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PSYCHOLOGICAL FEATURES OF HYPNOTIZABILITY: *A FIRST STEP TOWARDS ITS EMPIRICAL DEFINITION*

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Abstract: This study examined the relationship between the Hypnotic Induction Profile (HIP) and several psychological tests: Tellegen Absorption Scale (TAS), Spontaneity Assessment Inventory-Revised (SAI-R), Dissociative Experiences Scale (DES), Short-Form Boundary Questionnaire (SFBQ), Mini Locus of Control (MLOC), Testoni Death Representation Scale (TDRS), and the Interpersonal Reactivity Index (IRI). Two hundred and forty volunteers were administered the above tests; 78 of them were also administered the HIP, and its scores were compared to those on the other tests. A significant correlation was found among the TAS, DES, SFBQ, and IRI. The HIP was significantly correlated to the DES (r = .19 p_{1tail} = .045), and the IRI-ec subscale (r = .19 p_{1tail} = .044); 14 test items from DES, IRI, TAS, SAIR, and SFBQ were also significantly related to the HIP. The findings suggest that hypnotizability may relate to stronger perception of the inner world, decreased aptitude for managing memory processing, and increased sensitivity and empathy.

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Hypnotizability, that is, the capacity to experience a transition into a hypnotic state and to perform hypnotic tasks, has a wide range of degrees, from not being hypnotizable at all to being able to respond with intriguing and even surprising intensity to hypnotic instructions. The history of hypnosis has been strongly influenced by the observation of highly hypnotizable subjects and their unusual abilities, such as hypnotic analgesia or the emergence of previously unavailable childhood memories, including Charcot's idea of hypnosis as a sort of experimental hysteria.

In past decades, much effort has been devoted to rating most subjective phenomena in psychology and psychiatry, such as psychiatric symptoms and disorders, pain, general anesthesia, consciousness, and coma. A wealth of scales and tests have been published so far, with a threefold role: (a) quantifying the intensity and severity of symptoms and their changes following treatment; (b) providing information on prognosis; and (c) enabling comparison between treatments.

Arthur Guedel in 1937 rated general anesthesia in four stages following ether administration; however, the introduction of new selective agents, like muscle relaxants, hypnotic agents, and opioids has totally changed the relevance of the classic clinical signs, making the old grading system useless. As a result, the concept of depth of anesthesia has been elusive, and no gold standard has emerged so far, despite the vast number of published studies analyzing the effectiveness of both clinical and neurophysiological parameters. Likewise, the problem of vegetative and minimally responsive states has no solution yet: a substantial controversy about the terminology, diagnosis, prognosis, perception of pain, and conscious awareness persists in the literature, despite a wealth of studies published in the past 40 years (Celesia, 2013). As a result, a mistaken diagnosis is still present in up to 43% of cases (Celesia, 2013; Schnakers et al., 2009).

The same problems of quantification have been encountered involving pain, perhaps the most common clinical symptom and concern, which has been misunderstood for ages, due to its subjective nature. The situation was even worse for children until the end of the last century, where the ruling dominant perspective, with its illusion of objectivity in a condition with a lack of verbal communication, led to the false belief that infants were insensitive to pain or endured pain much better than adults. This led to recommend surgery with light or even no anesthesia at all, and many children were not given analgesics for postoperative pain (Swafford & Allen, 1968), inadvertently turning medicine into torture.

The above data clearly demonstrate the extent to which the assessment of consciousness and subjective experience remains partly elusive and complex despite its importance, especially when narration is impaired, absent, or disregarded. Indeed, it shows the strong limits of the ruling mechanistic and reductionist approach of scientific medicine with its traditional "objectivity fascination" and "subjectivity neglect"

(see Facco, 2014; Facco, Agrillo, & Greyson, 2015) for its main epistemological implications).

The scientific need for quantifying observed phenomena led to efforts to introduce scales to assess hypnotic ability starting in the late nineteenth century. In general, any scale closely depends on the definition and construct of the observed phenomenon, which, however accurate it may be, is likely to be only a partial description of it. Therefore, one can expect that the accuracy of hypnotizability scales, despite their being useful and reliable, may be less than optimal, a problem shared with the abovementioned medical symptoms and procedures. For example, if hypnosis is regarded in terms of sleep (as it was in the nineteenth century), its phenomenology can be accordingly described only in terms of somnolence, sleep, and somnambulism and a scale based on this concept might resemble those suitable for anesthesia.

