“How Deeply Hypnotized Did I Get?” Predicting Self-Reported Hypnotic Depth from a Phenomenological Assessment Instrument

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Published online: 29 Oct 2010.


To link to this article: http://dx.doi.org/10.1080/00207140600691344
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"HOW DEEPLY HYPNOTIZED DID I GET?"
Predicting Self-Reported Hypnotic Depth From a Phenomenological Assessment Instrument

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Abstract: Procedures for estimating hypnotic depth have been used for more than 70 years. This study predicted self-reported hypnotic depth from the phenomenological and behavioral variables of the Phenomenology of Consciousness Inventory-Hypnotic Assessment Procedure (PCI-HAP). Participants were divided into 2 groups; 1 was used to generate regression equations, and the other group was used for cross-validation. Both imagery vividness during hypnosis (imagoic suggestibility) and the PCI pHGS measure of hypnotic depth (hypnoidal state) accounted for most of the variance in self-reported hypnotic depth. The above results, further supported by correlational and 3-D visual analyses, are consistent with other researchers’ observations that ratings of hypnotic depth are a function of: (a) alterations in subjective experience, and (b) the perception of responsiveness to suggestions. The findings are also congruent with J. Holroyd’s hypothesis that suggestibility and altered-state effects interact to produce hypnotic effects.

After a hypnosis session, patients often make comments such as “I don’t know if I got into a trance” or “I was hearing what you said, I felt relaxed, but I am not sure if I was hypnotized.” Comments such as
these imply that the feeling of “being hypnotized” or feeling that a “special trance state” was induced may be important to the treatment process, especially to the extent that people who do not believe they were hypnotized will be less ego-involved in using hypnosis in their treatment.

Tart (1970) regarded the notion of hypnotic depth as a complex theoretical construct that is inferred from experiential and behavioral responses to hypnosis. He regarded hypnotic depth as “a momentary state of the S [subject] along some dimension of ‘profundity’ of the hypnotic state” (p. 105). Integrating Tart’s (1979) seminal article on hypnotic depth, Brown and Fromm (1986) suggested that subjects “feel more deeply hypnotized” to the extent (a) they believed there were alterations in experience, and (b) they were responsive to the suggestions (cf. Brown & Fromm, p. 46). This is consistent with Tart’s observation that “perceived changes in body experience were the most frequently mentioned criteria” (1979, p. 599) in judging hypnotic depth; although reactions to the suggestibility test items were also quite important.

Self-report hypnotic-depth scales. Over 70 years ago, Davis and Husband (1931) described a 30-point system to measure depth of trance in terms of the following categories: hypnoidal, light, medium, and somnambulistic. Various symptoms and phenomena were mentioned, demarcating each of the four stages. There are also other systems with 40-point, 4-point, and 10-point anchors (see Brown & Fromm, 1986). Tart’s (1970) review of hypnotic depth scales delineated six self-report scales anchored on a 0-to-100- or 1-to-10-point system for judging depth. His North Carolina Scale (NCS) had subjects rate their hypnotic depth on a 0-to-50-plus-point scale. About half of these scales instruct subjects to consciously deliberate as to their hypnotic depth, and the remaining half require subjects to spontaneously report their depth. Based on his own research, Tart (1970) concluded that the latter procedure better correlated with other measures of hypnotic depth than the former.

LeCron (1953) was perhaps the first to use a simple self-report, single-item scale to experientially measure hypnotic depth. He instructed his subjects to call out from 1 to 100 during hypnosis to indicate their depth of trance when asked, “How deep are you?” He also informed participants that the “subconscious mind can determine accurately the depth of trance” (p. 5). LeCron disregarded nonspontaneous responses, considering them invalid and attributing them to conscious, rather than to subconscious, origins. Weitzenhoffer (2002), however, noted that such hypnotic depth scores are “lacking in solid evidence” (p. 214).

Measuring hypnotic depth via the PCI. Pekala and colleagues have operationalized hypnotic depth in terms of a linear combination of ratings on multiple dimensions of a phenomenological self-report
The PCI, given during hypnosis, can be used to compute a predicted Harvard Group Scale (pHGS) score. This score is based on a regression of 10 of the PCI (sub)dimensions against the Harvard Group Scale of Hypnotic Susceptibility, Form A (Shor & Orne, 1962); correlations of about .60 have been found (Forbes & Pekala, 1993; Pekala & Kumar, 1984, 1987). The pHGS, or hypnoidal state (Pekala & Nagler, 1989), score, was developed to give the hypnosis clinician and researcher a quantitatively reliable and valid way to measure hypnotic depth or trance (Pekala, 1991a, 2002; Pekala & Kumar, 2000). The hypnoidal state score is a phenomenologically based measure of trance that is primarily a function of state effects, although influenced by trait factors (Kumar & Pekala, 1988, 1989; Kumar, Pekala, & Cummings, 1996). This score reflects the phenomenological alterations in consciousness associated with being hypnotized using the Harvard Group Scale as the criterion measure. The hypnoidal state score, which typically runs between 1.0 and 9.0, can be readily computed as part of the Phenomenology of Consciousness Inventory – Hypnotic Assessment Procedure (PCI-HAP; Pekala, 1995a, 1995b). Additionally, the PCI-HAP has a hypnotic dream item that measures participants’ imagery vividness during hypnosis and several other items.

TRANCE DEPTH, SUGGESTIBILITY, AND HYPNOSIS

Recently, Holroyd (2003) posited an interactive relationship between trance depth or altered-state effects and suggestibility. From a synthesis of research on the neurophysiology of hypnosis (Crawford, 2001; Crawford & Gruzelier, 1992) and its phenomenology (Cardeña, 2005; Pekala & Kumar, 2000), Holroyd distilled three factors to account for most of the effects we see in hypnosis: suggestibility, altered-state effects, and expectancy.

