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Thematic and Content Analysis of Positively Toned Dreams

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Résumé

L'objectif de cette étude était d'examiner un large échantillon de rêves hautement positifs afin de mieux comprendre les thèmes et les émotions dominants qui apparaissent dans ces rêves, ainsi que la manière dont les rêves hautement positifs se déroulent. Bien que les rêves positifs aient été largement négligés dans le domaine de la recherche sur les rêves, leur étude pourrait permettre de mieux comprendre la possible fonction des rêves. Au total, 380 participants ont tenu un journal des rêves à domicile dans lequel on leur demandait de noter leurs rêves chaque matin au réveil pendant 2 à 5 semaines consécutives. Cent dix-huit récits de rêves rapportés par 88 participants (26 hommes et 62 femmes) qui ont estimé que ces rêves contenaient des émotions très positives ont été examinés. Les résultats ont révélé que les thèmes les plus courants dans cet échantillon de rêves hautement positifs étaient les suivants : Contenu sexuel, interactions sociales platoniques positives, et nature/environnement généreux. Les émotions les plus fréquemment rapportées dans l'échantillon comprenaient : la joie, la luxure/l'excitation sexuelle, la fierté, le calme/la sérénité, la surprise et le jeu/l'amusement. Les analyses du chi carré ont démontré que, comparé à leurs homologues féminins, les participants masculins ont ressenti les thèmes des interactions sociales platoniques positives (32.5% vs 15.4%, $P = 0,031$) et des créations et entreprises artistiques (15% vs 2.6%, $P = 0,011$) beaucoup plus fréquemment. Aucune différence entre les sexes en matière d'émotions n'a été constatée. Près de la moitié des récits de rêves très positifs contenaient des descriptions d'éléments dans le narratif (c'est-à-dire des facteurs déclencheurs) qui ont rendu le rêve positif ou renforcé l'émotion positive du rêve. Les implications de ces résultats sont discutées à la lumière de la littérature plus large sur les rêves.

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MOTS-CLÉS: rêves ; rappel des rêves ; contenu onirique ; thèmes des rêves ; rêves lucides ; rêves de vols ; rêves sexuels ; émotions positives

Abstract

The aim of this study was to investigate a large sample of highly positive dreams in order to better understand the overarching themes and emotions that occur in such dreams, as well as the way in which highly positive dreams unfold. While the study of positive dreams has largely been neglected in the field of dream research, the study of such dreams may provide greater insight into the possible function of dreams. A total of 380 participants kept home dream journals in which they were asked to write down their dreams each morning upon awakening over the course of 2-5 consecutive weeks. One-hundred and eighteen dream narratives reported by 88 participants (26 men and 62 women) who self-rated these dreams as containing highly positive emotions were examined. Results revealed that the most common themes among this sample of highly positive dreams were: Sexual Content, Positive Platonic Social Interactions, and Nature/Bountiful Environment. The most frequently reported emotions in the sample included: Joy, Lust/Sexual Arousal, Pride, Calmness/Serenity, Surprise, and Playfulness/Amusement. Chi-square analyses demonstrated that, compared to their female counterparts, male participants experienced the themes of Positive Platonic Social Interactions (32.5% vs 15.4%, $P = .031$) and Artistic Creations and Endeavors (15% vs 2.6%, $P = .011$) significantly more frequently. No sex differences in emotions were found. Nearly half of all highly positive dreams contained elements within the narrative (i.e. triggering factors) that either rendered the dream positive or enhanced the positive

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emotion in the dream. The implications of these findings are discussed in light of the broader literature on dreams.

KEYWORDS: dreams; dreaming; dream recall; dream content; dream themes; lucid dreaming; flying dreams; sex dreams; positive emotions

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List of Abbreviations

Abbreviation	Meaning	Page
DMS	Dream Motif Scale	17
HVDC	Hall and Van de Castle coding system	11
PANAS	Positive and Negative Affect Schedule	11
TDQ	Typical Dreams Questionnaire	18

Dedication

This doctoral thesis is dedicated to my parents who have supported me unwaveringly in the pursuit of my dreams.

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I would like to express my deepest appreciation to my supervisor, Dr. Antonio Zadra, whose invaluable guidance, feedback, expertise, and sense of humor made this project a joy to undertake. I am sincerely thankful for the opportunity to have worked together and will cherish all that I learned through this process. Thank you to Ajar Diushekeeva, whose dedicated assistance was a great aid towards the completion of this project. I am eternally grateful to my kind and patient husband, whose love and support I leaned on through the entirety of my doctoral studies and who reminded me to have fun along the way. Words cannot properly express my love and gratitude for my mother, father, and sister. Their endless support, unconditional love, and encouragement carried me through my studies. A special thank you to my lizard, Jiggy, to whom the word “pet” does not suffice, and who has been my study partner since my high school years. Finally, this endeavor would not have been possible without the participants of this study, who allowed us to enter their private dream worlds and whose contributions have furthered the field of dream research.

Introduction

Interest in dreams and their possible significance dates back to the ancient cultures of Mesopotamia and Egypt (Hughes, 2000). Throughout the ages, philosophers and other scholars, from Hippocrates and Aristotle, to Freud, Jung, and Perls, among others (Pesant & Zadra, 2004; Webb, 1990), have emphasized the importance of studying the content of people's dreams as a means of learning more about the nature of the human mind.

Along with dreams' sensory imagery, narrative structure and typically bizarre thematic contents, emotions experienced within dreams have long been the source of particular fascination. In fact, even today, emotions are viewed by several dream theorists (e.g., Hartmann, 1998, 2011; Nielsen & Stenstrom, 2005; Scarpelli et al., 2019) as playing a key role in structuring dream content and are one of the most frequently investigated dream content variables (e.g., Domhoff, 1996; Scarpelli et al., 2019). That said, much of the research into the kinds of emotions experienced in dreams has focused on negatively toned dreams, such as bad dreams and nightmares, with surprisingly little work on dream reports featuring positively toned emotions and other forms of positive dream content (e.g., Sikka et al., 2018a, 2018b). This lack of data on positively valenced dreams is all the more important given the vital role that emotions play in many theories of dream content and dream function (e.g., Hartmann, 2014; Malinowski & Horton 2015; Scarpelli et al., 2019). In some theories of dream function for instance, dreams are viewed as playing a key role in sleep-related regulation of emotions (e.g., Scarpelli et al., 2019). However, even within these various models of dream function, researchers have almost exclusively focused on the presence of negative emotions in people's dreams and

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have paid little attention to positive emotions in dreams. The present project represents a first step towards addressing this paucity of information by investigating the content of dream reports containing exceptionally strong positive emotions.

This doctoral essay begins by describing key challenges to the study of dreams and summarizes research on the emotions and overarching themes experienced in positive dreams. Next, scales used to assess themes and emotions in dream reports are reviewed as is the literature on sex differences in positive oneiric content. The study objectives and methodology are then presented, followed by a section detailing the results and a final discussion section centered on the study's findings, their implications, and future research directions.

Challenges in the Study of Dreams

The study of dream content is not straightforward. Like pain, dreaming is a private subjective experience thereby limiting our ability to directly observe the experience in others. Hence, data collection on the content of people's dreams invariably relies on the use of self-report, which is typically gathered in the form of verbal or written dream reports.

Contemporary dream research mainly relies on one of three methods for collecting dream content: experimental awakenings in the sleep laboratory, retrospective questionnaires, and home dream logs (Hagemeyer et al., 2019). Dream reports collected following laboratory awakenings can allow for assessment of dream content closer in time to the actual dream experience, as a function of specific sleep stages across a night and can lead to the recall of dreams that would otherwise have been forgotten. However, due to the artificial sleep environment and biophysiological monitoring equipment, the

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laboratory setting can itself significantly impact the content of dream reports (Hagemeyer et al., 2019; Picard-Deland et al., 2021; Zadra & Domhoff, 2016). For example, over a third of laboratory dream reports may contain references to the experimental situation such as EEG monitoring equipment or references to the laboratory itself or its staff (Picard-Deland et al., 2021). Furthermore, some types of dreams, including non-trauma related nightmares as well as sexual dreams, are rarely reported in the sleep lab settings (Zadra & Domhoff, 2016). Finally, laboratory sessions are costly, a given participants' dream reports are rarely collected over more than a night or two, and participants may view this approach as more invasive and time-consuming than other alternatives (Zadra & Domhoff, 2016).

Retrospective questionnaires require that participants provide information on past dream experiences (sometimes from months or years past) and responses may therefore be influenced by recall bias. Moreover, studies on the relationship between questionnaire-based data on dream content and findings obtained from lab settings or through home journals reveal important discrepancies. For example, nightmare frequency is underestimated in retrospective questionnaires when compared to daily dream logs and correlates of questionnaire-based responses often differ from lab or log-based data (e.g., Wood & Bootzin, 1990; Zadra & Domhoff, 2016; Zadra & Donderi, 2000). That said, retrospective questionnaires are often the only way to address questions centered on unique or rare dream experiences, such as accounts of people's worst nightmare, their earliest remembered dream, dreams of sex, exams or falling, as well as a range of so-called paranormal dreams (e.g., Bulkeley et al., 2005; Schredl et al., 2004; Zadra & Domhoff, 2016).