According to Testoni et al. (Fonseca & Testoni, 2011; Testoni, Ancona, & Ronconi, 2015), the Enlightenment, the Age of Reason, led to the rationalization of the concept of soul and the idea of mind as a product of the brain. At that time, hypnosis, which seemed akin to spiritualism, laid claim to a scientific basis by linking hypnotic phenomena to the recent definition in physics of forces that could influence at a distance, such as magnetism and gravity (Darnton, 1968; D. Spiegel, 2002). Nevertheless, as emphasized by Freud himself, organized medicine prejudicially rejected hypnosis (Freud, 1889). Not surprisingly, hypnosis, which allowed for the first clinical observation of unconscious processes, was misunderstood due to its ostensible incompatibility with the century-old idea of man as a monolithic being endowed with a rational soul, a stance shared by both Rational Theology and the Enlightenment (Bodei, 2009; Facco et al., 2015). Furthermore, being subjective in nature, hypnosis could not be properly understood when observed from outside only, while skipping the content and meaning of subjective experience. In the nineteenth century, this led to the idea of hypnosis as a sleep-like condition or a sort of experimental hysteria. It was considered an altered state of consciousness (ASC), an idea challenged in recent years (Vaitl et al., 2005) or, anyway, as a less than normal condition, during which the subject loses control and/or was dominated by the hypnotist (see Fornari, 1970, pp. 9–12).

Hypnosis can be considered at the same time a procedure and its product (Barnier & Nash, 2008). The contradictory issue of hypnosis as an ASC has been debated in the literature (Kirsch, 2011; Mazzoni, Venneri, McGeown, & Kirsch, 2013; Pekala et al., 2010a, 2010b). A recent definition from Division 30 of the American Psychological Association emphasizes that hypnosis does involve an altered state of consciousness including absorption, dissociation, and enhanced capacity for response to suggestions (Elkins, Barabasz, Council, & Spiegel, 2015). Some make a link between hypnosis and other nonordinary

mental experiences, like near-death experiences (NDE) and meditation, while the very term ASC raises questions for others (Cardeña, 2005; Facco et al., 2015; Kirsch, 2011).

The psychological features of hypnotizability are still ill defined, despite the availability of a wealth of data on the relationship between hypnotizability and personality, including the assessment of hypnotic-like experiences, personality traits (e.g., Minnesota Multiphasic Personality Inventory [MMPI]), cognitive control, suggestibility, imaginative involvement, absorption, dissociation, ego receptivity, and insight (H. Spiegel & Spiegel, 2004, pp.137–149). Some relationships between hypnotizability and absorption, dissociative experiences, proneness to fantasy, reaction time in a Go/No-Go Task, proneness to trust, and empathy have been established (Balthazard & Woody, 1992; Council & Green, 2004; Dienes et al., 2009; Frankel, 1990; Green, 1997; Green & Council, 2004; Green & Green, 2010; Wickramasekera & Szlyk, 2003; Zachariae, Jorgensen, & Christensen, 2000).

As already mentioned, previous studies using the Minnesota Multiphasic Personality Inventory and other similar personality tests have failed to show any correlation with the available scales of hypnotizability (Laurence, Beaulieu-Prévost, & du Chéné, 2008). Focused attention and absorption are essential features of hypnosis, allowing the subject to dissociate from competing stimuli and thoughts (D. Spiegel, 2013; H. Spiegel & Spiegel, 2004). Absorption is defined as total attention that fully engages one's representational resources, leading to imperviousness to distracting events; it also involves an openness to absorbing and self-altering experiences (Tellegen & Atkinson, 1974). The Tellegen Absorption Scale (TAS) has been reported to be significantly related to hypnotizability (Balthazard & Woody, 1992; Council & Green, 2004; Green & Council, 2004; Kihlstrom et al., 1989; Tellegen & Atkinson, 1974; Zachariae et al., 2000). However, absorption might be more strongly related to difficult hypnotic performances than to easy ones (Balthazard & Woody, 1992), while the correlation may also be influenced by contextual factors such as acquiescence (or "yea-saying") and motivation consistency (Council & Green, 2004). Furthermore, some authors (Laurence et al., 2008) consider absorption more a cognitive pattern of response than a steady personality trait, related to motivation, attention, and capability of processing its objects. When the TAS is administered outside the context of hypnosis, its correlation with hypnotizability tends to decrease, suggesting that the relationship between the two may be influenced by expectation and context demands (Barnier & McConkey, 1999; Council & Green, 2004; Council, Kirsch, & Hafner, 1986; de Groot, Gwynn, & Spanos, 1988; Milling, Kirsch, & Burgess, 2000; Oakman, Woody, & Bowers, 1996; Spanos, Brett, Menary, & Cross, 1993).

On the other hand, efforts to manipulate expectancy do not seem to modulate hypnotic responsiveness (Frischholz, Spiegel, Spiegel, Balma, & Markell, 1982; Lifshitz, Howells, & Raz, 2012). One possible, though partial, explanation for changes in the correlation between absorption and hypnotizability is the way subjects may answer TAS items, that is, in terms of average, more likely, or best performance (Laurence et al., 2008). A similar context effect has been reported for dissociation as well (Nadon, Hoyt, Register, & Kihlstrom, 1991; Silva & Kirsch, 1992; Spanos et al., 1993).

Dissociation, which is considered a relevant component of hypnosis, is a term with a wide range of psychological and psychiatric meanings (Brown, 2006; Frankel, 1990), ranging from psychological detachment (essential for fairness, serenity, wisdom, and judgment) to Bleuler's psychiatric concept of *spaltung* (division, split) to a failure of normal integration of identity, memory, consciousness, and perception (American Psychiatric Association, 2013; D. Spiegel et al., 2013). This calls for a better definition of what is meant by dissociation in the context of hypnosis in order to avoid harmful misinterpretations.

