

HYPNOTIZABILITY AND SOMATIC COMPLAINTS: *A Gender-Specific Phenomenon*

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Abstract: The relationship between hypnotizability and somatic illness was measured in 45 college students. Several weeks after completing the Waterloo-Stanford Group C Scale (WSGC), participants filled out a somatic-complaint checklist and measures of psychopathology. Results indicated a positive correlation between hypnotizability and somatic illness, and the relationship was stronger for female participants. In contrast to the quadratic model proposed by Wickramasekera, the current data demonstrated a linear relationship between hypnotizability and somatic complaint. Further analyses showed that somatic complaints were associated with hallucination and imagery items, corresponding to the perceptual-cognitive factor identified in Woody, Barnier, and McConkey's (2005) factor analysis of the Stanford Hypnotic Susceptibility Scale, Form C. The results call into question some claims that high hypnotizability is an adaptive and healthy trait.

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Clinical evidence, dating back to the early writings of Charcot (1890) and Janet (1907), has suggested that highly hypnotizable individuals are prone to developing somatoform disorders. Somatoform disorders cover physical symptoms or somatic complaints that are not explained by a known medical condition (American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders*, 2000). Only a few scientific papers have been published on the association of hypnotizability and somatoform disorders (Kuyk, Spinhoven, & van Dyck, 1999; Roelofs et al., 2002). These studies are congruent with earlier clinical observations in that somatoform disorder patients are more hypnotizable than matched patient controls, although this relation is equivocal (Litwin & Cardena, 2000; Moene, Spinhoven, Hoogduin, Sanddyck, & Roelofs, 2001). These studies further show a positive correlation between hypnotizability and the number of conversion complaints in a patient sample.

Research into hypnotizability and somatoform disorders has also been extended to include psychosomatic complaints more generally. Both low and high hypnotizables have been described as susceptible to somatization (Zillmer & Wickramasekera, 1987). Wickramasekera's (1995) High Risk Model of Threat Perception states that highly hypnotizable individuals are hypersensitive to external stimuli and amplify the threat of these cues, leading to overactivation of the sympathetic nervous system. This chronic hyperactivity of the sympathetic system leads to stress- and anxiety-related somatic problems. In the same model, low hypnotizables are theorized to repress or to deny threatening stimuli consciously but experience these effects somatically. This model describes a quadratic relationship between psychosomatic symptoms and hypnotizability with medium hypnotizables having less psychosomatic risk than either lows or highs.

Support for Wickramasekera's model comes from comparing patients with healthy control samples. Somatizing patients yield a more negatively kurtosed distribution curve of hypnotizability than controls, with more individuals falling into the low or high range. This quadratic effect on health outcome for hypnotizability was also found in recovery from cardiac surgery (Greenleaf, Fisher, Miaskowski, & DuHamel, 1992). Specifically, individuals with medium hypnotizability recovered faster from cardiac surgery than lows or highs. It is not known, however, if hypnotizability is similarly associated with psychosomatic complaints in a healthy population.

Virtually no literature has argued for or against a hypnotizability-psychosomaticism relationship in healthy individuals. The closest relevant research involves hypnosis aftereffects. Early reports on somatic aftereffects of standardized research hypnosis protocols showed the most common symptoms to be headache, drowsiness, nausea, and

dizziness (Orne, 1965). Roughly 3% of research participants may experience adverse effects, although scales using more cognitive (Stanford Hypnotic Susceptibility Scale, Form C; SHSS:C; Weitzenhoffer & Hilgard, 1962) than ideomotor (Harvard Group Scale of Hypnotic Susceptibility, Form A; HGSHS:A; Shor & Orne, 1962) items may cause a much higher incidence of somatic aftereffects (Crawford, Hilgard, & Macdonald, 1982; Page & Handley, 1993). Some evidence also suggests prehypnosis expectations predict aftereffects on the HGSHS:A (Coe, Peterson, & Gwynn, 1995). Hypnotizability, therefore, has been shown to predict somatic complaints following a hypnosis session, with high hypnotizability being associated with more aftereffects (Page & Handley, 1993, 1996). It is unknown whether hypnotizability is also associated with greater somatic complaints in day-to-day life.

