Music and dreams: A review

Kate Isobel Olbrich and Michael Schredl

Central Institute of Mental Health, Medical Faculty Mannheim/Heidelberg University, Germany

Summary. The purpose of this paper is to review scientific studies of music dreams and also touch the area of creative music dreams, i.e., dreams inspiring new music. Different types of music dream categories will be defined. In large sample, the percentage of music dreams in relation to all remembered dreams ranges from 4% to 8%. The literature indicates that musicians tend to experience more music dreams than non-musicians. The positive correlation between musical activities in waking life and music dream percentage supports the continuity hypothesis of dreaming. Also in line with the continuity hypothesis are the findings that music dreams are more positively toned than dreams in general. As research regarding this topic is still in its infancy, there are several interesting topics for the future studies, e.g., incubating creative music dreams, stimulating the sleeper with music, or the relationship between music and sleep-dependent memory consolidation.

Keywords: Music dreams, creativity, continuity hypothesis

1. Introduction

A dream report or dream is the recollection of the subjective experiences that happened during sleep after waking (Schredl, 2018). As music is universal for all cultures throughout human history (Bohlman, 2013) and dreams reflect waking life experiences – according to the continuity hypothesis of dreaming (Schredl, 2003) – it seems natural that music also should show up in dreams. In the literature and research two aspects have been studied. First, how does music experienced during the day, (e.g. listening to music, playing an instrument, singing), affect subsequent dreams? Second, how do dreams affect music in waking life, for example, by providing musical inspirations?

The focus of this article is to review the research done so far, mostly in the area of how music affects dreams – starting with a definition and typology of music dreams, the findings regarding frequency of music dreams and factors affecting this frequency. The second part will address the creative part, i.e., how dreams gave rise to new music.

2. Types of Music Dreams

The basic definition of a music dream would be that music is in some form topic of the dreams, e.g., the dreamer is listening to music, talks about music, is playing an instrument, or is singing. For example, Sting's dreams about the massive, prehistoric blue turtles wrecking a garden would not be a music dream in that sense but a creative dream stimulating a great composer to create a new song "The dream of the blue turtles" (Webb, 2017).

As music dreams can be categorized in different groups with dreams in which music is simply being mentioned, listened to, and/or whether the dreamer is playing an instrument or singing (König & Schredl, 2019), several examples will be provided in the following.

Listening to music. This is where the dreamer is listening to any type of music in their dream, e.g., hearing a song on the radio or attending a rock concert. The following example is taken from data of König and Schredl (2019) and has been translated: "*…We came to a beach where a band was playing…Heavy metal style."* Regarding the creative aspect, these dreams can be divided into listening to well-known music or listing to new music, e.g., Tartini's dream of a devil playing a haunting melody of unearthly beauty on the violin (Barrett, 2001).

Playing an instrument/singing. In this dream type the dreamer is actively playing an instrument and/or singing. The example below is from Van Eeden: *"After that I had a succession of lucid dreams, very beautiful. At the end of them, while I was still singing loudly, I was suddenly surrounded by many demons, who joined in my singing, like a mob of vicious semi-savage creatures. (p.457, Van Eeden, 1913)"*. An interesting example of a dream including both listening to music and playing music is a dream of Olga Kern, a very prolific pianist, dreaming that Rachmaninoff himself gave her a piano lesson on how to interpret his piece "The Barcarolle" (Webb, 2017); a dream which was very helpful in improving her confidence and performance in the Rachmaninoff piano competition.

Talking/thinking about music. Within this dream there is actually no music, but the dreamer is either talking or thinking about music, e.g. people discussing a music album or buying a ticket for a jazz concert. This dream is translated from data of König and Schredl (2019): *"I talked to my sister about a CD; I was excited because the back was covered with stickers so I couldn't see what kind of songs were on [the CD]"*

Creative music dream. This is where the dreamer is actively listening to or creating new music. And, most importantly, can remember the melody after waking from the dream. Massey (2006) reported an example from his own dreams: *"It is night. I am sleeping in a small hotel on the island of Cyprus. I wake up and write down a melody that has come to me in my dream: a procession of young people, dressed in beautifully colored robes, has gone by, singing (p. 44, Massey, 2006)."* As mentioned above, a dream

