

# Book review: The Twenty-four Hour Mind – The Role of Sleep and Dreaming in Our Emotional Lives, by Rosalind D. Cartwright

Michael Schredl

Central Institute of Mental Health, Mannheim, Germany

*Summary.* The theory Rosalind Cartwright is presenting in her book is a big milestone in the dream research field because her arguments, drawn from psychological dream research and sleep medicine research, underline the importance of the nocturnal mental processes (NREM and REM dreaming) in the twenty-four hour mind. It is a very instructive book and hopefully stimulates more research into the function(s) of dreaming. Cartwright, R. D. (2010). *The Twenty-four Hour Mind – The Role of Sleep and Dreaming in Our Emotional Lives*. New York: Oxford University Press.

*Keywords:* Dreaming; Function; Sleepwalking

In her book, Rosalind Cartwright outlines a theory about the role of dreaming in the twenty-four hour mind, i.e., the interplay between dreaming and waking consciousness. Before focusing on the book itself, I would like to broaden the horizon by pointing out that this book can be seen as one in a series of books on the function(s) of dreaming, written by researchers who were active in the field for a very long time (since the sixties). Rosalind Cartwright first dream-related publication appeared in 1966 and was about the relationship between dreaming and drug-induced fantasy (Cartwright, 1966). It already aimed at studying the mind in different states of consciousness and how these processes are related. I personally like her study on the effect of an erotic film on dream content (Cartwright, Bernick, Borowitz, & Kling, 1969) because it is one of the rare empirical studies of Freudian dream symbols. The finding that, after the film, masculine sex symbols (gun, knife, tool) and feminine sex symbols (box, tunnel, corridor) occurred more often compared to the Hall and Van de Castle norms indicates that symbolization in dreams can be studied by applying experimental techniques. Other researchers who have written recently about the functions of dreaming are Milton Kramer (Kramer, 2007), Ernest Hartmann (Hartmann, 2011), and Allan Hobson (Hobson, 2011). The book of William Domhoff (Domhoff, 2003) could also be mentioned in this context. Whereas male researchers like Ernest Hartmann or Allan Hobson fail to acknowledge explicitly the contribution of other researchers to their theorizing, Rosalind Cartwright listed a number of names like Allan Rechtschaffen, Chris Gillin, Milton Kramer, Gerry Vogel, Ray Greenberg, and Ernest Hartmann, all pioneers active in the early days of sleep research. Their efforts and results are briefly reviewed in the first chapter of the book.

In chapter 10, Rosalind Cartwright nicely sums up the major points of her theory, so I will start with this chapter and work my way backwards through the other chapters, outlining the data and the reasoning on which the theory is based. The first premise is that the mind is active in both waking and sleep (indicated, of course, by the title of the book). Second, “emotionally-toned waking experience has a priority for being reactivated in sleep and stored in memory (p. 165)”. This is clearly in line with the continuity hypothesis of dreaming first formulated by Hall and Nordby (1972) and followed up by many others (Domhoff, 1996; Schredl, 2003). Third, dreams combine recent emotional experiences and previously associated images in order to down-regulate disturbing emotions. This is based on the mood-regulation function formulated by Kramer (2007). The range of emotions should be moderate; overwhelming dream emotions as found in nightmares and/or posttraumatic re-enactments might interfere with this function. This combining of new information with old information and the down-regulation of disturbing emotions serves an adaptive function: stabilizing the self-concept and the schemas we have constructed as models of the world so the person is on track towards meeting his or her short- and long-term goals. With this line of thinking Rosalind Cartwright adds the cognitive component to the model of Ernest Hartmann who focuses mainly on emotions (Hartmann, 2011). Interestingly, she refers to Michel Jouvett’s idea of reiterative programming taking place during REM sleep (Jouvett, 1998). This model should have been referred to by Allan Hobson because it is a precursor of his proto-consciousness theory (Hobson, 2011). Rosalind Cartwright’s dream theory is not limited to REM sleep dreaming: based on her knowledge of NREM parasomnias (see below) and the memory consolidation in the sleep literature, she also assigns a very important role to NREM dreaming (important information is re-activated and unimportant information is erased).

