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Content

This supplement of the International Journal of Dream Research includes the abstracts of presenters who gave consent to the publishing. The abstracts are sorted according to the last name of the first presenter.

Assessing dream impactfulness, session depth and dream understanding in a dream group

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There is considerable controversy about the extent to which the study of dreams in either individual psychoanalysis or group sessions can result in personal insight about the self or insight about possible meanings or memory sources of the dream. An extreme scepticism is shown about this in the work of Adolf Grünbaum, where even the agreement of the person who had the dream to an interpretation does not count as evidence for the truth of the interpretation. A more empirical approach has been taken by Clara Hill and Teresa DeCicco, where ratings of session depth are taken after dream psychotherapy sessions.

The current study aimed to assess variables related to dream impactfulness, session depth and dream understanding in a Dream Appreciation group based on the Montague Ullman method. Although such groups in the real-world run with a constant membership and over time, and with all members able to offer dreams, for purposes of scientific control the current study had a group composed of three permanent members (the authors of this paper) plus a space for one participant at a time. The participant would bring 1 or 2 dreams to the group, and the protocol of the Ullman Dream Appreciation method would be followed for each dream. There were 13 participants in total (4 males, 9 females; all undergraduate students), 22 dreams were reported. Each group session lasted from 45 to 75 minutes. Institutional Ethics Approval for the study was obtained, all participants gave informed consent to take part, and ethical guidelines of the IASD for working with dreams were adhered to.

Participants initially completed the Cernovsky Attitudes to Dreams Scale, where higher scores indicate a positive attitude. Each dream was then rated by the participant for its impactfulness on scale 0 to 4 (where 0 = not at all impactful and 4 = extremely impactful) for how on the day of the dream:

- a) the dream affected your waking mood
- b) the dream prompted personal reminiscence
- c) the dream sensitized you to aspects of your personal life
- d) the dream motivated you to changes in the way you live

Attitude to Dreams had only a small correlation with total impactfulness of dreams ($r = .13$, $n=13$).

After the group session participants and the other group

members rated the depth of the dream appreciation session for this dream on a 0 – 100 visual analogue scale. A VAS scale was then used for all group members to rate the degree to which the session for this dream gave them any new understanding of what the dream means, with 0 = not at all and 100 = very much. For the 22 dreams the 3 experimenters had correlations of .39, .28 and .48 with each other, but mean of the experimenters' ratings had only a negligible correlation with the participants' rating of new understanding of the dream due to the group process ($r = -.09$).

The rating of insight into any meaning of the dream, and the rating of any insight into one's self, were treated as separate variables. On the 0 – 100 VAS scales participants' mean rating of new understanding of each dream = 67.8 (SD = 18.2), mean experimenters' rating of post-group understanding of the dream = 72.0 (17.8), and participants' rating of 'Did the session for this dream give you new understanding or insight about yourself or about any aspect of your life?' = 57.0 (15.5).

Two instances of an apparent sudden feeling of realization about how the dream is related to waking life occurred.

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Clara E. Hill, Roberta Diemer, Shirley Hess, Ann Hillyer, and Robyn Seeman (1993). Are the Effects of Dream Interpretation on Session Quality, Insight, and Emotions Due to the Dream Itself, to Projection, or to the Interpretation Process? *Dreaming*, 3, 269-280.

Gendered dreaming: A theoretical overview

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Research in the area of gender differences in dreams has revealed several important and largely consistent differences between the dream lives of men and women. Keeping in mind the caveat that gender differences in dreams are generalizations, and there are many exceptions to the gendered "rules", this theoretical review highlights what appear to be several primary gender differences in the research to date and presents a critical analysis of such differences. One significant gender difference is dream recall frequency (DRF), with females consistently recalling dreams more often than males. This gender difference has been explored in several large studies and has been found cross-culturally. Men and women also report differences in dream aggression, with male dreamers reporting more dream aggression than female dreamers. For this gender difference, male dreams

are more likely than female's to contain physical aggression specifically, and female dreams are more likely than male's to contain aggression in the form of rejection. Familiarity of dream characters seems to be correlated with the sex of the dreamer: women report more dream characters who are familiar to them versus unfamiliar, while men report more unfamiliar dream characters than familiar. In addition, there is a gender difference regarding sex of dream characters, with males dreaming more often of male dream characters and females dreaming of both sexes equally. Other gender differences that have less support in the literature are also reviewed, with suggestions for further research. These include dream perspective, with men dreaming more often in the 3rd person perspective than women, and dream emotions, with women reporting more overall dream emotions than men. When possible, effect sizes for gender differences in dreams are reported.

The Dynamic Dream System. An empirical approach

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Dreams are frequently evaluated on a static basis. However, dreaming, recalling and reporting is a dynamic process. Haddad and Chellaboina (2008) define a dynamical system as "a system whose state changes with time. Specifically, the state of a dynamic system can be regarded as an information storage or memory of past system events". Accepting that dreams are conceived exclusively consciously due to the presence of memory and recall capacity, reflected in dream reports, our memory capacity could be considered as a state of a dynamical system. Hence, written dream reports might obey the state laws of a dynamical system. Consequently, specific report characteristics may change with time, and, possibly enhance a state reconstruction of the dynamic system. This is the subject of this study.

A series of quantitative report variables of 327 dreams from the present author, obtained in one year, have been analysed with respect to time. The reports are composed of a dream (D) and an annotations report (A). Volume variables comprise total word (DW, AW), sign (DT, AT), and sentence (DS, AS) counts. Structural variables are word length (DTW, ATW); sentence length for both dream reports and annotations reports (DWS, DTS, AWS, ATS); number of annotations per dream (DA); ratio of word counts (Rw) and sentence length in dreams and annotations (Rs). These variables are considered content free. All cases were analysed with respect to date (T1). 178 cases are analysed concerning time intervals of sleep start-arousal (T2), arousal-preliminary reporting (T3), arousal-final reporting (T4). Variables were analysed by linear, non-linear and factorial statistical techniques. Different techniques were compared.

T1. Report volumes are highly variable, but constant over a long period ($p=0.01$). Report structure variables show a significant change over time, which is attributed to dynamic impact factors. A major shift in reporting style is observed after reporting some 200 dreams, which co-occurs with obvious changes in dream observation style.

T2. Report volumes show significant fluctuations through the night. Early night dreams volumes are 50% of late night

dreams, approximately. A non-linear sinus-based correlation with T2 yields a reduction of 50% of residual variance, compared to linear correlation. The observed pattern might be interpreted as a circadian response. No systematic changes are observed in structural variables.

T3: For dream report volume variables, a linear regression, an exponential, and a logistic/exponential model are compared. The latter model shows an optimal fit with the data. From these data a generalized, unconstrained dream dynamic system model is proposed, combining an initial phase of dream development, a mature phase, and a phase of dream "decay".