The present study was designed to test the relationship between hypnotizability and somatic complaints. This report comprises three specific aims: (a) to determine if hypnotizability and somatic complaints are related in a healthy sample; (b) to determine if hypnotizability is related only to certain clusters of somatic complaints (e.g., muscular); and (c) to assess whether hypnosis in general or specific subclasses of suggestions (e.g., motor, challenge, or hallucination) are related to somatic complaints.

METHOD

Participants

Participants were undergraduate volunteers from psychology classes at the University of Tennessee, Knoxville. In return for their participation, individuals received nominal class credit. Twenty-two males and 23 females ($N=45$) participated in the study. The mean age was 19.5 years ($SD=5$ years). The protocol was approved by the University of Tennessee Institutional Review Board, and all participants provided written consent before the start of any study procedures.

Materials

Hypnotizability was scored in group sessions using the Waterloo-Stanford Group C scale (WSGC) of hypnotizability (Bowers, 1993). The 12-item scale has good (.81) internal reliability. The age-regression item was omitted from the protocol because we have anecdotally observed that some individuals have unpleasant experiences with that item.

Somatic complaints were assessed with an original scale of physical symptoms (Kruesi, Borckardt, Younger, Shaw, & Nash, 2004). This measure lists 42 physical complaints that are commonly attributed to psychosomatic processes. Several items cover each of 10 body

systems: muscular, cardiovascular, respiratory, gastrointestinal, reproductive, integumentary, nervous, endocrine, immune, and special senses. Participants were instructed to indicate both the number of times each symptom occurs in a month (frequency) and the impact of that symptom on their life (severity). The physical-symptom frequency and severity scales demonstrated good internal consistency reliability (α s = .91 and .93). In a previous study (Kruesi et al.), the somatization subscale of the Symptom Checklist-90R (SCL-90R; Derogatis, 1992) was used as a validity reference for both the frequency ($r = .70$, $p < .001$) and severity ($r = .63$, $p < .001$) scales. Frequency and severity subscales of the somatic checklist are highly correlated ($r = .86$), and only severity was analyzed in the present study, as we were interested primarily in health impact. In the present analyses, the original scale of somatic symptoms was used over the somatization SCL-90R subscale, because the number and breadth of items in the former measure allow for more precise analyses.

Psychological distress was measured with the SCL-90R. The scale contains nine subscales: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, anger-hostility, phobic anxiety, paranoid ideation, and psychoticism. The scale has demonstrated high convergent validity with the Minnesota Multiphasic Personality Inventory (Brophy, Norvell, & Kiluk, 1988).

Procedures

All scales were completed separately from the hypnosis sessions, with at least 3 weeks separating hypnosis measurement and self-report scales. Participants were not aware of the connection between the two measurement periods. Hypnosis sessions were conducted by one of the coauthors.

RESULTS

The mean hypnosis score was 4.5 ($SD = 2.3$, range 0–9) and somatic-complaint score was 25.49 ($SD = 13.89$, range 3–68). Data were normally distributed with no significant skew or kurtosis. No significant outliers were detected.

Gender was a predictor neither of hypnotizability, $t(43) = 1.57$, $p = .122$, nor somatic complaints, $t(43) = 1.21$, $p = .23$. There was no correlation between age and hypnotizability, $r = .09$, $p = .55$, or psychosomaticism, $r = .01$, $p = .98$.

Somatic-complaint severity was positively correlated with hypnotizability, $r = .452$, $p = .002$; however, a partial correlation identified gender as a significant modifier. All subsequent analyses were conducted by gender. For females, the correlation between somatic

complaints and hypnotizability was $.599, p = .003$. For males, it was nonsignificant, $r = .232, p = .288$. Post hoc contrast (one-tailed, Fisher r -to- z transformation) of the two correlations did not yield a significant difference, $z = 1.42, p = .08$. The pattern of correlations suggests, but does not fully document, that the degree of association between hypnotizability and somatic complaints might be stronger for females. Figure 1 shows scatterplots for both females and males. To test for a possible quadratic relationship, hypnotizability was correlated with the square of somatic complaint scores. This correlation was not different from the linear test in either females, $z = .09, p = .92$, or males, $z = .23, p = .81$. These tests support viewing the relationship as linear.

