Validation of the French version of the Mannheim Dream Questionnaire in a French adult sample

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Summary. The aim of the study was to provide a reliable French validation of the Mannheim Dream questionnaire in order to further examine demographic factors that may affect dream-related experience. The participants were 315 healthy French adult volunteers aged from 18 to 73 years. We performed a test-retest reliability study to evaluate the validity of our translation. The results obtained with the online French version of the Mannheim Dream questionnaire showed good indices of the test-retest reliability, and allowed us to have a first insight of the frequency repartition of some dream-related aspects and attitudes within a French population. The French version of the Mannheim Dream questionnaire is the first comprehensive French validated tool to investigate in large cohorts several aspects of the subjective dream experience, such as dream recall frequency, nightmares, lucid dreams, attitude toward dreams and effect of dreams on waking life.

Keywords: Mannheim Dream Questionnaire, MADRE, French version, Dream, Validation

1. Introduction

Dreaming is a subjective experience that occurs during sleep and is often accompanied by vivid and emotional contents. Since the discovery of rapid eye movements during sleep, scientific knowledge on the relationship between dreaming, specific dream contents and physiological brain correlates has accumulated (Aserinsky & Kleitman, 1953; Cipolli, Ferrara, De Gennaro, & Plazzi, 2017; Schwartz & Maquet, 2002). Nonetheless, whether dreams really serve any physiological, biological or psychological function at all or are just a trivial byproduct of the brain firing while we sleep remains elusive. Collecting the human material of dreams and understanding factors that influence the process of dream recall and dream content is another valuable source of knowledge that may complement that of the anatomic scrutiny of the dreaming process and function. To this purpose, several dream questionnaires have been developed and used (Bernstein & Belicki, 1995; Domhoff & Schneider, 1998; Kallmeyer & Chang, 1997; Schredl, 1998). Even though daily dream logs are generally considered to be more direct and valid measures of several dream aspects, retrospective measures can be obtained with a single question, are less time-consuming than daily logs and more easily implemented in large-scale studies (Beaulieu-Prevost & Zadra, 2007). With this in mind, the Mannheim Dream Questionnaire (MADRE), a compre-hensive reliable and validated auto-questionnaire, was designed to cover topics of individual dream experience that have not been combined before including the frequency of dream recall, emotional aspects of dreams (intensity and tonality), nightmares, lucid dreaming, attitude towards dreams and effects of dreams on real life (Schredl, Berres, Klingauf, Schellhaas, & Goritz, 2014). In order to provide a reliable French version of the MADRE questionnaire that could be useful in conducting surveys to investigate dream variables in France and in French speaking countries, we sought to conduct a local survey to test the reliability and the validity of a newly developed French version of the MADRE questionnaire. During the completion of our survey, a first French version of the MADRE was however published (Scapin, Dehon, & Englebert, 2018). By improving the translation procedure, the recruitment method and the general results analysis of this first published French version, the present study aimed at validating an improved new French version of the MADRE questionnaire.

2. Method

2.1. Research instrument

The English version of the MADRE questionnaire was used for the present study (Schredl et al., 2014). Briefly, a bilingual and bicultural professional native-speaking French translator translated the English version of the MADRE questionnaire into French. The translated version was then sent to a bilingual and bicultural professional native-speaking British translator, blind to the original English version, who translated it back into English. His translation and the original were then compared to analyze the exactitude of the French translation. The scales of the questionnaire were coded according to Schredl et al. (Schredl et al., 2014). The French version of the MADRE questionnaire is available in the appendix of this article.

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2.2. Procedure and Participants

The study was approved by the ethical committee (ID RCB N° 2017-A03360-53, CPP EST 1 N° 2018/03).

Study subjects were adult participants regularly registered in the University Hospital of Bordeaux database of healthy volunteers. Any individual who is willing to voluntarily participate to any clinical research program may apply to this database. To register, subjects however must be free of any disease and must not be taking any medication. Participants were informed about the purpose and aim of the study via e-mail campaign and completed the self-administered online anonymous questionnaire. Participants were informed that results from the study would be used in research and published at a later date. Total completion of the questionnaire required participants to answer to all the questions. The first completion of the questionnaire took place between May 30th and June 8th 2018, and the questionnaire was posted online again between June 30th and July 13th. The mean interval between the first and the second completion of the questionnaire was 24±3 days.