T4: There are significant differences between structural variables of dream and annotations reports. Dream reports generally contain shorter words and sentences. Our non-linear dynamic model predicts that dreams will be lost after several days, without the recall option. Therefore the model is refined as a constraint non-linear dynamic dream model.

The dynamic model approach has a potential to integrate some properties of dream phenomenology.

Dream and Blog Content Analysis of a Video Gamers Long Term Diary

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Our research group has for some time been collecting dreams and examining their association to media use. While we have looked at the impact of various media on dreams, our focus has been on the dreams of hard core video game players. We chose this group because they represent the most intense form of media immersion for long periods of time, and thus are most likely to evidence media use effects on dreams. The reason that it is important to investigate media effects on dreams is because today's post-secondary student, and indeed young adults in general, live in a media saturated world to an extent never before possible. We have used a variety of methods to study the dreams of gamers. This time we are focusing on a long term dream diary of a hard core gamer, NS.

About 430 dreams from his diary were content analyzed using the Hall and Van de Castle system. NS also provided daily blogs which were also content analyzed using a coding system developed by the authors. This diary allowed us to examine the continuity and consistency hypothesis as well as to examine if NS's diary over time evidenced similarities or differences from the norms or from his cohort of males of about the same age who are high end gamers. The findings were that the diary was consistent across time and there was incorporation of some elements of the daily bog into subsequent dreams. A mixed pattern emerged when NS's dreams were compared to same age male gamer cohorts. Some findings implied an adjusted individual; less misfortune, more good fortune, less aggression, less body misfortunes, less self-negativity, and more family characters relative to his cohorts. However, on the negative side are more negative emotions, more aggressor, and less familiarity and friends.

NS has been diagnosed with Obsessive Compulsive Disorder (OCD). One other study has examined OCD versus

control dreams and found no difference between the groups in negative emotions or failure. NS evidenced more negative emotions than HVDC norms but less failure. Additionally, there was no difference in failure from NS's cohorts. This may be due to the success experienced in video game play as illustrated in the dream of NS's:

At first, it was my sister getting stuck on this part. I wasn't familiar with the game so it was tricky for me to help with this. That's when I played through the game to familiarize myself with it. I played until I reached this spot then from there kept on playing in this nonscrolling area scoring big constantly.

Why are video game players' dreams important for understanding dreams?

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This presentation will summarize why studying the dreams of video game players is important for understanding dreams. Hard core gamers represent the leading edge of immersion in virtual worlds that increasingly has come to define a large part of contemporary entertainment and communication. Three conceptual points as to why this new element in contemporary society needs to be investigated in terms of its impact on dreams, will be illuminated. These points are 1) dreams as aid to solving the hard problem in consciousness, 2) evolutionary function of dreams, and 3) gaining lucidity in sleep through imaginal absorption.

First, Revonsuo (2006) argues that dreams are useful for understanding the binding problem in consciousness. The dream state and its inherent bizarre nature allows an unfettered examination of these networks. In other words, if the bizarre element happens due to skip in the track of the semantic network, it does not go too far afield. Thus having a waking situation, video game play, where subjects are exposed for long periods of time to unusual/bizarre experiences can help to further illuminate the nature of bizarreness in dreams and ultimately the hard problem in consciousness. Such a situation is not easily created in a laboratory with a few hours of media viewing or interacting.

Secondly, one evolutionary function of dreaming has been identified as threat simulation (Revonsuo & Valli, 2000). Gaming may reduce this dream function because this need is being addressed in another imaginal realm (i.e., during a game). Early support for this thesis was found by Gackenbach and Kuruville (2008a). Thus gaming offers another realm to investigate this evolutionary function of dreams. Relatedly, the rehearsal of nightmares while awake as a technique to decrease their intensity and persistence (Krakow, Kellner, Pathak, & Lambert, 1996), may also be manifest in some video game players. Specifically, in some studies the Gackenbach group has found gamers reporting fewer nightmares than those that rarely game (Gackenbach, 2009a).

The final reason that studying gaming informs dream studies is the potential of gaming to act as preparation or training for dreaming lucidly (Gackenbach, 2006, 2009b). Again the practice in this technologically generated imaginal realm can result in consciousness emerging in dreams. Thus such inquiries inform not only the question of how to have a lucid dream but also the broader question of the nature of con-

sciousness when it emerges in sleep. In a review of lucidity-gamer association Gackenbach, Hunt, and Dopko (2009) conclude that gaming enhances the experience of lucidity along the same lines as meditators'. These findings can be interpreted equally in terms of a psychology of imaginative absorption.

Research Articles in Dreaming: A Metastudy

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Over the past 21 years, well over 150 research articles have been published in our journal *Dreaming*. They cover an extraordinary range of topics, and have been submitted by many authors from a variety of countries and settings. While the editors of *Dreaming* have been responsibly selective in what articles they accept for publication, nevertheless when viewed objectively there is quite a range of diversity in the academic rigor of these articles. This brief presentation examines this range to try to determine whether there are any consistent trends. Articles are reviewed in terms of how explicit their description of the participant group was, the duration of the study, the number of quantitative tests performed, the level of accuracy accepted, whether they expressed any awareness of the limitations of the study, and whether their final conclusions were blithely global or cautiously hedged. The ultimate aim of the study is the upgrading of research standards in our flagship publication.

Dream Remembering

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Any evidence for having dreamt relies upon memory. This symposium introduced and emphasised the notion that any study of dreams is in fact a study of a dream memory. Three presentations raised important methodological issues surrounding working with dreams as memories. Many dream researchers are aware of the multiplicity of factors affecting dream recall. However literature from waking memory and cognitive psychology literatures are rarely referred to when considering the validity of a dream report. We emphasised the functioning and processing of the waking autobiographical memory system when considering dream recall and noted the similarities, as well as differences, between dream and waking remembering. We encouraged caution when devising systematic paradigms for the study of dreams, in order to ensure that inferences relate to the content and characteristics of dream reports rather than the processes involved in dream generation.

Horton (2010) introduced the autobiographical memory system as an informative comparison to dream remembering. Svob, Kuiken & Nielsen (2010) presented a psychometrically validated measure of dream remembering, whilst raising methodological issues associated with relying upon a uni-dimensional measure of dream recall, as is frequently used in the field. Horton (2010) then presented data demon-

strating the effects of rehearsal of dream and waking memories upon subsequent recall, emphasising the ways in which autobiographical remembering is constructive. Indeed rehearsal was shown to limit, as well as enhance, what was later recalled. Kahan (2010) drew attention to the need for dream scientists to employ methodologically rigorous and systematic designs in the study of dreams. Taken together, these ideas illustrate some of the difficulties associated with dream research, but that the study of various waking life comparisons to dreams, such as waking autobiographical memories, can be most insightful.