Corresponding address:
Michael Schredl, Sleep laboratory, Central Institute of Mental Health, PO Box 12 21 20, 68072 Mannheim, Germany.
Email: Michael.Schredl@zi-mannheim.de

Submitted for publication: July 2019
Accepted for publication: August 2019

theme that just stimulates the composer to create a new song would be, by definition, "only" a creative dream affecting subsequent waking life like problem solving dreams, dreams with creative ideas in other areas like painting or sculpting (Schredl & Erlacher, 2007).

3. Prevalence of music dreams – Empirical studies

Table 1 summarizes different studies looking at the percentage of music dreams. Two long dream series (Schredl, 2015; Webb, 2017)and a dream diary study (König & Schredl, 2019) in psychology students indicated that about 5% to 8% of the remembered dreams are related to music. Interestingly, the figure of 18.20% music dreams for non-musicians in the study of Uga, Lemut, Zampi, Zilli, and Salzarulo (2006) is considerably higher. Compared to the study of König and Schredl (2019) who carried out a general dream study analyzing music topics in dreams afterwards, Uga et al. (2006) have advertised specifically for a study about music and dream. In addition, each morning the participants completed questions about musical activity of the preceding day and questions whether music occurred in the dream, what type of music (known or unknown musical piece), i.e., the focus on music during the 30-days study period was very strong which might have increased the number of music dreams. A strong effect of instruction on the prevalence of specific dream topics (outdoor-nature settings vs. urban settings) was reported by Stern, Saayman, and Touyz (1978). In musicians, 40.10% of their diary dreams included a reference to music, a much higher percentage compared to the non-musicians (Uga et al., 2006), indicating that engaging in musical activities during the day affects the percentage of music dreams.

In several studies (Kern et al., 2014; König et al., 2018; Schredl, Berres, Klingauf, Schellhaas, & Göritz, 2015; Vogelsang, Anold, Schormann, Wübbelmann, & Schredl, 2016) the participants were asked to estimate the percentage of music dreams of all remembered dreams retrospectively. For non-musicians, percentages ranged from 4.03% to 6.15%, comparable with the findings of the diary studies (König & Schredl, 2019; Schredl, 2015; Webb, 2017). Similar to the study of Uga et al. (2006), participants actively engaging in musical activities during the day (music students and choir members) reported a much higher percentage of music (Vogelsang et al., 2016).

These findings indicate that music plays a considerable role in dreams, especially in persons with frequent musical activities during the day.

4. Factors affecting music dream frequency or music dream content

Based on the continuity hypothesis of dreaming that suggest that waking life experiences and concerns affect dream content (Domhoff, 2018; Schredl, 2003), it would be expected that persons who are into musical activities during the day also dream more often about music. As reported above, musicians, music students, and choir members report higher frequencies of music dreams than "non-musicians" (Uga et al., 2006; Vogelsang et al., 2016) supporting the continuity between waking and dreaming. The small number of only 19 participants in the large sample of König et al. (2018) stated music as their profession and also reported a high music dream percentage (15.32% compared to the 6.30% of the total sample with N = 1966). Two studies (Kern et al., 2014; Uga et al., 2006), however, found no direct correlation between time spent with musical activities and percentage of music dreams. This might be explained by small sample size and the type of musical activity as subsequent studies in larger samples (König et al., 2018; Vogelsang et al., 2016) showed that there is a clear relationship between musical activities during the day and music dreams. Interestingly, music dream percentage was related to playing an instrument and actively listening to music but not to the amount of time spent with passively listening to music, i.e., music as