In short, hypnotizability is a complex phenomenon, which cannot be ascribed to a single personality trait or psychological attitude. Absorption and dissociation play a relevant but, perhaps, context sensitive role; also, other features, like expectation, imagery, empathy, trust, capability to automatize, and ability to manage attentional resources may be involved as well and are worthy of further study (Kirenskaya, Novototsky-Vlasov, Chistyakov, & Zvonikov, 2011; Laurence et al., 2008; Muller, Bacht, Prochnow, Schramm, & Seitz, 2012; Rossi & Rossi, 2006).

The above data imply some criticism of the available scales, which were introduced some 50 years ago and were constructed upon a definition of hypnosis mainly based on suggestibility. Furthermore, if hypnotizability is a stable capability, it should be theoretically possible to test it even outside of hypnotic induction (Hilgard, 1991). There is recent evidence of functional resting state brain subregion connectivity differences between high and low hypnotizable subjects undergoing functional magnetic resonance imaging (fMRI) scanning while not hypnotized (Hoeft et al., 2012). This difference involves greater functional connectivity between the left dorsolateral prefrontal cortex and the dorsal anterior cingulate gyrus among high compared to low hypnotizable individuals as measured using the Hypnotic Induction Profile. However, in a practical sense, hypnotizability can be assessed only with a formal induction of hypnosis including standardized tasks, which allow for scoring different hypnotic abilities.

Method

Subjects

Two hundred and forty healthy volunteers (Total Sample, TS) were enrolled in the study. All of them completed the Tellegen Absorption Scale (TAS; Tellegen & Atkinson, 1974), Spontaneity Assessment Inventory-Revised (SAI-R; Kipper & Shemer, 2006), Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986), Short-Form Boundary Questionnaire (SFBQ; Hartmann, 1991), Mini Locus of Control (MLOC; Perussia & Viano, 2006), Testoni Death Representation Scale (TDRS; Testoni, 2007), and the Interpersonal Reactivity Index (IRI; Davis, 1980; Duan & Hill, 1996).

Out of 240 participants, 78 subjects (HIP Sample, mean age = 30.15 ± 11.29 years), selected on the basis of their voluntary participation in the study, were administered the Italian version of the HIP as well (Facco, Testoni, & Spiegel, 2015) in a separate session. The demographic characteristics of both the TS and HIP samples are shown in Table 1: The two groups were homogeneous, apart from the level of education, which was significantly higher in the HIP sample, $X^2 = 18.51$, $p < .001$. The interval between test and HIP administration was in all cases a week or more, with a range of 7–30 days; we purposefully avoided any link between test completion and the HIP in order to prevent any possible expectancy affecting the TAS and/or other tests.

Measures

The HIP consists of four main parts: (a) the preinduction phase, where the up gaze and eye roll are assessed; (b) the induction phase, where arm levitation is suggested; (c) postinduction phase, where the patient is asked to open one's eyes and to perform a second levitation; (d) the posthypnotic phase including the subjective experience report. It provides two different scales, a 0- to10-point scale, called the induction score (IS), and a newer Expanded Induction Score (EIS) consisting of a 0- to 16-point scale (H. Spiegel & Spiegel, 2004).

Hypnotizability was scored according to both the classical 11-point scale (low = 0–3.5; midrange = 3.5–7.5; high = 7.5–10) and the 17-point New Scale (low = 0–6; midrange = 6–12; high = 12–16), and the data were compared to the scores of administered tests. Systolic and diastolic blood pressure (SBP and DBP, respectively) and heart rate (HR) were measured before and after HIP administration.

We analyzed the relationship between hypnotizability, as assessed by the Hypnotic Induction Profile (HIP; H. Spiegel & Spiegel, 2004), and the following psychological tests: TAS, SAI-R, DES, SFBQ, MLOC, TDRS, and the IRI. The IRI is composed of four subscales, Perspective Taking (IRI-pt), Fantasy Empathy (IRI-fs), Empathic Concern (IRI-ec), and Personal Distress (IRI-pd).

Table 1
Demographic and Cardiovascular Data of the Total Sample and Subsample Tested for Hypnotizability and Medical Measures Pre- and Post-HIP Procedure for HIP Sample

Variable	Total Sample (N = 240)	HIP Sample (n = 78)
Age (1)	30.2 (11.3)	29.4 (9.3)
Gender Male	49%	47%
Gender Female	51%	53%
Level of Education*		
Low	13%	4%
Medium	37%	19%
High	50%	77%
Student	48%	51%
Unemployed	4%	0%
Worker	48%	49%
Not married	73%	78%
Married	24%	19%
Separate/Divorced/Widow	3%	3%
Children present	21%	13%
Children non-present	79%	87%
Believes in God	64%	58%
Nonbeliever	36%	42%
Religious practicing	18%	18%
Religious nonpracticing	82%	82%
Systolic blood pressure pre-HIP (1)		127.89 (11.80)
Systolic blood pressure post-HIP (1)		124.53 (13.12)
Diastolic blood pressure pre-HIP (1)		78.31 (8.74)
Diastolic blood pressure post-HIP (1)		79.51 (7.83)
Heart rate pre-HIP (1)		75.76 (11.61)
Heart rate post-HIP (1)		74.81 (11.10)

Note. For these variables are reported Mean (*SD*).
*X^2 = 18.51. *df* = 2. $p < .001$.

