The Dreamland: Validation of a Structured Dream Diary

Brigitte Holzinger1*, Lucille Mayer1, Isabel Barros2, Franziska Nierwetberg1 and Gerhard Klösch3

1 Institute for Consciousness and Dream Research, Vienna, Austria, 2 Psychology Department, California State University, Long Beach, CA, United States, 3 Department of Neurology, Medical University of Vienna, Vienna, Austria

Validated instruments for the analysis of dream contents are still scarce. Therefore, the aim of this study was to validate the Dreamland Questionnaire (DL-Q) by comparing its results to those of the Hall and van de Castle Coding System (HVDC). Twenty-two participants voluntarily filled in a written dream report as well as our DL-Q questionnaire, in total 30 dreams were collected with both measures. Written reports were analyzed with the HVDC and results of the two instruments were compared using Pearson correlations. Results showed that correlations were high for dominant characters, pleasantness of dream content, and body-related experiences. However, some DL-Q items showed low correlations and others could not be compared directly, as the HVDC did not include the same set of items. The DL-Q showed satisfactory validity and reliability as a measure of dream criteria and may serve as an effective tool for diagnosis and evaluation and facilitate future clinical and research studies. Nevertheless, some items could not be compared as part of this study and should be validated in future investigations.

Keywords: dream, DL-Q, Hall and van de Castle Coding System, sleep laboratory, research instrument development, questionnaire, dream diary

INTRODUCTION

A variety of methodologies has been used for the collection and analysis of dream reports, each covering different aspects of dreaming (Klösch and Holzinger, 2014). Dream reports differ as a result of setting, awakening method, collection technique, and analysis. Private settings produce markedly distinct reports from laboratory setting and influence dream recall (Foulkes, 1996; Schredl et al., 2003). Awakenings can be forced or spontaneous, and forced awakenings differ in the stimulus with which the dreamer is awakened (Dement and Wolpert, 1958; Klösch and Holzinger, 2014). Dream reports can be collected on audio tape, in more detailed written form (e.g., dream diary), in the more structured form of questionnaires, or even in the form of drawings and enactments (Schredl, 2002; Klösch and Holzinger, 2014). Using the therapeutic setting to discover the underlying meaning of a dream is an additional possibility to discover one's dream world. Furthermore, dreams can be collected on a daily basis or in retrospect (Schredl, 1999; Watson, 2003; Zadra and Geneviève, 2012). Several methodological shortcomings (e.g., how to interpret pictures objectively) of one or the other method often led to a combination of different techniques. However, scientists mostly rely on questionnaires and written reports, with dream diaries being considered as the most important source of information regarding dream characteristics (Klösch and Holzinger, 2014). The recalled dream content is usually first recorded on tape and written...
down later or written down directly in a dream diary (e.g., Foulkes, 1979; Hurovitz et al., 1999). Although most scientists in the field of dream research use dream diaries as a major instrument for the collection and analysis of dreams, basic literature on how to use and organize dream diaries is still scarce (Strauch and Meier, 1992; Schredl, 1999). Another major limitation of written dream reports is the lack of standardized procedures to collect and analyze written protocols (e.g., Smith, 1984).

One coding system that allows for a comparison of dreams is the Hall and Van de Castle Coding System (HVDC), which was developed in 1966 (Hall and Van de Castle, 1966). Overall, the HVDC is one approach with solid empirical support. However, the system has its weaknesses: short (less than 50 words) and long dreams (more than 300 words) cannot be analyzed. Learning how to use the coding system, i.e., getting to know all available categories, and the analysis of big samples is a quite time-consuming task.

To allow for a less demanding, more structured analysis of dreams, a large number of dream questionnaires has been developed. Unfortunately, most of them are still lacking standardization and validation (e.g., Hauri et al., 1967; Kallmeyer and Chang, 1997; Schredl, 1999, Schredl, 2004). Many questionnaires focus on specific topics such as dream motifs (e.g., Yu, 2012; Malinowski and Horton, 2014), nightmares (e.g., Belicki, 1992), impactful events and traumas (e.g., Orsillo et al., 2007), emotionality (e.g., Rezzonico and Liccione, 2004; Zadra et al., 2006; Yu, 2007), lucid dreaming (e.g., Voss et al., 2013), REM sleep behavior disorders (e.g., Boeve et al., 2011), or assess dreaming in general but in a rather complex manner (e.g., Kallmeyer and Chang, 1997; Aumann et al., 2012). One reason for the lack of validation is that several questionnaires refer to personal constructs or traits which are difficult to evaluate with other instruments (e.g., Hartmann’s concept of thick and thin boundaries, Hartmann et al., 1998). Nevertheless, in dream research there is a need of an easy-to-use instrument, which can be completed by patients as well as healthy subjects over longer time-periods. It should provide basic information regarding the formal criteria of the dream (frequency, length, time, etc.) as well as the content of the dream (themes, sources, emotional impact, the dreamer’s involvement in the dream etc.).