Suggestibility. Suggestibility means different things to different theorists (see Schumaker, 1991, for a comprehensive review of these very different viewpoints). Whereas E. R. Hilgard (1991) defined suggestion as a type of influential communication, Weitzenhoffer defined suggestibility more specifically as the “capacity to produce what I call the classical suggestion effect (Weitzenhoffer, 1974); that is, a nonvoluntary (or avolitional) response relevant to the content of a communication intended to be a suggestion” (2002, p. 210), hence highlighting his viewpoint of suggestibility as nonvolitional in nature. In contrast, Barabasz and Watkins (2005) view the term suggestibility as somewhat of a misnomer and see receptivity as primary: “receptivity is clearly one of the most essential aspects of hypnosis and is frequently mislabeled
suggestibility” (p. 71). Even the relationship between suggestibility and hypnosis is controversial. Given the charge by some that hypnosis is “just” suggestibility, Killeen and Nash (2003) responded: “Although changes in suggestibility are one of the main effects of hypnosis, suggestibility is not one of the causes of hypnosis” (p. 204).

Due to the aforementioned controversies, for the purposes of this paper suggestibility will be defined in terms of Kirsch and Braffman’s definitions. Kirsch and Braffman (1999) distinguished two main types of suggestibility: “if ‘hypnotic suggestibility’ is responsiveness to suggestions given after hypnosis has been induced;” (p. 226) then “nonhypnotic suggestibility” may be used “to denote responsiveness to suggestions administered without the prior induction of hypnosis” (p. 226). They emphasized the role of imagination in suggestibility. They defined “imaginative suggestions” as “requests to experience an imaginary state of affairs as if it were real” (2001, p. 59), and “imaginative suggestibility” as the “degree to which the person succeeds in having the suggested experiences” (p. 59) whether such experiences occur within, or outside of, hypnosis.

*Suggestibility and imagination.* Josephine Hilgard (1979) envisioned “imaginative and sensory-affective involvements” as being “closely related to the capacity to experience hypnosis” (p. 483), with imaginative involvements “expressing individual interests in a variety of experiences whereby imagination and fantasy provide the individual with highly satisfying experiences” (pp. 483–484).

Sheehan (1979), in a thorough review of the relationships between imagination and hypnosis, suggested that imaginative activity is a major, but not the only, predictor of hypnotic responsivity:

Finally, one should consider the accuracy of prediction of susceptibility afforded by conjoint cognitive, motivational, and personality attributes. Since (theoretically at least) one may distinguish varying aspects of imagery, fantasy, and hallucination, it seems plausible to argue that different kinds of association may be evident for these various manifestations of the subject’s ability to engage in imaginative activities. (p. 406)

Hence, imaginative suggestibility, as conceptualized by Kirsch and Braffman (1999, 2001), may be a major, but not the only, aspect of being hypnotizable. Because there are individuals who “seem to respond to suggestion solely on the basis of imaginative involvement—good ability to imagine or fantasize” (Holroyd, 2003, pp. 120–121), it may be that some moderately to highly hypnotizable people use their fantasy or imagery ability to achieve hypnotic effects and yet do not necessarily experience an altered state of awareness during hypnosis (see Pekala & Kumar, 2000).

*Imagery ability and imaginative involvement.* Imaginative involvement usually involves using vivid imagery to inculcate hypnotic suggestions
However, research assessing imagery vividness and hypnosis has usually been concerned with imagery outside of a hypnotic intervention.

Research into the relationship between such imagery (e.g., during normal, waking consciousness) and hypnotizability has usually shown the relationship to be weak and unstable (Glisky, Tataryn, & Kihlstrom, 1995; Wagman & Stewart, 1974). Sutcliffe, Perry, and Sheehan (1970) hypothesized that the lack of a linear relationship may relate to the finding that although vivid imagers may be either of low or high hypnotizability, poor imagers are usually not very hypnotizable. This was called the “missing quadrant” effect and was also noted by deGroh (1989) and Spanos et al. (1983).

Surprisingly little research has been done on the vividness of imagery/imagination that occurs during hypnosis and how it relates with hypnotic responsiveness. Sheehan (1979) has reviewed studies testing “the assumption that there is an actual enrichment of imagery experience in hypnosis” (p. 388). Although several studies found that hypnosis appeared to facilitate imagery, several other studies were not so supportive, leading Sheehan to conclude that “the hypothesis that imagery ability is enhanced under hypnosis has not been tested sufficiently” (p. 389). A well-controlled investigation by Coe, St. Jean, and Burger (1980) investigated the enhancement of visual imagery during hypnosis and waking imagination conditions with two studies. Although hypnosis appeared to enhance visual imagery, it did so in only one of three conditions and appeared to be influenced by order and context effects. Hence, not only is the relationship between imagery vividness and hypnosis problematic but, to the authors’ knowledge, the relationship between self-reported hypnotic depth and the vividness of hypnotic suggestions experienced during hypnosis, is unknown at present.

Altered-State Effects

Holroyd (2003), quoting Weitzenhoffer (2002), distinguished between hypnosis and hypnotism: whereas “‘hypnosis’ means ‘altered state’” (2003, p. 111), implying trance; “‘hypnotism’—means something entirely different—it means giving suggestions after you think a person is in the state of hypnosis” (pp. 111–112). To quote Weitzenhoffer (2002), “I will otherwise generally reserve the term hypnosis for the state [our italics] and the term hypnotism, for the production, study and use of suggestion with the state of hypnosis presumably being present, whether or not it adds anything tangible to the situation” (p. 210).