In chapter 9, Rosalind Cartwright defines three different modes of information processing: conscious processing, preconsciousness and unconsciousness. In Figure 10.1, the courses of these modes over the sleep-wake cycle are depicted. Roughly speaking, consciousness is down during sleep and active during waking, in REM sleep uncon-

Corresponding address:

Prof. Dr. Michael Schredl, Sleep laboratory, Central Institute of Mental Health, PO Box 122120, 68072 Mannheim, Germany.  
E-mail: Michael.Schredl@zi-mannheim.de

consciousness processes are most active, and preconscious cognitive activity dominates during NREM sleep and can also be found, for example, in daydreaming. Although these definitions might be helpful in describing different processes during sleep, I still have a problem with defining dreaming as unconscious cognitive activity. Rosalind Cartwright cites several well-known researchers acknowledging and studying non-conscious processes in waking but they aren't similar to dreaming. During sleep there is subjective experiencing which can be (not always) recalled upon awakening and there are a lot of other processes below the surface which might be, for example, very important for memory consolidation (synaptic strengthening is highly probable but a process one cannot be consciously aware of). It is still an unresolved issue as to whether dreaming is related to the intensely studied effect of sleep on memory consolidation (Schredl & Erlacher, 2010; Wamsley, Tucker, Payne, Benavides, & Stickgold, 2010). On the other hand, the three-streams model might help us to understand that there is a lot more going on in the influencing of emotions, cognition and behavior than in waking consciousness and, thus, stimulates specific research.

Being a sleep specialist, in chapter 3 Rosalind Cartwright reviews the findings that short sleep and insomnia have a severe impact on physiological functioning – like glucose tolerance levels – and psychological functioning, i.e., insomnia patients suffer from an increased risk of developing an episode of major depression. Rosalind Cartwright points out that the frequent awakenings during the night in these patients interfere with the function of dreaming like re-activating and integrating new information in order to down-regulate disturbing emotions. Indeed, insomnia patients do have more negatively-toned dreams (Schredl, Schäfer, Weber, & Heuser, 1998) and report nightmares more often than healthy controls (Schredl, 2009). In addition, sleep-dependent memory consolidation is impaired (Nissen et al., 2006), data supporting Rosalind Cartwright's theory. Another type of insomnia is mentioned which would be very interesting to study: Paradoxical insomnia (American Academy of Sleep Medicine, 2005). These patients complain of being awake for most part of the night even if polysomnographic recordings clearly indicate sleep. This is mostly NREM sleep because REM sleep, accompanied with intense dreaming, is more often judged as sleep than NREM sleep stage 2 (Amrhein & Schulz, 2000). These patients report cognitive activity similar to their waking experience while sleeping. It would be very interesting to study these cognitive processes (content, formal characteristics, relationship to waking mentation, etc.) in detail. This might be a challenge to the definition of dreaming as an unconscious process (see above). Rosalind Cartwright also added a recommendation for persons with insomnia complaints: taking a very hot bath 2 hours before bedtime. In addition to the relaxing effect, the core body temperature will be increased by the hot bath and, thus, can continually decrease afterwards, a process supporting sleep onset.

Chapter 4 covers the topic of sleep and dreaming in depression and Rosalind Cartwright's studies of people recently divorced. The altered sleep physiology – like reduced slow wave sleep, shortened REM latency and increased REM density – might serve as an explanation for the brief and often negatively-toned dreams found in these patients because the basic drives are not activated appropriately during the first, very brief NREM cycle. This hypothesis of

the author is very interesting because whether dream content is related to REM latency and the amount of slow wave sleep could be tested. One of the findings of the divorce studies is that dreaming of the ex-husband after the divorce is related to better recovery four months or one-year later in the subsequent study.

In my publications, I have often cited this finding to demonstrate how difficult it is to study the function of dreaming. The first explanation at hand is that dreaming of the ex-husband is something like actively working-through the separation process (Rosalind Cartwright provides several illustrative dream examples in this chapter) and by integrating these experiences an adaptation takes place. However, a skeptic may argue that the dreams were remembered (in order to tell them to the experimenter) and the person thought about the dreams and these cognitive processes taking place in waking life are the beneficial ones. As one cannot study unremembered dreams this dilemma seems unsolvable. Reading study 3 carefully, this argument acquires even more weight because the occurrence of the ex-spouse was strongly related to the current concern scores; a questionnaire the participants completed prior to the lab night. I.e., the more the ex-spouse was on the waking mind of the divorced person, the more often they dreamed about him or her; again in line with the continuity hypothesis. Regarding the function of dreaming one wonders whether the ex-spouse dreams simply reflect the more intense attempts to cope with the stressful situation in waking life or they are beneficial in themselves. As pointed out, this dilemma will keep dream researchers busy in the future.