The second aim of this study was to determine if specific items drove the relationship between somatic illness and hypnotizability. The small sample size precluded the use of sophisticated techniques for identifying critical items, therefore, correlations were performed between individual complaints and hypnotizability. These post hoc tests should, then, be interpreted with some caution. For women, 17 items were significantly related to hypnotizability. These items (p 's $< .05$) were: nausea/upset stomach, $r = .505$; numbness/tingling, $.441$; difficulty sleeping, $.537$; vomiting, $.448$; heart pounding/racing, $.497$; diarrhea, $.468$; backaches, $.507$; appetite problems, $.556$; fatigue/weakness, $.679$; chest pain, $.465$; hot/cold spells, $.535$; twitching of eyelids, $.620$; heartburn, $.535$; ringing in ears, $.479$; dry/red eyes, $.489$; muscle tension, $.522$; and excessive energy, $.447$. For males, only backaches, $.469$, were significantly correlated with hypnotizability. Given an alpha level of $.05$ and 42 comparisons made (42 items), two can be expected to be significantly correlated by chance.

A number of the items significantly correlated with hypnotizability in females seem, at face value, to be related to anxiety disorders. Post hoc analyses revealed that anxiety, as measured by the SCL-90R, was not correlated with hypnotizability, $r = .269, p = .225$. Tested another way, both hypnotizability and anxiety were entered into a general linear model predicting disease severity. Both hypnotizability, $F = 3.052, p = .007$, and anxiety, $F = 3.306, p = .004$, entered significantly into the model, which predicted 55% of the disease severity variance, $F = 13.827, p < .0001, r = .770$. These results further demonstrate anxiety and hypnotizability to be orthogonal and independently related to somatic complaints. Finally, a t test revealed that females reported no more anxiety than males, $t(43) = .802, p = .427$. Somatic complaints by females, then, are unlikely to be due to anxiety. Hypnotizability was not related to any of the other SCL-90R subscales (save for somatization, $r = .330, p = .027$) further indicating that high hypnotizables do not simply overreport negative experiences, nor are they generally higher in neuroticism.