For this purpose, we aimed to validate the Dreamland (DL-Q), a 14-item self-report dream questionnaire that enables to investigate the subjective dream experience in retrospect (see Supplementary Appendix). Although it is structured like a questionnaire, it also possesses the functions of a dream diary. It is a comprehensive, easy-to-use tool that can be used as a screening or monitoring instrument in a therapeutic setting, in the field of consciousness, sleep and dream research, or as a complementary tool for the diagnosis of sleep disorders and other psychological impairments. The original version of the questionnaire was developed as early as 1997, now more than 20 years ago, and derived from our clinical observations, previous empirical work, and existing questionnaires. Its items were selected based on expert ratings on which dream aspects are the most important and central. Dreamers were asked which items were missing for an adequate and comprehensive description of their individual dreaming experience. The goal was to create an instrument that, on the one hand, comprises all relevant dream aspects, but on the other hand, is as short and quick to fill out and evaluate as possible. Therefore, some items that are included in other questionnaires or in the HVDC, are not part of the DL-Q. As a result, the application, evaluation and interpretation are significantly faster than for written dream reports and no specific training is necessary. Since its first use, the DL-Q has been developed further: some items were rephrased, some of the response categories were replaced with visual analog scales (VAS), and the questionnaire was improved with the help of test theorists. Fourteen items assess the dream characteristics and additionally, the back side of the questionnaire can be used for a more detailed description of the dream. This allows a direct comparison of dreamers’ ratings of their own dream and the ratings of experts with the help of a coding system, e.g., HVDC. In this sense, the questionnaire reflects our understanding of a multidimensional approach in dream research. Since its first development in 1997, the DL-Q has proven its usefulness in studies with patients as well as healthy subjects and in the comparison of different subpopulations (Klösch et al., 1999a,b; Holzinger et al., 2001, 2015; Lorenzo et al., 2002). We suggest that the DL-Q might be able to provide additional information about the nature of certain psychological disorders, and found, for instance, that the emotionality and thought content typical for eating disorders such as aggression in anorexics are also experienced in dreams (Holzinger et al., 2015). The DL-Q has been used in different therapeutic settings and most patients confirmed that they preferred to fill out the questionnaire over a written dream report. The shortness and structure of the DL-Q may help certain subpopulations struggling with cognitive impairments such as short attention span and contains clear item responses. The DL-Q was also shown by other researchers to discriminate successfully between dream recall and content under the influence of different drugs and without medication (Lorenzo et al., 2002). The questionnaire can easily be integrated into a sleep diary or combined with objective sleep measurements such as polysomnography or ambulant activity monitoring by actigraphs (Klösch et al., 2001). The DL-Q constitutes the basic item collection to analyze dream content, but items can be added easily in order to investigate more specific research questions.

**METHODS**

**Procedure and Sample**

The aim of this study was to compare the results of the DL-Q to those obtained by the HVDC coding system. In order to analyze the written dream reports with the HVDC, the completion of a specific training is required. Therefore, we collaborated with specialists namely Bill Domhoff, Adam Schneider and IB, all working in the United States. To make this possible, the questionnaire was translated to English and all study participants were native English speakers. All the items included in both methods were selected and correlations were calculated.
In total, 22 participants took part in the study (12 women) aged between 24 and 65 ($M_{age} = 34.32$, $SD_{age} = 11.61$). Some provided more than one dream, which resulted in a collection of 30 dreams. Participants were recruited via E-mail and personal contacts, participation was voluntary. Before filling in the questionnaires, they were informed about the purpose of the study. All dreamers completed the questionnaire in the time frame from 21.09.17 – 16.05.18. Participants did not report any sleep disorders, psychological or physiological disorders, nor psychiatric history or substance abuse. Participants were informed that the study results would be used in research and published at a later date. They were instructed to fill in the questionnaire within 30 min after waking up. Participants were not educated about dreams in any way and we did not differentiate beforehand between levels of complexity and fragmentation. Since participation was completely anonymous and no names or other information was given, no ethical committee was consulted.