Table 1. Empirical findings regarding the prevalence of music dreams

Percentage of music dreams	Sample size	Sample characteristics	Method	Source
5.41%	10,398 dreams of one participant	Researcher with musical hobby	Dream diary	Schredl (2015)
about 6%	15,000 dreams of one participant	Dream expert and singer-songwriter	Dream diary	Webb (2017)
8.14%	1612 dreams reported by 425 participants	Psychology students	Dream diary	König and Schredl (2019)
18.20%	537 dreams reported by 30 participants	Non-musicians between 18-38 yrs.	Dream diary with probing questions after recording the dream	Uga, Lemut, Zampi, Zilli, and Salzarulo (2006)
40.10%	672 dreams reported by 35 participants	Musicians between 20-47 yrs.		
4.03%	128 participants	Politics students, Psychology Students & Employees	Retrospectively estimated percentage	Kern et al. (2014)
6.15%	2929 participants	Men and women aged 16-92	Retrospectively estimated percentage	Schredl, Berres, Klingauf, Schellhaas, and Göritz (2015)
4.31%	52 participants	Psychology students	Retrospectively estimated percentage	Vogelsang, Anold, Schormann, Wübbelmann, and Schredl (2016)
17.38%	32 participants	Music students		
15.61%	49 participants	Choir members		
6.30%	1966 participants	15-91 years old	Retrospectively estimated percentage	König et al. (2018)

background while being engaged in other activities (König et al., 2018). This would indicate that involvement regarding the musical activity during the day might also predict the frequency of music dreams. Whereas the age starting musical training was related to music dream percentage in the Uga et al. (2006) study, this finding could not be replicated (König et al., 2018). The basic idea is that dreams might also include daytime experiences that have occurred long time ago (cf. Schredl, 2018), i.e., persons who practiced a lot during childhood and adolescence should dream more often about music irrespective of their current engagement with musical activities. To shed more light on that hypothesis it would be necessary to study the content of music dreams in more detail, i.e., whether the music dream is reflecting current waking life or earlier waking-life experiences.

Another factor that correlated with the frequency of music dreams is dream recall frequency (König et al., 2018; Schredl et al., 2015; Vogelsang et al., 2016). This might be explained by methodological issues, high dream recallers might be better at recalling dreamed music upon awakening than low recallers. But one might also speculate whether the "Openness to experience" personality dimension, which is related to dream recall frequency (Schredl & Göritz, 2017), could also be related to music dream frequency as "open" persons are interested in all kind of topics (Schwaba, Luhmann, Denissen, Chung, & Bleidorn, 2018). Similar, the decrease of music dream with age in cross-sectional samples (König et al., 2018; Schredl et al., 2015) might reflect that music is not that important for older persons compared to young adults.

A very interesting finding was reported by Kern et al. (2014) and Schredl et al. (2015); the frequency of music dreams was related positively with the overall emotional tone of dreams. This would also be in line with the continuity hypothesis as listening to music in waking is often associated with positive emotions (e.g., Liljeström, Juslin, & Västfjäll, 2013). This was confirmed by König and Schredl (2019) who compared a music dream with a non-music dream in 69 participants (within-subject analysis) and found that music dreams include more intense positive and less intensive negative emotions. However, the music students reported music dream examples that are negatively toned, e.g., *"I am supposed to play a concert, but do not know the piece by heart;"* or *"Sitting in the orchestra, I heard the signal for my entry but did not find my instrument and missed it."* So, it would be very interesting to study music dreams in music students and musicians.

Regarding the content of music dreams, in non-musicians the topic "Listening to music" occurred most often (König et al., 2018; König & Schredl, 2019). Also very often topics like attending a party or concert, dancing, talking about music were mentioned quite often whereas performance and rehearsal were not prominent in music dreams (König et al., 2018; König & Schredl, 2019; Schredl, 2015). In about 16.76% of the music dreams the music was unknown (König et al., 2018), a somewhat higher figure was reported by (Uga et al., 2006) for musicians: 28%. A singer-songwriter (Webb, 2017) reported that about 80% of his music dreams included original music. It would be very interesting to study dream content in musicians who are engaged in composing and writing new songs. Interestingly, there is little research studying the question whether the music genre preferred in waking life is reflected in dreams. König et al. (2018) asked their participants about their preferred music genres in waking like Classic, Hip-hop, Rock, Pop, Heavy metal, German folk music, Reggae, Electronic music, Jazz/blues/swing and the genre of the dreamed music. The correlations ranged from r = .490 to r = .603, indicating that the music preferences are also reflected in dreams but the correlations are considerably lower than r = 1.0, i.e., there might be some dreams with music that is not preferred by the dreamer in waking. It would be interesting to study the emotional tone of such mismatch dreams because one might expect that these dreams are less positive than dreams in which the preferred music style or even the favorite piece is featured.