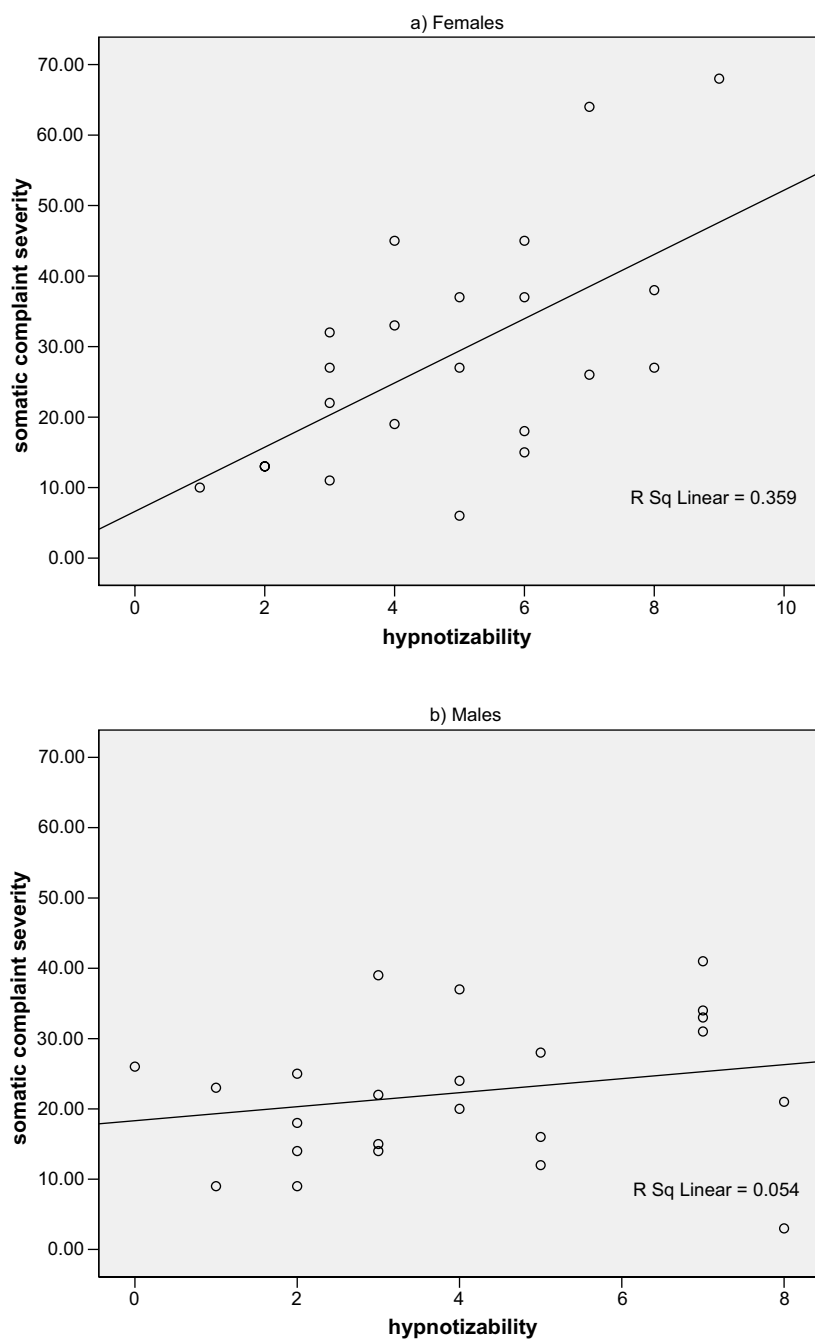


Figure 1. Hypnotizability and somatic complaint severity in (a) females and (b) males.

Our third specific aim looked at which hypnosis items were most related to somatic complaints. For women, four items reached statistical significance (using point-biserial correlations): mosquito hallucination, $r = .438$, $p = .041$; taste hallucination, $r = .663$, $p = .001$; dream, $r = .488$, $p = .021$; and negative visual hallucination, $r = .532$, $p = .011$. It is notable that all of these items involve a hallucinatory element. For men, no items were significantly correlated with somatic complaints (r 's $.032$ – $.196$, p 's $> .40$).

Major analyses were repeated with the somatic subscale of the SCL-90R. All results were replicated. For women, somatization was correlated with hypnotizability ($r = .534$, $p = .011$). The correlation was not significant in men ($r = .011$, $p = .959$). The significant relationship between hypnotizability and somatization was again driven by the perceptual-cognitive WSGC items (r 's $.352$ – $.691$).

DISCUSSION

The present study was designed to explore the relationship between hypnotizability and psychophysiological complaints. Men and women were given a somatic complaint scale as well as the WSGC scale of hypnotizability. Women showed significant positive correlations between hypnotizability and a number of gastrointestinal, nervous, and muscular system complaints. Males evidenced little relationship between their hypnosis scores and somatic complaints.

Physical symptoms related to hypnotizability in women were system-specific, focusing on gastrointestinal, nervous, and muscular complaints. Several of the somatic items could be associated with sympathetic nervous system arousal; however, the present findings do not indicate a role for neuroticism or anxiety. There was no evidence that high hypnotizables were more anxious than lows or mediums. Previous studies have also found no association between hypnotizability and general neuroticism (Heilizer, 1960), and some have reported hypnotizability to be associated with *greater* psychological health (Schulman & London, 1963; Spiegel, Detrick, & Frischholz, 1982; Zlotogorski, Hahnemann, & Wiggs, 1987). The converse hypothesis, that low hypnotizables underreport physical symptoms, is also not supported by the literature (Wickramasekera, 1995).

