream recall frequency as well as to assess the relationship between anxiety and dream recall. Because depression can co-vary with anxiety and also impacts dream content, correlational analyses were performed to explore the relation between our dream content variables and participants' scores on the Beck Depression Inventory (BDI; Beck, Steer, & Carbin, 1988). All resulting correlations were non-significant and thus this variable was not considered in subsequent analyses.

To take into account variations in dream report length, the frequency of each dream content variable was calculated per 100 words (i.e., dividing the total number of occurrences of each content variable by the total number of words in the report and multiplied the result by 100). This approach, used in numerous studies in the field, allows to correct for the fact that frequency scores of most content analytical scales strongly correlate with dream report length (Smith, 2000).

### 3. Results

The scores on the STAI-T in our sample of 30 women (mean age =  $30.7 \pm 12.2$  yrs) ranged between 21 and 71, with a mean of  $43.5 \pm 15.7$ . These values are similar to those reported by Gentil & Lader (1978) for their comparably aged group of healthy controls (mean age =  $31.5 \pm 9.4$ ): mean STAI-T score of  $33.0 \pm 7.0$  for the LAN control group and  $46.0 \pm 8.0$  for the HAN control group.



The length of time during which our participants kept a dream log varied between 10 and 28 days (mean  $18.3 \pm 4.3$  days) and a total of 502 dream reports were collected. The number of dream reports per participant ranged from 4 to 40 with a mean of  $16.7 \pm 9.2$  dreams.

The correlations between participants' scores on the STAI-T and the dream content variables investigated as well as the overall dream recall and the mean number of bad dreams and nightmares reported per week are presented in Table 1. As can be seen in this table, none of the correlations were statistically significant apart from the correlation between STAI-T and dream recall length as measured by number of words per dream report, which was significant with the Spearman correlation. Correlations between STAI-T scores and positive dream content elements (e.g., friendly interactions, success, good fortunes) were also non-significant.

Table I. Correlations between STAI-T scores and dream content variables, dream recall measures and mean number of disturbing dreams reported per week.

Dream Variable	Pearson r		Spearman r		Effect size (Cohen's criteria)
	r	p	$\rho$	p	
Aggressive interactions (overall)*	.008	.965	-.097	.611	Weak
Aggression directed toward the dreamer*	-.220	.243	.102	.591	Weak
Misfortunes*	-.005	.980	-.113	.553	Weak
Failures*	.168	.374	.286	.126	Weak-to- moderate
Negative affect	.220	.244	.183	.333	Weak
Disturbing dreams (bad dreams and nightmares)	.162	.393	.073	.700	Weak
Dream recall frequency (# dreams/week)	-.010	.959	.056	.767	Weak
Dream recall length (mean # words/dream report)	.299	.109	.38	.035	Moderate

**Note:** Cohen's criteria are used to reflect the strength of the correlation: weak correlation ( $r < .24$ ), moderate correlation ( $.24 \leq r \leq .36$ ), strong correlation ( $r > .36$ ; Cohen, 1988); Results are presented with outliers being recoded to fit the 95% of the distribution. \* Indicates the presence of an outlier in the distribution of the variable; none of the variables had more than one outlier.

#### 4. Discussion

The aim of this study was to investigate the relationship between trait anxiety and dream content within a non-clinical population of adult women. Converging with the results of Gentil & Lader (1978), our findings reveal a positive relationship between trait anxiety and dream recall length, as measured by the number of words per dream report, within a healthy population of women ( $\rho = .38$ ,  $p = .035$ ). Although the Pearson correlation for this association is

not significant, it is likely related to our low number of participants. These findings likely reflect the effects that moderate stress may have on increased performance (Diamond, 2005) whereas healthy women who are more prone to experience anxiety may be more conscientious of performing well on the experiment and thereby write more elaborate dream reports. In addition, these findings may suggest that higher scores on trait anxiety are associated with more vivid dreams within a healthy population of women.

Contrary to our predictions, our findings did not reveal significant correlations between levels of trait anxiety and frequency of occurrence of specific dream content variables, including aggressive interactions, failures, misfortunes, positive and negative emotions, as well as frequency of disturbing dreams. These findings diverge from those of Gentil & Lader (1978) who found a significant association between trait anxiety and an increased occurrence of aggression directed toward the dreamer as well as an association between trait anxiety and longer dream reports. Given the methodological improvements of this study relative to Gentil & Lader's (1978) (e.g., greater number of dream reports per participant, longer duration of dream logs, inclusion of all dream reports), the present findings are likely more representative of the general relationship between trait anxiety and dream content, especially in non-clinical female populations. Taken as a whole, however, our negative findings across dream content variables are consistent with those of Gentil & Lader (1978) in that they too found no significant associations between STAI-T scores and 14 of their 16 measures of dream content.