Citing neurophysiological research (e.g., Crawford, 2001; Crawford & Gruzelier, 1992; Ray, 1997), Holroyd suggested that
there is a neurophysiological basis for the subjective altered-state effects reported by high hypnotizables in hypnosis that parallels absorptive meditation: “both hypnosis and concentrative meditation result in inhibitory patterns, particularly in the midline and frontal cortical areas associated with executive function and cognitive control” (pp. 117–118). Thus, both would involve an alteration in state of consciousness associated with changes in brain-wave patterns accompanying the aforementioned changes.

Holroyd posited that both suggestibility and altered-state effects associated with being hypnotized, in interaction with expectancy (Kirsch, 2000), account for the phenomenon of being hypnotized: “Suggestion without an altered state is just an invitation to use imagination and fantasy. An altered state without suggestions is just trance or meditation. Not only are altered state and imagination interactive contributors, but they also interact with expectancy” (Holroyd, 2003, p. 121).

Two of the three processes in Holroyd’s model (2003) can be operationalized using the PCI-HAP:³ (a) the pHGS score obtained from the PCI-HAP generates a “hypnoidal state” (pHGS) score (Pekala & Nagler, 1989) that may be construed as a “general measure of trance” (Pekala & Kumar, 2000, p. 112); and (b) the imagery vividness dream item assessed by the PCI-HAP debriefing form taps what we call “imagoic suggestibility,” an aspect of imagination and fantasy as defined by Sheehan (1979), or “imaginative suggestibility” as defined by Kirsch and Braffman (2001): “requests to experience an imaginary state of affairs as if it were real” (p. 59). (Imagoic suggestibility we conceive as one aspect of imaginative suggestibility, since the latter may include other aspects of suggestibility besides imagery vividness.) Additionally, the PCI-HAP debriefing form allows participants to estimate their hypnotic depth in the spirit of Lecron, via a self-reported hypnotic depth (srHD) score.

THE PRESENT STUDY: HOW HYPNOTIZED DID I GET?

The PCI-HAP debriefing form assesses several other items: a finger-response item, an eye-catalepsy item, and a “fell-asleep” item. Thus, a main purpose of this study was to see how well these variables predicted the srHD scores. We were particular interested in the imagery vividness scores (as a measure of imagoic suggestibility), and the pHGS scores (as a general measure of trance or altered state), given Weitzenhoffer’s distinction between hypnosis and hypnotism. We asked if the imagery vividness of the hypnotic dream item, or the

³Recent pilot research (Pekala & Kumar, 2005) has added hypnotic and therapeutic expectancy, as part of a new preassessment form, as additional (preassessment) variables operationalized by the PCI-HAP. That research, once replicated with a larger sample, will be reported more fully in a future publication.
The relationship between these two processes (imagoic suggestibility and altered-state effects) may be quite important for understanding the nature of hypnotic responsivity. Sheehan and McConkey in 1982 and Barnier and McConkey in 2003 have argued “that there are multiple cognitive pathways to compelling hypnotic experiences” (2003, p. 298) with some individuals using a “constructive” or “deliberate, strategic, effortful, reflective, analytic” (p. 298) style, while others, a “concentrative” or “intuitive, automatic, effortless, impulsive, primitive” style (p. 298). In a similar vein, Woody and McConkey (2003) suggest that “different responses require different combinations of underlying component abilities” (p. 316), and different individuals, or the same individuals at different times, may use “two or more different sets of components [which] are each sufficient to produce a particular hypnotic response and thus represent alternative ways to pass a particular item” (p. 317). Hence, we asked, how are imagoic suggestibility and altered-state effects related to the perception of one’s hypnotic depth?

Another purpose of this study was to examine how well an overall single-item measure of hypnotic depth (the srHD score), correlates with the phenomenological and behavioral items assessed by the PCI-HAP. Specifically, we wanted to see if the srHD score correlates with the “hypnoidal state” (pHGS) score, a phenomenological measure of altered-state effects and depth of trance. This would address Weitzenhoffer’s (2002) concern of the lack of evidence supporting the use of a single-item Lecron-type measure of hypnotic depth. Further, one might be appropriately concerned that measuring hypnotic depth directly by a single item would be too obvious to control for demand characteristics that are associated with face valid measures. In contrast, the PCI items used in generating the pHGS score require participants to rate their subjective experiences on a variety of dimensions during a sitting-quietly period during hypnosis, making it less obvious to the participants that hypnotic depth is being assessed. In addition, the pHGS score is a complex measure requiring a linear combination of 10 PCI (sub)—dimensions that are predictive of an external criterion, the Harvard Group Scale of Hypnotic Susceptibility, Form A. (The regression equation used to derive pHGS scores is from a previous study, Pekala & Kumar, 1987.) Thus, a high correlation between the srHD and the pHGS scores would be reflective of concurrent validity of the two measures. Additionally, we expected the two hypnotic-depth scores to
be correlated with imagoic suggestibility (the vividness of the hypnotic dream).

METHOD

Participants

Three hundred participants from two substance abuse residential rehabilitation treatment programs (SARRTPs) initially matriculated into the study on relapse prevention. Informed consent was procured; participation was voluntary. Of those participants, 261 subsequently completed the PCI-HAP. Eliminating participants with incomplete data resulted in 250 participants.

Materials and Procedures

Participants from the substance-abuse treatment units, within which they were matriculated, and as part of a study on relapse prevention (reported in Pekala et al., 2004), completed a variety of questionnaires before discharge. One of those involved the hypnotic assessment procedure (PCI-HAP) described below (Pekala, 1995a, 1995b, 2002; Pekala & Kumar, 2000).