A total of 315 participants completed the first online survey and were used for the descriptive results of the questionnaire. They were aged from 18 to 73 years (mean age: 36±15 years) with a majority of women (71.2%). Among them, a total of 170 completed the second online survey for the retest purpose. These were aged from 18 to 72 years (mean age: 38±15.6 years) with a majority of women (71.76 %).

2.3. Statistics

All statistical analyses were carried out with the R 3.5.1 software. In line with Schredl et al. (Schredl et al., 2014), ordinal scales were treated with ordinal regressions to study the correlations between age, gender and dream recall frequency with different dream variables. In the case of numeric variable, linear regressions have been computed. The retest reliability analyses were different depending on the kind of variable. We computed exact agreement for binary items, Spearman Rank correlation for ordinal variables and Pearson correlation for interval variables. We also ran a confirmatory factorial analysis in order to evaluate the presence of a single factor model fitting with the group of attitude towards dreams items. We therefore verified that the application conditions (differences within the correlation matrix and adequate quality of the MSA indices) were respected and that the indices judging the adequacy of the model (RMSEA, CFI and SRMR) were satisfactory (Hooper, Coughlan, & Mullen, 2008). To evaluate the inter-consistency of our model, we ran a Cronbach's alpha involving all the items included in the model.

3. Results

The distribution of the dream recall frequency (N=315) is shown in Table 1. In our sample, there was no significant gender difference in dream recall frequency (standardized estimates=0.2481, Chi²=1.24, p=.2649), but a significant age decline as older participants recalled dreams less frequently than younger ones (standardized estimates=-0.0224, Chi²=10.96, p=.0009). Average emotional intensity of dreams was 2.4±0.83 and average emotional tone was almost neutral (mean=-0.06±1.02). Indeed, a large majority of the participants reported their dreams to be either neu-

tral or somewhat positive or negative (88.5%), whereas only 11.5% of the cohort indicated that the emotional tone of their dreams was either very positive or very negative.

The distribution of current nightmare frequency and the nightmare frequency in childhood is shown in Table 2.

Nightmares during childhood (from 6 to 12 years old) appeared to be more frequently reported than current nightmares (Sign-rank test S=11445, p=.0002), and the inter-correlation between current nightmare frequency and nightmare frequency during childhood was significant (r=.3538, p<.0001), meaning that the more participants reported current nightmares, the more they recalled nightmares during childhood. Mean current nightmare distress was 1.66±1.22 (in between « not that distressing » and « somewhat distressing » and a positive correlation between current nightmare frequency and nightmare distress was found (r=.4922, p<.0001). As there was a strong relationship between these variables, we added current nightmare frequency as a covariate in the regression analyses for nightmare distress and showed the relationship between the two variables was still significant (standardized estimates=.5201, Chi²=84.81, p<.0001). Older people reported fewer disturbing nightmares than younger ones, even when nightmare frequency is controlled (standardized estimates=-.0206, Chi²=8.20, p=.0042), whereas women experienced almost similar distressful nightmares when compared to men (standardized estimates=.3473, Chi²=2.11, p=.146). Nightmares occurring in a recurrent fashion were largely distributed among our sample, and 31.7% of the participants reported recurring nightmares related to real-life situations.

The distribution of lucid dreams frequency is shown in Table 3. Among participants who reported having experienced lucid dreaming at least once, 62.24% were able to estimate the age of their first experience. For these individuals, mean age of the first recalled lucid dream was 16.06±6.14, with 76.67% of them declaring that lucid dreams started before or at the age of 18.

Table 4 depicts the distribution of responses for each item on the attitude towards dreams scale (question 12 of the MADRE questionnaire, see annexed questionnaire).

Using confirmatory factor analysis, and similar to what was previously shown (Scapin et al., 2018; Schredl et al., 2014), we have been able to confirm the presence of a single factor model fitting with the group of items 2 to 7 and mirroring the general attitude towards dreams. Scores of all 6 items incorporated in the model were correlated to each other (inter-item consistency: r=.87; 95% CI [.84, .89]).