Color Reported in Dreams in the First and Second Half of the 20th Century: a Content Analysis

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There has been speculation at times that color in dreams has changed over time, based largely on observations that dream studies prior to 1960 contained less reported color (9% to 20% range) than more recent studies. After REM was discovered, REM awakenings produced color recall in the 69% to 83% range (Herman et.al., 1968; Kahn et. al., 1962). This increased to 80% to 100% when subjects were questioned specifically about color and closer to the time of dreaming than earlier studies (Schredl, 2008). Although change in research method appears to be the likely factor, Schwitzgebel (2002) speculated about the possible pre-sleep influence of black and white versus color media, or attitudes about color dreaming, prior to 1960. Some possibility remained when tested by Murzyn (2008).

The objective was to determine if any such effect was general and strong enough to be noticeable in a large database of dreams that spanned this timeframe; dreams reported prior to 1950 or of those who grew up before 1950 (when only 12% of movies were in color and before color TV) versus dreams reported after 1980 (when color dominated media). A content analysis was performed on a database (Schneider & Domhoff, 1999) of 25,222 spontaneously recalled dream reports, resulting in 4,555 color reports from 55% males and 45% females, spanning a time period of from the early 1900's through the present. This study looked at: 1) percent color recall (standard set of 13 most frequently recalled colors); and 2) the relative frequency pattern of specific colors recalled.

A consistent color frequency pattern (with 6 dominant colors including black and white) was observed to exist in most every sampling of large and small data sets of individuals and small groups regardless of age or timeframe. Comparing 500 female dreams from the late 1940's with 3,900 post 1980 female dreams, indicated relatively equivalent color recall (25.3% and 26.9% respectively), and a consistently shaped color pattern, although there was 6% less of both black and white relative to color in the pre-1950 data than in the post 1980. Comparing 2458 dreams of older persons, who grew up with black and white media (1930s and 1940s), to 1584 dreams of those born after 1960 showed similar color recall (26% and 22.5% respectively) and a similar color pattern but again with slightly more color and less black for the older group than the younger.

The content analysis indicates no appreciable difference

in the percentage of color recall nor pattern of specific colors reported before and after 1950 although there appeared a trending toward more color recalled relative to black and white for the older groups – which is counter to the speculated effect of media exposure or attitude. The color patterns in dreams across the century seem to have remained relatively constant.

The full report can be found in the International Journal of Dream Research Volume 3, No. 1 (Hoss, 2010).

Evidence of Wisdom in Dreams

Robert J. Hoss

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Carl Jung (1971) attributed an inner “wisdom” to the unconscious claiming it to be an “independent productive activity, constantly supplying us with contents (predominantly in dreams) which if consciously accepted would extend the range of consciousness.” To Jung dreams are an emotionally driven “transcendent” function that brings about a change in attitude by “compensating” for the misconceived aims of the ego. Other theorists, researchers and psychologists have attributed a “wisdom” of sorts to dreaming, or characterized dreaming as: a creative recombination of memories and knowledge (Foulkes, 1982); an adaptive, emotion guided, hyper-connective mental function, which is in part how the brain learns by creating new connections and weaving new material into established memory (Hartmann, 2010); a source of wisdom that can guide and inspire us at times of crisis, accessing hidden feelings and unexpressed needs (Siegel, 2002); a source of insight, which when recognized and utilized may be one of the most life-enhancing actions we can take (Krippner, 2009).

I have observed three common characteristics accompany this process (Hoss, 2005): 1) Surprise - unusual imagery combinations, plot “twists”, or unexpected discoveries that juxtapose incompatible beliefs or concepts; 2) Guidance – words, actions or events which direct the dream ego toward a new awareness or possibility; 3) Positive Reinforcement – projecting a rewarding outcome based on dream ego actions or decisions.

Some recent neurological findings appear supportive of a conflict resolution, behavioral learning and reinforcement function. During REM (the more vivid dream state) executive functions are inactive including: rational thought, linear logic, episodic memory, and sensory and motor functions. However a unique combination of centers become active which not only stimulate the dream and imagery, but which suggest a degree of cognition, inner wisdom and self-healing similar to the “compensation” and “transcendent” functions Jung described.

High Limbic activity (emotional brain) has lead many researchers to conclude that dreams selectively process emotionally relevant memories via a cortical interplay with the Limbic system (Nofzinger, Braun, Marquet in Hobson et. al., 2003 also Dang-Vu et.al., 2007). Although the Primary Visual Cortex is inactive, the active Association Cortex forms visual and sensory associations with what is being processed, creating the stuff we recall as the dream. During REM there are also a number of centers that are active which play an unconscious role in waking cognition. The Medial Prefrontal Cortex is involved in goal-directed behavior, so-

cial and self-referential activities (Gusnard, 2001) and self-monitoring of learning (Marley, 2009). The Anterior Cingulate monitors and mediates resolution of anomalies and conflicting perceptions, by anticipating the consequences based on experience or imagined outcomes (dream scenarios?), then selecting responses based on valuing the rewards, monitoring the outcome, and adapting behavior based on that outcome (Bush, 2002; Apps, 2009; Hayden, 2009, Botvinick, 1999; Luu, 2004; Allman, 2001; Posner, 1998). It works with the Orbitofrontal Cortex, which processes internal information during decision making and expectation, evaluates emotional value and adjusts our planning behavior, leading to changes in ongoing behavior (Kringelbach, 2005; Bechara, et al 1994).

Emotion and Reflective Awareness in Dreaming: Mapping Their Reciprocal Influence

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This presentation will provide initial results from the project that was named the primary recipient of the 2008 IASD Dream Science Research Grant.

The focus of the project is developing a new approach to the scientific study of 1) emotion in dreams and 2) reflective awareness across the waking, sleeping, and dreaming states. Our goal is to combine these two areas of research. Using an innovative analytic method that combines content and process approaches, we hope to advance the scientific understanding of how dreams are generated. Specifically, we want to shed new empirical light on the roles of feeling and thinking in the formation of dreams.

The theoretical basis for this project is our belief that the dream generating process involves a dynamic interaction of emotional and cognitive factors. Recent research in (waking) cognitive neuroscience has demonstrated that feeling and thinking interact in complex, mutually supportive ways (Damasio, Forgas, Panksepp), with the implication that old psychological theories of consciousness need to be revised in light of the new data. Our project is aimed at extending this theoretical revision into new territory by investigating the interaction of emotion and cognition in dreaming.