Our aims were (a) to evaluate the results of previous studies, (b) to analyze the relationship between different personality features potentially involved in hypnotizability, (c) to provide further insight into their role in hypnosis, and (d) to identify psychological factors predictive of hypnotizability.

The statistical analysis was conducted with the Pearson's *r*, Spearman's X, an analysis of variance (ANOVA), Student *t* test, and Principal Factor Analysis. The significance level was set at $X^2 = .05$.

Results

A close correlation among the TAS, DES, SFBQ, and IRI was found in both groups of subjects (see Table 2), while MLOC, TDRS, and SAIR did not correlate with other tests.

The HIP IS and EIS scores were 7.0 ± 2.22 and 10 ± 3.13 (mean ± *SD*), respectively. They also showed a close correlation to each other ($r = .92$, $p < .001$), with a slight tendency of the EIS to underestimate the level of hypnotizability with respect to the IS, when the scores were classified in the abovementioned three categories of low, midrange, and high hypnotizability, according to the H. Spiegel and Spiegel classification (2004; see Table 3). This was mainly due to the fact that the EIS in a few subjects was close to the upper limits of midrange hypnotizability, while the IS was close to the lower limits of high hypnotizability.

The relationship between the HIP and psychological tests was significant only for two tests (see Table 4): The IRI-ec showed a significant correlation with IS ($r = .19$, $p_{1\text{tail}} = .044$), while the DES was significantly correlated with EIS only ($r = .19$, $p_{1\text{tail}} = .045$).

Given the lack of correlation between the HIP and the total score of most tests, the relationship between each item of all tests and the HIP score was examined. For 14 items, the correlation was significant ($p_{1\text{tail}} < .05$; five items were positively related to both IS and EIS, five to IS only, and four items were positively related to EIS only) (see Table 5).

Principal component factor analysis was carried out on these 14 items, allowing us to explore their factor structure. Three factors were retained by scree plot examination, the solution of which accounted for 41% of the total variance (factor loadings over .40 are reported in Table 6). These factors may be provisionally named as follows:

Factor 1—"Trance (or dissociative) amnesic feelings" (including DES 11, 14, 24, 26, and SFBQ 14): This factor was mainly related to dissociation, that is, DES items reflecting the inclination to forget past actions, to depersonalization or, conversely, to dissociate from the outer world to be involved in a recalled inner experience.

Factor 2—"Serene and spontaneous fulfillment" (including SAIR 1, 9, 13, and TAS 18): This factor showed a mix of positive- and negative-factor loadings including a mix of SAIR items, that is, balance and creativity, and inclination to absorption-dissociation (TAS 18). The inverse correlation between the TAS 18 and the SAIR items indicates that this factor is inherent to the perception of subjective focusing on the external reality and positive feeling. In fact, absorption requires profound concentration and focused attention, which characterize the ability of some people to be highly hypnotized (H. Spiegel & Spiegel, 2004). On the contrary, spontaneity requires an open and released

Table 2

Descriptive Statistics for all Tests (N = *240) and Correlation in Each Sample (Total Sample in Upper Triangle,* N = *240, and HIP Subsample in Lower Triangle,* n = *78)*

Test	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. TAS	18.80	5.84		.38*	.44*	.26*	.48*	.31*	.06	.46*	−.14	−.15	.15
2. DES	70.11	46.48	.40*		.35*	.05	.2	.09	.19	.23*	.07	−.14	.11
3. SFBQ	31.43	8.35	.40*	.35		.12	.40*	.15	.25*	.39*	.01	−.09	−.06
4. IRI-pt	17.48	4.34	.32	.10	.06		.32*	.30*	−.07	.58*	−.21	−.08	−.08
5. IRI-fs	16.26	5.96	.45*	.10	.37	.36		.27*	.12	.74*	−.13	−.08	.01
6. IRI-ec	19.38	4.24	.26	.13	−.01	.21	.09		.12	.64*	−.12	−.13	.11
7. IRI-pd	11.49	5.18	.09	.38	.31	.01	−.03	.20		.50*	.18	−.03	−.27*
8. IRI Total	64.61	12.27	.48*	.3	.33	.65*	.67*	.57*	.49*		−.11	−.13	−.10
9. LOC	12.11	2.84	−.19	.17	−.04	−.22	−.12	−.15	.27	−.09		.09	−.06
10. TDRS	18.31	6.20	−.23	−.17	−.23	−.16	−.19	−.21	−.13	−.29	.14		−.13
11. SAIR	58.74	8.98	.14	.03	.01	−.14	.04	.22	−.32	−.09	−.21	−.01	

*$p < .001$ (Bonferroni correction).