Previous models of hypnotizability and psychosomaticism, such as that proposed by Wickramasekera (1995), claim that high hypnotizables have an overengaged sympathetic nervous system (albeit as a consequence of high threat perception). Although this pathway could explain the current results, it is not known why the relationship would be stronger in females. Males and females exhibited similar degrees of hypnotizability, which is supported by the literature to date (see Kihlstrom et al., 1980, for an exception). Similarly, there were no gender

differences found in number and severity of somatic complaints. Some studies have found females to score higher on such scales (e.g., Apfel, 1982; Kolip, 1997). No significant outliers existed in either group and group sizes were very similar, providing comparable power for analyses. Our results partially support Wickramasekera's model. High hypnotizables were more likely to suffer from psychophysiological complaints, however, we did not find a similar risk for low hypnotizables. It appears that, in a nonclinical sample, the relationship between hypnotizability and psychophysiological illness severity is linear and not quadratic.

One way in which hypnotizability and somatic complaints may be linked is through trauma and dissociation. A rich literature has linked trauma to both hypnotizability (Bryant, Guthrie, Moulds, Nixon, & Felmingham, 2003; Butler, Duran, Jasiukaitis, Koopman, & Spiegel, 1996) and somatic dissociation (Näring & Nijenhuis, 2005; Nijenhuis, Spinhoven, van Dyck, van der Hart, & Vanderlinden, 1998; van Ommeren, Sharma, Sharma, Komproe, Cardena, & de Jong, 2002). Given contemporary theories of hypnosis as a dissociative experience (Barber, 1999; Carlson & Putnam, 1989; Kihlstrom, Glisky, & Angiulo, 1994), it is possible that both hypnotizability and psychophysiological complaints are influenced by trauma-related factors such as dissociation. Links between trauma, dissociation, and hypnotizability cannot, however, be equivocally stated (Faith & Ray, 1994; Frاسquilho & Oakley, 1997; Green, 1997; Nash, Hulse, Sexton, & Harralson, 1993).

Interestingly, psychophysiological complaints seemed to be predicted only by hallucination and visual items. These results support previous factor analyses of the Stanford Hypnotic Susceptibility Scale, which show distinct item-clusters (Field & Palmer, 1969; Monteiro, Macdonald, & Hilgard, 1980). The most recent analyses, conducted by Woody, Barnier, and McConkey (2005), found four factors: direct motor, motor challenge, perceptual-cognitive, and posthypnotic amnesia. Using their factor structure, psychosomaticism is associated with the perceptual-cognitive factor. The authors describe the subjective experience of perceptual-cognitive items as "a feeling of external reality in the face of an inconsistent actual reality" (p. 210). It is not known how this tendency to have this type of experience might be related to somatic complaints.

If these findings are reflective of a general phenomenon, it is surprising that so few studies show a similar linear relationship between psychophysiological complaints and hypnotizability. It is possible that confounds such as gender and the specific nature of the somatic complaints prevented detection of the relationship in previous analyses. Shorter symptom complaint scales may not contain enough of the relevant somatic items, leading to a nonsignificant relationship between the scale and hypnotizability. There is no evidence of

systematic bias in the present sample; however, it is possible that the findings are limited to the present sample. Participants were drawn from a restricted population (relatively healthy college students) and the protocol should thus be repeated with a larger and more varied sample. Statistical power may also be a limitation: although power was sufficient to detect significant correlations in the group as a whole, $\beta = .941$ for $r = .50$, $\alpha = .05$, splitting by gender reduced this power, $\beta = .653$, which could lead to some suppressed results. Finally, a number of analyses were conducted, increasing the chance of Type I error, especially in cases where individual items were used in correlations.

The study results call into question the health benefits of high hypnotizability, especially in females. High hypnotizability has been considered an adaptive trait (Santarcangelo & Sebastiani, 2004), as these individuals respond more positively to some hypnotic interventions. Interestingly, it has been shown that highly hypnotizable individuals may be particularly responsive to hypnotic treatments of somatic complaints, such as asthma, pain, and warts (Wadden & Anderton, 1982). In order to reconcile our present findings with past results, it may be possible that high hypnotizability reflects an increased susceptibility to environmental and interpersonal influences. In such a case, high hypnotizability may be either a help or a hindrance, depending on situational factors.