Many theories of dream formation assign a central role to emotion (Cartwright, Hartmann, Kramer, Freud) and/or posit a fundamental deficiency in thought processes during dreaming (Hobson). We believe these theories do not account for evidence that dreaming as a whole is more cognitively sophisticated and less emotionally intense than is often assumed (see Hall and Van de Castle, Domhoff, Kahan, Hunt, Gackenbach and LaBerge, Kozmova and Wolman). We further believe that trying to determine whether emotions cause thoughts or thoughts cause emotions is a reflection of the old theoretical paradigm that needs to be discarded. To understand the dream formation process, we need to understand the mutual relationship between emotion and cognition. They are co-determining factors whose interactive potentials have yet to be mapped out in systematic, empirical terms. Our goal is to make new progress in that mapping effort.

The specific focus of our project is the emotional context in which reflective awareness (RA) does or does not emerge. We will investigate the following questions: Does

RA emerge more often in dreams with intense emotions, or in dreams with no emotions? Is there a difference in RA between dreams with very negative or very positive emotions? What other aspects of dream content (e.g., characters, social interactions, colors) are related to the emergence of RA in dreaming? Our hypothesis is that dreaming involves a more complex and variegated relationship between cognition and emotion than has been recognized by other dream theorists.

Dreaming, Lucidity and Mind Wandering

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An overview of the brain networks that are involved in mind wandering and in lucid and non-lucid dreaming is given, as well as an overview of the kinds of awareness associated with these networks. When awake and actively engaged in performing a task, appropriate regions of the brain are available as are the neuromodulatory brain stem systems. In REM sleep, however, the aminergic neuromodulatory brain stem systems become unavailable, as do several brain regions including the dorsolateral prefrontal cortex and the precuneus. In REM sleep with lucidity, increases in 40 Hz power helps to physiologically distinguish lucid from non-lucid dreaming (Voss, et al., 2009). Mind wandering is distinguished from both of these REM states as well as from the active wake state by activation of the default network (Raichle, et al., 2001). The default network, active during mind wandering, includes parts of the posterior cingulate, the medial prefrontal and dorsolateral prefrontal cortex and the precuneus, the last two, by contrast, being deactivated in REM dreaming. These brain networks, the default, lucid and non-lucid networks are responsible for different kinds of awareness. For example, in a dream there may be awareness of oneself in the dream story that is unfolding, but no awareness that you are talking with a person long since dead in the wake world. In lucid dreaming one becomes aware that one is dreaming. Mind wandering provides yet another kind of awareness. It differs from the awareness that is brought to bear on the performance of a goal-directed task. The question of how different kinds of awareness influence creative insight is addressed by citing the work of Cai, et al., 2009 who used the remote association test (RAT) that measures our ability to come up with a word that is associated with other words. The RAT has been used to demonstrate that subjects find more associations when previously primed after a nap if it included REM sleep than if it did not, or if no nap was taken. The RAT may be used to test for the creativity of subjects who became lucid during a nap; and after a period of doing nothing except mind wandering.

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Cognitive Processes Investigated in Threatening Dreams of Japanese and Ukrainian Dreamers

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Previous studies that investigated dreamers' responses to nocturnal dilemmas mainly focused, through the use of dream content analyses, on elucidating the adaptive function of dreams positioned within an individual's personal mythology (Kuper, 1983) or within adaptations connected with psychoanalytical theory (Glucksman & Kramer, 2004; Greenberg, Katz, Schwartz, & Pearlman, 1992; Wolowitz & Anderson, 1989). It is not yet known, however, what might be the extent and the variety of cognitive processes dreamers are capable of using in the context of dreams' specific problems defined as threats, dangers, risks, or fear-related concerns.

The goal of the current study is to report the results of a qualitatively based investigation that was guided by the question, What types of problem-solving strategies are dreamers capable of using when confronted, within their dreams, with imminent environmental or self-created threatening or dangerous situations? The study utilized 400 self-selected dreams of male and female dreamers (aged 20 to 70 years, with a few younger or older exceptions) from Japan and Ukraine. With the operationalized definition stating that a problem-solving dream included a *prima facie* observable fear-induced quality, from these four distinct groups of dreamers were selected problem-solving narratives with threatening features in the following distribution: 64 dreams of Ukrainian males; 44 dreams of Ukrainian females; 41 dreams of Japanese males; and 61 dreams of Japanese females. These dreams contained descriptions of subjective experiences in which dreamers used variety of tactics, maneuvers, and strategies to confront or resolve the problems they faced (e.g., threats, dangers, risks, or fear-related concerns).

The analysis of dream content with problem-solving elements utilized the method of constant comparative analysis of grounded theory (Glaser & Strauss, 1967; Glaser, 1987) with the exclusive focus to capture the sequence, extent, and types of cognitive processes dreamers are capable of using with the purpose of eliminating threatening situations. The study describes the types of cognitive strategies often by using *in vivo* language—the language of participants. The opening, focal, and closing strategies contain types of thinking that include specifically cognitive processes and also cognitive problem-solving processes with emotional underpinnings.

Based on the results of this qualitative analysis of subjective experiences of dreamers, the classification of problem-solving cognitive processes demonstrated by dreamers in threatening situations might currently represent the extent of known possibilities for resolving conflictual, problematic, or dilemmatic situations in dreams that are underlined by the presence of emotion of fear. The scope of cognitive capacities dreamers used to alleviate these perturbations within the dream scenarios also allows for the conclusion that the goal-oriented strategies might expand our understanding of executive function that operates during dreaming. The range of cognitive processes further points to the existence of a phenomenon of nocturnal cognitive problem solving (Kozmová, 2008) that becomes activated in response to

emotional disequilibrium and renders itself to speculations about the function of specific problem-solving dreams.

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Evidence of wisdom in 'extraordinary' dreams

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The history of dreams and dreaming contain anecdotal reports as well as research evidence that dreams can sometimes reach beyond ordinary limits of space and time providing information so profound that dreamers often refer to it as "wisdom." These "extraordinary dreams" not only provide evidence of information that seem to transcend ordinary sensory barriers but may even provide glimpses into dimensions considered by many cultures to be the domain of spirit. These dreams include geological discoveries (Louis Agassiz's discovery of a rare fossil, following directions given him in a dream), archeological discoveries (Herman Hilprecht's piecing together a Middle Eastern artifact after receiving instructions from a "dream teacher"), technological discoveries (Elias Howe's invention of the lock-stitch sewing machine following a dream-delivered insight), and mathematical discoveries (Jerome Cardan's recurring dream that motivated him to write his most celebrated book), and musical discoveries (Giuseppe Tartini's composing of the "Devil's Sonata," Wagner's composing of the beginning of "Das Rheingold"). Occasionally, these dreams provide wisdom in the spiritual domain as well (ranging from the predictive dreams of Buddha's mother as well as those of the Old Testament prophets). The New Testament tells the story of how a warning dream enabled Joseph, Mary, and the infant Jesus to escape King Herod's wrath. A combination of these two domains can be seen in the dreams of the Indian mathematical prodigy Srinivasa Ramanujan who consorted with Hindu goddess Namakal in his dreams to go beyond mathematical theory current in Europe at the time. When he was invited to study at Cambridge University in England, his mother refused until she was urged to change her mind by the goddess Managiri who appeared to her in a dream. In contemporary indigenous and shamanic traditions, dreams continue to provide insights into major and minor life cri-

ses, providing the basis for decision-making and problem-solving.