Table 1. Dream recall frequency distribution (%) of the total population (N=315) and by gender

Category	Total (N = 315)	Women (N = 224)	Men (N = 91)
Almost every morning	13.3	13.4	13.2
Several times a week	30.8	33.0	25.3
About once a week	25.7	24.1	29.7
Two to three times a month	14.6	16.1	11.0
About once a month	8.6	7.1	12.1
Less than once a month	4.8	4.5	5.5
Never	2.2	1.8	3.3

Table 2. Current nightmare and childhood nightmare frequencies distribution (N=315)

Category	Current nightmares (%)	Childhood nightmares (%)
Almost every morning	5.1	7.3
About once a week	11.4	13.0
Two to three times a month	17.5	23.2
About once a month	16.8	17.8
About two to four times a year	22.2	19.4
About once a year	9.8	7.6
Less than once a year	6.7	5.4
Never	10.5	6.3

Table 3. Current lucid dreams frequency distribution (N=315)

Category	Lucid dreams (%)
Almost every morning	12.7
About once a week	9.2
Two to three times a month	15.2
About once a month	12.7
About two to four times a year	13
About once a year	9.2
Less than once a year	4.4
Never	23.5

Average subjective meaning attributed to dreams was little (2.06±1.07) as was the prevailing impression that dreams provide clues in personal real-life (2.32±1.11).

We found a positive correlation between dream recall frequency and the attitude towards dream factor (r=.2835, p<.0001), meaning the more frequently dreams are recalled the more individuals have positive attitudes towards their dreams.

In our sample, and as shown in Table 5, although a majority of the participants commonly share their dream experiences with others, many of them did not believe that dreams would impact their daily life. A large majority of participants (68.9%) admitted having read about dreams and those who believed this was helpful in understanding their dreams ranged from somewhat helpful (36.9%) to very helpful (3.2%).

Table 6 shows the relationship between age and gender, and the main subjective dream variables. Dream recall frequency and emotional intensity of dreams, but not emotional tone, significantly decreased with age and the same relationship was observed for current nightmare frequency and nightmare distress intensity. Older subjects reported less childhood nightmares and lucid dreams, and they estimated their first lucid dream to occur later in their life compared to the younger ones. When compared to men, women reported significantly higher nightmare frequency with nightmares being more distressful.

Table 7 represents the relationship between age and gender, and dream subjective attitudes and beliefs when dream recall frequency is controlled. Dream recall frequency is significantly correlated to all the items of question 12 "Attitude towards dreams". When dream recall frequency is controlled, older age was shown to be associated with a weaker interest in dreams and a less marked desire to learn about dreams that were no more considered as an interesting phenomenon. Regarding gender, and when compared to men, women had in general a better attitude towards dreams as they attribute more meaning to their dreams, show greatest interest in dreams and wish to learn more about.

Table 8 represents the relationship between age and gender, and dream aspects and beliefs when dream recall frequency is controlled. Higher dream recall frequency positively influenced almost all the variables listed in Table 8. Only reading about dreams and the benefit of dream literature were not influenced by dream recall frequency. When dream recall frequency is controlled, older adults showed less willingness to share their dreams and reported less déjà-vu experiences than younger adults, while women were more willing to report and record their dreams, and also admitted more curiosity about dream topics than men.

Table 4. Distribution of responses (%) for items on question 12 "Attitude towards dreams" (N=315)

Variables	Not at all	Not that much	Partly	Somewhat	Totally
How much meaning do you attribute to your dreams?	7.6	23.2	33.0	27.9	8.3
How strong is your interest in dreams?	5.1	21.3	23.2	29.5	21.0
I think that dreams are meaningful	1.9	10.2	20.0	40.3	27.6
I want to know more about dreams	1.6	4.8	11.1	29.2	53.3
If somebody can recall and interpret his/her dreams, his/her life will be enriched	4.8	16.8	27.0	30.2	21.3
I think that dreaming is in general a very interesting phenomenon	0.3	3.5	11.4	26.0	58.7
A person who thinks about her/his dreams is certainly able to learn more about her/himself	1.0	6.7	21.0	38.7	32.7
Do you have the impression that dreams provide impulses or pointers for your waking life?	5.7	18.4	28.9	32.1	14.9

Table 5. Frequency distribution of different dream variables in % (N=315)