The PCI-HAP begins with an overview of the assessment procedure, and a description of the induction ceremony. The PCI-HAP hypnotic induction consists of relaxation instructions called a body scan, which is similar to a progressive relaxation protocol, but instead of tensing different muscles, the participant is told to feel “wave upon wave of deep soothing relaxation” dissolving away the tension of the different muscles throughout the body; the protocol starts at the top of the head and ends at the toes), a hypnotic deepening procedure called a mind calm (counting from 10 to 1 while suggesting that the mind become calm and empty), a suggestion to have a vivid dream while being on vacation, and several other items.

The client completes the 53-item PCI (Phenomenology of Consciousness Inventory, Pekala, 1982, 1991b) retrospectively in reference to the sitting-quietly period embedded near the end of the induction procedure; it measures 12 major and 14 minor dimensions of phenomenological experience. The major dimensions (with minor dimensions in parentheses) are: altered state of awareness, altered experience (body image, time sense, perception, unusual meaning), volitional control, self-awareness, rationality, internal dialogue, positive affect (joy, sexual excitement, and love), negative affect (anger, sadness, and fear),

Copies of the PCI, the PCI-HAP, and the therapist and self-report debriefing forms are available from the first author, along with an outline of how to use the PCI-HAP with participants.
imagery (amount and vividness), attention (direction and absorption), memory, and arousal.

After completing the PCI, the participant completes a debriefing form rating the vividness of their imagery in reference to going “on a vacation somewhere to a beautiful place and have a very relaxing and very wonderful time;” rating on a 1-to-10 intensity scale the vividness of their imagery, letting 1 = just a thought, no image at all and 10 = as real and vivid as actually being there. The debriefing form also asks whether participants opened their eyes during the eye catalepsy item (1 = opened eyes, 2 = did not open eyes); if they raised their finger when asked to do so (1 = did not raise finger, 2 = raised finger); and their self-report as to whether they fell asleep on a 4-point scale (1 = no, I did not fall asleep, 4 = yes, I fell asleep). The latter two items (finger response and fell asleep) were included in the PCI-HAP to determine if people, especially when tested in groups, may have fallen asleep. The last item on the debriefing form asks the participants about their hypnotic depth: “On a 1-to-10 scale, how hypnotized do you feel that you became? Let 1 = not hypnotized at all, and let 10 = the most hypnotized that you can imagine.”

RESULTS

Correlational and 3-D Graphic Analyses

Table 1 lists the correlation matrix for the following scores: the srHD score, the PCI pHGS (hypnoidal state) score, the imagery vividness dream item (imagoic suggestibility) score, and other PCI-HAP debriefing item scores. Individuals who completed the PCI unreliably (i.e.,

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Self-Reported Hypnotic Depth (srHD)</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCI-HAP Variables:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. pHGS Score (Hypnoidal State)</td>
<td>.57²</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Imagery-Vividness Dream Item (Imagoic Suggestibility)</td>
<td>.72</td>
<td>.45</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Finger-Response Item</td>
<td>.20</td>
<td>−.08</td>
<td>.19</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Eye-Catalepsy Item</td>
<td>.15</td>
<td>.30</td>
<td>.08</td>
<td>−.26</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>6. Fell-Asleep Item</td>
<td>.08</td>
<td>.27</td>
<td>.06</td>
<td>−.32</td>
<td>.18</td>
<td>1.00</td>
</tr>
</tbody>
</table>

¹n = 180.
²r > .15 (p < .05); r > .19 (p < .01); and, r > .26 (p < .001).
obtained a reliability index of greater than 2.30) were excluded from analyses.

As expected, the two hypnotic depth scores, the srHD and the pHGS, were highly correlated, \( r = .57, p < .001 \), with each other and with imagoic suggestibility, \( r = .72 \) and \( .45, p < .001 \), respectively; the latter two correlations differed significantly for each other, \( t = 5.53, p < .001 \). Further, the correlations with the PCI-HAP variables showed (a) the finger response was significantly correlated with the srHD score, \( r = .20 \), but not with pHGS, \( r = -.08 \); the difference in correlations was significant, \( t = 4.22, p < .001 \); (b) the eye-catalepsy item had a significantly lower correlation, \( t = 2.22, p < .05 \), with the srHD score, \( r = .15 \), than the pHGS score, \( r = .30 \); and (c) the fell-asleep item was significantly correlated with the pHGS score (.27), but not the srHD score, \( r = .08 \); the difference in correlations was significant \( t = 3.84, p < .001 \).

The correlation between the finger-response item and the fell-asleep item (see Table 1) was \(-.32, p < .001\), suggesting that those individuals who did not raise their finger (when asked to do so) were more likely to report that they fell asleep during the hypnotic assessment. The correlations between the imagery vividness of the hypnotic-dream item and the PCI imagery amount and vividness scores (during the open-ended sitting-quietly period embedded in the hypnotic protocol) were .50 and .46, respectively (both significant at \( p < .001 \)), suggesting that the imagery vividness of the hypnotic dream was significantly correlated with the imagery amount and vividness reported on the PCI during the subsequent sitting quietly period near the end of the hypnotic protocol.

The correlation of imagoic suggestibility with the srHD score was large, \( r = .72 \), suggesting that a significant portion of the variance of participants’ reported hypnotic depth were accounted for by how vivid participants rated their imagery vividness during a suggested dream. This suggested a further examination of the relationship between hypnotic depth, imagoic suggestibility, and hypnoidal state using a 3-D figure. Figure 1 represents a 3-D plot with imagoic suggestibility on the x-axis, the hypnoidal state on the y-axis, and srHD on the z-axis. The figure represents a three-dimensional “distance weighted least squares fit (of) a surface through a set of points by least squares. Unlike linear or low order polynomial smoothing, however, the surface is allowed to flex locally to fit the data better,” and produces a “true, locally weighted three-dimensional surface” (Willkinson, 1988, p. 550).