Table 3
Induction Score (IS) and Expanded Induction Score (EIS) Distribution of Hypnotizability Classification Categories

	IS		EIS	
Hypnotizability	Number of Cases	%	Number of Cases	%
Low	9	11.5	9	11.5
Midrange	31	39.8	38	48,7
High	38	48.7	31	39.8

Table 4
Descriptive Statistics for all Tests and Correlation with Hypnotizability (EIS of the HIP) in 78 Healthy Subjects: Only DES and IRI-ec Showed a Significant Correlation with IS and/or EIS (Significant Values in Bold)

	Test Score	IS		EIS		
Test	Mean	*SD*	*r*	*p* (one-tail)	*r*	*p* (one-tail
DES	67.77	47.90	.169	.070	.194	.045
IRI Total	66.50	12.38	.085	.231	.138	.114
IRI-pt	18.67	4.82	−.057	.311	.004	.485
IRI-fs	17.55	6.22	.067	.280	.091	.213
IRI-ec	19.72	4.48	.194	.044	.185	.052
IRI-pd	10.56	5.21	.007	.477	.056	.314
TAS	20.17	5.97	.105	.181	.125	.138
TDRS	18.29	6.78	−.093	.209	−.110	.168
LOC	12.00	2.82	.058	.307	.101	.190
SAIR	58.91	9.28	.176	.061	.89	.219
SFBQ	31.90	8.94	.089	.218	.082	.238

responsiveness to the environmental situation (Kipper & Shemer, 2006). Surprisingly, this factor indicates the possible importance of spontaneity in hypnotizability, despite the fact that this psychological trait is the opposite of absorption. Spontaneity can be thought of as being primarily related to the management of the inner world, while absorption deals primarily with the outer one, and, perhaps, might be the aptitude most closely related to what has been considered suggestibility in the past.

Factor 3—"Sympathy and bewilderment" (including IRI 2, 6, 14): This factor indicated the inclination to sympathy and social sensitivity with the tendency to some but not steady self-control (or dissociation), as disclosed by the contradictory coexistence of IRI 6 and 14.

Table 5

List of Single Items of Each Test Showing a Significant Positive Correlation with Hypnotizability (HIP) IS and/or EIS (Spearman's Rho and p *(one-tail) <.05; Significant Values in Bold)*

N. Item	Item Description	IS		EIS	
		rho	*p* (one-tail)	rho	*p* (one-tail)
DES26	Some people find writings, drawings, or notes among their belongings that they must have done but cannot remember doing.	.281	.006	.262	.010
DES11	Some people have the experience of looking in a mirror and not recognizing themselves.	.274	.008	.250	.014
IRI2	I often have tender, concerned feelings for people less fortunate than me.	.251	.013	.195	.044
DES14	Some people have the experience of sometimes remembering a past event so vividly that they feel as if they were reliving that event.	.194	.045	.209	.033
TAS18	I am able to wander off into my thoughts while doing a routine task and actually forget that I am doing the task, and then find a few minutes later that I have completed it.	.192	.046	.255	.012
TAS2	I can be greatly moved by eloquent or poetic language.	.237	.018	.156	*ns*
SAIR13	Fulfilled	.218	.027	.117	*ns*
TAS6	I like to watch cloud shapes change in the sky.	.209	.033	.182	*ns*
IRI14	Other people's misfortunes do not usually disturb me a great deal.	.207	.035	.162	*ns*
SAIR9	To live in full balance.	.200	.040	.188	.050
IRI6	In emergency situations, I feel apprehensive and ill-at-ease.	.121	*ns*	.232	.020
SAIR1	Creative	−.165	*ns*	−.213	.031
SFBQ14	I believe I am influenced by forces that no one can understand.	.184	*ns*	.203	.037
DES24	Some people sometimes report that they cannot remember whether they have done something or have just though about doing that thing (e.g., not knowing whether they have mailed a letter or just thought about it).	.131	*ns*	.195	.044

Table 6
Factor Analysis Results for All Psychological Tests: Factor Loadings (> .40), Cronbach's Alpha, Means, and Correlations (N = *240)*

Item	Factor 1	Factor 2	Factor 3
des26	.76		
des11	.73		
des24	.66		
SFBQ14	.52		
des14	.48		
sair13		.75	
sair9		.68	
tas18		−.45	
sair1		.45	
tas2			
iri14			.74
iri2		.44	.58
iri6			.54
tas6			
Cronbach's alpha	*.68*	*.48*	*.45*
Mean	12.87	10.11	7.75
SD	8.38	2.24	2.26
Correlation			
Factor 1	*1*		
Factor 2	*−.02*	*1*	
Factor 3	*.30**	*−.01*	*1*

*$p < .01$.

Only Factors 1 and 3 showed a significant correlation with EIS and IS (see Table 7).