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Dream logs, also referred to as dream journals or dream diaries, require that participants record their dreams upon awakening each day, often for two or more consecutive weeks. Compared to laboratory and questionnaire-based approaches, dream logs often yield a greater number of recalled dream reports per participant, are ideally suited to the study of everyday dreams recalled in participants' natural sleep environment, and allow for the study of day to day variations in dream content (Zadra & Domhoff, 2016). Furthermore, keeping a dream log can enhance everyday dream recall in normally low dream recallers (Aspy et al., 2015; Cohen, 1969; Zadra & Robert, 2012). Collecting dream reports through daily home dream logs is one of the more widely used methods in the field and is considered the gold standard for the measurement of key dream content characteristics and dream types, including nightmare content and frequency (Levin & Nielsen, 2007).

Scoring Emotions in Dreams

Many contemporary models of dream formation and dream function ascribe a key role to emotions experienced during one's dreams (e.g., Hartmann, 1998, 2011; Nielsen & Stenstrom, 2005; Scarpelli et al., 2019). In fact, when dreamers are asked to rate the emotions present in their dream narratives, it is quite rare for dream reports to be devoid of any emotion or underlying mood (Nielsen et al., 1991; Nixon et al., 2017; Samson-Daoust et al., 2019). Emotions thus represent a core feature of everyday dreams.

Different methods exist to assess emotions in dream reports, including self-ratings by the dreamer as well as ratings by external judges (e.g., Röver & Schredl, 2017; Sikka et al., 2014). Self-ratings require that the participants themselves provide descriptions of the emotions experienced during the dream. These can include lists of specific emotions

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experienced throughout the dream, ratings of the dream's overall positive or negative emotional tone, and the intensity of dreamt emotions. External ratings usually focus on emotional content that is either explicitly reported in the dream report, or implicitly referred to, or a combination of the two.

Most standardized coding methods, such as the widely used Hall and Van de Castle coding system (HVDC; Hall & Van de Castle, 1966), focus solely on explicitly described emotions in dream reports. Even when instruments developed for emotions experienced during wakefulness, such as the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988), are used to score dream reports, they typically focus on explicitly reported emotions. By comparison, assessments of implicitly reported emotions in dream narratives often involve external raters' evaluation of the dream's overall emotional tone. Research has shown that when compared to subjects' own ratings of emotions in dreams, external raters tend to underreport emotions when scoring the same dream reports (Amini, 2011; Merritt et al., 1994; Sikka et al., 2014). There exists, specifically, a significant underestimation of positive emotions in dream reports when assessed by external raters, even when using established coding instruments (Schredl & Doll, 1998; Sikka et al., 2014). Merritt et al. (1994) note that when participants describe their dreams, their reports tend to focus more on plot and character description and are less likely to include emotions evoked throughout the dream. Therefore, participants may inadvertently omit explicit information on the presence of affect in their dreams, which can result in biased findings when external judges are used to score dream emotions, particularly in the scoring of positive emotions in dream narratives.

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As previously noted, the Hall and Van de Castle (1966) coding system, one of the most widely used coding instruments in dream research, was developed specifically for the study and quantification of dream reports. It includes eight content categories, of which one is focused on emotions. Of note, the emotion category comprises four sub-categories of negative emotions (anger, apprehension, sadness, and confusion) and only one category of positive emotions (happiness). Judges using this coding system may thus be more likely to search for and identify negative emotional content in dream logs, leading to an underrepresentation of positive affect in the dream reports (Shredl & Doll, 1998; Sikka et al., 2014).

Consequently, variations in the methods used to assess the presence of emotions in dream reports can lead to different results, especially with regards to the frequency of positive emotions in dreams. These methodological variations are one reason underlying a negativity content bias observed in dream research (e.g., Sikka et al., 2014), in which negative dream experiences are found to appear more frequently in dream reports than positive ones (e.g., Hsu & Yu, 2016; Kramer et al., 1971).

Until recently, most studies of emotions in dream reports relied on external raters and the HVDC system to evaluate the emotional content of the reports. Not surprisingly, this research showed that when present, a great majority of the emotions in dreams were negatively toned (e.g., Hall & Van de Castle, 1966; Merritt et al., 1994). Combined with a burgeoning interest in negatively charged dream experiences such as bad dreams and trauma-related nightmares, these results led to a view of dreams as being primarily negatively toned experiences. As a result, positively toned dream experiences have received little attention.

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Today, there is increasing awareness that positive and negative emotions are more equally distributed in dreams than previously believed as well as growing interest in the correlates and predictors of positive dream affect (e.g., Samson-Daoust et al., 2019; Sikka et al., 2018a; Sikka et al., 2018b; Sikka et al., 2021). For example, one prospective study (Samson-Daoust et al., 2019) documented a relatively equal frequency of positive and negative emotions in a large sample of 1,600 everyday dream reports. Furthermore, in a study of over 250 nightmare reports collected from the general population, it was found that, even amongst these maximally rated negative dreams, 20% contained positive emotions and almost a quarter of all reported nightmares ended on either a partially or entirely positive note (Robert & Zadra, 2014). In light of these findings, the current study will tabulate the presence of negative emotions in maximally rated positive dreams to determine whether oppositely valenced emotions appear within such dreams, as was found in nightmares.

Emotions and Themes Found in Positive Dreams

While no study to date has targeted emotional content solely among a sample of positive dreams, a few researchers have investigated positive as well as negative emotions in dreams. For instance, in a study by Kallmeyer & Chang (1998) on the emotional content of both positive and negative dreams, 153 undergraduate students self-reported the general emotion in their dream narratives using the PANAS (Watson et al., 1988). A total of 42 dream reports were rated as positive by participants and included dimensions of joviality, self-assurance, and serenity. Another study examined the dream narratives involving interpersonal interactions from 157 participants (Hill et al., 2007). The authors found that dream narratives with positive interpersonal content contained

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descriptions of pleasure, that participants reported feeling good about themselves in these dream narratives, and that these positive dreams possessed a sense of beauty, comfort, serenity, and cooperation.

While much is known about the thematic content of negatively toned dreams, including for bad dreams and nightmares (e.g., Duval et al., 2010; Robert & Zadra, 2014; Zadra et al., 2018), the kinds of thematic contents (overarching themes found in dream narratives) associated with the experience of positive dreams remains largely unknown and purely anecdotal in nature. Of the few studies presenting data on positive dream content, one (Gauchat et al., 2015) used retrospective questionnaires to examine the recurrent dreams of children who were followed annually between the ages of 11-15. In their total sample of 102 recurrent dreams, only 9% contained positive themes, of which the majority fell under the category of “contact with strangers” (Gauchat et al., 2015, p. 106). In the same study, additional positive themes included finding oneself in a bountiful environment, being at an amusement park, being at a party with friends, dancing, and playing a sport. In their study of 144 female undergraduate students, Kahan & Claudatos (2016) examined the prevalence of sensory modalities in dream narratives in association with self-reported dream emotions. The authors found a strong positive relationship between positive dream emotions and the presence of auditory stimuli in the dream reports. The relationship was particularly strong when dreamt auditory stimuli involved a social component such as talking and listening, in which pleasant interpersonal interactions took place in the dream.

One specific category of dreams that may provide more information on positive oneiric content is “impactful dreams,” also known as “big dreams” (e.g., Bulkeley, 2006;

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Kuiken et al., 2006). These dreams can be either negative or positive in nature or contain a mixture of markedly positive and negative emotions. In addition to evoking intense emotions, “impactful dreams” are typically highly memorable, include dramatic imagery, and leave a lasting impression on the dreamer (Bulkeley, 2006). Positive emotions associated with impactful dreams include awe, ecstasy, and wonder (Kuiken et al., 2006). Themes found in positive impactful dreams include flying, a loved one coming back from the dead, prophecies, sexually arousing content, as well as transcendent or godly experiences (Bulkeley, 2006). In a study examining the prevalence of good fortunes amongst the HVDC normative dream dataset (a sample of 1000 dreams collected from 500 men and 500 women by Hall and Van de Castle, 1966), impactful dreams made up “barely one percent of all norm dreams” (Bulkeley, 2006, p. 19). Although impactful dreams occur infrequently, they are well remembered and stand out due to the intensity of the dream’s emotions (Nixon et al., 2017). Therefore, some extremely positive dreams can fall into the category of impactful dreams.