Visual perusal of the figure suggests that either a high hypnoidal-state score or a high imagoic-suggestibility score (above 7.0) was not associated with a high srHD score (above 7.0), if the other variable’s score was low (3.0 or below). Hence, although both imagoic suggestibility and hypnoidal state each individually accounted for significant portions of the variance (based on their high correlation coefficients with the srHD score), each appears to moderate the level of self-reported
hypnotic depth, more so if the particular score of the other variable is low. To further understand these relationships, regression analyses were performed to examine the relative contributions of imagoic suggestibility and hypnoidal state, along with other PCI-HAP and PCI variables, in predicting self-reported hypnotic depth.

Regression Analyses

For cross-validation purposes (to assess for shrinkage), the sample was randomly divided into two approximately equal groups using SYSTAT (Wilkinson, 1998). Group 1 participants \( (n = 132) \) were used to generate regression equations, which were then cross-validated on Group 2 participants \( (n = 118) \).

Half-sample regression analyses. Two sets of regression analyses were completed on Group 1 participants. The first regression equation attempted to predict from only the PCI-HAP variables (and not the PCI major dimensions): the pHGS score, and the PCI-HAP debriefing variables (imagoic-suggestibility item, the finger-response item, the eye-catalepsy item, and the fell-asleep item). The regression equation

\[ \text{Self-reported hypnotic depth} = \beta_0 + \beta_1 \text{imagoic suggestibility} + \beta_2 \text{hypnoidal state} + \epsilon \]

where \( \beta_0 \) is the intercept, \( \beta_1 \) is the coefficient for the imagoic suggestibility, \( \beta_2 \) is the coefficient for the hypnoidal state, and \( \epsilon \) is the error term.
used a (default) forward step-wise algorithm with alpha-to-enter and
alpha-to-remove of .15 (Wilkinson, 1998). Left in the regression equa-
tion were the imagery-vividness item, the pHGS score, and the finger-
response item, for an $R$ of .848 and an $R^2$ of .719 (see Table 2). (Regres-
sion analyses were also completed using the interactions terms; the
interactions were all nonsignificant.)

“Partial regression coefficients can indicate, with a good deal of confi-
dence, whether specific predictors make contributions to the criterion
that are unrelated to the contributions made by the other variables”
(Grimm & Yarnold, 1995, p. 41); the coefficients thus allow for “the rela-
tive contributions of each predictor to the overall effect” (p. 41) to be com-
pared. The standardized regression coefficients listed in Table 2 indicated
that participants’ imagoic suggestibility accounted for about 60% of the
relative variance in srHD scores; followed by level of subjective trance as
measured by the pHGS score (about 30% of the variance); followed by
the finger-response item: whether they raised their finger or not (10%).

A second regression analysis (see Table 3) was undertaken to pre-
dict hypnotic depth using the PCI-HAP variables (imagoic suggestibility,
the finger-response item, the eye-catalepsy item, and whether partici-
pants believed they fell asleep) and the 12 PCI major dimensions (but not
including the pHGS score since it is a function of the various PCI dimen-
sions). This forward step-wise regression resulted in an $R$ of .897 for an $R^2$
of .805. Again, accounting for over half the relative variance was imagoic
suggestibility (standardized regression coefficient of .59). Accounting for
the other half of the variance were altered experience (.24), altered state
(.13), the finger-response item (.13), and internal dialogue (−.08).

Cross-validation. The multiple Rs reported above are quite large;
however, such Rs may shrink upon cross-validation. Thus, we pre-
dicted the srHD scores for Group 2 participants using the unstandard-
ized regression coefficients (listed in Tables 2 and 3) obtained with the
Group 1 participants. The shrinkage (see Table 4) was small: the multi-
ple $R$ for the PCI-HAP items of .85 shrank to .74; and the multiple $R$ of
.90 for the PCI-HAP and the PCI major dimensions shrank to .73. Thus,
the regression equations from Group 1 participants generalized well to
Group 2 participants.

**DISCUSSION**

**Correlational, Regression, and Graphic Analyses**

**Imagoic suggestibility, hypnoidal state, and self-reported hypnotic depth.**

Of all the variables in Table 1, the Pearson $r$ between the imagoic
suggestibility had the highest correlation (.72) with the srHD score.
Accounting for about 52% of the variance, this result was also sup-
ported by the cross-validation regression analysis. The imagery item
<table>
<thead>
<tr>
<th>Subscale</th>
<th>$R$</th>
<th>$R^2$</th>
<th>Unstandardized Coefficient</th>
<th>Standardized Coefficient</th>
<th>$F$ Value</th>
<th>$p$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imagery-Vividness Dream Item (Imagoic Suggestibility)</td>
<td>0.804</td>
<td>0.646</td>
<td>0.53</td>
<td>0.60</td>
<td>69.75</td>
<td>.00</td>
</tr>
<tr>
<td>pHGS score (Hypnoidal State)</td>
<td>0.840</td>
<td>0.705</td>
<td>0.57</td>
<td>0.31</td>
<td>19.97</td>
<td>.00</td>
</tr>
<tr>
<td>Finger-Response Item</td>
<td>0.848</td>
<td>0.719</td>
<td>0.67</td>
<td>0.12</td>
<td>4.19</td>
<td>.04</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td>−0.04</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^1$F and $p$ are final values for independent variables left in the regression equation.
Table 3
Predicting Hypnotic Depth Using the PCI Major Dimensions and the PCI-HAP Debriefing Form Items: Half Sample