A small but significant decrease of SBP was found at the end of HIP administration, $t(69) = 3.30$, $p = .002$.

Discussion

There is a close correlation between the TAS, DES, SFBQ, and IRI. This suggests that their constructs and the personality features they identify partly overlap. This is not surprising, since absorption, engaging all the subject's representational resources, necessarily implies the loss of perception of the periphery of the attentional field, and, thus, some dissociation and vice versa. Likewise, since absorption is related to openness to absorbing and self-altering experiences, it may have a partial overlap with the personality features explored by the SFBQ as well as IRI (such as fantasy and empathy).

Table 7
Descriptive Statistics for Three Factor Scores Computed and Correlation with Hypnotizability (HIP) IS and EIS (n = *78)*

Factor scores	Mean	*SD*	IS	EIS
Factor 1	12.17	9.30	.28*	.35*
Factor 2	10.21	2.24	.10	.00
Factor 3	8.06	2.22	.27*	.30*

*$p < .01$.

The substantial lack of correlation we found between hypnotizability (as defined by the HIP) and the administered psychological tests is somewhat surprising, given other studies that reported a significant correlation with the TAS (Balthazard & Woody, 1992; Council & Green, 2004; DePascalis, Marucci, & Penna, 1989; Green & Council, 2004; Kihlstrom et al., 1989; Tellegen & Atkinson, 1974; Zachariae et al., 2000). This result may be related to the fact that we purposefully avoided any link between their administration and hypnosis, which might affect subjects' expectancies and context demands, consistent with other reports (Barnier & McConkey, 1999; Council et al., 1986; de Groot et al., 1988; Milling et al., 2000; Oakman et al., 1996; Spanos et al., 1993). However, the HIP correlations with the DES, TAS, and IRI-ec showed a *p* value close to significance, suggesting that a relationship was possible and its significance might be a matter of restricted power due to sample size.

Since none of the other administered tests is a hypnotizability test but may include some items related to hypnotizability, we analyzed the correlation between each test item and the HIP: This allowed us to record a pool of questions significantly related to hypnotizability or close to the significance level. Our hypothesis is that this approach might allow for a new, empirical definition of hypnotizability and a possible development of new hypnotizability scales. This exploratory approach also might allow us to avoid the constraints of any a priori definition or construct. The results of this analysis provide a provisional identification of which parts of each test may identify hypnosis-related personality features: However, this is only a first step calling for further confirmatory studies on larger samples and other tests reflecting further, possibly relevant, personality features.

The main factor analysis carried out on test items showing a significant relationship with HIP scores allowed us to explore their factor structure. Three factors were retained by scree plot examination, the solution of which accounted for 41% of the total variance (factor loadings are reported in Table 6). The three factors "Trance (or Dissociative) Amnesic Feelings," "Serene Fulfillment," and "Sympathy and

Bewilderment" suggest a softer contact with the outer world or, rather, a softer boundary between inner and outer world and/or a stronger salience of the former; this feature is associated with a decreased aptitude for managing memory processing and practical reality. Although the positive propensity toward others fosters the understanding and acceptance of their problems, its price is a proneness to suffering, only partly offset by the capability of dissociating from them, while "sympathy and bewilderment" may not always help in solving concrete situational problems. The latent dimension that unifies the three factors related to hypnotizability seems to involve two elements, flexibility and regressive infantile predisposition. Flexibility, that is, the ability to both enhance and suppress emotions, is a crucial factor for fruitful coping strategies and successful adaptation, though it may at times expose one to the risk of negative emotions (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Westphal, Seivert, & Bonanno, 2010). Highly hypnotizable subjects may also have a regressive or infantile predisposition to detect the environment and an inclination to trust in others and to find a dominant and reassuring guide, are more able to yield the control of the situation and yet experience a serene condition. This is in line with the so-called "Dionysian" highly hypnotizable patients with psychological dysfunction, who show role confusion, a sense of inferiority, and a proneness to uncritical trust in others, like "disciples in search of a teacher" (H. Spiegel & Spiegel, 2004, pp. 96–97). On the other hand, this disciple-like behavior may also be the result of a true, critically adopted trust and motivation to learn: Perhaps, different subjects, according to their personality, may lie at different points of the continuum between these two different stances (critical and well-motivated behavior vs. uncritical acceptance). HIP administration includes a rapid induction yielding relaxation but also includes eye opening followed by further hypnotic tasks (i.e., second hand levitation); the latter, not being relaxing, might increase sympathetic tone, like fractionation techniques (Casiglia et al., 2012). The significant decrease of SAP observed in our sample suggests that the HIP is likely to function as a relaxation technique, decreasing sympathetic tone or increasing parasympathetic tone, or both, and, therefore, modulating stress reactions. This also confirms the psychosomatic implications of hypnosis, allowing a subject to enhance control even over hemodynamic reactions to strongly stressful events, like surgery (Facco, Pasquali, Zanette, & Casiglia, 2013; Lang et al., 2000), thus making hypnosis a powerful tool for patient's empowerment in facing both stressful physical and psychological events.