The Subjective and the Objective Duration of Static NREM Sleep Dreams

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Background: Several researchers have argued that dreams may last throughout the night, while others have claimed that dreams are formed instantaneously at the moment of awakening. Yet, only a few empirical studies, based on post-awakening reports, incorporation of external stimuli into dream content, or counting tasks performed in lucid dreams, have aimed to explore the average duration of dreams. These studies have focused on the duration of typical complex REM sleep dreams, leaving the more simple forms of NREM sleep dreaming aside. We aimed to investigate the duration of static NREM sleep dreams, which usually consist of just a few comparatively mundane experiences.

Method: 10 participants spent 4 experimental non-consecutive nights in the sleep laboratory and were awakened 8 times per night, following the early-night serial awakenings paradigm (Noreika, Valli, Lahtela, & Revonsuo, 2009). Awakenings took place during NREM sleep Stages 2 and 3 as well as during sleep onset REM sleep and were followed by a free dream report. Participants were also asked to answer a detailed questionnaire on different aspects of dreaming, including 5 questions about the subjectively estimated duration and the speed of time passage in the dream. The objective duration of NREM dreams was tentatively explored by EEG contrast between the reports of dreaming and dreamless sleep in a series of 2 s pre-awakening segments, starting with a 2 s segment of sleep just before awakening, then analyzing a previous 2 s segment, then another previous segment, and so on. We expected that such stepwise analysis would detect a time point at which alpha and beta power of pre-awakening sleep EEG would not differ anymore between conditions of reported dreams and dreamless sleep, which would suggest how long these dreams may have lasted on average.

Results: (1) Most of the NREM dreams appeared to be static and limited in content, while the majority of the REM dreams were complex and dynamic. (2) Even though the duration of sleep was equivalent, the subjectively estimated duration of dreams differed between sleep stages, with REM dreams being reported as having been longer than NREM dreams. Yet, even the simplest NREM dreams were often experienced as having a duration of 30 s, 1 min or even longer, rather than being brief flashes of images. (3) By contrast, the subjective speed of time passage did not differ between dreams of different sleep stages and was typically scored as resembling waking life. (4) EEG spectral power in alpha to beta frequency range varied randomly between the dream and the dreamless conditions across a pre-awakening period of 20 s.

Conclusions: The subjectively reported duration of

dreaming is associated with the complexity of dream experiences: dynamic REM dreams seem to last longer than static NREM dreams. Even though NREM dreams are also reported as extended in time, EEG findings do not support this and are compatible with the view that static NREM dreams might be generated during a brief moment before or during awakening.

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REMS Suppression and Significantly lower Nightmare vs Dream Recall In Patients with OSA

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In a study of a sleep laboratory population including patients with more severe apnea undergoing split-night studies (204/393 [51.9%]) patients with more severe OSA, as based on higher AHI, reported a significantly lower frequency of nightmares. No such changes were found to significantly affect the reported frequency of dream recall in this study. Mean Apnea-hypopnea Index (AHI) for this study population was 34.9 (std = 32.0). AHI and AI (Apnea Index) were significantly higher ($p=0.000$) for the grouping reporting infrequent nightmare recall. 71.4% of individuals in the grouping with an AHI < 5.0 reported nightmares occurring more than once/week. As the AHI score increased, the percent of participants with such frequent nightmare recall decreased linearly. This finding indicates that OSA, suppresses the cognitive experience of nightmare recall, an effect that occurs independently of OSA effects on reported dream recall frequency.

This finding, that worsening OSA results in a significant decline in reported nightmare recall frequency could potentially be secondary to the effects of OSA in inducing daytime sleepiness. Patients that are more difficult to arouse report lower nightmare frequency. However, daytime sleepiness is not present in all patients with OSA, with studies reporting excessive sleepiness in 15.5-22.5% of middle-aged OSA patients. In addition to daytime sleepiness, OSA is known to result in cognitive deficits that include declines in working memory and deficits in frontal cortex executive functions. However, cognitive deficits are not present in all OSA patients and have been difficult to describe consistently for the disease process. The potential effects of OSA in inducing cognitive impairment do not explain why worsening OSA should significantly affect nightmare as opposed to dream recall. The possibility that insomniacs, known to have higher nightmare frequency than the general population, might comprise a higher percentage of low AHI no-CPAP group and introduce a selection variable accounting for the higher proportion of nightmares was also addressed in this study. Even in the lower mean AHI group not treated with CPAP, increasing AHI significantly reduced reported nightmare frequency. While dreaming occurs throughout sleep, nightmares are generally described as a REMS associated parasomnia. REMS is the sleep stage most susceptible to abnormal breathing events, with OSA selectively suppressing REMS. It appears likely that diminished REMS in OSA

patients accounts for the finding of decreased frequency of nightmares compared to dreaming in this population.

Absolute Metaphor in Dreams

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Science can be defined as the study of the correspondence, grounded in correctness, between metaphoric characteristics and the subject of study. The phenomena of dreaming that can be “scientifically” studied include: content, emotion, recall frequency, visual process, memories and memory process, associated diagnoses and effects on behavior. Most approaches to the study of dreaming avoid studying such dream phenomena and move directly into the study of postulated underlying processes (the phenomenology of dreaming). Studies of dream phenomenology are generally either neuro-physiological (primarily the study of REM sleep) or psycho-dynamic (Freudian, Jungian, etc.). Such approaches (studies of theory-constitutive metaphors) are conducted at a degree of logical remove from the topic of study in that the scientific validity for the proposed correlates of dreaming in each of these systems of study are unproven. These approaches do have advantages in that they address the process of dreaming rather than discrete and limited associated phenomena. Potential approaches that exist for scientifically studying dream process include the study of absolute metaphors of the dream state – characteristics that are not reducible with conceptual thought or language. Such absolute metaphors in dreaming include studies of formal structure and rhetoric, as well as studies of imagery viewed non-contextually (without replacement, interpretation, or analysis of association).

