Suggestibility, Expectancy, Trance State Effects, and Hypnotic Depth: II. Assessment via the PCI-HAP

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Abstract
This study sought to determine if self-reported hypnotic depth (srHD) could be predicted from the variables of the Phenomenology of Consciousness Inventory - Hypnotic Assessment Procedure (PCI-HAP) (Pekala, 1995a, 1995b; Pekala & Kumar, 2007; Pekala et al., 2010), assessing several of the processes theorized by researchers to be associated with hypnotism: trance (altered state effects), suggestibility, and expectancy. One hundred and eighty participants completed the PCI-HAP. Using regression analyses, srHD scores were predicted from the PCI-HAP pre-hypnotic and post-hypnotic assessment items, and several other variables. The results suggested that the srHD scores were found to be a function of imagoic suggestibility, expectancy (both estimated hypnotic depth and expected therapeutic efficacy), and trance state and eye catalepsy effects; effects that appear to be additive and not (statistically) interactive. The results support the theorizing of many investigators concerning the involvement of the aforementioned component processes with this particular aspect of hypnotism, the self-reported hypnotic depth score.

Keywords: Altered states of consciousness, consciousness, expectancy, hypnosis, hypnotic depth, hypnotism, psychophenomenology, suggestibility, trance.
Introduction

A prior paper (Pekala, Kumar, Maurer, Elliott-Carter, Moon, & Mullen, 2010) reviewed the relationships among trance or altered state effects, suggestibility, and expectancy. These are variables that many hypnosis researchers and theorists (Barber, 2000; Cardeña, 2005; Kihlstrom, 2003, 2005; Kirsch, 1985, 1991; Lynn & Kirsch, 2006; Schumaker, 1991; Weitzenhoffer, 2002; among others) have posited to be important in understanding the nature of hypnotism. In an integrative review, Holroyd (2003) suggested altered state effects and imagination/suggestibility combine with expectancy to account for how individuals understand hypnotism.

As mentioned in our prior article (Pekala et al., 2010) Holroyd’s model (2003) of hypnotism can be operationally defined with aspects of the model quantified and estimated using the PCI-HAP (Phenomenology of Consciousness Inventory: Hypnotic Assessment Procedure; Pekala, 1995a, 1995b; Pekala & Kumar, 2000, 2007). The PCI-HAP is a phenomenologically based hypnotic assessment instrument that is used to assess hypnotic responsivity for this predominantly phenomenological perspective. It includes a pre- and post-assessment along with completion of the PCI (an instrument that measures 12 major and 14 minor dimensions of consciousness; Pekala, 1982, 1991b) embedded within the PCI-HAP. The PCI is retrospectively completed in reference to a sitting quietly period embedded in a hypnotic induction protocol after the deinduction.

The PCI-HAP generates: (a), a pHGS (predicted Harvard Group Scale) score or “hypnoidal state” score (Pekala & Nagler, 1989) that may be construed as a “general measure of trance” (Pekala & Kumar, 2000, p. 112). The hypnoidal state score, we believe, is less prone to distortion via demand characteristics (Orne, 1962) and response sets (Wagstaff, Cole, & Brunas-Wagstaff, 2008) than typical self-report hypnotic depth measures, due to the nature of the phenomenology that the hypnoidal state score is measuring (see below).

In addition to the hypnoidal state score, the PCI-HAP assessment protocol also includes a measure of “imagoic suggestibility” that is assessed via an imagery vividness dream item. Imagoic suggestibility is 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 additional aspects.)

The PCI-HAP includes self-report measures of two types of expectancy: pre-hypnotic estimated hypnotic depth and pre- and post-hypnotic therapeutic efficacy. The post-assessment form also assesses responses to several other items: a finger response item, an eye catalepsy item, and a “fell asleep” item. In addition to the above, the PCI-HAP EXCEL program (which is used to generate a 5-page report concerning the client’s hypnotic talents), generates raw and percentile scores for the various (sub)dimensions mapped by the PCI.