There are at least two ways of interpreting our findings. First, trait anxiety may be unrelated to dream content in relatively healthy women. Second, since trait anxiety can represent a multidimensional construct, its multifaceted nature may not be entirely captured by the STAI-T (Julian, 2011; Vagg, Spielberger, & O'Hearn, 1980). In this case, it is possible that alternative measures of anxiety (e.g., taking into account the types of situations in which one is most likely to experience heightened anxiety, differentiating between cognitive versus somatic symptoms of anxiety) may in fact be related to everyday dream content.

The first interpretation is in line with affirmations that psychometrically measured personality traits are largely unrelated to dream content (Blagrove & Pace-Schott, 2010). In fact, reviews of the relationship between personality traits and dream content have yielded

mixed and largely unconvincing results (Blagrove, 2007; Blagrove & Pace-Schott, 2010). These reviews also highlight the fact that studies reporting significant findings on personality and dream content tend to suffer from important methodological limitations (e.g., small sample sizes, multiple comparisons, collection of dream reports via questionnaires, use of in-house scoring instruments) (Schredl & Engelhardt, 2001). Hence, it is possible that personality traits, including trait anxiety, do not impact dream content in a significant way in healthy populations.

Given that waking levels of anxiety are largely contingent on exposure to situations that individuals perceive as being threatening (Norman S Endler & Kocovski, 2001; Eysenck, 2014), dream content may be more likely to be affected by state anxiety in response to situational stressors. In fact, research indicates that dream content is reactive to naturalistic and experimental stressors (De Koninck, 2000; De Koninck & Koulack, 1975; Schredl, 2003) and specific events associated with elevated state anxiety, such as surgery, watching a stressful movie, and student examinations can also impact dream content (Breger, Hunter, & Lane, 1971; Cartwright et al., 2006; Cartwright, Lloyd, Knight, & Trenholme, 1984; Cartwright, Newell, & Mercer, 2001; Delorme, Lortie-Lussier, & De Koninck, 2002; Najam, Mansoor, Kanwal, & Naz, 2006; Valli, Revonsuo, Pälkäs, & Punamäki, 2006).

It is also possible that instruments such as the STAI-T do not capture the heterogeneous nature of trait anxiety. Some research suggests that individuals with low trait anxiety are comprised of two distinct subgroups: those that are truly low trait individuals and “repressors” – individuals who show high physiological response to stressful situations despite scoring low on trait anxiety (Eysenck, 2014, p. 6). A recent study suggests that individuals who tend to repress their thoughts, dream more of their waking life emotions than non-repressors (Malinowski, 2015). In addition, whereas STAI-T measures trait anxiety as a unidimensional construct (Vagg et al., 1980), some authors argue that it is a multidimensional construct (Endler, 1975; Endler & Kocovski, 2001; Endler, Magnusson, Ekehammar, & Okada, 1976; Endler, Parker, Bagby, & Cox, 1991).

The multidimensional model of trait anxiety specifies the types of situations in which individuals differ in anxiety proneness (e.g., interpersonal, physical danger, ambiguous, daily routine situations; Norman S Endler & Kocovski, 2001). For example, a person who has a trait predisposition to respond with anxiety to social situations might not respond with anxiety to ambiguous situations. Individuals who differ on the types of situations to which they respond with anxiety can also differ on the types of cognitive biases that they tend to have (Calvo, Averó, Castillo, & Miguel-Tobal, 2003). Individuals with similar scores on STAI-T may thus constitute a heterogeneous group and show differential relations between anxiety profiles and everyday dream content. For instance, the dreams of individuals prone to experience anxiety in interpersonal situations may be more likely to show distinguishing features in the interpersonal sphere (e.g., more negative social interactions) while the dreams of individuals prone to experience anxiety in ambiguous situations may be more likely to contain negative events that are outside of an individual's control (e.g., more misfortunes).

This view is concordant with the proposed idea that a trait could be predictive of dream content, but only if this trait is important to the dreamer's overall personality (Blagrove & Pace-Schott, 2010). What may be most important to the individuals' personality is not their overall predisposition to experience anxiety (i.e., general trait anxiety), but rather the specific types of situations that evoke anxiety. In a related vein, in his thoughtful clarification of the origins and meaning of the continuity hypothesis of dreaming, Domhoff (2017) argues that from this enduring and often misunderstood theoretical framework, it is the intensity of an individual's primary concerns and interests that shape central aspects of his or her dream content. This viewpoint adds to the idea that it is not generalized anxiety *per se* that should be expected to be reflected or embodied in the dreams of anxious individuals, but rather their most important (and at times long-standing) preoccupations that, in some cases, may tie into their anxiety.