<table>
<thead>
<tr>
<th>Subscale</th>
<th>$R$</th>
<th>$R^2$</th>
<th>Unstandardized Coefficient</th>
<th>Standardized Coefficient</th>
<th>$F$ Value$^1$</th>
<th>$p$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imagery-Vividness Dream Item (Imagoic Suggestibility)</td>
<td>0.854</td>
<td>0.730</td>
<td>0.55</td>
<td>0.59</td>
<td>79.50</td>
<td>.000</td>
</tr>
<tr>
<td>PCI Altered-Experience Dimension</td>
<td>0.884</td>
<td>0.781</td>
<td>0.57</td>
<td>0.24</td>
<td>11.96</td>
<td>.001</td>
</tr>
<tr>
<td>Finger Response Item</td>
<td>0.889</td>
<td>0.791</td>
<td>0.76</td>
<td>0.13</td>
<td>6.32</td>
<td>.014</td>
</tr>
<tr>
<td>PCI Altered-State Dimension</td>
<td>0.894</td>
<td>0.799</td>
<td>0.21</td>
<td>0.13</td>
<td>3.56</td>
<td>.062</td>
</tr>
<tr>
<td>PCI Internal-Dialogue Dimension</td>
<td>0.897</td>
<td>0.805</td>
<td>−0.11</td>
<td>−0.08</td>
<td>2.36</td>
<td>.128</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.37</td>
<td></td>
</tr>
</tbody>
</table>

$^1F$ and $p$ are final values for independent variables left in the regression equation.
had a standardized regression coefficient of .60; almost double the pHGS score (coefficient of .31), and about four times the finger-response item (.12) in the regression analysis using the PCI-HAP variables and the pHGS score as reported in Table 2. When using the PCI-HAP items and the PCI dimensions in predicting the srHD scores (see Table 3), imagoic suggestibility again accounted for over half the relative variance (standard regression coefficient of .59), with altered experience and altered state (PCI dimensions analogous to Holroyd’s “altered-state” factor), accounting for about a third (sum of standardized regression coefficients = .37) of the relative variance.

Since these coefficients allow comparisons of “the relative contributions of each predictor to the overall effect” (Grimm & Yarnold, 1995, p. 41), we can conclude that the imagoic suggestibility was the most important predictor of the srHD scores, followed by altered-state effects, whether determined by the pHGS score or the altered experience/altered state PCI dimension scores. The fact that there was little shrinkage upon cross-validation (see Table 4) adds further support for the above findings.

However, although imagoic suggestibility accounted for a majority of the variance in predicting the srHD scores, the relationship between the two appears to be moderated by hypnoidal state. Thus, when looking at Figure 1, a high vividness of imagery score (above 7.0) was associated with a high srHD score (above 7.0) provided hypnoidal state was not low. Alternatively, a high hypnoidal-state score (above 7.0) was associated with a high (above 7.0) srHD score, provided imagoic suggestibility was not low. These results suggest that self-reported hypnotic depth is a function of both imagoic suggestibility and hypnoidal state (the pHGS score), with scores on one variable moderating the effects of the other, more so at low levels of the other variable.

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Correlations between Predicted Hypnotic Depth and Actual srHD Scores of Group 2 Participants Using Regression Equations from Group 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable Set</td>
<td>1</td>
</tr>
<tr>
<td>1. Self-Reported Hypnotic Depth (srHD) score</td>
<td>1.00</td>
</tr>
<tr>
<td>2. Predicted Hypnotic Depth Scores for PCI-HAP Items Only</td>
<td>1.00</td>
</tr>
<tr>
<td>3. Predicted Hypnotic Depth Scores for PCI-HAP Items and PCI Major Dimensions</td>
<td>1.00</td>
</tr>
</tbody>
</table>

1All correlations are significant at $p < .0001$.
2Items in parentheses represent multiple Rs using Group 1 participants.
Relationship between the srHD and pHGS scores and their relationship with the PCI-HAP variables. A correlation of .57 between the srHD score and the pHGS score suggests that the srHD score and the pHGS hypnoidal-state score are measuring similar, but not identical, conceptions of hypnotic depth, since only about one third of the variance is shared in common between them. The aforementioned inference is also supported by the different pattern of correlations for the two depth scores with the other PCI-HAP items. While the finger response item was significantly correlated with the srHD score, it was not correlated with the pHGS scores; the reverse occurred for the fell-asleep item, which was significantly correlated with the pHGS score, but not the srHD score. The eye-catalepsy item approached significance ($r = .15$) for the srHD score but had a significantly higher correlation ($r = .30$) for the pHGS score.

The imagoic-suggestibility item was also significantly correlated with both depth scores but was significantly higher for the srHD score, accounting for about 33% more variance. It seems that the pHGS (hypnoidal state) score is less influenced by imagoic suggestibility, suggesting that the pHGS score may be more a measure of altered-state effects than is the srHD score. The srHD score, on the other hand, appears more influenced by imagery suggestions that are given during hypnosis. [The pHGS score is a function of 10 PCI (sub)dimensions included in the unstandardized regression equation—60% of the variance of this score is due to altered experience, alterations in state of consciousness, and lower self-awareness and loss of volitional control, see Pekala & Kumar, 1987.] Although it is tempting to conclude that while the srHD score may be more a measure of “hypnotism,” and the pHGS score more a measure of “hypnosis,” a la Weitzenhoffer (2002), caution is warranted concerning this inference.

Imagoic Suggestibility, Altered-State Effects, and Hypnotic Depth

To the extent that imagery vividness during hypnosis and imagination are related, our results support the work and theorizing of J. Hilgard (1979), Sheehan (1979) and Lynn and colleagues (Lynn & Rhue, 1986, 1988; Lynn et al., 1987) on the importance of imagination and imaginative involvement in hypnotic-depth ratings (the srHD scores). The results also support Tart’s (1970, 1979) and Brown and Fromm’s (1986) theorizing that participants feel more deeply hypnotized to the extent that participants: (a) responded to suggestions (with the phenomenological imagoic-suggestibility item apparently having greater salience than the behavioral eye-catalepsy item); and (b) believed that there was an alteration in their conscious experience, as assessed in by the pHGS score (Table 2) or the PCI altered experience/altered-state dimension scores (Table 3).

