Hypnotic Susceptibility, Sleepiness and Subjective Experience

Levente MÓRÓ [a], Valdas NOREIKA [a], Antti REVONSUO [b, a], and Sakari KALLIO [b, a]

[a] University of Turku, Finland, [b] University of Skövde, Sweden

Address correspondence to Levente Móró, MSc, Centre for Cognitive Neuroscience, University of Turku, FI-20014, Finland. E-mail: leve@utu.fi

Introduction

Hypnosis vs. Sleep

Hypnosis and sleep may resemble each other:
- subjects sit/lay still, eyes closed, may not respond
- enhanced visual imagery and decreased self-reflection
- hypnotized subjects fall asleep without instructions

Theoretical and experimental work:
- transient hypofrontality hypothesis (Dittrich)
- virtuosos (Kallio, Revonsuo, Hämäläinen, Markela, & Gruzelier)
- susceptibility of nappers and non-nappers (Evans)

-> relationship between hypnotic suggestibility and aspects of sleep

Susceptibility and Subjectivity

Hypnosis self-scoring correlates with objective scores

Cognitive-behavioral abilities predicting susceptibility
- correlations: absorption, fantasy proneness, empathy
- maybe sleep-related aspects too?

-> self-scoring of the subjective experience: may reveal more (in some cases) than self-rating of behavior?

Our Study

Investigating the relationships between:
- hypnotic susceptibility
- self-reported sleepiness
- subjective experience of hypnotic suggestions

Initial hypotheses:
1) Hypnotic susceptibility correlates positively with self reported daytime sleepiness.
2) Higher hypnotic susceptibility = higher hypnotic inertia (increased drowsiness after the hypnotic procedure).
3) Subjective experience of hypnotic susceptibility may be more relevant than behavioral scores.

Methods

Participants

- 90 unpaid volunteers (71 females, 19 males)
- Age range 18 - 57 (M = 23.3, SD = 5.9)
- Mostly University of Turku psychology students

7% had previous experience of hypnosis
84% saw it on TV
38% read about it in books
28% personally knows a hypnotized person

Hypnosis-Related Scales

Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A)
- widely used for initial screening of hypnotic susceptibility
- behavioral: subjects self-evaluate their overt responses
- hypnotic induction and suggestions, challenges
- 12 items, scoring by Shor and Orne (1962):
  1 if observable response, 0 if little or no response
- amnesia scoring: original HGSHS:A; Kihlstrom & Register

Subjective experience questionnaire (Form E):
- a form developed for this study
- measures experience to suggestions, not behavior

Sleep-Related Scales

Karolinska Sleepiness Scale (KSS)
- clinical tool for measuring instantaneous sleepiness
- a single question with a 9-point scale
- 1=very alert, 9=very sleepy

Epworth Sleepiness Scale (ESS)
- used in diagnosing excessive habitual sleepiness
- 8 questions, score range 0 to 24
- 0=would never fall asleep, 3=very high chance to doze
- healthy subjects ~6 points; sleep disorder 12+ points

Pittsburgh Sleep Quality Index (PSQI)
- assesses sleep quality and disturbances
- 19 self-rated items, global score range 0 to 21

Procedure

- 4 sessions (2 days), average group size: 23 persons
- obtaining signed informed consent
- basic personal information
- sleepiness scale before
- hypnotic induction and suggestions (45 min, CD)
- sleepiness scale after
- hypnosis-related scales
- on-line questionnaires at home

Response percentage 98.9%, total time 1.5 hours.

Results

HGSHS:A Total Score

M = 6.54, SD = 2.35

- lower than Finnish norms M = 7.26, SD = 2.61

12 participants (13.3%) High (10 to 12 points)
57 participants (63.4%) Medium (5 to 9 points)
21 participants (23.3%) Low (0 to 4 points)

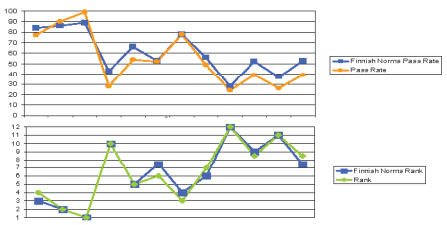
Differences non-significant between females and males
Differences non-significant between the 4 session groups