Also interesting is the music dream example reported by a participant of the Vogelsang et al. (2016) study: *"I dreamed that I sang a song—that I have practiced for a very long time—perfectly. My waking-life performance was also markedly better."* Sleep research clearly supports that sleep is beneficial for memory (Axmacher & Rasch, 2017) and some studies (Klepel & Schredl, 2019; Wamsley & Stickgold, 2019; Wamsley, Tucker, Payne, Benavides, & Stickgold, 2010) indicate that dreaming might be related to sleep-dependent memory consolidation. Moreover, it has been shown that lucid dream training can enhance performance in subsequent waking life (Erlacher & Schredl, 2010; Schädlich, Erlacher, & Schredl, 2017; Stumbrys, Erlacher, & Schredl, 2016). Schädlich and Erlacher (2018) were able to show in a small (N = 5) qualitative study that musicians can use lucid dreams to facilitate guitar playing and enhance their confidence. The example of Olga Kern getting a lesson from the master (Rachmaninoff) himself (Webb, 2017) would fit into this category.

In summary, engaging in musical activities during waking is affecting music dream frequency and the content of these dreams and, thus, these findings support the continuity hypothesis. More detailed studies, e.g., using dream diaries, in persons who are highly involved with music in their waking life, music students, musicians, composers, dancers, disc jockeys and so on, would be very interesting.

5. Creative music dreaming

Schredl and Erlacher (2007) estimated that about 7.8% of the recalled dreams included some form of idea that stimulated waking life (solving a problem, inspire a painting etc.), i.e., creative dreams are quite common. Systematic studies on creative music dreams have not yet been carried out but there are many anecdotes from musicians who have created wonderful new songs from their dreams (Barrett, 2001; Grace, 2001, 2012; Massey, 2006; Prokop, 1979; Webb, 2017, 2019).

The phenomenon of dream-inspired music has a long history. Noone (1939) reported that shamans of the Temiar Senoi of Malaya perform songs and rituals that are based on their dreams. Classical composers such as Beethoven, Stravinsky, Wagner, Korde and Ligeti have also experienced creative music dreams. Richard Wagner told a friend about his opera "Tristan and Isolde": *"For once you are going to hear a dream, I dreamed all this; never could my poor head have invented such a thing purposely."* (p. 73, Barrett, 2001). Igor Stravinsky's "Rite of Spring" was inspired by a dream about a pagan sacrificial ritual in which the virgin that was going to sacrificed ended up dancing herself to death. "The Devil's Trill Sonata" was another piece inspired by a dream: Guiseppe Tartini had dreamed that the Devil sat on his bed and played a tune on a violin. Upon waking Tartini tried to reproduce the tune the Devil had played by playing it on his

violin. A more modern example was provided by Paul McCartney who dreamed a melody that he played on the piano upon awakening in order to memorize it. For some time, he thought that he heard the melody somewhere but it turned out it was a new melody and the song "Yesterday" was born (Webb, 2017). The list of musicians whose songs were inspired by dreams is long, e.g., Sting, Billy Joel, Paul Simon, Neil Young, Johnny Cash (Barrett, 2001; Webb, 2017). An interesting avant-garde music piece was dreamed by Karlheinz Stockhausen; he dreamed that he was flying above four helicopters each carrying a member of a string quartet playing music and was able to materialize this dream in his "Helikopter-Streichquartett" composition. A small qualitative study with five musicians (Schädlich & Erlacher, 2018) indicated that the ability to control the dream can help to create and practice new music within the dream.