Dream Incorporation of Video Game Play: Interactivity, Fidelity and Presence

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In a series of studies Gackenbach and colleagues have been investigating the impact of media exposure, especially video game play, on dreaming. These studies are primarily descriptive using methods from first person interviews, retrospective questionnaires, and morning after dream diaries regarding dreams and media use. Video game play has been found to be associated with various dream types. However, no study from this laboratory to date, has done an experimental manipulation of game immersion factors in order to investigate subsequent dream incorporation. Nielsen, Saucier, Stenstrom, Lara-Carrasco, and Solomonova (2007) did something very close when they used an immersive virtual reality (VR) setup to investigate dream incorporation. They had subjects follow a maze in VR and examined subsequent dreams. They were successful in having subjects identify incorporation of the VR experience into their dreams.

The current study is a replication and extension of that preliminary effort but this time a video game was used, *Mirror's Edge*. In this case, we added presence self reports

as a dependent variable for both the game and the dream, along with interactivity and fidelity independent measures to manipulate immersion. The former independent measure was either passive or active, while fidelity was either high screen resolution with stereophonic headset audio versus low screen/audio.

We developed a dream content analysis system based on the game, beyond the subjects self report of perceived incorporation. Two high end gamers, who are researchers in this study, went through a grounded theory approach to develop a dream content system for evidence of this game being incorporated into the dream. Their final coding system was based upon act frequency and was divided into four classes of variables: 1. Primary elements were defined as being unavoidable, core processes; 2. Secondary elements were supportive of the primaries; 3. Extra-game elements accounted for indirect products of game play (i.e. fear of heights); and 4. Laboratory elements are in-dream manifestations of the experimental setting. They achieved over 80% reliability on coding the same dreams and are currently doing the rest of the dream coding. Finally, all dreams collected over the two weeks following the manipulation are also being content analyzed using the Hall and Van de Castle system.

The independent variable of fidelity was especially strong both in the manipulation and in the subsequent dream incorporation for self report while interactivity became the dominant variable when viewed from the judges' perspectives. The effects of demand characteristics and emotionality were also considered.

Religious and Spiritual Dream Symbols in Two Samples: Canadians and The United Arab Emirates

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Research on religious and spiritual symbols in dreams has been examined in the past but remains relatively understudied across many cultures, to date. Research by Salem and colleagues (2009) has focused on dream experiences within a student sample from the United Arab Emirates. Since dreams are highly valued in Islamic societies because of religious factors, the results of this study provides insight into dream content for this culture. The current study was undertaken in order to extend this research by examining religious and spiritual content between two diverse cultural groups. One group is Canadian which is a heterogeneous sample including Protestants, Catholics, Atheists, and others. The second is from the United Arab Emirates which is predominantly of the Islamic faith. The goal of the study was to test the following hypotheses: 1) Since people of the Islamic faith are religious and spiritually oriented in waking day, they will be high in religious and spiritual dream content (Salem et al., 2009). This will confirm the continuity hypothesis of dreaming (Schredl & Hoffman, 2007). Also, it is expected that the Canadian sample will have some religious and spiritual dream content, but less so than the United Arab Emirates sample. 2) It is expected that the two samples will differ significantly in dream categories and will be

representative of waking day religious/spiritual beliefs and behaviours of each group. For example, a significant difference is expected between the two samples for religious figures appearing in dreams.

This study examined the dreams of 114 Canadian female students and 114 United Arab Emirates female students (UAE). For the UAE sample, 101 were single and 13 were married. For the Canadian sample, 96 were single, 4 were married, and 14 were co-habiting. Students were asked to volunteer 1 dream for a research project. They were also given a demographics sheet assessing gender, marital status, and the following questions: Do you consider yourself religious or spiritual? Do you change your daily and life plan in response to your dreams?

The dreams were content analyzed as has been established in previous research (DeCicco, 2007; DeCicco & Higgins, 2009), for salient religious and spiritual symbols. Both hypotheses were confirmed in that religious and spiritual imagery was relevant and salient for each group and much higher for the UAE sample. The findings shed light onto the dreaming mind in terms of beliefs and practices for UAE and Canadian female students. The findings show that the dream imagery reflects each culture appropriately and supports the continuity hypothesis. Future research examining prediction of variables based on dream content and implications for applied practice appear warranted. Furthermore, extending the research to other cultures is certainly warranted.

Effects of Watching Films on Dreams of the UAE University Students

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Background: Films have a powerful effect on the individual, affecting many psychological functions. Films allow the viewer to enter a world which they have not seen before, and with modern day computer generated images and special effects, the possibilities are countless and unpredictable. Films present characters and variety of actions with colour and sound effects that can affect our emotions and leave strong impressions. Like wakeful life events, they might affect our dreams.

Aims: The purpose of this research is to investigate the effect of watching films on the dream life of a sample of UAE university students and whether there are any gender differences in such effects.

Methods: This study was a descriptive cross-sectional epidemiological survey in the academic year 2008 /2009. A questionnaire was randomly distributed among students, and those who consented for the study filled the questionnaire

Results: The sample included 200 students, 100 males and 100 females. The mean age of the sample was 19.7 years, and the majority were single (90.3%). They responded to the questionnaire for items eliciting the habits of the student in watching films; the frequency, venue, company, and the preferred types of films. The student chose the most preferred type among a choice of the different film categories. They described the effects of watching the films on their dreams across various aspects including dream recall,

dream characters, actions and emotions. Also, they were inquired about nightmares and repeated dreams with negative emotions in relation to the watched films. In all of the above findings gender differences were studied.

Conclusion: In this study, watching films had a significant effect on many aspects on the viewer's dreams, including dream recall, and there was a significant gender difference in many of these findings.

Comparing The Projective Method of Dream Interpretation between Italians and Canadians

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The examination of dream interpretation techniques has been a key focus of research and writings in the psychological literature (e.g. DeCicco, 2007; Hill, 2003). More recently, methods have been translated from an English-only Version of dream interpretation to other languages. For example, an Italian Version of The Storytelling Method (DeCicco, 2006; DeCicco & Donati, 2008) has been translated and tested in clinical practice (Decicco, Donati & Pini, 2009). The purpose of the current research was to extend previous findings by testing a second dream interpretation method, The Projective Method, in both an English speaking sample (DeCicco, 2008) and an Italian speaking sample (DeCicco & Schinco, 2009). The Projective Method is a revised and updated version of the Ullman Method (DeCicco, 2009).

The method was administered to groups, one in Italy and one in Canada with a total of 17 participants in each sample. Five males and 12 females participated in each group. One recent dream and one discovery from that dream were collected from each participant. Discovery categories were also content analyzed for major categories such as family, work, stress, major life change, health/illness. The discovery categories were also scrutinized for additional relevant categories.