**Measures**

**The Hall and Van de Castle Coding System**

The HVDC system consists of ten general categories, many of which are divided into subcategories: (1) Characters; (2) Social Interactions; (3) Activities; (4) Striving: Success and Failure; (5) Misfortune and Good Fortunes; (6) Emotions; (7) Physical Surroundings, Settings and Objects; (8) Descriptive Elements; (9) Food and Eating; (10) Elements of the Past. Interrater reliability between scores has been found to vary between categories, with the lowest percentage of perfect agreement for the scale “Social Interactions” (54–64%). For the analysis, the MS-Excel™ spreadsheet developed by Schneider and Domhoff (1995) can be used and allows for calculation of frequencies and certain indexes. After the coding procedure, individual dreams can be compared with those of a normative population (e.g., age- and sex-matched controls).

**Dreamland Questionnaire (DL-Q)**

The DL-Q comprises 14 items, pooled into three parts: In the first part, seven questions help assessing the number, duration, time of occurrence, perception, recall of dreams and awakenings due to dreams. In the second part, subjects are asked to write down last night’s most prominent dream and to characterize it by means of a set of given categories related to the dream content, degree of participation, affectivity as well as sensory and emotional involvement. Finally, the last part contains two items regarding lucid dreaming (Klösch and Holzinger, 2014). More detailed information and response categories can be found in the Supplementary Appendix. Only items 4, 8, and 9 allow multiple answers. Items 10 and 11 consist of visual analog scales (VAS). Results are analyzed by transferring the marked questions into a MS-Excel™ spreadsheet.

**Statistical Analyses**

To see whether the correlation between corresponding items of the DL-Q and HDVC was sufficient, point-biserial correlations were calculated. All statistical analyses were carried out with the Statistical Package for Social Science 26 (SPSS, IBM Corp, 2017). On SPSS, point-biserial correlations were calculated as Pearson correlations. For statistical analysis, the threshold for the rejection of the null hypothesis was set to 0.05.

**RESULTS**

This analysis only included those items of the DL-Q with a counterpart in the HVDC. Therefore, only the second part of the DL-Q could be included, in which one dream of last night was described in more detail by the participants. Pearson correlations were high for some items, results are shown in Table 1. The appearance of animals, friends, family, unknown towns showed significant overlap in both measures. Body-related sensory impressions were correlated significantly with the physical and motor activity captured by the HVDC. The rating of the dream-plot as pleasant or unpleasant was also correlated in both instruments. The remaining items did not show significant concordance or could not be included in the analysis, since there were no corresponding items when comparing the DL-Q with the HVDC.

A post hoc power analysis showed that the sample size of 30 dreams is sufficient (0.86) (Cohen, 1988).

**DISCUSSION**

This study provides a first validation of the DL-Q. While some of the DL-Q items were compared to the results of the HVDC, others were not covered by both instruments and a comparison was impossible. Therefore, only items of the second part of the questionnaire were included. Of those that were contrasted, dominant characters, the pleasantness of a dream, and body-related activity correlated significantly in both measures. These aspects might be those remembered most clearly and least affected by memory distortions. The findings suggest that the DL-Q is a promising way of analyzing dreams but this investigation does not allow general conclusions. Further validity and reliability studies should be done in the future to support the findings presented in this study. Unfortunately, an overall comparison to other dream questionnaires is difficult, since they do not include the same set of items or even the same overall research question. Furthermore, the DL-Q includes different types of response categories which enables participants to provide more adequate answers, however, statistical analysis is more complicated. Also, research with a bigger sample is needed in the future.

With the DL-Q, we hope to provide an easy-to-use tool for research and diagnostics. It facilitates the re-evaluation of the dream content in relation to the dreamer’s biography, goals and desires. The process of remembering, writing down, and evaluating a dream may be the initiator of a new look at things or might even lead to long-sought solutions for problems from the awake life. The mere act of writing down dreams regularly may enable to experience lucid dreams and take control of nightmares and issues that interfere with our daily functioning. The DL-Q
The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.
ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

BH and LM conducted the literature search, selected the eligible studies, conducted the statistical analysis and drafted the manuscript. IB and FN coded and evaluated the results of the HVDC. GK was part of the development of the DL-Q and involved in the statistical analysis. All authors confirm being the only contributors of this work and have approved it for publication.