In reviewing the large collections of reports on dream-inspired music (Barrett, 2001; Grace, 2001; Massey, 2006; Webb, 2017), there are some characteristics that are typical for creative music dreams. Often, the dreamer is not playing an instrument himself/herself but listens to the music played by someone else, e.g., the devil in Tartini's dream. Does the dream reflect the attitude that inspiration is a gift that cannot be "made" deliberately? A second aspect is related to memory, even for gifted musicians it is not always easy to remember the new melody heard in the dreams, so they tried to memorize it within in the dream and keep a voice-recorder near the bed side in order to capture the melody. This is illustrated by a dream of Webb (2017) reporting that he heard an amazing African-sounding piece which he tried to memorize in the dream. In the same dream he was told the song was already recorded by someone else, so he was disappointed. This is also a characteristic in some creative music dream examples, the dreamer did not at first believe that it was her or his own creation, e.g., the "Yesterday" dream of Paul McCartney. Is this also hinting at the fragile nature of human inspiration? Another topic that shows up in the accounts is that musicians have nightmares, e.g., Alex Lifeson, guitarist for the Canadian rock trio Rush or Peter Green, founder of Fleetwood Mac (Webb, 2017). That creative musicians experience more nightmares compared to the general population as creativity is related to thin boundaries (Hartmann, 1991) and thin boundaries are related to nightmare frequency (Schredl, Bocklage, Engelhardt, & Mingebach, 2009). Heightened nightmare frequency was found in creative filmmakers (Pagel, Kwiatkowski, & Broyles, 1999). Although the accounts portray a creative usage of the nightmares, it would be very interesting to study whether nightmare treatment strategies like Imagery Rehearsal Therapy (Krakow & Zadra, 2010) might be beneficial for musicians.

6. Future Directions for research

Even though several empirical studies addressing the music dream topic and comprehensive compilations collecting accounts on creative music dreams (see above) have been published, several research areas seems to be very promising. First, it would be interesting to study dreams of persons professionally involved in music, e.g., music students, musicians, dancers, in more detail using dream diaries. There might be a problem of credibility with the accounts that were reported by musicians to the press after the song had been released. Furthermore the effect of engaging in composing during the day on the frequency of dreaming of new music can be studied, the range of dreams with original music had a great range from 20% to 80% (Uga et al., 2006; Vogelsang et al., 2016; Webb, 2017). Anecdotal reports indicate that professionals also experience negatively toned music dreams whereas non-musicians reported an overall positive emotional tone of music dreams, so a diary study might help to indicate how many music dreams of professionals are negatively toned.

As music dreams are often experienced as positive, it would be very interesting to study the effect of music played during REM sleep on dream content and dream emotions. External stimuli are incorporated into dreams (Schredl, 2018) with incorporation rates ranging from 9% (sinus tone) to 60% water spray on the hand or face. As listening to music activates a variety of brain regions, (Koelsch, 2014), one might speculate that the incorporation rate of music played during REM sleep is high, comparable to the effect of "Non, je ne regret rien" of Edith Piaf in the movie "Inception". An illustrative dream example was reported by Weygandt (1893) in his dissertation: "While I was sleeping once, my experimenter began to sing the legend of the grail from the opera, Lohengrin, by Richard Wagner. During the verses "Brought down by a group of angels" sung in forte, I dreamed of beautiful angels floating down from heaven singing those words." (p. 96, Schredl, 2010). If listening to music, especially a favorite song, is able to produce positive emotions, like positive odors increase positive emotions, (Schredl, Atanasova, et al., 2009), it might be a treatment strategy for nightmares.

Regarding creative music dreams, Webb (2017) reported that 7 out of 8 students of his were able to dream about music if they tried to incubate them (autosuggestion that tonight I will dream something about music). Given the large number of famous songs inspired by dreams, incubating creative music dreams could be beneficial for the musicians' careers and success. In the same way, lucid dreaming might help create new songs (Schädlich & Erlacher, 2018). From a scientific point of view, controlled studies would be interesting.

Lastly, learning new musical pieces is an interesting model for studying brain plasticity (Schlaug, 2015) and, thus, also an interesting paradigm for studying sleep-dependent memory consolidation, (see dream example reported above). If dreams are related to consolidation processes that are active in the sleeping brain, then one would predict that musicians with a lot of music dreams might be more efficient in learning new pieces.