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Hypnotisierbarkeit und somatische Beschwerden: Ein geschlechtsspezifisches Phänomen

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Anthony F. Tasso und Michael R. Nash

Zusammenfassung: Der Zusammenhang zwischen Hypnotisierbarkeit und somatischer Erkrankung wurde bei 45 College-Studierenden bestimmt. Einige Wochen nach dem Absolvieren der Waterloo-Stanford Gruppenskala (Form C, WSGC), vervollständigten die Teilnehmerinnen und Teilnehmer eine Checkliste zu körperlichen Beschwerden und Fragebögen bezüglich psychischer Probleme. Die Resultate ergaben eine positive Korrelation zwischen Hypnotisierbarkeit und körperlicher Erkrankung.

Dieser Zusammenhang war bei Frauen stärker ausgeprägt. Entgegen dem quadratischen Modell, wie es von Wickramasekera vorgeschlagen wurde, wiesen die vorliegenden Daten einen linearen Zusammenhang zwischen Hypnotisierbarkeit und somatischen Beschwerden auf. Weitere Analysen zeigten, dass somatische Beschwerden mit Halluzinations- und Vorstellungsisems zusammenhingen. Dies er Befund deckt sich mit dem perzeptuell-kognitiven Faktor wie er von Woody, Barnier und McConkeys Faktorenanalyse der Stanford Hypnotic Susceptibility Scale, Form C, identifiziert wurde. Die Ergebnisse stellen damit Behauptungen in Frage, denen zufolge hohe Hypnotisierbarkeit eine adaptive, gesundheitsförderliche Eigenschaft darstellt.

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Hypnotisabilité et plaintes somatiques : Un phénomène sexospécifique

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Résumé: La relation entre l'hypnotisabilité et la plainte somatique a été mesurée chez 45 étudiants universitaires. Plusieurs semaines après avoir répondu au questionnaire sur l'échelle de susceptibilité hypnotique de Waterloo-Stanford, groupe C (WSG : C), les participants ont répondu à un questionnaire portant sur les plaintes somatiques et les instruments de mesure de la psychopathologie. Les résultats de cette étude ont indiqué une corrélation entre l'hypnotisabilité et la maladie somatique, et cette corrélation s'est révélée plus forte chez les participants de sexe féminin. Contrairement au modèle quadratique proposé par Wickramasekera, les données actuelles démontrent une relation linéaire entre l'hypnotisabilité et la plainte somatique. Des analyses plus poussées ont démontré que les plaintes somatiques étaient associées à des hallucinations et à des items d'imagerie, ce qui correspond au facteur perceptuel-cognitif relevé dans l'analyse des facteurs de l'échelle de susceptibilité hypnotique de Stanford, formulaire C, effectuée par Woody, Barnier et McConkey. Ces résultats remettent en question les prétentions selon lesquelles une grande hypnotisabilité est un trait adaptatif et sain.

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Hipnotizabilidad y quejas somáticas: Un fenómeno específico de género

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Resumen: Medimos la relación entre la hipnotizabilidad y la enfermedad somática en 45 estudiantes universitarios. Varias semanas después de completar la Escala Grupal Waterloo-Stanford C (WSGC), los participantes rellenaron una lista de quejas somáticas y medidas de psicopatología. Los resultados indicaron una correlación positiva entre la hipnotizabilidad y

la enfermedad somática, y la relación fue más robusta en las mujeres. En contraposición con el modelo cuadrático propuesto por Wickramasekera, nuestros datos mostraron una relación lineal entre la hipnotizabilidad y las quejas somáticas. Análisis adicionales mostraron que las quejas somáticas estuvieron asociadas con los reactivos de alucinación e imaginación, correspondientes al factor cognitivo-perceptual identificado por Woody, Barnier, y McConkey en el análisis factorial de la Escala de Susceptibilidad Hipnótica de Stanford, Forma C. Los resultados problematizan la hipótesis de que la hipnotizabilidad alta es una característica saludable y adaptativa.

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