Lucid dreams are another category of dreams that encompass positive oneiric content and affect. Lucid dreams are those in which the dreamer experiences awareness of dreaming while still in the dream, and in some cases, possess a variable degree of control over the dream narrative (Stumbrys & Erlacher, 2017). A meta-analysis of 34 studies found that 55% of individuals have experienced at least one lucid dream in their lifetime, while approximately 25% of individuals experience lucid dreaming at least once per month (Saunders et al., 2016). Lucid dreams can elicit intense positive emotions since they often include themes such as flying, sex, and enjoyable social interactions (Green, 1968; Stumbrys et al., 2014). Kitson et al. (2018) conducted qualitative interviews on a

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group of 10 participants who reported having lucid dreams at least once per week for the past 20 years. The authors found that most participants described their lucid dreams as positive and identified emotions such as bliss, happiness, freedom, peace, lightness, childlike-wonder and playfulness in these dreams, and that those who experienced flying in their lucid dreams associated this action with feelings of peacefulness and excitement. In addition, the lucid dreamers in this study generally described feeling in control while lucid dreaming since their ability to manipulate their dream environment evoked a sense of omnipotence (Kitson et al., 2018). While it is evident that lucid dreams tend to feature positive oneiric content, no study has quantified the co-occurrence of positive dream features and dream lucidity in a large sample of everyday dream reports. Therefore, the frequency of specific themes and emotions amongst highly positive lucid dreams will also be explored as part of the present study.

Furthermore, no study has examined how positive dreams begin and end, and whether specific experiences or events (also known as “triggering factors”) in the dream narrative can account for the onset or intensification of positive emotions experienced. In past research on bad dreams and nightmares (e.g., Robert & Zadra, 2014), triggering factors have been grouped into four categories: events, (e.g., “Looking up at the sky I see a missile coming right down at us”); cognitions (e.g., “I suddenly realize that if I am floating in the air, it is because I am dead”); emotions (e.g., “My sister was there and I was very afraid of her”); or a combination thereof. In their sample of nightmares (n=253), Robert & Zadra (2014) found that 76% of all triggering factors occurred in the form of events. Moreover, research on the general unfolding of negative dreams reveals that they typically progress from “bad to worse” (Merritt et al., 1994, p. 56; Robert & Zadra,

2014). While this line of research has helped advance our understanding and modeling of psychological as well as neurobiological factors involved in the process of dream construction (e.g., Levin & Nielsen, 2007; Scarpelli et al., 2019), no research has investigated if incremental processes described in relation to negative dreams apply to positive dreams. Hence, to better understand how highly positive dreams unfold, the current study will examine whether triggering factors exist in highly positive dreams, as well as their place of occurrence (e.g., beginning, middle or end) within the dream narrative.

Finally, while prevalence of nightmares in home dream logs (involving almost 10,000 dream reports from over 570 participants) has been established at almost 3% (Robert & Zadra, 2014), no comparable data exists on the prevalence of highly positive dreams. The current study will thus aim to estimate the prevalence of highly positive dreams in home dream logs.

Scales Related to Themes and Emotions in Positive Dreams

Given that very few studies have investigated the thematic content and affective experiences in positive dreams, no one scale or questionnaire exists to assess these dimensions in reports of highly positive dreams. Of the many scales and questionnaires used in the field of dream research, some encompass dimensions of positive dream themes and emotions although most of these items are overly broad and cursory. The Dream Motif Scale (DMS; Yu, 2012), a retrospective questionnaire used to measure participants' perceived frequency of specific dream contents, includes thematic categories that may be endorsed by participants as being positive including eating delicious food, encountering a person that you like or want to see, swimming or vacationing, flying or

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floating through the air, becoming rich or winning the lottery, a person now dead as alive, having magical powers, becoming a celebrity, rescuing somebody, and sexual and intimate relations. Another questionnaire that encompasses positive themes in dreams and that shows some overlap with the DMS is the Typical Dreams Questionnaire (TDQ; Nielsen et al., 2003) used to assess the lifetime prevalence of various dream themes. A factor-analysis of responses to the TDQ provided by over 1000 participants from different Canadian universities revealed a positive factor with seven sub-themes, including eating delicious food, being at a movie, finding money, seeing yourself in a mirror, swimming, being a child again, and a person now dead as alive (Nielsen et al., 2003).

As previously mentioned, the widely used HVDC coding system consists of eight broad content categories, including the coding of characters, friendly and aggressive social interactions, success and failure, activities, emotions, settings, and objects. Of these eight categories, one is titled “Misfortunes and Good Fortunes.” Six sub-scales exist for classifying misfortunes; however, no sub-scales exist for classifying good fortunes, which is coded when there is an acquisition of goods or something beneficial happens to a character that is completely adventitious or the result of a circumstance over which no one has control. The reason for the absence of positive sub-scales for this scale is that good fortunes occur less frequently in dreams than do misfortunes (Domhoff, 1996; Hall & Van de Castle, 1966). Bulkeley (2006), however, created a revised version of the Good Fortunes Scale by taking all six sub-scales for misfortunes and inverting them. According to Bulkeley, the Good Fortune sub-scale would therefore include wishes coming true,

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flying, helpful forces in the environment, magical objects, extraordinary powers, and having a loved one return from the dead.

Taken together, the DMS, the TDQ, and Bulkeley's revised good fortune subscale of the HVDC present a range of themes that may be found in positively toned dreams. Therefore, when examining the data in the current study, a master list of all positive themes mentioned above was used as a starting point for identifying overarching themes in highly positive dream narratives. That said, since other positive themes might exist that have yet to be formally identified, these were addressed as needed in the study's results.

As little data exists on the kinds of positive emotions found in positive dreams, the literature on waking positive emotions was reviewed. Barbara Fredrickson (2013), who heads the Positive Emotions and Psychophysiology Laboratory in North Carolina, has identified 10 positive waking emotions that she notes are experienced relatively frequently in people's daily life. The list of positive emotions compiled by her lab is as follows: joy, gratitude, serenity, interest, hope, pride, amusement, inspiration, awe, and love (Fredrickson, 2013).

Other authors have theorized on the various so-called "basic emotions," both positive and negative, which are typically defined as having an evolutionary function with universally recognized features. Izard's (1992) list of basic emotions includes two positive emotions, namely joy and interest. In Izard's (2007) theory of emotions, she posits that joy and interest occur in order to enable exploratory behavior and learning, as well as to promote attachment. In Panksepp & Watt's (2011) list of basic emotions, care, play, and lust are classified as positive experiences. All three of these emotions involve

social behavior and, from an evolutionary standpoint, encourage propagation of the human species (particularly with care and lust).

Circling back to positive emotions in dream reports, as part of a study on emotions associated with central images in impactful dreams, Hartmann (2008) developed a list of emotions (and their synonyms), which included positive feelings such as power, awe, happiness, hope, peace, longing, relief, and love. In addition, a recent diary-based study by Samson-Daoust et al. (2019) examined factors predicting affective valence in the everyday dreams of 128 participants. The authors focused on both negative and positive emotions reported in the dream journals and found that reported positive emotions included joy, surprise, calm, and affection (including love).

For the purpose of the current study, in order to better understand the frequency of occurrence of various positive emotions in highly positive dreams, a comprehensive list of positive emotions was compiled based on the above reviewed literature on the kinds of positive emotions experienced during wakefulness as well as in dream reports.

Sex Differences and Positive Dream Content

Robust sex differences have been documented in relation to the frequency and content of negative dreams, including in bad dreams and nightmares. For instance, it is well established that bad dreams and nightmares are more frequently reported by women than by men (e.g., Levin & Nielsen, 2007; Schredl & Reinhard, 2011) and that when compared to men's nightmares, women's nightmares are significantly more likely to contain themes of interpersonal conflict, but less likely to feature themes involving physical aggression (Robert & Zadra, 2014). Additionally, sex differences were found in Nielsen et al.'s (2003) factor analysis of responses from 1,181 university students from

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three Canadian universities to the Typical Dreams Questionnaire. Specifically, men had higher prevalence rates for 10 typical dream themes, 6 of which were predominantly positive and included fantasy-type themes with a positive emotional valence such as alien-life and magic-myth. By comparison, of the 8 items for which women obtained higher prevalence rates, 7 were predominantly negative, including items related to snakes-insects, paralysis, loss of control, and failure (Nielsen et al., 2003).

Sex differences have also been documented in studies comparing negative and positive dream content in men and women. First, even though Hall and Van de Castle (1966) found no significant sex differences with regards to proportions of misfortunes versus good fortunes found in their participants' dream reports, Bulkeley (2006) found that, when using his revised version of the HVDC Good Fortune Scale and applying it to the 1000 HVDC norm dreams, men experienced 36% more good fortunes in their dreams than did women. In a study by Gauchat et al. (2015), examining 572 children's recurrent dreams, the authors found that, regardless of whether the recurrent dream was considered positive or negative by external raters, friendly interactions were evident in almost one third of girls' recurrent dreams, compared to less than 3% of the recurrent dreams reported by boys. Amongst the normative sample of 1000 dreams, Hall and Van de Castle (1966) found that while women express more emotions in their dream reports compared to men, there are no significant sex differences in the types of emotions reported (Domhoff, 1996; Hall & Van de Castle, 1966). Finally, Merritt et al. (1994) had 20 university students choose from six affective categories when describing the emotional content of their dream reports (10 reports per participant), with 3 of the choices being

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positive descriptors, including joy/elation, affection/erotic, and surprise, but found no significant sex differences in the self-reported emotions in dreams.