To summarize, the empirical findings so far have shown some intriguing results regarding the relationship between music and dreams but the research in this area is just beginning.

References

Axmacher, N., & Rasch, B. (2017). Cognitive Neuroscience of Memory Consolidation. Cham, Switzerland: Springer.

Barrett, D. (2001). The committee of sleep: How artists, scientists, and athletes use dreams for creative problem-solving - and how you can too. New York: Crown.

Bohlman, P. V. (2013). The Cambridge History of World Music. Cambridge: Cambridge University Press.

Domhoff, G. W. (2018). The emergence of dreaming: Mind-wandering, embodied simulation, and the default network. New York: Oxford University Press.

Erlacher, D., & Schredl, M. (2010). Practicing a motor task in a lucid dream enhances subsequent performance: A pilot study. Sport Psychologist, 24, 157-167.

Grace, N. (2001). Making dreams into music: Contemporary songwriters carry on an age-old dreaming tradition. In K. Bulkeley (Ed.), Dreams - A reader on the religious, cultural, and psychological dimensions of dreaming (pp. 167-171). New York: Palgrave.

Grace, N. (2012). Music and dreams. In D. Barrett & P. McNamara (Eds.), Encyclopedia of sleep and dreams: The evolution, function, nature, and mysteries of slumber (pp. 430-432). Santa Barbara: Greenwood.

Hartmann, E. (1991). Boundaries in the mind. New York: Basic Books.

Kern, S., Auer, A., Gutsche, M., Otto, A., Preuß, K., & Schredl, M. (2014). Relation between waking politic, music and sports related tasks and dream content in students of politics and psychology students. International Journal of Dream Research, 7, 80-84. doi:10.11588/ijodr.2014.1.13124

Klepel, F., & Schredl, M. (2019). Correlation of task-related dream content with memory performance of a film task – A pilot study. International Journal of Dream Research, 12(1), 112-118.

Koelsch, S. (2014). Brain correlates of music-evoked emotions. Nature Reviews Neuroscience, 15, 170. doi:10.1038/nrn3666

König, N., Fischer, N., Friedemann, M., Pfeiffer, T., Göritz, A. S., & Schredl, M. (2018). Music in dreams and music in waking: An online study. Psychomusicology: Music, Mind, and Brain, 28(2), 65-70. doi:10.1037/pmu0000208

König, N., & Schredl, M. (2019). Music in dreams: A diary study. Psychology of Music, (online first).

Krakow, B., & Zadra, A. L. (2010). Imagery Rehearsal Therapy: Principles and Practice. Sleep Medicine Clinics, 5, 289-298.

Liljeström, S., Juslin, P. N., & Västfjäll, D. (2013). Experimental evidence of the roles of music choice, social context, and listener personality in emotional reactions to music. Psychology of Music, 41(5), 579-599. doi:10.1177/0305735612440615

Massey, I. J. (2006). The musical dream revisited: Music and language in dreams. Psychology of Aesthetics, Creativity, and the Arts(1), 42-50.

Noone, H. D. (1939). Chinchem: a study of the role of dream-experience in culture-contact amongst the Temiar Senoi of Malaya. Man, 39, 57.

Pagel, J. F., Kwiatkowski, C., & Broyles, K. E. (1999). Dream use in film making. Dreaming, 9, 247-255.

Prokop, H. (1979). Eine schöpferische Produktion des Unbewußten. Musik + Medizin(11), 49-51, 55-56.

Schädlich, M., & Erlacher, D. (2018). Lucid music – A pilot study exploring the experiences and potential of music-making in lucid dreams. Dreaming, 28(3), 278-286. doi:10.1037/drm0000073

Schädlich, M., Erlacher, D., & Schredl, M. (2017). Improvement of darts performance following lucid dream practice depends on the number of distractions while rehearsing within the dream – a sleep laboratory pilot study. Journal of Sports Sciences, 35(23), 2365-2372. doi:10.1080/02640414.2016.1267387

Schlaug, G. (2015). Musicians and music making as a model for the study of brain plasticity. In E. Altenmüller, S. Finger, & F. Boller (Eds.), Progress in Brain Research (Vol. 217, pp. 37-55): Elsevier.