REFERENCES

Aumann, C., Lahl, O., and Pietrowsky, R. (2012). Relationship between dream structure, boundary structure and Big Five personality dimensions. Dreaming 22, 124–135. doi: 10.1037/a0028977
Beaulieu-Prévost, D., and Zadra, A. (2007). Absorption, psychological boundaries and attitude towards dreams as correlates of dream recall: two decades of research seen through a meta-analysis. J. Sleep Res. 16, 51–59. doi: 10.1111/j.1365-2869.2007.00572.x
Belicki, K. (1992). The relationship of nightmare frequency to nightmare suffering with implications for treatment and research. Dreaming 2, 143–148. doi: 10.1037/h0094355
Bernstein, D. M., and Roberts, B. (1995). Assessing dreams through self-report questionnaires: Relations with past research and personality. Dreaming 5, 13–27. doi: 10.1037/h0094420
Boeve, B., Molano, J., Ferman, T., and Silber, M. (2011). Validation of the mayo sleep questionnaire to screen for REM sleep behavior disorder in an aging and dementia cohort. Sleep Med. 12, 445–453. doi: 10.1016/j.sleep.2010.01.009
Cohen, J. (1988). Statistical Power Analysis for the Behavioral Sciences. Hillsdale, NJ: Lawrence Erlbaum Associates.
Dement, W., and Wolpert, E. (1958). The relation of eye movements, body motility and external stimuli to dream content. J. Exp. Psychol. 55, 543–553. doi: 10.1037/h0040031
Foulkes, D. (1979). Home and laboratory dreams: four empirical studies and a conceptual reevaluation. Sleep 2, 233–251.
Foulkes, D. (1996). Dream research: 1953–1993. Sleep 19, 609–624. doi: 10.1093/sleep/19.8.609
Hall, C., and Van de Castle, R. (1966). The Content Analysis of Dreams. New York, NY: Appleton Century Crofts.
Hartmann, E., Rosen, R., and Rand, W. (1998). Personality and dreaming: boundary structure and dream content. Dreaming 8, 31–39. doi: 10.1023/b:dream.0000005913.21794.1f
Hauri, P., Sawyer, J., and Rechtschaffen, A. (1967). Dimensions of dreaming: a multidimensional dream inventory: preliminary evidence for validity and reliability. Percept. Mot. Skills 85, 803–808. doi: 10.2466/psych.1997.85.3.803
Klösch, G., Gruber, G., Anderer, P., and Saletu, B. (2001). Activity monitoring in sleep research, medicine and psychopharmacology. Wien. Klin. Wochenschr. 113, 288–295
Klösch, G., and Holzinger, B. (2014). Dream content analysis: methodological and theoretical approaches. Psychother. Forum 19, 121–129. doi: 10.1007/s00729-014-0023-2
Klösch, G., Parapatics, S., Holzinger, B., Gruber, G., Saletu, B., Barbanoj, M., et al. (1999a). Dream recall in healthy subjects: are there any differences between males and females? Third international congress of the world federation of sleep research societies (WFSSR), Dresden, October 5–9, 1999. Sleep Res. Online 2(Suppl. 1), 296.
Klösch, G., Parapatics, S., Holzinger, B., Gruber, G., Saletu, B., Barbanoj, M., et al. (1999b). Unterscheiden sich Traumerinnerungen im Schlaflabor von anderen Nächten? Somnologie 1:66.
Lorenzo, J. L., Barbanoj, M. J., Clos, S., Morte, A., Klösch, G., Luque, A., et al. (2002). Changes in dream recall and dream content under drug treatment in healthy subjects: effects of alprazolam, paroxetine and its combination (0-1). 16th Congress of the ESRS in Reykjavik. J. Sleep Res. 11(Suppl.1), 1–260.
Malinowski, J., and Horton, C. (2014). Memory sources of dreams: the incorporation of autobiographical rather than episodic experiences. J. Sleep Res. 23, 441–447. doi: 10.1111/jsr.12134
Orsillo, S., Theodore-Oklota, C., Lutterick, J., and Plum, J. (2007). The development and psychometric evaluation of the emotional reactivity and numbing scale. J. Nerv. Ment. Dis. 195, 830–836. doi: 10.1097/NMD.0b013e318156816f
Rezzonico, G., and Liccione, D. (2004). Dreams and Psychotherapy: The use of Dream Material in Cognitive Psychotherapy. Torino: Bellati Boringheri Press.
Schneider, A., and Domhoff, G. W. (1995). Coding Rules for the Hall/Van de Castle System of Quantitative Dream Content Analysis. Available online at: https://dreams.ucsc.edu/Coding/
Schredl, M. (1999). Die nächtliche Traumwelt. Eine Einführung in die Psychologische Traumforschung. Stuttgart: Kohlhammer.
Schredl, M. (2002). Questionnaires and diaries as research instruments in dream research: methodological issues. Dreaming 12, 17–26. doi: 10.1023/a:1013890421674
Hurovitz, C., Dunn, S., Domhoff, G., and Fiss, H. (1999). The dreams of blind men and women: a replication and extension of previous findings. Dreaming 9, 183–193. doi: 10.1023/a:1021397817164
IBM Corp (2017). IBM SPSS Statistics for Macintosh, Version 25.0. Armonk, NY: IBM Corp.
Kallmeyer, R., and Chang, H. (1997). The multidimensional dream inventory: the HVDC. J. Nerv. Ment. Dis. 185, 31–39. doi: 10.1016/0021-9975(97)06.009
Kloster, G., and Rezzonico, G., and Liccione, D. (2004). Dreams and Psychotherapy: The use of Dream Material in Cognitive Psychotherapy. Torino: Bellati Boringheri Press.
Schneider, A., and Domhoff, G. W. (1995). Coding Rules for the Hall/Van de Castle System of Quantitative Dream Content Analysis. Available online at: https://dreams.ucsc.edu/Coding/
Schredl, M. (1999). Die nächtliche Traumwelt: Eine Einführung in die Psychologische Traumforschung. Stuttgart: Kohlhammer.
Schredl, M. (2002). Questionnaires and diaries as research instruments in dream research: methodological issues. Dreaming 12, 17–26. doi: 10.1023/a:1013890421674