Frequency	Telling dreams to others	Recording dreams	Dreams affecting day-time mood	Dreams providing creative ideas	Dreams identifying and solving problems	Déjà-vu experiences
Several times a week	10.2	0.6	5.4	1.3	1.3	7.6
About once a week	14.6	0.6	7.9	1.6	2.5	8.9
Two to three times a month	15.9	2.2	8.3	5.1	7.0	17.8
About once a month	16.5	2.2	15.2	6.7	10.5	19.0
About two to four times a year	17.1	3.5	15.6	12.7	15.9	26.3
About once a year	6.7	3.5	6.7	7.6	9.8	8.9
Less than once a year	8.6	5.7	10.8	15.2	13.7	5.1
Never	10.5	81.6	30.2	49.8	39.4	6.3

Table 9 shows the retest reliability indices. All variables showed indices indicating acceptable positive correlations, with 10 of them showing values ranging from .70 to .80.

4. Discussion

Here we provide a reliable French version of the MADRE questionnaire using adequate methodology. Here we can see that most of the items of the questionnaire showed frequencies distributions and averages close to those formerly reported (Schredl et al., 2014). Our retest reliability correlation coefficients were all significant and showed good (0.90-.071, 10 items) to moderate correlation (0.7-.051, 15 items) (Donner & Eliasziw, 1987), and almost all of the questionnaire items reached quite similar retest reliability correlation coefficients compared to those reported in the original paper (Schredl et al., 2014) with, however, few items reaching lower although significant coefficient (emotional intensity, age of first lucid dream, meaning attributed to dreams, frequency of recording dreams and of dreams giving creative ideas, and dream literature helping interpretation of dreams). Even if the measurement interval was correct (4 weeks on average), these lower coefficients might be explained by the instability of some dream characteristics over time, and this time span could be considered sufficient enough to reveal intra-individual fluctuations of the dreams emotional tone (Schredl, Funkhouser, Cornu, Hirsbrunner, & Bahro, 2001). We also fully report retest reliability coefficients of all the items of the attitude towards dream scale (question 12) including the 8th item that was missing in both previous studies using the MADRE questionnaire (Scapin et al., 2018; Schredl et al., 2014).

One previous assessment of a French version was proposed in a Belgian sample (Scapin et al., 2018). Although this first French version was relevant, the translation process of the English version was not performed according to scientific admitted procedures, so this may have negatively impacted the whole wording process downstream. The use of a single translator does not allow for valuable discussions of independent translations across a group of translators (Epstein, Santo, & Guillemin, 2015). In our study, we used a back-translation procedure according to highly recommended standards because two similar languages from different cultures can have nonequivalent words or idi-

Table 6. Regression analyses showing the relationship between age and gender, and the main subjective dream variables (N=315)

Variable	Effect of age			Effect of Gender		
	β	χ^2/t	p	β	χ^2/t	p
Dream recall frequency[1]	-.0222	10.72	.0011	.2481	1.24	.2649
Emotional intensity[1]	-.0197	7.52	.0061	.3980	2.89	.0889
Overall emotional tone[1]	-.0077	1.28	.2586	-.3992	3.21	.0733
Current nightmare frequency[1]	-.0303	20.28	<.0001	.7332	10.28	.0013
Currrent nightmare distress[1]	-.0328	22.7	<.001	.6870	9.04	.0026
Recurring nightmares (Yes/No)[1]	-.0051	.39	.5317	.2843	1.10	.2952
Percentage of recurring nightmares[2]	-.0013	-1.38	.1679	.0388	1.26	.2077
Childhood nightmare frequency[1]	-.0357	27.00	<.0001	.2764	1.51	.2191
Lucid dreaming freqency[1]	-.0152	5.32	.0210	.2188	1.03	.3092
Age of first lucid dream (N=150)[2]	.1480	4.42	<.0001	1.413	1.28	.2011

β = Standardized estimates, [1]ordinal regression (χ^2 values), [2]linear regression (t values)

Table 7. Regression analyses showing the relationship between age and gender, and attitudes towards dream (N=315)