Imagoic suggestibility was better able to predict srHD, a global measure of hypnotic depth, than the pHGS score, a measure of hypnoidal
state or altered-state effects. That a vivid, or near vivid, visual hallucination (rating of the hypnotic dream item as a 10, i.e., as real and vivid as actually being there), would garner more salience (and explain more of the variance) in the srHD scores than possibly less palpable altered-state effects as assessed by the pHGS score, is consistent with the results herein obtained. However, as Figure 1 illustrates, the srHD scores generally appear to be a function of both suggestibility and hypnoidal state, with higher scores on imagoic suggestibility or hypnoidal state being associated with increased hypnotic depth, provided the score on the other variable was at least moderate.

These results are also consistent with the theorizing and research of McConkey and Woody (Barnier & McConkey, 2003; Sheehan & McConkey, 1982; Woody & McConkey, 2003) concerning the relationship between individual differences in hypnotic responding and activation of differing psychological processes in the passing of differing types of hypnotic suggestions. Woody and McConkey (2003) suggest that “different people (or the same person on different occasions) could pass an item via different underlying processes” (p. 317). Although the self-reported hypnotic depth (srHD) score is not a hypnotic “item” in the aforementioned sense, it does give a general measure of the participant’s self-perceived hypnotic responsivity. A perusal of Figure 1 suggests that the participant’s perception of hypnotic depth does appear to be a function of both imagoic suggestibility and hypnoidal state, with higher scores in either leading to an increased hypnotic depth perception, provided the other dimension is not low.

Because imagoic suggestibility outside of hypnosis was not assessed in this study, it is not known to what extent the vividness of ones hypnotic dream during the PCI-HAP would highly correlate with a similar “dream” outside of hypnosis, that is, we did not assess nonhypnotic imagoic suggestibility, as defined as a subset of imaginative suggestibility a la Kirsch and Braffman (2001). Future research will need to assess both nonhypnotic imagoic suggestibility (imagery vividness of a suggested item without a hypnotic intervention), and hypnotic imagoic suggestibility (imagery vividness during a hypnotic intervention), to better determine the impact of the imagery vividness of suggestions upon self-perceived hypnotic depth, and their relationship to altered-state effects. The significant correlations between the imagery vividness of the hypnotic dream and the PCI imagery amount and vividness scores during the subsequent sitting quietly period does, however, suggest that imagery vividness during hypnosis, whether a function of a direct hypnotic suggestion or more spontaneous, unstructured imagery (that participants report during an unstructured sitting quietly interval later on in the protocol), appears more highly correlated than imagery vividness assessed outside of hypnosis (Glisky, Tataryn, & Kihlstrom, 1995; Wagman & Stewart, 1974).
Additionally, to what extent “hypnosis,” a la Weitzenhoffer (2002), that is, altered-state effects, potentiates the imagery vividness of suggestions for some people, over and above that accounted for by waking suggestibility is unknown at this point. However, our results suggest that altered-state effects potentiate the degree to which a person feels hypnotized, especially if the person has the ability to experience fairly vivid imagery during hypnosis. It is also unknown to what extent altered-state effects may enhance or reduce nonhypnotic imaginative suggestibility, although most clinicians would suggest that it enhances such suggestibility, Sheehan’s (1979) and Coe et al.’s (1980) research notwithstanding.

Other Results

There are two behavioral items on the PCI-HAP, the eye catalepsy item and the finger response item. One might think, because of their overt nature, that these items would correlate with srHD scores. The eye catalepsy item, however, only correlated .15 with srHD, which, although not significant ($\alpha = .05$), approached significance (see Table 1). The eye catalepsy item of the Harvard Group Scale (Shor & Orne, 1962) typically has a high correlation with total hypnotizability (Hilgard, 1965) vis-à-vis the other items of this scale. However, it did not remain in the PCI-HAP regression equation (see Table 2). The finger response item was, however, included in this equation, with a standard coefficient of .12. This item was added after the PCI-HAP was developed (Pekala, 2002) to assess the possibility that some participants, especially during a group administration of the PCI-HAP, may have fallen asleep. Thus, if participants did not raise their finger when asked, they tended not to rate their hypnotic depth as highly, quite possibly we believe, because they fell asleep during this part of the protocol, and consequently, had less conscious information to make a valid estimate of their hypnotic depth. This inference is supported by the significant correlation ($- .32$) between the finger response item and the falling asleep item. The finger response item may turn out to be useful for “teasing out” individuals who may have fallen asleep during the PCI-HAP assessment protocol.

The correlations between the imagery vividness of the hypnotic dream item and the PCI imagery amount and vividness scores (during the open-ended sitting quietly period during hypnosis) were .50 and .46, respectively (both significant at $p < .001$). This is interesting, given that individuals were told during the sitting quietly period to “continue to experience the state you are in right now.” Apparently, the vividness of imagery generated during a suggested hypnotic task, appears significantly related to spontaneous imagery reported during a subsequent sitting quietly period. This is in contrast to imagery vividness assessed outside of hypnosis, vis-à-vis imagery vividness during hypnosis, which typically has a lower correlation (Glisky, Tataryn, & Kihlstrom, 1995; Wagman & Stewart, 1974).
Limitations

Both the imagery vividness score and the srHD score are taken from the debriefing form, which was completed after the PCI. The higher correlation for these variables, vis-à-vis the correlation between the srHD and the pHGS scores, may relate to their contiguous completion on the debriefing form. Additionally, the pHGS score is a function of the 2-minute sitting quietly period, since participants are directed to complete the PCI only in reference to this period of time. The srHD score, on the other hand, is a function of participants’ perception of their hypnotic depth during the hypnotic ceremony, that is, “how hypnotized do you feel that you became.” These differences may relate to the differences in correlations among these variables.