HGSHS:A Total Score Means and SDs Compared With 10 International Norms

Country	CAN n=535	AUS n=1994	ROM n=340	ITA n=376	GER n=374	Study n=90	SWE n=291	SPA n=220	FIN n=285	USA n=132	DAN n=376
M	5.38	5.45	6.24	6.41	6.51	6.54	6.77	7.13	7.26	7.39	7.64
SD	3.28	2.95	2.68	2.80	2.43	2.35	2.50	2.61	2.61	3.04	2.50

HGSHS:A Item Difficulty

Correlates with Finnish norms: r = .98, p < .01



Subjective Experience (Form E)

M = 16.4, SD = 5.7, n = 90

Strong significant correlation with HGSHS:A (r = .69, p < .01)

Coefficient of determination:
- Experience shows 48 % shared variance

Standard multiple regression analysis:
- Experience is good predictor of HGSHS:A total score
  (B = .267, beta = .635, p < .0005)

Karolinska Sleepiness Scale (KSS)

Sleepiness increased from 4.4 to 5.9 (SD = 1.3, n = 88)

Spearman significant : pre vs. post
Kruskal-Wallis significant : pre vs. post of 4 sessions (time of day)
Wilcoxon significant : all groups
Spearman significant : Form E vs. post

Epworth Sleepiness Scale (ESS)

Means: Highs 8.08, Meds 7.33, Lows 6.45

Spearman significant : HGSHS:A total vs. ESS total
Mann-Whitney significant : HGSHS:A upper vs. lower half

Item correlations significant :
- strongly and 10 weakly between individual items
  ESS total score vs. HGSHS:A "Right arm immobilization
- ESS "Lying down to rest in the afternoon" vs. both HGSHS:A total and post KSS

(…BUT all non-significant with Bonferroni adjustment!)

Pittsburgh Sleep Quality Index (PSQI)

Means: Highs 4.42, Meds 4.49, Lows 4.10

Item correlations significant :
- PSQI "Had bad dreams" vs. both HGSHS:A "Head lowering" and "Eye catalepsy"
- PSQI "Daytime dysfunction" vs. HGSHS:A total
- PSQI "Having sleep company" vs. Experience…

(…BUT all non-significant with Bonferroni adjustment!)

Discussion

Findings

Correlation between HGSHS:A & ESS
- supports initial hypothesis #1:
  higher hypnotic susceptibility = greater daytime sleepiness

Correlation between Form E & KSS difference
- supports initial hypotheses #2:
  higher hypnotic susceptibility = greater drowsiness after hypnosis

(No correlation between HGSHS:A & KSS weakens hypothesis #2)

Correlation between Form E & KSS, but not HGSHS:A & KSS
- supports initial hypotheses #3:
  subjective scale better than behavioral scale

Other Issues

Post-hypnotic sleepiness vs. susceptibility is ambiguous:
- positive correlation: support for "hypnotic inertia" ?
- negative correlation: highs obey alertness suggestion ?

Difference of KSS scores show general drowsiness:
- no control situation – silent sitting may increase sleepiness

Common cognitive mechanisms for altered consciousness:
- ability to quickly relax the mind-body?
- immersing into less externally driven mental content?

Studying the fluctuating levels of daytime sleepiness and arousal

Summary

· The relationships between hypnotic susceptibility, sleepiness, and the subjective experience of hypnotic suggestions were investigated in 90 participants.

· Scores from hypnosis-related scales (HGSHS:A & Form E) and sleep-related scales (KSS, ESS & PSQI) were obtained and analyzed.

· Findings show that hypnotic susceptibility correlates with both habitual daytime sleepiness and instantaneous sleepiness after the hypnotic procedure.

· Results also indicate that subjective self-evaluation of responses to hypnotic suggestions is a useful tool when compared with other subjective scales.

This study was supported by the Jenny and Antti Wihuri Foundation (LM), an Academy of Finland grant 8110957 (VN & AR), and the Signe and Ane Gyllenberg Foundation (VN & SK).