Sex differences in the frequency of specific dream themes found in positive dreams have yet to be empirically investigated. However, researchers have investigated such differences in negatively toned dreams. For example, Robert and Zadra (2014) examined the content of bad dreams and nightmares in a sample of 9,796 home dream reports. They found that men were more likely than women to report themes involving natural disasters and calamities (9.4% versus 4.7%, e.g., floods, earthquake, war), as well as insects (9.4% versus 4.5%). However, themes of interpersonal conflicts were twice as frequent in women's nightmares suggesting, as argued by several theorists and researchers (e.g., Domhoff, 2018; Hartmann, 2014; Lakoff, 1993; Malinowski & Horton, 2015), that much as in waking thought, conceptual metaphors (ways of representing or understanding abstract concepts in concrete, everyday terms) can structure people's dreams and reflect the dreamer's broad (including sex-based) preferences for thematic metaphors that best encapsulate their ongoing preoccupations and concerns. While such work thus suggests that positive as well as negative dream themes can appear in people's dreams because they most clearly or directly speak to their ongoing concerns, no study to date has examined sex differences in self-reported frequencies of emotions and thematic content in a sample of highly positive dreams.

Objectives

Our overarching goal was to investigate a range of dream content variables to obtain a comprehensive description of prospectively collected highly positive dream reports. Specifically, the principal aims of the present study were: a) to investigate the

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thematic contents of highly positive dreams in a large sample of positive dream reports; b) to compile and describe the most frequently reported positive emotions in this sample of dreams; and c) to help address the paucity of information on the differences between men and women with regards to the prevalence of positive emotions in dreams as well as on the thematic contents that characterize such dreams. Secondary objectives include: a) to determine the overall prevalence of intensely positive dreams in a large sample of home dream reports; b) to investigate the presence of triggering factors (e.g., turn of events, cognitions, emotions) that appear to be responsible for triggering or amplifying the dream's positivity; c) to determine the proportion of highly positive dreams that are lucid dreams; and d) to tabulate the frequency and kinds of negative emotions contained in highly positive dreams. Due to the exploratory and descriptive nature of this study, as well as lack of data on the key questions of interest, no explicit predictions were made regarding expected outcomes.

Methods

Participants

Participants were non-paid volunteers recruited from the general population and local universities through media announcements for four interrelated studies conducted between 1991 and 2010 as part of a larger program of research on the relation between dream content and measures of wellbeing and personality (see Robert & Zadra, 2014 for details). Data from Sample 1 was collected in 1991 and included a total of 105 participants, Sample 2 (2006) had 134 participants, and Sample 3 (2000) had 119 participants. While Sample 4 (2009) originally contained 124 participants, we selected dream reports from only male participants (22) to increase the number of men in the

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current study's final sample. A total of 380 participants (285 women, 92 men, and 3 with missing information on sex) were thus included in the present study. In each of the original studies, participants were informed that the researchers were interested in examining the relationship between personality variables and dream content.

Procedure

Participants first completed a series of questionnaires, including measures of personality, wellbeing, and past dream experiences. Specifically, participants from all 4 samples completed: the Sleep and Dream Questionnaire (Brown and Donderi, 1986), a 72-item questionnaire that evaluates several dimensions of dream experiences, including dream recall frequency, frequency and content of nightmares, bad dreams, lucid dreams, and recurrent dreams; the Beck Depression Inventory (BDI; Beck et al., 1996), a 21-item questionnaire that measures depressive symptoms; and the State-Trait Anxiety Inventory-Trait Scale (STAI; Spielberger et al., 1970), a 20-item questionnaire that measures feelings of anxiety as they are generally experienced; the Symptoms Checklist-90 (SCL-90; Derogatis, 1977), a 90-item questionnaire that measures the intensity of various symptoms of psychopathology. In addition, participants in samples 2 and 4 also completed the Nightmare Distress Questionnaire (NDQ; Belicki, 1992), a 13-item questionnaire that measures emotional distress resulting from nightmares; the Differential Personality Questionnaire: Absorption Scale (DPQ; Tellegen & Atkinson, 1974), a 34-item questionnaire that measures psychological absorption—that is, an openness to absorbing and self-altering experience; and the short version of Boundary Questionnaire (BQ; Hartmann, 1989), an 18-item questionnaire that measures Hartmann's concept of "boundary permeability"; that is, the overlap ("thinness") or separation ("thickness")

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between mental states (Kunzendorf et al., 1997). All participants were then required to keep a home dream journal for a minimum of 2 weeks to a maximum of 5 consecutive weeks and were all required to provide a written description of each remembered dream upon awakening from the preceding night along with the date of log completion. In addition to providing a complete narrative description of each remembered dream, participants were also instructed to report the main emotions experienced in the dream as well as their intensity. In Sample 1, intensity of the emotion was determined by a close-ended question asking participants to rate the emotional intensity of each reported dream as being either mild, moderate, strong, or intense. In Samples 2 and 3, participants rated the intensity of the overall emotion for each dream reported on a Likert scale ranging from 1-9, with 9 being most intense. In Sample 4, intensity was rated on a Likert scale ranging from 1-5, with 5 being the most intense. In an effort to examine positive dreams in their strongest and most unambiguous form, only those narratives with maximal ratings were included. Analysis of maximally rated positive dreams also allows for comparison with previous findings on nightmares. Finally, dream reports from all four samples included a close-ended question asking participants whether the dream was a lucid dream, for which participants were provided a written definition. Depending on participants' preference, questionnaires and dream journals were provided in either French or English. Each of the four studies was approved by the University Ethics Committee and signed consent was obtained from each participant.

Dream reports of 25 words or more containing positive emotions that were self-rated by participants as being maximally intense (e.g., rated as 5/5 or 9/9 on the provided Likert scales) were included in the present study. To prevent an overrepresentation of

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positive dreams from participants who may have reported many such dreams in their logs, a maximum of 2 dreams per participant were selected. The first highly positive dream reported in the log was automatically included and, if available, a second report was randomly selected from the log. Each highly positive dream report was then scored by two independent raters on all content variables including thematic content, emotional content, and triggering factors.

All content variables (themes, emotions, triggers) were scored by two independent raters, including the author and another doctoral student in the Dream Laboratory. Scoring techniques were refined using the first 25 dreams in the sample. Subsequently, the entire sample of dream reports was independently scored and then corroborated between judges. When discrepancies occurred in scoring between the two judges, the study's supervisor (AZ) reviewed the dream narratives and discrepancies were adjudicated by discussion.

Measures

Thematic Content

Classification of themes in the dream reports was based on themes reported in the literature, including those found in instruments such as the DMS (Yu, 2012), the TDQ (Nielsen et al., 2003), the revised Good Fortune Scale (Bulkeley, 2006), and pilot testing. When new categories emerged, raters determined an appropriate category name by discussion. All thematic categories were kept and conceptually related categories were grouped together to avoid overlap, specifically if such categories captured less than 2% of the overall sample of dream reports. Table 1 in Appendix B presents the final 16 thematic categories used to classify the themes found in highly positive dreams. When dream

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reports contained more than one theme, raters had the option of identifying a secondary theme if its occurrence was not the direct consequence of the main theme. A primary theme was defined as the one for which participants provided the detailed description and/or for which the positive emotion was mostly related to. A secondary theme was scored if another, less detailed theme was present in the dream narrative and less central to the dream's positive emotional tone. Results related to thematic content in the sample of highly positive dream narratives can be found in Appendix B, Table 2.

Emotional Content

To avoid the underreporting of emotions in dream reports when scored by external raters, both explicitly and implicitly described emotions were included in the analyses. To illustrate an implied emotion, reports in which a participant reported laughing were coded as "joy." Based on the previously reviewed literature on waking positive emotions (Fredrickson, 2013; Izard, 1992, 2007; Panksepp & Watt, 2011), as well as studies of positive emotions in dreams (Hartmann, 2008; Samson-Daoust et al. 2019), a list of positive emotions was created and used to categorize positive emotions in the current sample of dream reports. This list includes the following positive emotions: Joy, Surprise, Calmness/Serenity, Affection/Love, Interest, Playfulness/Amusement, Lust/Sexual Arousal, Awe, Pride, and Hope. Table 3 in Appendix B presents the definitions for each category of positive emotions. As with the scoring of themes, if needed, a primary and secondary emotion could be scored when two such emotions were present in a given report. A primary emotion was defined as one that takes precedence in the dream narrative, is explicitly reported as being the most intense, or which is described

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throughout the dream narrative. A secondary emotion is one that plays a lesser role in the dream narrative or is the object of a less detailed description in the dream report.

The presence of negative emotions was also tabulated in all selected dream narratives. Whenever present, judges noted the type of negative emotion as well as the timing of its occurrence within the dream narrative (i.e., first third, second third, or last third of the narrative as determined by the report's total word count).