The following hypothesis was tested: Since it was found in previous research that the dreams of Italians and Canadians do not differ significantly for many categories (DeCicco, Zanasi, Musolini, Wright, 2009) discovery categories between the two groups would be examined. It is hypothesized that there would be significant differences for several categories between the two groups. Discovery categories would also be culturally relevant.

It was found that the two groups had the same discovery categories for stress, work, family, and future. The Italian sample also had the additional categories of ethics, health, parenting, personal change, personal acceptance, and sharing. The Canadian sample also had discovery categories of romantic relationships, challenges, worry, and the past. When t-tests were performed, there was a significant difference between the stress category for Italians and Canadians. This could be due to the differences in the samples though they were both predominantly counselling students. It appears that the method was useful for both the Italian and the English speaking groups. Further research is warranted and the method should be extended to groups that have found dream interpretation useful such as recovering alcoholics (DeCicco & Higgins, 2009), cancer patients (Goelitz, 2007), and other groups of therapy patients (Waden-

sten, 2009). The method should also be translated into other languages and tested with other cultural groups.

Gender differences in dream content: Related to biological sex or sex role orientation?

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Despite the large number of studies addressing gender differences in dream recall and dream content, research regarding whether these differences might be affected by sex role orientation is rather scarce. It was hypothesized that dream topics more present in males should correlate positively with masculinity/instrumentality and dream topics more often found in women should correlate positively with femininity/expressivity.

Method. Overall, 2894 persons (2016 women, 878 men) completed the online survey including a most recent dream between Oct. 10, 2008 and Nov. 20, 2008. The mean age of the sample was 34.2 ± 14.7 years (range: 14 to 86 years). The participants were asked report a most recent dream and to complete the GTS+, a questionnaire measuring sex role orientation along two dimensions: expressivity/femininity and instrumentality/masculinity. Dream reports were rated along the several scales by a "blind" rater.

Results and Discussion. The results clearly indicate that sex role orientation (femininity/expressivity and masculinity/instrumentality) affect the same dream characteristics that show marked gender differences, e.g., sexual dream content, physical aggression. One major difference to prior studies was ratio of male dream characters to male and female dream characters found in this study: 59.2 % (women's dreams) vs. 42.4 % (men's dreams). Whereas the effect of sex role orientation on dream content support the continuity hypothesis of dreaming, the effect of biological sex on dream content does not exclude that other variables such as, for example, the amount of sexual fantasies during waking, have an effect on dream content in addition to sex role orientation. Thus, future studies have to elicit more waking-life variables in order to model the varying daytime experi-

ences of men and women in order to investigate whether these daytime differences sufficiently explain gender differences in dreaming or whether biological factors are also of importance.

Nightmare frequency and nightmare topics in a representative German sample

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Nightmare content has been studied very rarely in a systematic way, especially in adults. The present study investigated nightmare frequency and the frequency of various nightmare topics in a representative German sample. The five most common themes were falling, being chased, being paralyzed, being late, and the deaths of close persons. Even though several effects can be explained by the continuity hypothesis of dreaming, further research is needed to investigate the possibly metaphoric relationship between nightmare topics like falling or being chased and waking-life stressors.

A Multi-dimensional Approach to Measuring Dream Remembering

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Most research on dream remembering has focused on a single aspect of recall, in particular, how often dreams are remembered. In contrast, we present the results of a series of studies that suggest five separate dimensions of dream remembering. Exploratory factor analysis (Principal Components; Varimax Rotation) of the newly developed 23-item Dream Remembering Questionnaire (DRQ) yielded a 5 factor solution that has now been replicated across three separate studies. The 5 factor structure includes: (1) Vivid Recall (e.g., "Images in my dreams are so visually striking that I can recall every detail as if there were a picture in front of me");

Table to Schredl "Gender differences in dream content": Dream content and logistic regression analyses (Standardized estimates)

Variable							
Sexuality	8.7 %	9.9%	.126***	.142***	.059	-.258***	.033
Verbal aggression (aggressor)	2.9 %	3.6 %	.103	.078	.026	-.037	.136**
Verbal aggression (victim)	4.1 %	5.1 %	.080	.002	.018	-.018	.117**
Physical aggression (aggressor)	2.1 %	3.4 %	.170*	.020	.051	-.062	.284***
Physical aggression (victim)	4.9 %	4.4 %	.021	.010	.054	-.139*	.182***
Depression-related topics	2.2 %	1.6 %	-.072	.214**	-.065	.168*	.004
Work-related topics	9.3 %	18.0 %	.145***	-.117**	-.052	.081	-.012

* p < .05, ** p < .01, *** p < .001

(2) Cued Recall (e.g., "There are times when I see something during the day that triggers the recall of something similar from a dream"); (3) Sensory Intrusions (e.g., "I wake up from dreams to find that I have been dreaming about some sound that was ongoing in the room [e.g., a radio, pet noises]"); (4) Mood Carryover (e.g., "My dreams continue to influence my mood after I awaken"); and (5) Enactive Carryover (e.g., "I wake up from angry dreams to find that I am acting out some aggressive or defensive behavior [e.g., pushing, hitting, kicking, clenching a fist]"). In the concluding study of the series, each factor accounted for roughly the same proportion of the overall variance (range: 11.9% to 13.7%), and subscales derived from each factor demonstrated satisfactory internal consistency (alpha range: .80 to .85).

The results suggest that dream remembering is not a uni-dimensional construct. In fact, the traditional measure of dream recall frequency loaded on only a single factor (Vivid Recall), indicating that prior research on dream recall has implicitly neglected the other four components of dream remembering. A more comprehensive theory of dream remembering might consider what is distinctive about each of these five factors. For example, differentiation between Vivid Recall and Cued Recall suggests that different cognitive processes may contribute to voluntary and involuntary forms of dream recall. Also, differentiation between Vivid and Cued Recall on the one hand, and Enactive and Mood Carryover on the other, support separate examination of the cognitive forms of delayed dream recall and the embodied forms of immediate dream recall. Separate consideration of each of these forms of dream remembering may add complexity to models of dream recall, but that complexity has potential benefits. By motivating a multi-dimensional approach to studies of dream remembering, the factor array identified here suggests greater specificity in future studies of not only how dreams are remembered, but also how dreams cognitively, affectively, and enactively influence waking consciousness.