Variable	Effect of age			Effect of Gender			Effect of dream recall frequency		
	β	χ²	p	β	χ²	p	β	χ²	p
How much meaning do you attribute to your dreams?	-.0102	2.22	.1359	.7356	10.00	.0016	.2997	17.02	<.0001
How strong is your interest in dreams?	-.0236	12.02	.0005	.6277	7.42	.0064	.4600	40.30	<.0001
I think that dreams are meaningful	-.0087	1.64	.2000	.5058	4.68	.0305	.2587	12.73	.0004
I want to know more about dreams	-.0248	11.78	.0006	.6095	6.39	.0114	.3562	22.68	<.0001
If somebody can recall and interpret his/her dreams, his/her life will be enriched	-.0021	.0940	.7592	.3790	2.87	.0902	.2295	11.03	.0009
I think that dreaming is in general a very interesting phenomenon	-.0316	18.09	<.0001	.4575	3.53	.0604	.2854	13.89	.0002
A person who thinks about her/his dreams is certainly able to learn more about her/himself	-.0106	2.16	.1412	.1824	.6270	.4284	.1926	7.48	.0063
Do you have the impression that dreams provide impulses or pointers for your waking life?	-.0026	.1430	.7053	.0593	.0679	.7945	.2247	10.11	.0015

β = Standardized estimates, ordinal regression

omatic expressions which would not elicit the same answer (Epstein et al., 2015; Shahabian et al., 2017; Sperber, Devellis, & Boehlecke, 1994). Indeed, although our French translation showed some similarities with the Belgian version, our wording was more straightforward and more adapted to the French cultural background. Furthermore, and as mentioned in the Method section of the Belgian survey, Belgian participants were not required to answer to all the questions and the interval between the first and the second completion of the questionnaire ranged from 48 to 115 days (Scapin et al., 2018). These methodological flaws may have reduced the number of fully completed questionnaires to be included in the final results analysis, as well as the number of participants to the second questionnaire completion (N=90), therefore negatively impacting the relevance and the reliability of the Belgian questionnaire. Finally, inconsistencies in the reported results and interpretation definitively corrupted the scientific impact and relevance of the paper. By

using a back translation procedure to ensure the most absolute quality and accuracy of the translation process and by reducing the interval between the first and the second questionnaire online filling, we here provide a reliable French version of a comprehensive dream questionnaire that may be used worldwide in French speaking countries to assess dream experiences and beliefs across cultures.

By using different wording from the French Belgian version and almost comparable samples in terms of age and gender repartition, our results showed some, but not all, similar results with both the Belgian and the German surveys (Scapin et al., 2018; Schredl et al., 2014). Indeed, and by contrast to what was reported by both groups, dream recall frequency was almost similar between men and women in our sample. By using a non-validated questionnaire, one previous French survey in younger students showed weekly dream recall frequency to be higher in women (Vallat, Eskinazi, Nicolas, & Ruby, 2018). Given the substantial reported

Table 8. Regression analyses showing the relationship between age and gender, and dream aspects and beliefs (N=315)

Variable	Effect of age			Effect of Gender			Effect of dream recall frequency		
	β	χ²	p	β	χ²	p	β	χ²	p
Frequency of telling dreams	-.0300	18.00	<.0001	1.086	22.63	<.0001	.7059	89.97	<.0001
Frequency of recording dreams	.0077	.633	.4263	.7977	5.134	.0235	.2606	5.916	.0150
Frequency of dreams affecting daytime mood	-.0109	2.46	.1167	-.0111	2.502	.1137	.5342	53.07	<.0001
Frequency of dreams giving creative ideas	-.0077	1.16	.2824	-.2135	.8353	.3607	.3170	18.15	<.0001
Frequency of dreams solving problems	-.0101	02.01	.1560	.2435	1.139	.2860	.3937	29.34	<.0001
Frequency of déjà-vu experiences	-.0370	28.70	<.0001	.0159	.0052	.9427	.3504	24.44	<.0001
Frequency of reading about dreams							.1210	2.790	.0948
Dream literature helping interpretation of dreams (N=217)							-.0093	.0109	.9170

β = Standardized estimates, ordinal regression

Table 9. Retest reliability (N=170)