Schredl, M. (2003). Continuity between waking and dreaming: a proposal for a mathematical model. Sleep and Hypnosis, 5, 38-52.

Schredl, M. (2010). History of dream research: The dissertation "Entstehung der Träume (Origin of dreams)" of Wilhelm Weygandt published in 1893. International Journal of Dream Research, 3, 95-97.

Schredl, M. (2015). Musik in Träumen. Musik-, Tanz- und Kunsttherapie, 26(4), 184-191. doi:10.1026/0933-6885/a000218

Schredl, M. (2018). Researching Dreams: The Fundamentals. Cham: Palgrave Macmillan.

Schredl, M., Atanasova, D., Hörmann, K., Maurer, J. T., Hummel, T., & Stuck, B. A. (2009). Information processing during sleep: the effect of olfactory stimuli on dream content and dream emotions. Journal of Sleep Research, 18, 285-290.

Schredl, M., Berres, S., Klingauf, A., Schellhaas, S., & Göritz, A. S. (2015). Factors affecting the frequency of music dreams: An online study. International Journal of Dream Research, 8(2), 139-141. doi:10.11588/ijodr.2015.2.23473

Schredl, M., Bocklage, A., Engelhardt, J., & Mingebach, T. (2009). Psychological boundaries, dream recall, and nightmare frequency: A new Boundary Personality Questionnaire (BPQ). International Journal of Dream Research, 2, 12-19.

Schredl, M., & Erlacher, D. (2007). Self-reported effects of dreams on waking-life creativity: An empirical study. Journal of Psychology, 141, 35-46.

Schredl, M., & Göritz, A. S. (2017). Dream recall frequency, attitude toward dreams, and the Big Five personality factors. Dreaming, 27(1), 49-58. doi:10.1037/drm0000046

Schwaba, T., Luhmann, M., Denissen, J. J. A., Chung, J. M., & Bleidorn, W. (2018). Openness to experience and culture-openness transactions across the lifespan. Journal of Personality and Social Psychology, 115(1), 118-136. doi:10.1037/pspp0000150

Stern, D. A., Saayman, G. S., & Touyz, S. W. (1978). A methodological study of the effect of experimentally induced demand characterictics in research of nocturnal dreams. Journal of Abnormal Psychology, 87, 459-462.

Stumbrys, T., Erlacher, D., & Schredl, M. (2016). Effectiveness of motor practice in lucid dreams: a comparison with physical and mental practice. Journal of Sports Sciences, 34(1), 27-34. doi:10.1080/02640414.2015.1030342

Uga, V., Lemut, M. C., Zampi, C., Zilli, I., & Salzarulo, P. (2006). Music in dreams. Consciousness and Cognition, 15, 351-357.

Van Eeden, F. (1913). A study of dreams. Proceedings of the Society for Psychical Research, 26, 431-461.

Vogelsang, L., Anold, S., Schormann, J., Wübbelmann, S., & Schredl, M. (2016). The continuity between waking-life musical activities and music dreams. Dreaming, 26(2), 132-141. doi:10.1037/drm0000018

Wamsley, E. J., & Stickgold, R. (2019). Dreaming of a learning task is associated with enhanced memory consolidation: Replication in an overnight sleep study. Journal of Sleep Research, 28(1), 1-8. doi:10.1111/jsr.12749

Wamsley, E. J., Tucker, M., Payne, J. D., Benavides, J. A., & Stickgold, R. (2010). Dreaming of a learning task is associated with enhanced sleep-dependent memory consolidation. Current Biology, 20, 850-855.

Webb, C. S. (2017). The Dreams Behind the Music: Learn Creative Dreaming as 100+ Top Artists Reveal their Breakthrough Inspirations. Montreal, Canada: Craig Sim Webb.

Webb, C. S. (2019). Music and dreams. In R. J. Hoss & R. P. Gongloff (Eds.), Dreams: Understanding biology, psychology, and culture - Volume 2 (pp. 650-655). Santa Barbara: Greenwood.

Weygandt, W. (1893). Entstehung der Träume. Leipzig: Grübel & Sommerlatte.