Triggering Factors

To clarify how and when dreams turn into highly positive dreams, each narrative was scored for the presence of triggering factors that initiate a positive turn of events or intensifies the dream's positive tone. As was done in research on negatively toned dream reports (Robert & Zadra, 2014), triggers were categorized into one of four categories: events (e.g., Mick Jagger walked into the room and took me into his arms), cognitions (e.g., I realized it was a dream and decided to fly), emotions (e.g., I was so happy we were together), or a combination of these. The trigger's occurrence in either the first, second, or last third of the narrative was determined by dividing the number of words before the trigger by the dream report's total word count. An example of a positive dream report with an event as a triggering factor in the second third of the dream narrative can be found in Appendix A.

Statistical Analyses

The proportion of intensely positive dreams found in participants' dream logs, was determined by calculating the frequency of positive dreams divided by total number of dreams reported by each participant. The percentage of all intensely positive dreams that fell within each of the thematic and emotion categories was then calculated for the

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entire sample, as well as separately for men and women. Chi-square analyses were used to evaluate whether sex-based differences in observed frequencies in themes and emotions were significant. The percentage of highly positive dreams that contained a negative emotion was calculated, as well as the frequency of occurrence of negative emotions based on their positioning in the dream narratives (i.e., first, second or third portion of the dream narrative). Moreover, the percentage of highly positive dreams that contained a triggering factor was tabulated, as well as the percentage of these triggers categorized as an event, a cognition, an emotion, or a combination of these. The frequency of occurrence of triggering factors in either the beginning, middle, or end of the dream report was also determined. The proportion of all highly positive dreams that were lucid dreams was calculated for the entire sample as well as separately for men and women. Finally, the proportion of various themes and emotions found in highly positive lucid dreams was also investigated.

Since kappa coefficients are unreliable when applied to variables with infrequent occurrences (as is the case with several dream content categories), inter-judge reliability was assessed with Gwet's (2008) AC1 statistic for all variables, including discrepancies in scoring on themes, positive emotions, presence of negative emotions, location of negative emotions, type of negative emotion, presence of a trigger, type of trigger, and trigger location.

Results

The initial study sample was comprised of 380 participants (285 women, 92 men, and 3 with missing information on sex). After excluding the 3 participants with missing information on sex as well as an additional 32 participants (14 men, 18 women) due to

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blank dream logs or missing information on ratings of emotional intensity, the final sample consisted of 345 participants (78 men; 267 women; mean age = 30.7 ± 13.6 , range = 18 to 90). Of these participants, a total of 88 (25.5%) reported one or more intensely positive dreams, including 26 men (mean age = 34.6 ± 16.2 years) and 62 women (mean age = 32.2 ± 13.2 years). A descriptive table for the 88 retained participants can be found in Appendix C. Male participants reported a total of 1,389 dreams, with a mean of 17.8 ± 14.8 dreams per participant, and 69 of these dream reports (4.9%) were rated as intensely positive. Female participants reported a total of 4,113 dreams with a mean of 15.4 ± 9.1 dreams per participant. One-hundred and eighteen of these dreams (2.9%) were rated as intensely positive. A total of 5,502 dream reports were thus collected from a total of 345 participants, with a mean of 15.9 ± 10.7 dream reports per participant. Of this total, 187 dream reports, or 3.4%, were rated by 88 participants as being highly positive. The remaining 257 participants who did not report any intensely positive dreams in their dream logs were excluded from further analyses. Additionally, 3 highly positive dream reports were excluded from the sample as they contained fewer than 25 words. Therefore, the final sample of highly positive reports consisted of 118 dream reports collected from these 88 participants.

Seventy-three of the 88 participants (82.9%) kept their dream journals in French and 15 in English (17.0%). Dream reports from female and male participants contained an average of 161.6 ± 118.5 and 165.4 ± 130.3 words per dream report, respectively, while mean number of words per dream report for the entire sample was 162.9 ± 122.1 . Among the 88 participants, no significant differences were found between male and female

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participants in age ($t(86)=1.068, p=.288$), dream report length ($t(116)=.159, p=.874$), or dream recall frequency ($t(86)=.915, p=.363$).

Inter-Rater Results

Results from Gwet's AC1 statistic used to calculate inter-rater reliability showed good to excellent agreement across all content variables, with AC1 values ranging between .66 (classification of positive emotions) to .92 (location of negative emotion).

Thematic Content

Of the 118 highly positive dream narratives, 68.6% contained a single overarching theme, while the remaining 31.4% also contained a secondary theme. No patterns were found in thematic pairings for dream narratives with more than one theme. The distribution of thematic categories across all positive dream reports is presented in Appendix B, Table 2. Amongst the entire sample, themes involving Sexual Content, Positive Platonic Social Interactions, and Finding Oneself in Nature/Bountiful Environment were most frequently reported, while the remaining themes appeared in less than 10% of the dream narratives. The most frequently reported themes by male participants were Positive Platonic Social Interactions, Sexual Content, Artistic Creations or Endeavors, Learning/Gaining Knowledge, Nature/Bountiful Environment, and Success/Overcoming an Obstacle. Themes of Babies and Pregnancy as well as Sports and Games were absent from men's highly positive dreams. Additionally, within the thematic category of Receiving a Gift/Good News, men only reported Receiving Good News and never the theme of Receiving a Gift. The most frequently reported themes by women were Sexual Content, Nature/Bountiful Environment, and Positive Platonic Social Interactions. The remaining themes occurred in 10% or less of women's dream reports.

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Contrary to male participants, within the thematic category Receiving a Gift/Good News, female participants only reported the theme of Receiving a Gift and never reported the theme of Receiving Good News.

Positive Emotions

Of the 118 highly positive dream narratives, 61.9% contained a single overarching positive emotion, while the remaining 38.1% also contained a secondary theme. Table 4 in Appendix B presents the distribution of positive emotions in our sample of highly positive dreams. The most frequently reported emotions in the entire sample of dreams were Joy, Lust/Sexual Arousal, Pride, Calmness/Serenity, Surprise, and Playfulness/Amusement, while the remaining emotion categories appeared in less than 10% of the dream narratives. Joy was the most frequently reported emotion in men's dreams, occurring in half of the dreams, followed by Lust/Sexual Arousal, Calmness/Serenity, Surprise, Interest, and Awe. Joy was also the most frequently reported emotion by female participants, present in almost 40% of their highly positive dreams, followed by Lust/Sexual Arousal, Pride, Playfulness/Amusement and Calmness/Serenity.

Sex Differences

Sex differences were examined for thematic and emotion categories that characterized 10% or more of the reports from male or female participants. Chi-square analyses showed that men were significantly more likely than women to report the theme of Positive Platonic Social Interactions in their dream narratives (32.5% versus 15.4%; $X^2 = 4.639$, $P = .031$). Male participants were also significantly more likely to report the theme of Artistic Creations and Endeavors in their dream narratives compared to female

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participants (15.0% versus 2.6%; $X^2= 6.470$, $P = .011$). No other significant sex differences were found regarding themes or positive emotions.

Negative Emotions

Twenty of the 118 highly positive dream narratives (16.9%) contained at least one negative emotion. Thirty-five percent of these 20 narratives ($N=7$) were from male participants and 65% ($N=13$) were from female participants. Examples of reported negative emotions include panic, anxiety, worry, anger, disappointment, shame, fear, confusion, and abandonment. Thirty-five percent of the negative emotions occurred in the first third of the dream report, 35% occurred in the second third, and 45% were found in the last third of the dream report (percentages add up to more than 100% as some dream reports contained more than one negative emotion).

Triggering Factors

Triggering factors responsible for rendering the dream positive or intensifying the dream's positive emotion were identified in 55 of the 118 (46.6%) dream reports. In 54.5% of the cases, the trigger was an event (e.g., "I win the medal"), whereas cognitions (e.g., "Then I realized all the beauty") were triggers in 14.5% of the reports, emotions (e.g., "I'm so overjoyed") in 7.3% of the cases and 23.6% of the dream reports contained triggers that represented a combination of these factors. Twenty percent of positive triggers occurred during the first third of the dream narrative, 38.2% in the second third, and 41.8% in the last third.

Lucid Dreams

Three of the highly positive dream narratives had no information regarding whether or not the report was a lucid dream. After excluding these 3 dream reports, 26 of

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115 (22.6%) dream narratives were identified as being lucid dreams by participants (16 women and 10 men). Thus, 21.3% of the positive dream narratives reported by women were lucid dreams as were 25.0% of positive dreams reported by men. Of the 26 lucid dreams in the sample, 16 (61.5%) had only one overarching theme, while 10 (38.5%) had two main themes. Themes found in 10% or more of the present sample of lucid dreams included Sexual Content (34.6%), Positive Platonic Social Interactions (26.9%), Nature/Bountiful Environment (15.4%), Flying (11.5%), and Magical/Supernatural Powers (11.5%). Themes of Babies and Pregnancy, Receiving a Gift/Good News, Learning/Gaining Knowledge, and Self-Assertion were not found amongst highly positive lucid dreams. The most frequent themes in men's lucid dreams included Positive Platonic Social Interactions (40%; the majority of these dreams involved being complimented), Sexual Content (20%), and Artistic Creations and Endeavors (20%), while the most frequently occurring themes in women's lucid dreams were Sexual Content (43.8%), Nature/Bountiful Environment (25.0%), Flying (18.8%), Positive Platonic Social Interactions (18.8%), and Magical/Supernatural Powers (12.5%).