Variable	Retest reliability (N=170)	Variable	Retest reliability (N=170)
Dream recall frequency[1]	.766	I want to know more about dreams[1]	.755
Emotional intensity[1]	.585	If somebody can recall and interpret his/her dreams, his/her life will be enriched[1]	.693
Emotional tone[1]	.611	I think that dreaming is in general a very interesting phenomenon[1]	.684
Current nightmare frequency[1]	.829	A person who thinks about her/his dreams is certainly able to learn more about her/himself[1]	.679
Current nightmare distress[1]	.616	Do you have the impression that dreams provide impulses or pointers for your waking life?[1]	.656
Recurring nightmares (Yes/No)[2]	79.42%	Frequency of telling dreams[1]	.774
Percentage of recurring nightmares[3]	.604	Frequency of recording dreams[1]	.634
Childhood nightmare frequency[1]	.713	Frequency of dreams affecting daytime mood[1]	.710
Lucid dream frequency[1]	.728	Frequency of dreams giving creative ideas[1]	.583
Age of first lucid dream (N=150)[3]	.697	Frequency of dreams solving problems[1]	.756
How much meaning do you attribute to your dreams?[1]	.668	Frequency of déjà-vu experiences[1]	.658
How strong is your interest in dreams?[1]	.772	Frequency of reading about dreams[1]	.781
I think that dreams are meaningful[1]	.676	Dream literature helping interpretation of dreams[1]	.572

[1]Spearman Rank correlation, [2]exact agreement, [3]Pearson correlation

findings of gender differences in dream recall, the question of what factors might explain our findings arises. There is no simple explanation that could account for the discrepancy between previously reported results and our findings, but one may argue different methods for measuring dream recall frequency, socio-demographic factors and possible cultural differences that are still to be defined in the French population. In our sample, the absence of gender difference in dream recall frequency was not age-dependent and the relative small size of our cohort may have masked an existing but subtle gender difference (Schredl & Reinhard, 2008). If such, our findings should be invalidated in French larger cohorts. Of importance, our sample was not a representative one, as our e-mail campaign may have targeted a particular population favorably interested by the dream topic. A significant group difference with higher dream recall frequency was found between an online sample, probably self-selected with regard to their interest in dreams, and a representative sample (Schredl et al., 2014). These limitations should be considered when comparing our data with the results of studies with different population samples whether they used dream diaries or non-validated questionnaires. Interestingly, similar absence of difference in dream recall frequency between men and women was previously reported in one representative large cohort of the Austrian population (Stepansky et al., 1998).

In our sample, similarly to the German cohort, current nightmare distress positively correlated with nightmare frequency, and gender also influenced nightmare distress and nightmare frequency but to a lesser extent other dream variables by contrast to what was previously reported (Schredl et al., 2014). In the Austrian population and using another dream questionnaire, the frequency of nightmare sufferers did not differ significantly between men and women (Ste-

pansky et al., 1998). Regarding this specific gender effect on dream variables, for the above mentioned reasons, direct comparison of our results with those of the Belgian report was not possible. In our sample, and when dream recall frequency variable is controlled, we also show that women had better attitudes towards dreams, showed more willingness to learn and to read more about dreams, and to share their dreaming experience, a result partly in accordance with the one reported in the German sample where women showed more positive beliefs in dreams than in our survey (Schredl et al., 2014; Schredl & Schawinski, 2010). Whether this is related to different cultural environment or life style and/or to different occupational status remains to be established but again the lack of representativeness of our sample should be considered before drawing definitive conclusions. Again, direct comparison of our results regarding this specific gender effect on dream attitudes with the Belgian report was not possible.

Dream recall frequency declined with advancing age similarly to what was already reported in population survey using either the MADRE questionnaire (Scapin et al., 2018; Schredl et al., 2014) or other questionnaires (Nielsen, 2012; Stepansky et al., 1998). Independently from cultural differences and used investigational methods, age-related changes in dreaming is a constant and expected finding that might reflect changes seen in other domains of cognitive functioning, such as episodic or autobiographical memory (St-Laurent, Abdi, Burianova, & Grady, 2011). Consistent with previous results retrieved from the MADRE questionnaire in a German survey (Schredl et al., 2014), the age decline also concerned other aspects of the dreaming experience including emotional intensity of dreams, frequency of nightmare and lucid dreaming. One exception was the nightmare distress intensity that also correlated negatively with older age in

our sample in contrast with what was previously reported (Scapin et al., 2018; Schredl et al., 2014). One important factor is the decline of memory retrieval with age and a possible growing unconcern among elderly in dreaming issues. This is further reflected by the tendency of older participants to show weaker interest in dreams and less marked desire to share personal dreams and to learn about dreams as these were less considered as an interesting phenomenon. This tendency was even more pronounced in the German sample (Schredl et al., 2014).