Because the 2-minute sitting quietly period (for which the PCI is completed) occurs later in the hypnosis protocol than the hypnotic dream suggestion, a vivid hypnotic dream may have led to greater alterations in state of consciousness than would have been recorded, had the sitting quietly period occurred before the hypnotic dream. Because such order effects were not controlled, how much altered-state effects were augmented by the preceding hypnotic dream, is unknown.

Implications and Conclusions

Both imagoic suggestibility and hypnoidal state appear to affect how deeply hypnotized a person feels himself or herself to be, at least when assessed with the PCI-HAP. The feeling of “being hypnotized” may be important to the treatment or intervention process. Being able to first quantify imagoic suggestibility, hypnoidal state, and reported hypnotic depth may allow the clinician and researcher to get a better idea as to how hypnotizable a client or research participant feels himself or herself to be, and why they feel that way. With this knowledge in hand, the researcher or clinician may then attempt to augment such suggestibility, hypnoidal state, or hypnotic depth, which, if successful, may allow the client or participant to become more ego involved in the process and hence augment treatment efficacy. As an example, simple interventions to increase self-reported hypnotic depth, such as lengthening the induction ceremony, may not only deepen trance levels, but also allow the client or participant to feel that such a deeper state will be subsequently associated with increased clinical or therapeutic efficacy. Although such reasoning seems intuitively sound, validation by empirical research is necessary.

Overall, our results seem most consistent with the theorizing of Holroyd (2003), who suggested that suggestibility and altered-state effects interact to produce hypnotic effects, to the extent that self-reported

\[5\] After doing the PCI-HAP, we typically do a hypnotic deepening routine to increase self-reported hypnotic depth. We typically get about a 1- to 2-point increase in the srHD score from the PCI-HAP assessment.
hypnotic depth is regarded as a type of “hypnotic effect.” Although expectancy effects were not evaluated in the present study, imagery vividness (as a measure of imagoiic suggestibility) and the pHGS score (as a measure of hypnoidal state or “trance depth” [Pekala, 2002; Pekala & Kumar, 2000, 2005]) appear to be salient variables in predicting hypnotic depth from the PCI-HAP. The results are also congruent with the theorizing of Tart (1979) and Brown and Fromm (1986) concerning hypnotic depth being a function of the participant’s perception of responsiveness to suggestions and perceived alterations in subjective experience. The fact that a high score of either variable was associated with increased self-reported hypnotic depth (unless the other variable was low), also supports the theorizing of Woody and McConkey (2003) on different cognitive/phenomenological processes leading to the same hypnotic effect. Besides supporting the concurrent validity of the pHGS and srHD scores as measures of trance depth, the results add some support for the use of the PCI-HAP in assessing “hypnosis” and “hypnotism,” as defined by Weitzenhoffer (2002).

REFERENCES


"Wie tief ging ich in Hypnose?" Prädiktion von selbstberichteter Hypnotiefe mithilfe eines phänomenologischen Messinstruments

Ronald J. Pekala, V. K. Kumar, Ronald Maurer, Nancy C. Elliott-Carter, und Edward Moon

Zusammenfassung: Verfahren zur Abschätzung der Hypnotiefe sind seit mehr als 70 Jahren im Einsatz. In dieser Studie wurde die selbstberichtete Hypnotiefe aus den phänomenologischen und verhaltensbezogenen Variablen des Phenomenology of Consciousness Inventory – Hypnotic Assessment Procedure (PCI-HAP) vorhergesagt. Die Teilnehmer wurden in zwei Gruppen aufgeteilt. Eine Gruppe diente dazu, die Regressionsgleichungen aufzustellen, an der anderen wurden diese dann kreuzvalidiert. Die Lebhaftigkeit der Vorstellungen in Hypnose (imagoische Suggestibilität) und das PCIpHGS-Maß...

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"Est-ce que j’ai été hypnotisé profondément? “ Prédiction de l’auto-évaluation de la profondeur de l’hypnose au moyen d’un instrument d’évaluation phénoménologique

Ronald J. Pekala, V. K. Kumar, Ronald Maurer, Nancy C. Elliott-Carter, et Edward Moon


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"¿Qué tan hipnotizado estuve?” Cómo predecir auto-informes de profundidad hipnótica con un instrumento de evaluación fenomenológica

Ronald J. Pekala, V. K. Kumar, Ronald Maurer, Nancy C. Elliott-Carter, y Edward Moon

Resumen: Se han usado procedimientos para estimar la profundidad hipnótica durante más de 70 años. Este estudio predijo auto-informes de profundidad hipnótica a partir de variables de conducta y fenomenológicas
del Inventario de Fenomenología de la Conciencia- Procedimiento de Evaluación Hipnótica (Phenomenology of Consciousness Inventory-Hypnotic Assessment Procedure, PCI-HAP). Dividimos a los participantes en dos grupos. Usamos un grupo para generar ecuaciones de regresión y el otro grupo para la validación. La vividez de imágenes durante la hipnosis (sugestibilidad de imagos) y la medida pHGS del PCI de profundidad hipnótica (el estado hipnoidal) explicaron la mayoría de la varianza en los auto-informes de profundidad hipnótica. Estos resultados, corroborados por análisis de correlación y tri-dimensionales, son consistentes con las observaciones de otros investigadores de que la profundidad hipnótica depende de: (a) alteraciones en la experiencia subjetiva, y (b) la percepción de la receptividad a sugestiones. Las conclusiones son también congruentes con la hipótesis de J. Holroyd de que los efectos de sugestionabilidad y alteraciones de conciencia interactúan para producir los efectos hipnóticos.

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