Our study confirms the previously reported relationship between hypnotizability and dissociation and suggests a relationship with social sensitivity, leading to feeling stronger unease when confronted with other peoples' misfortunes. On the other hand, high hypnotizables are

capable of turning inward, detaching, and/or dissociating as a defense against the enhanced proneness to suffering. Our data also suggest a relationship with emotional flexibility and a regressive infantile predisposition, that is, a possible inclination to depend on dominant and/or reassuring figures. The substantial lack of correlation between the HIP and other tests we administered might depend on sample size. On the other hand, the administered tests were not constructed to relate to hypnotizability, but they may include some hypnotizability-related items reflecting personality features involved in hypnosis. This led us to examine the correlation between each test item and the HIP, which may also provide a basis for a new empirical, inductive approach to the still unsolved but emerging definition of hypnotizability. It may provide some clues to the possibility of improving the definition of hypnosis, constructing a new hypnotizability test, and/or confirming the validity of existing ones.

It is worth emphasizing that we purposefully avoided creating any link between psychological test administration and hypnosis to avoid overestimating the value of both whole tests and single items and detecting only the items more consistently related to hypnotizability.

Despite the continuous evolution of psychology and neuropsychology and the availability of a large number of studies, the process of developing a definition of hypnosis and hypnotizability is not yet concluded. Suggestibility, which played a central role in the past, is still uncertain and ill defined and does not appear to be specific to hypnosis (Tasso & Perez, 2008). Furthermore, it is not clear whether hypnotic capacity is related to suggestibility or, rather, to the subject's trust, motivation, and cognitive flexibility, since they may lead one to effectively follow the same hypnotic instructions for very different reasons.

The subjective experience of hypnosis also appears to be related to hypnotizability (Cardeña, Jonsson, Terhune, & Marcusson-Clavertz, 2013), where the depth of hypnosis is a matter of both quantitative and qualitative factors: Lows keep a mind state more similar to the ordinary one, mediums report an increased rate of bodily sensations and images, while highs may yield stronger spontaneous imagery and experiences of affective, fusional, and even transcendent flavor. These features seem to be also related to changes in brain activity (as defined by electroencephalogram [EEG] and fMRI). As noted above, a recent study comparing resting state functional connectivity between 12 highly and 12 low hypnotizable individuals on the HIP identified greater spontaneous connectivity between the left dorsolateral prefrontal cortex and the dorsal anterior cingulate gyrus among the highs compared with the lows (Hoeft et al., 2012). This suggests an improved coordination of brain regions involved in executive control and salience detection, content of experience, and the process of choosing a focus of attention.

A more synthetic approach to personality features of hypnotizability has been introduced by H. Spiegel and Spiegel (2004), based on three different personality styles (or, better, different clusters of personality traits) called Dionysians, Apollonians, and Odysseans. Dionysians are more compulsive responders to social input and are able to accept logical incongruities and paradoxes, while Apollonians have a ruling rational style and an opposite inclination towards incongruences and paradoxes; Odysseans lie halfway between the two and their behavior shows a tendency to fluctuate between involvement and detachment, activity and passivity, trust and distrust. These features may be also described in terms of relatively high, moderate, and low compliance (of Dionysians, Odysseans, and Apollonians, respectively) which, in turn, is reflected by high, medium, and low hypnotizability.

The reliability of the HIP is confirmed by its significant correlation with the Stanford scales (Frischholz, Spiegel, Tryon, & Fisher, 1981; Gritzalis, Oster, & Frischholz, 2009; Orne et al., 1979; H. Spiegel, 1977), while it provides the unique advantage of being brief and usable among patients. In the past years, some authors discouraged the use of HIP in research on hypnosis, claiming that they might only reduce standardization in the field of research in comparison to the use of the Stanford Scales only (Kihlstrom, 2008). However, a true standardization can be achieved only when all people, that is, both normal subjects and patients, can be assessed with the same criteria, in order to avoid an unbridgeable gap between research and clinical practice. Furthermore, the Stanford and Harvard scales, although effective, are based on the construct of suggestibility and include behavioral parameters only; in this regard, it is worth recalling that their authors themselves wisely warned against considering them the gold standard of hypnotizability assessment (Weitzenhoffer, 2002; Weitzenhoffer & Hilgard, 1962).

To summarize, there is a need to reappraise the concepts of hypnosis, hypnotizability, and its scales after some half century since their introduction. This might lead to a better definition of hypnosis, more congruent with a neurophysiological perspective. This might also help in the development of new hypnotizability scales and/or confirm the reliability of the available ones. At this moment, the HIP remains the only effective scale allowing for a fast (less than 10 min) and simple assessment in both clinical and research contexts, providing a clinically relevant estimation of patient's hypnotic ability and potential for response to treatment.

The strength of our study is its empirical, inductive approach to the definition and correlates of hypnotizability, a first step to a much wider exploration. Its strength is at the same time its weakness, since in a single study only a few tests can be administered. Further studies are required to confirm our results, and other potentially relevant personality features should be tested, such as creativity, flexibility, trust, and engagement/disengagement, in order to build

up a reliable spectrum of the personality, inclinations, and abilities of hypnotizable subjects.