In our survey, average emotional intensity of dreams almost matched that reported by the German and the Belgian populations (Scapin et al., 2018; Schredl et al., 2014). Neutral emotional tone was reported by a majority of the respondents, similarly to what was reported in large populations (Schredl et al., 2014; Schredl & Doll, 1998; Stepansky et al., 1998). This suggests that in otherwise healthy populations emotional tone of dreams is rather balanced. Interestingly, our sample showed more positive emotional tone than the Belgian sample (Scapin et al., 2018). Whether geographical location or occupation may influence the affective nature of dreams at a large sample level remains unknown. One study showed that residential environment did not impact the affective dream content ratings of the surveyed population whereas it did influence dream recall frequency (Stepansky et al., 1998).

Frequency of lucid dreaming was higher among our participants (76.5%) compared to what was reported in the MADRE questionnaire in both the Belgian (71%) and the German (61%) cohorts (Scapin et al., 2018; Schredl et al., 2014) but lower than what was reported by a French survey in young students (83%) (Vallat et al., 2018), and higher than the lifetime estimate of lucid dreaming prevalence of 55% that was reported in a previous meta-analysis (Saunders, Roe, Smith, & Clegg, 2016) thus reflecting a substantial variation in lucid dream frequency as currently estimated. Using different wording, only 26% of the Austrian population admitted awareness of dreaming while dreaming (Stepansky et al., 1998). In our sample, and after controlling the dream recall frequency variable, lucid dreaming recall was not significantly different between men and women in accordance with previous findings (Schredl et al., 2014; Schredl & Erlacher, 2011).

In conclusion, here we provide a valid French version of the MADRE questionnaire. As it provides adequate measures of several dream aspects and related experiences and beliefs, the generalized use of this tool will allow coherent and reliable comparison of different populations in the context of epidemiological studies. A larger French cohort using this version may be necessary to further confirm and extend the present findings.

Acknowledgments

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Appendix

Questionnaire sur les rêves

Ce questionnaire anonyme a pour objectif d'obtenir une bonne vue d'ensemble sur plusieurs aspects du rêve.

Il vous prendra environ 5 à 10 minutes pour le remplir.

Veillez prendre votre temps et répondre à toutes les questions avec attention et de façon complète.

Merci de votre collaboration

Age : _____ ans

Sexe : ◯masculin   ◯féminin

Profession / Sujet d'études (étudiants) : _____

1. A quelle fréquence vous êtes-vous souvenus de vos rêves récemment (ces derniers mois) ?

◯ presque tous les matins
◯ plusieurs fois par semaine
◯ environ une fois par semaine
◯ deux ou trois fois par mois
◯ environ une fois par mois
◯ moins d'une fois par mois
◯ jamais

2. Emotionnellement parlant, quelle est l'intensité de vos rêves ?

Pas du tout intense	Pas très intense	Moyennement intense	Assez intense	Très intense
◯	◯	◯	◯	◯

3. Quelle est en moyenne la tonalité émotionnelle de vos rêves ?

Très négative	Un peu négative	Neutre	Un peu positive	Très positive
◯	◯	◯	◯	◯

4. A quelle fréquence avez-vous fait des cauchemars récemment (ces derniers mois) ?

Définition : Les cauchemars sont des rêves avec de fortes émotions négatives qui provoquent le réveil du sujet. Au réveil, le contenu du rêve peut être rapporté de manière très vive.

◯ plusieurs fois par semaine	◯ environ deux à quatre fois par an
◯ environ une fois par semaine	◯ environ une fois par an
◯ deux ou trois fois par mois	◯ moins d'une fois par an
◯ environ une fois par mois	◯ jamais

1

5. Si actuellement vous faites des cauchemars, à quel point sont-ils perturbants pour vous?

Pas du tout perturbants	Pas très perturbants	Moyennement perturbants	Assez perturbants	Très perturbants
○	○	○	○	○

6. Avez-vous des cauchemars récurrents en rapport avec une situation réellement vécue ?

○ Oui   ○ Non

7. Quel pourcentage de vos cauchemars représentent les cauchemars récurrents ?

_____%

8. A quelle fréquence faisiez-vous des cauchemars étant enfant (de 6 à 12 ans) ?

○ plusieurs fois par semaine
○ environ une fois par semaine
○ deux ou trois fois par mois
○ environ une fois par mois

○ environ deux à quatre fois par an
○ environ une fois par an
○ moins d'une fois par an
○ jamais

9. Veuillez si possible notez les thèmes de vos cauchemars d'enfance :

-
-
-

10. A quelle fréquence avez-vous des rêves lucides (voir la définition) ?
Définition : lors d'un rêve lucide, le dormeur sait qu'il est en train de rêver. Il lui est donc possible de se réveiller délibérément, d'influencer activement la trame de son rêve ou bien d'observer passivement le déroulement du rêve.