Of the 26 highly positive lucid dreams, 53.8% contained a single overarching positive emotion, while the remaining 46.2% also contained a secondary positive emotion. The most frequently reported emotions were Joy (46.2%), Lust/Sexual Arousal (34.6%), Playfulness/Amusement (23.1%), Pride (15.4%), and Calmness/Serenity (11.5%), while the remaining categories of emotions appeared in less than 10% of the lucid dream narratives. Joy (60%) was the most frequently reported emotion in men's lucid dreams, followed by Pride (20%), while Lust/Sexual Arousal (43.8%) was the most

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frequently reported emotion by female participants, followed by Joy (37.5%), Playfulness/Amusement (31.3%), Calmness/Serenity (18.8%), and Pride (12.5%).

Discussion

The main findings of the present study of highly positive dreams are as follows: a) the prevalence of maximally rated positive dreams in our sample of over 5,500 everyday dream reports was 3.4%; b) the most frequently reported themes in highly positive dreams were Sexual Content, Positive Platonic Social Interactions, and Finding Oneself in Nature/Bountiful Environment; c) men were significantly more likely than women to report themes of Positive Platonic Social Interactions and of Artistic Creations or Endeavors in their highly positive dreams; d) the most frequently reported emotions in highly positive dreams were Joy, Lust/Sexual Arousal, Pride, Calmness/Serenity, Surprise, and Playfulness/Amusement; e) men and women did not differ in the kinds and frequency of positive emotions reported in their dream narratives; f) approximately 1 in 6 highly positive dream reports contained at least one negative emotion which occurred most often in the last third of the dream; g) nearly half of all positive dreams contained a triggering factor that either rendered the dream highly positive or enhanced the intensity of the positive emotion with the majority of these triggers being events that occurred in the last third of the dream report; h) almost a quarter of all highly positive dreams were described by participants as lucid dreams and were most likely to contain themes of Sexual Content, Positive Platonic Social Interactions, Nature/Bountiful Environment, Flying, and Magical/Supernatural Powers. Implications of these findings are discussed below.

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When examining the 5,502 dream reports collected from our 345 participants, highly positive dreams were found to comprise about 3.5% of all dream narratives. In a study on the content of a large sample of bad dreams and nightmares (based on 9,796 home dream reports collected from 572 participants), the authors found that nightmares comprised 2.9% of the entire sample (Robert & Zadra, 2014). The similar prevalences for highly positive dreams and nightmares indicates that dreams with maximal intensity ratings are relatively infrequent and that highly positive as well as highly negative dream experiences occur with comparable frequencies. When these findings are combined, they suggest that irrespective of valence, approximately 1 home dream out of 20 contains maximally intense emotions.

The most frequently reported themes in the sample of highly positive dreams were Sexual Content, Positive Platonic Social Interactions, and Nature/Bountiful Environment. Although the literature on themes in positive dreams is scarce, authors that did examine such dreams identified similar thematic contents. For example, Bulkeley (2006) mentions sexual content being present in positive impactful dreams, while the Dream Motif Scale (DMS; Yu, 2012) includes the item of sexual and intimate relations, which can be endorsed by participants as positive. However, based on these few descriptive mentions of sexual content in positive dreams we could not have predicted that Sexual Content would be the most frequently reported theme in our sample of highly positive dreams. With regards to themes related to positive platonic social interactions in positive dreams, Gauchat et al. (2015) found that 9% of their sample of recurrent dreams reported by adolescents contained positive themes, with the most prevalent theme being contact with strangers, and noted the presence of other social themes such as being at a party with

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friends. Other studies of dreams that mention social components as a theme include Kahan & Claudatos (2016) who reported finding a strong positive relationship between positive emotions and the presence of auditory stimuli in dreams, particularly when a pleasant social component took place such as talking or listening to others. Lastly, being in nature or finding oneself in a bountiful environment was also a theme previously identified in the literature on positive dreams. The Typical Dreams Questionnaire (TDQ, Nielsen et al., 2003) and the Dream Motif Scale (DMS, Yu, 2012) include the items of “swimming” as well as “vacationing”, and in our sample, dreams with content of swimming or vacationing often fell under the overarching category of Nature/Bountiful Environment. Finally, the study by Gauchat et al. (2015), also identified the theme of being in a bountiful environment in their sample of positively rated recurrent dreams.

Other themes reported in the literature on positively toned dreams and that occurred in less than 10% of all dream narratives within the current sample of highly positive dreams include the themes of flying and a loved one returning from the dead. The theme of flying or floating through the air is an item found on both the TDQ (Nielsen et al., 2003) and the DMS (Yu, 2012), and was noted as a predominant theme amongst positive impactful dreams (Bulkeley, 2006), as well as in positive lucid dreams (Green 1968; Stumbrys et al., 2014). Additionally, the theme of a loved one returning from the dead is indexed in the TDQ (Nielsen et al., 2003), the DMS (Yu, 2012), and in the literature on impactful dreams (Bulkeley, 2006).

With regards to sex differences in identified dream themes, male and female participants reported similar themes in their highly positive dreams. Men, however, were significantly more likely than women to report dreams involving Positive Platonic Social

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Interactions and Artistic Creations or Endeavours. It is interesting to note that, when comparing themes in bad dreams and nightmares reported by men and women, women report dreaming about interpersonal conflict twice as often as men (Robert & Zadra, 2014). Why intensely positive interpersonal interactions in dreams (but not intensely negative ones) are more commonly reported by men than by women remains to be determined as does the preliminary finding that men were more likely than women to report highly positive dreams involving artistic creations or endeavors.

The most frequently reported emotions in the sample of highly positive dreams were Joy, Lust/Sexual Arousal, Pride, Calmness/Serenity, Surprise, and Playfulness/Amusement. These categories were created based on previous literature on emotions in positive dreams (e.g., Hill et al., 2007; Kallmeyer & Chang, 1998; Samson-Daoust et al., 2019) as well as positive emotions experienced in waking states (e.g. Fredrickson, 2013; Izard, 1992; Panksepp & Watt, 2011). Our findings are consistent with the literature on categories of positive emotions in positively rated dreams. In their sample of 153 participants, Kallmeyer & Chang (1998) found that dreams rated as positive by participants contained emotions such as joviality, self-assurance, and serenity, while Samson-Daoust et al. (2019), who examined factors predicting affective valence in the everyday dreams of 128 participants found that positive emotions reported by participants included joy, surprise, calm, and affection (including love). Additionally, in the 7 interpersonal positive dreams found in their sample, Hill et al (2007) noted that these dreams included feelings such as comfort and serenity. No significant differences were found in our study between male and female participants on emotions in their highly positive dream narratives. These results are consistent with previous findings in the

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literature on a general lack of significant sex differences in the emotional content of everyday dreams (Domhoff, 1996; Hall & Van de Castle, 1966; Merritt et al., 1994).

While our findings on positive emotions appear consistent with the few studies that also examined emotions in positive dreams, it should be noted that the process of identifying and categorizing positive emotions in our participants' dream logs was not always evident. More specifically, while all dream narratives read as being generally positive, the intensity of these dream reports could not be inferred by external judges solely based on the written reports; participants' self-reported emotional intensity ratings were essential for this task. As discussed in the general introduction, there exists an underestimation of positive emotions in dream reports when they are scored by external raters as opposed to being assessed by participants' own ratings of their emotional content (Schredl & Doll, 1998; Sikka et al., 2014). Our own observations are in line with these findings and confirm the necessity of having participants provide their own information as to the intensity and kinds of emotions experienced in their dreams and in utilizing both implicit and explicit scoring systems for identifying dream emotions and determining their intensity ratings, particularly for positive dreams.

Our six most frequent emotion categories (i.e., Joy, Lust/Sexual Arousal, Pride, Calmness/Serenity, Surprise, and Playfulness/Amusement) were each present in 10% or more of all dream narratives. However, other categories of emotions (e.g., Interest, Awe, Affection/Love, Hope), were also identified, albeit less frequently. Based on these findings, it is evident that the range of emotions that can be experienced in highly positive dreams is numerous and quite varied. While the HVDC (Hall & Van de Castle, 1966) system only includes one category for scoring positive emotions (i.e. happiness),

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our results demonstrate the potential for individuals to experience a more diverse and wide-ranging spectrum of positive emotions in their highly positive dreams. The single category for rating positive emotions in the HVDC system may therefore be contributing to the issue of underrepresentation of positive emotions in dreams when scored by external raters.