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Psychologische Eigenschaften der Hypnotisierbarkeit: ein erster Schritt zu einer empirischen Definition

Enrico Facco, Ines Testoni, Lucia Ronconi, Edoardo Casiglia, Gastone Zanette, und David Spiegel

Abstract: Diese Studie untersuchte das Verhältnis zwischen dem Hypnotic Induction Profile (HIP) und verschiedenen psychologischen Tests: Tellegen Absorption Scale (TAS), Spontaneity Assessment Inventory-Revised (SAI-R), Dissociative Experiences Scale (DES), Short-Form Boundary Questionnaire (SFBQ), Mini Locus of Control (MLOC), Testoni Death Representation Scale (TDRS) und dem Interpersonal Reactivity Index (IRI). 240 Freiwillige wurden für diese Tests herangezogen. 78 von ihnen sollten auch den HIP ausfüllen, dessen Ergebnisse mit denen der anderen Tests verglichen wurden. Es wurde eine signifikante Korrelation zwischen der TAS, der DES, dem SFBQ und dem IRI gefunden. Der HIP korrelierte signifikant mit der DES ($r = 0{,}19$ $p_{1tail} = 0{,}045$). 14 Testmerkmale der DES, des IRI, der TAS, des SAIR und des SFBQ waren ebenfalls signifikant dem HIP ähnlich. Die Ergebnisse weisen darauf hin, daß Hypnotisierbarkeit mit stärkerer Wahrnehmung der Inneren Welt, verminderter Eignung für den Umgang mit Gedächtnisverarbeitung und verstärkter Sensibilität und Empathie verbunden sein könnte.

STEPHANIE RIEGEL, MD

Caractéristiques psychologiques de la susceptibilité hypnotique: une première étape vers sa définition empirique

Enrico Facco, Ines Testoni, Lucia Ronconi, Edoardo Casiglia, Gastone Zanette et David Spiegel

Résumé: Les auteurs de cette étude ont examiné la relation entre le Profil d'induction hypnotique (PIH) et plusieurs tests psychologiques: l'Échelle d'absorption de Tellegen (TAS), l'Inventaire d'évaluation révisé de la spontanéité (SAI-R), l'Échelle d'expériences dissociatives (DES), le Questionnaire abrégé sur les limites personnelles (SFBQ), le mini Lieu de maîtrise (MLOC), l'Échelle Testoni de représentation de la mort (TDRS) et l'Indice de réactivité interpersonnelle (IRI). Ces tests psychologiques ont été administrés à 240 volontaires, dont 78 se sont vu également administrer le PIH, et les résultats de ce dernier ont été comparés à ceux obtenus par les volontaires n'ayant subi que les autres tests. Une corrélation significative a été observée entre les TAS, DES, SFBQ et IRI. Le

PIH et l'échelle DES ont présenté une corrélation significative (r = 0,19 ^{p1tail} = 0,045), ainsi que la sous-échelle IRI-ec (r = 0,19 p^{1tail} = 0,044); et 14 items des DES, IRI, TAS, SAIR et SFBQ étaient aussi significativement associés au PIH. Les résultats semblent démontrer que la susceptibilité hypnotique peut dépendre d'une perception plus forte de son monde intérieur, d'une diminution de l'aptitude à gérer le traitement de la mémoire, et d'une augmentation de la sensibilité et de l'empathie.

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Características psicológicas de la hipnotizabilidad: Un primer paso hacia su definición empírica

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Resumen: Este estudio examinó la relación entre el Perfil de Inducción Hipnótica (HIP por sus siglas en Inglés) y varias pruebas psicológicas: Escala de Absorción de Tellegen (TAS, por sus siglas en Inglés) el Inventario de Evaluación de la Espontaneidad Revisado (SAI-R), la Escala de Experiencias Disociativas (DES, por sus siglas en Inglés), el Cuestionario de Límites, Forma Corta (SFBQ, por sus siglas en Inglés), el Mini Locus de Control (MLOC, por sus siglas en Inglés), la Escala Testoni de Representación de la Muerte (TDRS, por sus siglas en Inglés), y el Índice de Reactividad Interperonal (IRI, por sus siglas en Inglés). Se administraron los anteriores cuestionarios a 240 voluntarios; a 78 también se les administró el HIP y se comparó sus puntuaciones con los otros instrumentos. Se encontraron correlaciones significativas entre el TAS, DES, SFBQ y el IRI. El HIP correlacionó significativamente con el DES (r = .19, p1cola = .045) y con la subescala IRI-ec (r = .19, p1cola = .044); catorce reactivos de la DES, IRI, TAS, SAIR, y SFBQ también se relacionaron significativamente con el HIP. Estos hallazgos sugieren que la hipnotizabilidad puede estar relacionada con una percepción del mundo interno más fuerte, menor aptitud para el manejo de la memoria de procesamiento, y mayor sensibilidad y empatía.

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