○ plusieurs fois par semaine
○ environ une fois par semaine
○ deux ou trois fois par mois
○ environ une fois par mois

○ environ deux à quatre fois par an
○ environ une fois par an
○ moins d'une fois par an
○ jamais

11. Si vous avez déjà fait des rêves lucides, quel âge aviez-vous lorsque ceux-ci ont commencé ?

_____ans

2

12. Attitude envers les rêves :

	Pas du tout	Pas vraiment	Moyennement	Assez	Totalement
Attribuez-vous beaucoup de signification à vos rêves ?	◯	◯	◯	◯	◯
Vous intéressez vous beaucoup à vos rêves ?	◯	◯	◯	◯	◯
Je pense que les rêves ont du sens.	◯	◯	◯	◯	◯
Je voudrais en savoir plus sur les rêves.	◯	◯	◯	◯	◯
Si quelqu'un peut se souvenir de ses rêves et les interpréter, sa vie n'en sera que plus riche.	◯	◯	◯	◯	◯
Je pense que le rêve en général est un phénomène très intéressant.	◯	◯	◯	◯	◯
Une personne qui réfléchit sur ses rêves est certainement capable d'en apprendre plus sur elle-même.	◯	◯	◯	◯	◯
Avez-vous le sentiment que les rêves procurent des impulsions ou des indications dans la vraie vie ?	◯	◯	◯	◯	◯

13. A quelle fréquence racontez-vous vos rêves aux autres ?

◯ plusieurs fois par semaine
◯ environ une fois par semaine
◯ deux ou trois fois par mois
◯ environ une fois par mois

◯ environ deux à quatre fois par an
◯ environ une fois par an
◯ moins d'une fois par an
◯ jamais

14. A quelle fréquence prenez-vous note de vos rêves ?

◯ plusieurs fois par semaine
◯ environ une fois par semaine
◯ deux ou trois fois par mois
◯ environ une fois par mois

◯ environ deux à quatre fois par an
◯ environ une fois par an
◯ moins d'une fois par an
◯ jamais

15. A quelle fréquence vos rêves affectent-ils votre humeur dans la journée ?

◯ plusieurs fois par semaine
◯ environ une fois par semaine
◯ deux ou trois fois par mois
◯ environ une fois par mois

◯ environ deux à quatre fois par an
◯ environ une fois par an
◯ moins d'une fois par an
◯ jamais

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16. A quelle fréquence vos rêves vous donnent-ils des idées créatives ?

○ plusieurs fois par semaine
○ environ une fois par semaine
○ deux ou trois fois par mois
○ environ une fois par mois

○ environ deux à quatre fois par an
○ environ une fois par an
○ moins d'une fois par an
○ jamais

17 A quelle fréquence vos rêves vous aident-ils à identifier et résoudre des problèmes ?

○ plusieurs fois par semaine
○ environ une fois par semaine
○ deux ou trois fois par mois
○ environ une fois par mois

○ environ deux à quatre fois par an
○ environ une fois par an
○ moins d'une fois par an
○ jamais

18. A quelle fréquence avez-vous des sensations de déjà-vu (voir définition) ?
Définition : lors d'une sensation de déjà-vu, une personne est convaincue de revivre une situation déjà vécue en rêve.

○ plusieurs fois par semaine
○ environ une fois par semaine
○ deux ou trois fois par mois
○ environ une fois par mois

○ environ deux à quatre fois par an
○ environ une fois par an
○ moins d'une fois par an
○ jamais

19. Avez-vous déjà lu au sujet des rêves ? [Livres ou articles de magazines]

○ Non
○ Une ou deux fois
○ Plusieurs fois

20. Ces lectures au sujet des rêves ou de leur interprétation vous ont-elles aidé à mieux comprendre vos rêves ?

Pas du tout	Pas vraiment	Un peu	Assez	Beaucoup
○	○	○	○	○