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Academic Profile

Very early in my career I developed a very strong interest in dreams. After reading almost every book of Erich Fromm, and especially his book on myths, dreams, and fairy tales, and being very impressed by his thinking, I started to keep a dream diary, now including more than 16,650 dreams. After all these years, I am still fascinated how creative dreams are. After finishing the studies of electrical engineering, I switched to studying psychology. The master thesis and my PhD thesis combined my interest in dreams with the newly growing field of sleep medicine by studying dream recall and dream contents in patients with sleep disorders like insomnia, restless legs syndrome, narcolepsy, or sleep-related breathing disorders.

As the field of dream research is a very small one, I dedicated my research efforts mainly in three directions. First, I wanted to contribute sound empirical findings to the knowledge in the field, to go beyond psychoanalytic thinking and/or neurophysiological reductionism explaining dreaming as the result of random activations with in the sleeping brain. With more than 400 peer-reviewed articles so far, I clearly achieved this goal and are among the top five dream researchers worldwide. Second, I wanted to improve the scientific rigor in the field, as many dream researchers were not familiar with the up-to-date statistical methods, I was the first one to compute a structural equation model (for explain home dream recall frequency, a DFG funded project), time series analyses for binary data, and conducted large-scaled meta-analyses to identify factors affecting the gender differences in dream recall and nightmare frequency. I am also the first one who published a textbook on dream research that included a balanced discussion of pros and cons of the methods used in dream research, e.g., the method of dream content analysis. In addition, I started to conduct replication studies as in this small field almost every newly published study covered a topic that had not been looked at before. Lastly but not least, I am also interested in promoting the knowledge about dreams and way how to work with dreams in the general population. From a clinical viewpoint, this is especially important for dealing with nightmares. Research has developed effective and easy-to-apply treatment tools (“Imagery Rehearsal Therapy”) that are the first-line treatment option recommended by most sleep societies around the world, but professionals who are not specialized in sleep medicine and nightmare sufferers alike do know this approach.

My colleague and friend Daniel Erlacher (sports scientist) and I set up a peer-reviewed journal in 2008, the “International Journal of Dream Research”, publishing two issues per year; worldwide the second journal dedicated to dream research. With about 450 contributions so far, the journal is a success. We chose the format of an open-access journal without charges for the authors (the journal is hosted by the Library of the University of Heidelberg) in order to encourage young researchers and researchers all over the world to submit and publish their research, this was also successful as we received submission from Nigeria, India, Iran and other countries that normally are underrepresented in scientific journals. In addition, I founded the working group “Dreams” within the German Sleep Society (DGSM) to promote dream research within Germany. I am also co-chair with my Finnish colleague Katja Valli of the research committee of the International Association for the Study of Dreams (IASD), the only association focusing on dreams (research, therapy, art, culture, religion) worldwide. I am teaching at the Faculty of Social Sciences of the University of Mannheim and the Medical Faculty Mannheim, Heidelberg University. These students learn about sleep disorders and

their treatments which is of importance as sleep disorders are a very common problem and – so far – not part of the psychology curriculum nor the medical one.

Within my research career of now more than thirty years, I studied a large number of different topics. One of the first topic was dream recall as it is the prerequisite of dream research. Dreaming defined as subjective experience during sleep is only accessible if the person remembers – after waking up – what s/he had experienced before waking up. Despite the first comprehensive study including a large variety of factors that are associated with dream recall (my "Habilitation"), it became clear that trait factors like personality, creativity, visual memory, sleep behavior play a rather small role (less than 10% explained variance) in explaining inter-individual differences in dream recall. Subsequent research indicated that focusing on dreams, e.g., keeping a dream diary as a study requirement, can increase dramatically. We even were able to demonstrate that girls talk more often about dreams than boys, providing an explanation why girls and young women recall their dreams more often than boys and young men.

The second research area is the so-called continuity hypothesis stating in its general form that dream reflect waking-life experiences. Already in 2003, I formulated a mathematical model that includes factors that might affect the probability of integrating waking-life experiences into waking life, for example, emotional intensity of the experience. Another factor was the so-called Sociality bias, as dreams are more often – compared to waking life – featuring social interactions compared to, for example, academic activities like reading and writing. My extensive research supports the model and counteracts the idea that dreams are messages from the unconscious or the result of random brain activation. In this context, I also studied the creativity of dreams, as dreams include also topics we have never experienced in waking life, a popular theme, for example, is flying. I was also able to show that dreams provide creative insights for waking life, not only for famous persons, like the story that Paul McCartney dreamed the melody of "Yesterday", but also in everyday persons; about 7.8% of the dreams can include creative ideas.