Approximately 17% of our sample of highly positive dreams also contained negative emotions. Of note, the majority of these negative emotions occurred in the last third of the dream narrative. An analogous pattern was found in a study of a large sample of log-based nightmares, where over 20% of the 253 nightmare reports contained either a partially or entirely positive ending (Robert & Zadra, 2014). Taken together, these data suggest that as many as 1 in 5 dreams featuring highly intense and largely positive or negative emotional content contain oppositely valenced emotions, particularly towards the end of the dream (e.g., nightmares ending with positive emotions and highly positive dreams ending with negative emotions). What exact factors underlie these marked alterations in emotional tone that characterize a sizable proportion of emotionally intense dreams remains unknown. However, it is evident that when individuals classify dreams as either intensely positive or negative, the dominant and overarching emotion in the dream is viewed by the dreamer as being the most salient despite the subsidiary presence of differently valenced emotion in the dream narrative.

Turning to triggering factors, our findings indicate that such elements were present in almost half of all highly positive dream narratives. As found in a content analysis of a large sample of everyday nightmares and bad dreams (Robert & Zadra, 2014), events, as opposed to cognitions or emotions, were by far the most common

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trigger in intensely positive dreams. Contrary to Robert & Zadra's (2014) findings, however, most (42%) of the triggers in our sample of highly positive dreams occurred in the last third of the narrative whereas triggers most often occurred in the first third of nightmare reports (65%). This suggests that whereas a large portion of nightmares quickly begin with a negative trigger and continue to progress from bad to worse, intensely positive dreams may unfold more gradually, with key positive elements occurring later in the dream narrative. That said, it is important to note that over half of all highly positive dreams did not contain a triggering factor. These reports were positive throughout the recalled dream from the start. In line with these observations, Fredrickson's (1998; 2013) broaden-and-build theory posits that, compared to negative emotions, positive emotions "widen the array of thought, action urges, and percepts that spontaneously come to mind" (Fredrickson, 2013, p. 17) and thereby help enhance an individual's set of resources (Fredrickson, 1998). Additionally, positive emotions are considered to be more diffuse and less discrete compared to negative ones (Fredrickson, 1998). From this theoretical model, positive emotions experienced in the waking state foster expansive and creative thought and behavior, while negative emotions typically narrow one's focus and attention. If correct, the broaden-and-build theory might help explain why, compared to nightmares, half of all highly positive dream reports do not appear to possess an emotional arc or apex and whereby the positive emotion appears diffuse and dispersed throughout the dream report. Alternately, the valence and intensity of emotions experienced in highly positive dreams may bias what people recall of their dreams (e.g., where and how the dream "began") as well as the recall or perception of their narrative evolution across time.

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With regards to highly positive dreams also identified as lucid dreams by participants, the most frequently reported themes included Sexual Content, Positive Platonic Social Interactions, Nature/Bountiful Environment, Flying, and Magical/Supernatural Powers. These themes were consistent with the often reported themes of flying, sex, and enjoyable social interactions found in the literature on lucid dreaming (Green, 1968; Kitson et al., 2018; Stumbrys et al., 2014). Positive emotions in our sample of highly positive lucid dreams included Joy, Lust, Playfulness/Amusement, Pride, and Calmness/Serenity. This is also largely consistent with the literature on positive emotions often experienced during lucid dreaming (e.g., bliss, happiness, freedom, childlike-wonder, playfulness, peacefulness and excitement; Kitson et al., 2018). Finally, the current findings revealed no significant differences in positive emotions experienced by male and female participants in their highly positive lucid dream reports.

While this study is the largest investigation of highly positive dreams to date, it has several important limitations. First, the subject pool was biased towards individuals who had a particular interest in dreams and thus more likely to participate in dream-related studies. Compared to the average adult, these individuals are likely to pay more attention to their dreams in general, consider dreams to be important, and have better dream recall. As an example, whereas the average level of dream recall in the general adult population is about 4-6 dreams per month (e.g., Schredl, 2008) our participants reported an average of approximately 4 dreams per week. Second, our sample was overrepresented by women's extended home dream logs, as is often the case in dream studies (e.g., Robert & Zadra, 2014; Schredl et al., 2006; Vallat et al., 2018). Our

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relatively small number of male participants made it difficult to report on sex-related differences when examining subtypes of dreams. Third, some specific categories of dreams investigated (e.g., positive lucid dreams) were limited in number and may not be representative of positive lucid dreams in general.

As the thematic and affective contents of positive dreams have largely been neglected in the literature, this study represents a needed first step towards defining the qualities and content characteristics of highly positive dreams. Future research could focus on wake-related variables and other individual characteristics that might impact the frequency or quality of positive dreams. Aside from one recent study demonstrating that experiencing waking peace of mind is a predictor of positive affect in dreams (Sikka et al., 2018), authors have not made such questions the focus of their research. Much of what has been written on the ways in which indices of wellbeing or psychopathology might influence dreamers' experiences concern bad dreams and nightmares (Levin & Nielsen, 2007; Miró & Martínez, 2005; Yu, 2016). Similarly, with few exceptions (e.g., Pesant & Zadra, 2006), measures of wellbeing and psychopathology have also been examined in relation to negatively toned dream content (e.g., Ohayon et al., 1997; Simor et al., 2010; Zadra & Donderi, 2000). Furthermore, dream research has largely focused on sex as a biological variable when examining differences between men and women. Given that dream content is tied to our personal experiences, sense of identity and conceptions of the world, the variable of gender as opposed to underlying biology would also be of interest to assess in future research. Additionally, while many sleep laboratory studies have focused on negatively toned dream content, especially in relation to bad dreams and nightmares (e.g., Krakow, 2006; Mellman et al., 1995) to our knowledge none have

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specifically set out to investigate the relation between polysomnographic variables and positive dream content. Another promising line of research includes the investigation of emotional intensifications of positive emotions in lucid dreams. Since lucid dreaming can be used as a treatment for chronic nightmares, (e.g. Zadra & Pihl, 1997; Spoormaker & van den Bout, 2006), researchers could examine how lucid dreaming could be used to induce or intensify positive emotions while dreaming.

At a broader level, given that the often-cited continuity hypothesis of dreams posits that waking thoughts, ongoing concerns, and emotionally salient experiences are often reflected in people's everyday dreams, future research could examine to what extent and how positive experiences in waking states are reflected in individuals' positive dreams, including whether positive dreams play a role in emotion-regulation, as theories of dream function and emotion-regulation have posited for negative dreams (Scarpelli et al., 2019). Additionally, in order to more clearly define positive dreams and compare them to nightmares, only maximally rated dreams were included in this study. However, as an equivalent to bad dreams, it may be of interest for future research to analyze dream narratives rated as mildly or moderately positive.

Furthermore, since the exploration of and clinical work on bad dreams and nightmares can provide insights on a client's psychological suffering and related symptomatology (e.g., Carona & Fonseca, 2022; Hill, 1996a), researchers and clinicians could focus on the clinical uses and implications of working with positive dreams in clinical settings. Jung (1974), for instance, posited that big dreams (i.e., those that individuals identify as highly significant and memorable; Bulkeley & Hartmann, 2011) should be focused on in therapeutic settings as dream content is representative of

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meaningful aspects of a person's waking state and life (e.g., Pesant & Zadra, 2004). In fact, many approaches to clinical dream work argue that the exploration of clients' dreams, including positive dreams, can help individuals gain insight by favoring the making of previously unexplored connections between their positive dreams and different elements of their waking life (e.g., Hill, 1996b; Pesant & Zadra, 2004). This form of dream work can be seen as relating to the therapeutic orientation of positive psychology which focuses on "positive experiences and positive individual traits" (Duckworth et al., 2005, p. 630) and is concerned with clients' "well-being and optimal functioning" (p. 630).

As an example, in the field of addiction treatment, many clients new to recovery experience bad dreams or nightmares of using substances or relapsing (Christo & Franey, 1996; Tanguay et al., 2015) and clients are often encouraged to disclose such dreams, which typically evoke feelings of shame and guilt, specifically those new to recovery (Flowers & Zweben, 1998). These clients, however, may also find it beneficial and therapeutic to not only focus on their bad dreams and nightmares related to substance use, but also on their positive dreams, such as those in which they choose not to use drugs or alcohol, or in which they experience positive emotions related to their recovery process or sobriety. In addition, when engaging in dream work in a therapeutic setting with populations suffering from addictions, or any other psychological condition, it could be interesting to investigate whether symptom reduction over time in clients' waking lives is reflected in the appearance of specific positive elements in their everyday dreams.

Conclusion

This study was the first to examine a large sample of highly positive dreams to better understand their nature and content characteristics. Given the paucity of information on the content of highly positive dreams, our results add new and important findings to the field of dream research. Much work, however, remains in order to better understand the various forms of highly positive dreams as well as the state and trait factors that may contribute to their occurrence. Ultimately, a better understanding of these often impactful but long neglected categories of dreams and the ways in which they may relate to waking states and general wellbeing may lead to a greater appreciation of the range of highly intense emotions that can be experienced in dreams, their possible role and impact in people's lives, and new insights into methods of integrating such dreams in clinical practice.