Three chapters of the book are devoted to NREM parasomnias. The fifth chapter consists of the story of Scott Falater, accused of murdering his wife. Rosalind Cartwright served as an expert witness during the trial and was unable to convince the jury that Scott Falater was sleepwalking and, therefore, not responsible for his violent act. Even though he had a history of sleepwalking and experienced stressors which would increase the probability of a sleepwalking episode, the complex and long episode that took place including his trying to repair the pool pump and changing clothes after the crime before going to bed rendered it unlikely for the jury that Scott Falater sleepwalked that night, even though motives for the murder were completely lacking. By carefully recounting the process, Rosalind Cartwright encourages sleep specialists to serve as expert witnesses to help accused persons even though it is not easy to cope with the rough interrogation manners at court. It definitely is a challenge to the field of sleep medicine as to how to diagnose sleepwalking because these activities rarely occur in the lab – some recent imaging and EEG studies using spectral analysis might help in this process. But, moreover, even if the accused person is a sleepwalker it has to be shown – at least with high probability – that he or she was sleepwalking that particular night. Overall, the sleep cases that have been prominent in the media might have the effect of stimulating research in this area.

By analyzing the most plausible course of action in that night, Rosalind Cartwright looked into the motives for sleepwalking in order to support her theory of dream function. Interestingly, the sleepwalker's behaviors were quite limited in range, Scott Falater was trying to finish a task he wasn't able to finish in the evening before going to bed. Other sleepwalkers explore their surroundings, protect close family members, eat, have sex, or use the bathroom. One of

our adult patients used the closet for urinating, much to his surprise in the morning and did not remember the incident, which is normal for most sleepwalkers. Studying the motives of sleepwalkers has led Rosalind Cartwright to the assumption that during the first NREM sleep episodes (whereas night terrors often occur in the first cycle, sleep walking can also be found later in the night) the basic instincts of the persons related to pre-sleep experiences are re-activated and, thus, are preparation for the processes of interweaving new experiences with old material during REM sleep. This line of research has been neglected by most dream researchers because REM dreams are easily assessable whereas sleepwalking episodes are rare under laboratory conditions (even though more effective provoking methods have been developed [see Chapters 5 and 6]). How fruitful careful video analyses are has been demonstrated by Jürgen Hoppe in the more than twenty cases he studied in his lab (Hoppe, 2011). However, one has to keep in mind that the brain during a sleepwalking episode is not totally sleeping, visual coordination, motor cortices are “awake” and well-functioning – in Allan Hobson’s terminology it would be a hybrid state (Hobson, Pace-Schott, & Stickgold, 2000). In general, I was impressed with her idea of including NREM dreaming into a general model of dreaming; most often theorizing is restricted to REM dreaming (Hartmann, 2011; Hobson, 2011).

One chapter is devoted to the REM parasomnias nightmares and REM sleep behavior disorder – both are diagnostic entities relevant for sleep clinicians. First, nightmares are very common and normally underdiagnosed and undertreated (Schredl, 2010) and, second, REM sleep behavior is a very serious, but luckily rare condition because it is a precursor of a neurodegenerative disease like Parkinsons, multiple system atrophy or Lewy body dementia. Studying REM sleep behavior disorder is also very useful for theoretical purposes, one does not have to rely on the dream report of the person but can study the dream-enactment by means of a video camera (Valli et al., 2011). Michel Jouvet also demonstrated that animals show waking-life behavior in REM sleep if the muscle-tone blocking neurons in the brainstem are destroyed experimentally (Jouvet, 1979). This line of research adds substantial information and support to the studies relying on the dream reports given by sleep study participants after awakening.

Within the last chapter, Rosalind Cartwright mentions her unofficial title, “Queen of Dreams”, and recounts an anxiety dream of her childhood. The harlequin, a frightening figure in that dream, also showed up in later dreams, and she related the fear experienced in the dream to current waking life issues; again in line with the continuity hypothesis of dreaming.

The first two chapters – I promised to review the book chapters in reverse order (almost) – give an overview of the early days of sleep and dream research and basic methodological issues that are important if one wishes to set out to study dreams. It is nicely written and serves as a solid ground for understanding the major findings that Rosalind Cartwright presents in the subsequent chapters.

To summarize, Rosalind Cartwright’s theory as presented in the book is a big milestone in the dream research field because her arguments, drawn from psychological dream research and sleep medicine research, underline the importance of the nocturnal mental processes (NREM and REM dreaming) in the twenty-four hour mind. It is a very instruc-

tive book and hopefully stimulates more research into the function(s) of dreaming.

I conclude this review with the last two sentences of the book: “Dreams are a window onto the ongoing work of the mind during its essential night-shift.” and “We are always works in progress.” And so is dream research, I would like to add.

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