The third research topic is lucid dreaming. Within a lucid dream, the person is knowing that s/he is dreaming and can – with some training – control her or his dream actions, e.g., jumping in the air and start flying. This topic is especially popular since the movie "Inception" was released in 2010. From a scientific viewpoint, there are two areas why lucid dreams are very valuable for research. First, the dreamer can move his/her eyes within the dream and this can be measured as the real eyes are moving due to the dreamed movements. So, we (research collaboration with Daniel Erlacher) were able to demonstrate that the time experienced in dreams is more or less comparable with the time experienced in waking, that is, put the old myth that dreams happen in milliseconds during the awakening process to rest. Second, experienced lucid dreams can practice motor skills during the dreams – similar to mental training in waking – and improve their waking-life performance. We were able to demonstrate that for darts throwing in a sleep lab study and, thus, clearly demonstrated the potential of lucid dreaming.

The last topic is the study of nightmares because this is very important for the clinical practice. About 5% of the adult population (up to 30% in patients with mental disorders) suffer from the nightmare disorder (ICD-10: F51.5), that is frequent nightmares that cause clinically significant distress in waking life. In addition to studies looking into the etiology of nightmares, I especially designed studies to investigate the coping behavior of persons who suffer from nightmares. It was astonishing that only 10 to 20% of persons with severe nightmare disorder have asked for professional help, and even more disturbing, the professional help was beneficial in 30%. The

nightmare disorder is severely underdiagnosed and undertreated, thus, information of professionals and persons with nightmares is a big topic on my agenda.

Key output of the years 2020 to now

Prior to list some of my contribution to the field of dream research, I would like to start with my frequent involvement with popular media, from women's magazines, newspapers, podcasts, radio, and TV. For example in 2022, I took part in the ARTE production about dreams ("42 – Die Antwort auf fast alles"), a very well received documentary. For me, this part of my work (about 30 to 50 media outputs per year) is very important as there are many myths about dreams still out there, for example, we dream in black and white, dreaming occurs only in REM sleep etc. Popular belief is still influenced by psychoanalytic thinking, thus, the update to the modern view of dreaming is very important. An illustrative example is my recent study about dogs in dreams. There books and websites stating that dogs in a dream might point to your animal nature, but we were able to show that dog owner very often dream about their dogs – not because of their hidden animal nature, but because they spend a lot of time with their pet. Interestingly, we also found negatively toned dog dreams in adults who experienced something negative with dogs, e.g., being bitten, in their childhood. This clearly indicates that dreams can say a lot about the person's life history if correctly looked at.

As many dream studies were carried out in students, thus, work-related dreams have not been studied. I was the first to conduct larger studies in population-based sample to look at this topic. Stress at work is directly reflected in stressful dreams, but – and I didn't expect that – even years after retirement. The work-life balance in dreams, that is having more positively tone hobby-related dreams compared to the more stressful work-related dreams, was affected by the frequency of engaging in hobbies (positive) and work-associated stress (negative), i.e., the same factors that affect the work-life balance in waking life.

In cooperation with research groups in the US, in Canada, and in Italy, I studied the effect of the Covid-19 pandemic on dreaming. In about 15% of the population, negatively toned dreams increased, especially in those who were strongly affected by the pandemic and the countermeasures in waking life, e.g., feeling socially isolated or depressed. That is, dreams can show whether the pandemic is getting "under one's skin".

In cooperation with my colleague Claudia Schilling, I have published a German version of a questionnaire about sleep-related metacognitions. These metacognitions are diagnostic for insomnia and play a significant role in insomnia etiology. Thoughts like "I have to switch off my thought to fall asleep." are often experienced as stressful and can perpetuate the sleep disorder. I also working on the scientific evaluation of our insomnia therapy program that is very successful with very high effect sizes from pre to post measurements.

In addition to my research regarding nightmares etiology and coping strategies, we also conducted a telephone counseling study (about 30 min per patient) for nightmares, explaining and practice the "Imagery Rehearsal Therapy", showing very high success rates, even in patients who would not sought professional help by themselves. Thus, we think it is possible to close the gap between the number of patients who suffer from nightmares and the number of patients who are treated with the state-of-the-art therapeutic strategies. In a very important study we found that the beliefs about nightmares contributes substantially to nightmare distress, beliefs like "Nightmares contain clues to unconscious fears." or "Some nightmares can become reality." are associated with heightened nightmare distress (in addition to

nightmare frequency). This finding clearly indicate how important it is to inform the general public about the adequate and up-to-date etiological models of nightmares (disposition-stress model).

Selected literature (2020 to now):

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