Dream content and movements during REM sleep in Parkinson patients with REM sleep behavior disorder

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Patients with REM sleep behavior disorder (RBD) feature complex and often violent behaviors that emerge in REM sleep. These behaviors are believed to be reflect simultaneously ongoing dream content, and dream enactment behaviors are now used as a diagnostic criterion for RBD. Systematic and controlled sleep laboratory studies assessing the relation between movements and dream content are, however, largely lacking. Thus, we investigated the correlation between nocturnal REM sleep related movements and dream content in Parkinson patients diagnosed with REM sleep behavior disorder systematically in a sleep laboratory setting with controlled REM sleep awakenings and infra red video recordings. Systematic awakenings were performed in six patients (5 males, mean age 57.4 ± 8.9 years; 1 female,

age 64 years) approximately ten minutes after the onset of 2nd and then successive REM stages of sleep, and the patients were interviewed about any dream content they could recall. Then, the video recordings of behaviors were presented to seven blind judges with the following combination of four dreams reports, 1) a dream report given by the patient after the awakening, 2) a random dream report from another RBD patient, and 3) two random dream reports from control patients affected by Parkinson's Disease without RBD. The judges' task was to choose one of the four dreams that best matched the behavior on video, and thus had 25% possibility of matching the corresponding dream report to the video clip by chance. Of the 35 REM awakenings, a total of 17 (48.6%) motor-behavioral episodes with recalled dream content were obtained. All judges performed above chance levels ($M = 39.5\%$, range = 29-53%), although not particularly well, and the mean of correctly identified video-dream-pairs was 39.5% (range = 0-100%). Some video-dream-pairs proved to be easier to match than others, depending on the intensity of movements manifested on the video and clarity of the dream reports. Based on our findings, it seems that dream content can be reliably matched to REM related behaviors only when the behavior is complex instead of stereotypical jerks and twitches, that is, cases that represent the extreme end of the continuum.

Why do some dreams become nightmares?

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Introduction: Although numerous studies have investigated different aspects of idiopathic nightmares, (e.g., frequency, association to psychopathology, treatment), surprisingly little is known about why some dreams unfold into nightmares and very little data exist on nightmares' actual thematic content. Recent empirical findings suggest that when compared to nightmares (i.e. disturbing dreams that awaken the sleeper), bad dreams (i.e. disturbing dream that do not awaken the sleeper) represent a less severe expression of the same basic phenomena. However, no studies have specifically examined the content of bad dreams.

Objective: The goal of the present study was to investigate and compare the content of adult nightmares and bad dreams using a range of objective content analysis systems. Method: Written reports of nightmares ($n=170$) and bad dreams ($n=246$) containing 25 words or more were obtained from 2-5 week prospective dream logs collected from 212 adults (175 women, 37 men, 30.8 ± 14.8 years) who volunteered for a study on dream content and personality. To avoid an overrepresentation from individuals reporting many nightmares and/or bad dreams, a maximum of two nightmares and two bad dreams were randomly selected from each log. Variables investigated included their thematic content, narrative development, emotional content, and presumed cause of awakening.

Results: Physical aggression was one of the most frequently reported themes and occurred in a significantly greater proportion of nightmares in comparison to bad dreams. Themes that were significantly more frequent in bad dreams than in nightmares included interpersonal conflicts and failure or helplessness. Other frequently reported themes in both the nightmare and bad dream narratives

included being chased, health-related concerns, presence of an evil force, death of the dreamer or other character, and accidents. In terms of their narrative development, most nightmares and bad dreams begin as banal, neutral or mildly negative dreams and become distressing dreams in the first third (68% of NM; 57% of BD), middle portion (25% of NM; 35% of BD), or final third of the dream narrative (7% of NM; 8% of BD). As expected, a greater proportions of nightmares (76%) contained an unfortunate ending (e.g., dreamer being injured, dreamer losing control of a key situation, death of a character) as compared to bad dreams (64%; $p < .01$), but some also ended with either partially (19% of NM; 28% of BD) or fully (5% of NM; 7% of BD) positive outcomes (e.g., dreamer takes control of the situation, dreamer becomes lucid, dreamer is saved).

Conclusion: This is the first study to investigate the content of prospectively collected nightmares and bad dreams. Taken together, the findings show that contrary to popular belief and many clinical case reports, nightmares can contain a wide range of themes beyond those of pursuit and physical aggression. Moreover, results suggest significant differences regarding the content and the narrative structure between nightmares and bad dreams. These results have implications for recently proposed theoretical models of disturbed dreaming and clinical views of how these dreams unfold.

Waking day Anxiety and Dreams: Dream Content and Predictors in Italian and Canadian Samples

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Previous research has shown that waking day mood is related to dreams in a number of ways (DeCicco & Higgins, 2009; Schredl, Pallmer & Montasser, 1996; Jones & DeCicco, 2009). Research has also begun examining the relationship between mood and dreams between Italian and Canadian samples (DeCicco, Donati & Pini, 2009; Zanasi, DeCicco, Musolino & Wright, 2009) and has revealed that the connection between mood and dreams is important for both groups. Anxiety has also been found to be important in terms of dream imagery (DeCicco, 2007) and in particular, for the number of location changes and animal imagery. Since the research in this area has just begun, a full understanding of these processes is yet to be established in both Canadians and Italians.

This study tested the following hypotheses: 1) Dream content for location changes, animals, and emotion would be correlated with a waking day measure of anxiety (BAI) and mood (POMS) for both Italians and Canadians (DeCicco, 2007; Zanasi et al., 2009), 2) There would be significant differences in dream content between an Italian sample and Canadian sample for emotion, location changes, and animals, since previous research has found a difference between the two in terms of emotion (Zanasi et al., 2009) and, 3) Waking day anxiety can be predicted with regression analyses from the number of location changes and animals in dreams (Jones & DeCicco, 2009) for both samples.

The study included 100 female undergraduate students from Trent University in Canada and 100 female undergrad-

uate students from The University of Rome; they completed the BAI, the POMS, and provided one dream. Dreams were analyzed with computer textual analysis for major categories (e.g. emotional state). The categories of animals and location changes were analyzed via content analysis by counting each occurrence of the image. Both procedures have been used in previous research (e.g. Zanasi et al., 2009).

Significant differences were found between the two groups in that the Italians were significantly higher in anxiety ($t=3.47$, $p < .001$), overall mood state with the POMS score ($t=2.20$, $p < .05$), in animal dream content ($t=2.07$, $p < .05$) and in location changes ($t=1.98$, $p < .05$) but not in overall dream emotion, as compared to Canadians.

Dream content for location changes and animals was correlated with anxiety (BAI) for the Canadian sample, ($r=.22$ and $r=.24$, respectively) but for the Italian sample, only location change was correlated with the BAI ($r=.23$). The POMS was not correlated with any dream category for both groups. Waking day anxiety was predicted with regression analyses from the number of location changes ($\beta=.248$) and animals ($\beta=.226$) in dreams for the Canadian sample ($R=.33$, $p < .01$) but not the Italian sample. Clinical implications and applications for Canadians, Italians, and other cultures are implied by these findings. Furthermore, future research should include measures of mood and waking day anxiety in both clinical and non-clinical populations with location changes in dreams.