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Appendix A

Example of Dream Narrative with a Triggering Factor

Female, age 33

It is broad daylight in the morning, it is beautiful and warm outside and we're getting ready to leave, my sister and I, to go out with our kids, *when suddenly the mailman arrives and gives me my allowance checks* in hand since I was at the door ready to leave. The mailman had a nice smile, he was young and very friendly. I thanked him, filled with joy because at last I could see my little family better and I felt very light.

(Translated from French to English)

*Trigger appears between asterisks

Appendix B

Table 1. Classification of Thematic Categories in Highly Positive Dreams

Theme	Description
Sexual Content	Engagement in sexual activities
Positive Platonic Social Interactions	Interpersonal platonic interactions, including camaraderie, friendship, celebration, acts of benevolence, cooperation with others, as well as being complimented by others
Being in Nature/Bountiful Environment	Descriptions of beautiful natural surroundings and scenery, including flora, fauna, and landscapes
Artistic Creations or Endeavors	Descriptions of creativity and entertainment, including the presence and descriptions of literature, poetry, dance, painting, cinema, music, comedy, and cuisine
Success/Overcoming an Obstacle	Succeeding in a task, challenge, competition, or adventure
Learning /Gaining Knowledge	Acquiring new understanding or experiencing a form of epiphany
Sports and Games	Playing or watching sports or other forms of games
Flying	The act of flying or floating in the air
Love and Romance	Descriptions of romantic love towards another, and/or being attracted to or flirting with another, in which sexual content is not present
Magical/Supernatural Powers	Possession of superhuman capabilities (e.g., invisibility), not including flying
Self-Assertion	The act of standing up for oneself, opposing authority, breaking rules, or seeking revenge
Babies and Pregnancy	Including being pregnant, giving birth, having a new baby, or taking care of a baby

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Receiving a Gift/Good News	Dreamer receives a gift or positive news/information
Humor/Laughter	Finding something humorous in the dream and/or descriptions of laughter
Nostalgia	Returning to a nostalgic place, time, or person
Other	Including travel, a godly or spiritual presence, and an individual returning from the dead or presence of ghost(s)

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Table 2. Distribution of Percentages of Highly Positive Dream Themes*

Theme	Men (N = 40 dreams)	Women (N = 78 dreams)	Entire Sample (N = 118 dreams)
Sexual Content	N=9, 22.5%	N=24, 30.8%	N=33, 27.9%
Positive Platonic Social Interactions	N=13, 32.5**	N=12, 15.4	N=25, 21.2
Nature/Bountiful Environment	N=4, 10.0	N=15, 19.2	N=19, 16.1
Success/Overcoming an Obstacle	N=4, 10.0	N=6, 7.7	N=10, 8.5
Artistic Creations or Endeavors	N=6, 15.0**	N=2, 2.6	N=8, 6.8
Learning/Gaining Knowledge	N=4, 10.0	N=4, 5.1	N=8, 6.8
Sports and Games	N=0, 0	N=7, 8.9	N=7, 5.9
Flying	N=1, 2.5	N=5, 6.4	N=6, 5.1
Love & Romance	N=2, 5.0	N=4, 5.1	N=6, 5.1
Magical/Supernatural Powers	N=2, 5.0	N=4, 5.1	N=6, 5.1
Self-Assertion	N=1, 2.5	N=5, 6.4	N=6, 5.1
Other	N=2, 5.0	N=3, 3.8	N=5, 4.2
Babies and Pregnancy	N=0, 0	N=4, 5.1	N=4, 3.4
Receiving a Gift/Good News	N=2, 5.0	N=2, 2.6	N=4, 3.4
Nostalgia	N=2, 5.0	N=2, 2.6	N=4, 3.4
Humor/Laughter	N=1, 2.5	N=2, 2.6	N=3, 2.5

*Wherein the theme was either the sole theme of the dream, the primary theme of the dream, or the secondary theme of the dream

**P<0.05

THEMATIC AND CONTENT ANALYSIS OF POSITIVELY TONED DREAMS

Table 3. Categories for Positive Emotions

Emotion	Description
Joy	Expressions of happiness, enjoyment, or pleasure
Lust/Sexual Arousal	Sexual desire, including descriptions of physical arousal and urge
Pride	Self-satisfaction, including descriptions of confidence and self-esteem, as well as assertiveness
Surprise	Astonishment at an unexpected event or occurrence
Playfulness/Amusement	Descriptions of light-heartedness, fun, and hilarity, as well as the feeling of being entertained
Calmness/Serenity	Peacefulness and tranquility
Awe	A sense of being overwhelmed with wonderment
Interest	Curiosity and inquisitiveness
Affection/Love	Fondness, endearment, and caring, including, but not restricted to, the context of an interpersonal relationship
Hope	Descriptions of optimism, including in relation to faith, beliefs, or aspirations

THEMATIC AND CONTENT ANALYSIS OF POSITIVELY TONED DREAMS

Table 4. Distribution of Percentages of Emotions in Highly Positive Dreams*

Emotion	Men (N = 40 dreams)	Women (N = 78 dreams)	Entire Sample (N = 118 dreams)
Joy	N=20, 50.0%	N=31, 39.7%	N=51, 43.2%
Lust/Sexual Arousal	N=9, 22.5	N=22, 28.2	N=31, 26.3
Pride	N=4, 10.0	N=13, 16.7	N=17, 14.4
Calmness/Serenity	N=6, 15.0	N=8, 10.3	N=14, 11.9
Surprise	N=6, 15.0	N=7, 8.9	N=13, 11.0
Playfulness/Amusement	N=4, 10.0	N=9, 11.5	N=13, 11.0
Interest	N=6, 15.0	N=4, 5.1	N=10, 8.5
Awe	N=5, 12.5	N=4, 5.1	N=9, 7.6
Affection/Love	N=2, 5.0	N=3, 3.8	N=5, 4.2
Hope	N=0, 0	N=2, 2.6	N=2, 1.7

* Wherein the emotion was either the sole emotion of the dream, the primary emotion of the dream, or the secondary emotion of the dream

THEMATIC AND CONTENT ANALYSIS OF POSITIVELY TONED DREAMS

Appendix C

Descriptive Table of 88 Retained Participants

	Participant	Sex	Age	Language	Number of Intensely Positive Dreams
Sample 1	1	Male	39	English	2
	2	Female	48	English	1
	3	Female	36	English	2
	4	Male	24	English	2
	5	Female	43	English	1
	6	Female	26	English	1
	7	Male	24	English	1
	8	Female	31	English	1
	9	Female	50	English	2
	10	Female	35	English	1
	11	Female	30	English	1
	12	Female	30	English	2
	13	Female	19	French	1
	14	Female	38	French	1
	15	Female	31	French	2
	16	Female	42	French	1
	17	Female	41	French	1
	18	Female	32	French	1
	19	Female	29	French	1
	20	Female	33	French	1
	21	Female	50	French	2
	22	Male	28	French	1
	23	Female	30	French	1
	24	Female	55	French	2
	25	Female	45	French	2
	26	Female	24	French	2
	27	Female	24	French	1
	28	Male	37	French	1
	29	Female	20	French	1
	30	Female	55	French	1
	31	Female	43	French	1
	32	Female	19	French	1
	33	Female	41	French	2
	34	Female	29	English	1
	35	Female	81	French	1
	36	Male	44	French	1
	37	Male	40	English	2
	38	Female	40	French	2
Sample 2	1	Female	37	French	2

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	2	Female	21	French	2
	3	Female	22	French	1
	4	Female	22	French	1
	5	Female	21	French	1
	6	Female	21	French	1
	7	Female	24	French	1
	8	Female	20	French	1
	9	Female	22	French	1
	10	Female	38	French	1
	11	Female	20	French	1
	12	Female	20	French	1
	13	Female	21	French	1
	14	Female	22	French	1
Sample 3	1	Female	54	French	1
	2	Female	20	French	1
	3	Female	30	French	2
	4	Female	24	French	1
	5	Male	21	French	2
	6	Male	25	French	2
	7	Female	20	French	1
	8	Female	22	French	1
	9	Male	22	French	1
	10	Male	21	French	2
	11	Male	20	French	2
	12	Female	22	French	1
	13	Male	27	French	1
	14	Female	23	French	2
	15	Female	21	French	1
	16	Female	20	French	1
	17	Female	20	French	1
	18	Female	22	French	1
	19	Female	21	French	1
	20	Male	64	French	2
	21	Female	49	French	1
	22	Female	62	French	1
	23	Female	50	French	2
	24	Male	61	French	1
	25	Female	21	French	1
Sample 4	1	Male	68	French	1
	2	Male	69	French	1
	3	Male	24	French	2
	4	Male	31	French	2
	5	Male	21	French	2
	6	Male	58	French	2
	7	Male	21	French	1
	8	Male	21	English	2

THEMATIC AND CONTENT ANALYSIS OF POSITIVELY TONED DREAMS

	9	Male	36	French	2
	10	Male	26	French	1
	11	Male	27	French	2
Total	88	26M, 62F	32.2±13.2 years	73F, 15E	118