Finally, one model (Levin & Nielsen, 2009) of dysphoric dream production suggests that variations in the frequency and intensity of negative dream content are partly determined by *affect load*, or day-to-day variations in emotional stress, and that the impact of stress on dream content may vary as a function of personality traits. For example, people who are prone

to experience heightened negative emotions (e.g., anxiety) in response to stressors in everyday life are more likely to subsequently experience negatively-toned dream content. Thus, the dreams of people scoring high on measures of trait anxiety may be reactive to this disposition, but only when combined with unique stressors that heighten their anxiety response.

## 5. Limitations

There are several methodological shortcomings to the present study, including the fact that the sample was relatively small and included only female participants. In addition, our sample was likely biased toward individuals who were interested in dream research.

## 6. Conclusion

Converging with findings of Gentil & Lader (1978), our findings suggest that higher trait anxiety is associated with longer dream reports within a healthy population of women. These findings may reflect the effects that moderate amounts of stress may have on increased performance (Diamond, 2005) as well as the fact that higher trait anxiety may be associated with more vivid dreams in a healthy population of women. Our results further reveal no other significant relationship between trait anxiety and measures of dream content, a finding consistent with reviews suggesting that personality traits may have a limited impact on everyday dream content (Blagrove, 2007; Blagrove & Pace-Schott, 2010). However, trait anxiety may have a differential impact on dream content depending on the specific types of situations that individuals perceive as being most threatening or anxiety provoking. More research is required to delineate the differential and possibly synergistic impact of people's level of anxiety, ongoing preoccupations and concerns, and specific situational stressors on the content of their everyday dreams.

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### **PART III – GENERAL CONCLUSIONS**

The findings of this thesis suggest that higher trait anxiety is associated with higher dream recall length within a healthy population of women. These findings potentially reflect the effects of moderate stress on increased performance (Diamond, 2005).

The findings of this thesis also suggest that there is no significant link between trait anxiety as measured by the STAI-T questionnaire and dream content in a non-clinical population. As suggested in the present article, one way of interpreting these results is to consider trait anxiety as being unrelated to dream content in relatively healthy women – an explanation that would be consistent with research suggesting that dream content is unrelated to personality traits (Blagrove, 2007; Blagrove & Pace-Schott, 2010). Another explanation that could account for our negative results is the fact that we used a measure of trait anxiety (STAI-T), which views anxiety as a unidimensional construct whereas anxiety can also be conceptualized as a multidimensional construct.

The Endler Multidimensional Anxiety Scales (EMAS) questionnaire may therefore present a more appropriate tool to investigate the link between dream content and trait anxiety. The EMAS is a tool that has been validated across clinical and healthy populations and that permits the assessment of four dimensions of trait anxiety: social evaluation, physical danger, new and ambiguous situations, and daily routines (Endler, Edwards, & Vitelli, 1991; Endler, Edwards, Vitelli, & Parker, 1989; Endler, Parker, Bagby, & B. J. Cox, 1991; Kantor, Endler, Heslegrave, & Kocovski, 2001; Kocovski, Endler, Cox, & Swinson, 2004; Miclea, Albu, & Ciuca, 2009). The use of EMAS would allow for the exploration of various relationships between these four anxiety dimensions and corresponding dream content variables. For example, the social anxiety dimension could be positively associated to negative social interactions in dreams whereas the physical danger dimension could be positively associated to misfortunes in dreams. Finally, in addition to its capacity to reflect the multidimensionality of anxiety, another advantage of EMAS over the STAI-T is its better differentiation between anxiety and depression (Kocovski et al., 2004). As such, the EMAS is a tool that could be used

in future investigations to elucidate the nature of the relation between trait anxiety and dream content.

If trait anxiety, even when measured as a multidimensional construct, shows to be unrelated to dream content in a healthy population, it would remain possible that such an association exists in clinical populations. In fact, Gentil and Lader's (1978) findings reveal a greater impact of trait anxiety on dream content in a clinical population compared to healthy participants. Of note, our findings reveal non-significant results not only for the relationship between trait anxiety and dream content but also for the relationship between depression scores (mean score on BDI =  $9.63 \pm 10.17$ ) and dream content. The existence of this link, however, has been previously demonstrated, primarily in clinical populations (e.g., see Barrett & Loeffler, 1992; King & DeCicco, 2007; Kramer, 2010). These patterns of results would suggest that trait-like emotional dispositions of healthy individuals are generally not strong enough to impact everyday dreams. Additional research is needed to elucidate how, when, and to what degree dream content can be shown to be reactive to clinical levels of trait anxiety.

To conclude, our research suggests that sub-clinical levels of trait anxiety do not influence everyday dream content in healthy adult women. Given that the continuity hypothesis of dreaming states that it is people's most salient concerns that are most likely to be reflected in everyday dreams (Domhoff, 2017), understanding how anxiety affects dream content may require the assessment of the interplay between individuals' general anxiety (e.g., by using EMAS) and the presence of anxiety-related concerns (be they punctual or longstanding). Such an investigation may help nuance our findings and allow revealing subtler and more complex relations between waking emotional states and dream content.

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