

Content and frequency of dream reports: psychological and neurophysiological correlates

Humans have been intrigued by their dreams since the dawn of time. Yet, despite millennia of exploration, several questions regarding dreaming are still unresolved. The goal of the present thesis was to improve our understanding of this phenomenon through several studies, involving different methodologies and each addressing a particular aspect of dreaming. First, we investigated the mechanism of dream recall by comparing the cognitive, psychological and brain functioning of high and low dream recallers (HR and LR, respectively) during sleep and wakefulness (Studies 1 to 4). Second, we investigated the content and function of dreaming through an extensive behavioral analysis of the relationship between waking-life and dream content (Study 5). Finally, we leveraged our expertise in sleep science to develop an open-source and comprehensive software dedicated to sleep analysis (Study 6).

With regards to dream recall, our results revealed that the ability to recall dream is positively associated with a specific neurophysiological profile, characterized notably by an increased activity in the default mode network during both sleep and wakefulness. For instance, we observed that, as compared to LR, HR exhibit a greater functional connectivity in regions critical to memory encoding just after awakening from sleep. HR also showed longer intra-sleep awakenings and higher scores of creative-thinking than LR. These findings led us to propose an integrative and comprehensive model of the dream recall process. Furthermore, the results of Study 5 enhanced and refined our comprehension of the continuity between waking-life and dream content, and provided support for the hypothesis of an active role of dreaming in emotional regulation. In conclusion, the experimental, theoretical and methodological contributions of the present work could serve as a basis for future research, in the hope that someday, we will be able to apprehend dreaming in all its richness and diversity.

Keywords: dream, sleep, awakening, memory, magnetic resonance imaging, electroencephalography, brain networks, software development