ACKNOWLEDGMENTS

The authors would like to express their sincere thanks to the editor and the reviewers for their careful work and thoughtful suggestions. Many thanks to Bill Domhoff and Adam Schneider from the University of California, Santa Cruz, for their help on this project. They also like to express our appreciation to the certificate program “Sleepcoaching” at the Medical University of Vienna.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2020.585702/full#supplementary-material

Supplementary Data Sheet 1 | DREAMLAND II Questionnaire.

The authors would like to express their sincere thanks to the editor and the reviewers for their careful work and thoughtful suggestions. Many thanks to Bill Domhoff and Adam Schneider from the University of California, Santa Cruz, for their help on this project. They also like to express our appreciation to the certificate program “Sleepcoaching” at the Medical University of Vienna.
Schredl, M., Wittmann, L., Ciric, P., and Götz, S. (2003). Factors of home dream recall. A structural equation model. *J. Sleep Res.* 12, 133–141. doi: 10.1046/j.1365-2869.2003.00344.x

Schredl, M. (2004). Reliability and stability of a dream recall frequency scale. *Percept. Mot. Skills* 98, 1422–1426. doi: 10.2466/pms.98.3c.1422-1426

Schredl, M., Berres, S., Klingauf, A., Schellhaas, S., and Görtz, A. (2014). The Mannheim Dream questionnaire (MADRE): retest reliability, age and gender effects. *Int. J. Dream Res.* 7, 141–147. doi: 10.11588/ijdrr.2014.2.16675

Smith, R. (1984). The meaning of dreams: the need for a standardized dream report. *Psychiatry Res.* 13, 267–274. doi: 10.1016/0165-1781(84)90042-8

Strauch, I., and Meier, B. (1992). *Den Träumen auf der Spur. Ergebnisse der Experimentellen Traumforschung*. Bern: Huber Verlag.

Voss, U., Schermelleh-Engel, K., Windt, J., Frenzel, C., and Hobson, A. (2013). Measuring consciousness in dreams: the lucidity and consciousness in dream scale. *Conscious. Cogn.* 22, 8–21. doi: 10.1016/j.concog.2012.11.001

Watson, D. (2003). To dream, perchance to remember: individual differences in dream recall. *Personal. Individ. Differ.* 34, 1271–1286. doi: 10.1016/s0191-8869(02)00114-9

Yu, C. K. C. (2007). Emotions before, during, and after dreaming sleep. *Dreaming* 17, 73–86. doi: 10.1037/1053-0797.17.2.73

Yu, C. K. C. (2012). Dream motif scale. *Dreaming* 22, 18–52. doi: 10.1037/ a0026171

Zadra, A., and Geneviève, R. (2012). Dream recall frequency: impact of perspective measures and motivational factors. *Conscious. Cog.* 21, 1695–1702. doi: 10.1016/j.concog.2012.08.011

Zadra, A., Pilon, M., and Donden, D. (2006). Variety and intensity of emotions in nightmares and bad dreams. *J. Nerv. Ment. Dis.* 194, 249–254. doi: 10.1097/01.nmd.0000207359.46223.dc

**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2020 Holzinger, Mayer, Barros, Nierwetberg and Klösch. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.