The PCI-HAP also allows participants to estimate their hypnotic depth in the spirit of LeCron (1953) via a self-reported Hypnotic Depth (srHD) score. Over 20 years ago Laurence and Nadon (1986) suggested that the elucidation of “hypnotic depth is a complex task involving the interaction of experiential, cognitive and contextual variables” (p. 215). Weitzenhoffer (2002) in his classic paper, “Scales, scales, and more scales,” noted that hypnotic depth scores are “lacking in solid evidence” (p. 214). In contrast, and in support of self-report depth scales, Wagstaff et al. (2008) suggested that depth scales may serve as a useful alternative to conventional suggestion-based tests of hypnotizability. The present study helps operationalize Laurence and Nadon’s (1986) “experiential, cognitive, and contextual variables” to better understand self-reported hypnotic depth.
The Present Investigation

The purpose of this investigation was to determine how well self-reported hypnotic depth could be predicted from altered state effects, suggestibility, and expectancy (measured via PCI-HAP), variables implicated in hypnotism by many hypnosis theorists and researchers. Barnier and McConkey (2003) (see also Sheehan and McConkey, 1982) have argued “that there are multiple cognitive pathways to compelling hypnotic experiences” (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 somewhat different vein Woody and McConkey (2003) suggested 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, altered state effects, and expectancy related to the perception of one’s subsequent self-reported hypnotic depth. Although the PCI-HAP does not include all the component processes defined by Woody, Barnier, and McConkey (2005) in their “multiple hypnotizabilities” article, we believe the imagoic suggestibility item taps an aspect of their perceptual-cognitive factor; the eye catalepsy item taps an aspect of their motor challenge factor; and the hypnoidal state score taps an aspect of their “general hypnotizability” factor.

Additionally, the study attempted to replicate the results of Pekala, Kumar, Maurer, Elliott-Carter, and Moon (2006), wherein hypnotic depth was predicted from an earlier version of the PCI-HAP that did not include the expectancy variables. Pekala et al. (2006) found that imagoic suggestibility and altered state effects (as assessed by the hypnoidal state score) accounted for most of the variance associated with participants’ self-reported hypnotic depth. Because the srHD score provides a general measure of the participant’s self-perceived hypnotic responsivity, this measure may serve an important function in clinical situations. If individuals do not believe they were “hypnotized,” how motivated will they be to use hypnotism and self-hypnosis to help them with their particular symptom(s)?

This study also sought to replicate the results obtained in Pekala et al. (2006) wherein a correlation of .57 was found between the srHD score and the pHGS score, and an $r$ of .72 was obtained between the srHD score and imagoic suggestibility. This earlier study added some support for the use of hypnotic depth scores, in contradiction to Weitzenhoffer’s (2002) conclusion that hypnotic depth scores are “lacking in solid evidence” (p. 214), but consistent with the theorizing of Wagstaff et al. (2008).

Method

Participants

Two hundred and twenty three participants from two Substance Abuse Residential Rehabilitation Treatment Programs (SARRTPs) initially matriculated into two slightly different studies on relapse prevention which included completion of the PCI-HAP. Both studies used the same design with one major difference - the first study paid the participants for a follow-up interview ($n = 120$), the second study ($n = 103$) did not. The pre-assessment form was added part way through Study 1 and was used throughout Study 2.

Informed consent was procured; and participation was voluntary. The study was reviewed and approved by the hospital IRB and R&D committees. Eliminating participants
with a reliability index (RI)\(^1\) of greater than 2.30 on the PCI, to control for unreliable responses, resulted in 180 participants. Using only those participants who completed all pre- and post-assessment forms resulted in a final \(n\) of 123.

**Materials**

Participants took part in a study on relapse prevention for which they 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, 2007; Pekala et al., 2010).

The PCI-HAP\(^2\) consists of a pre-assessment, a hypnotic induction, and a post-assessment (debriefing). For the pre-assessment, participants report whether they experienced hypnotism before and if so, how hypnotizable they felt they were at that time. They also are asked to estimate their subsequent level of hypnotic depth on a “1” to “10” scale (estimated hypnotic depth). Additionally, participants are told to visualize themselves in a hot tub and estimate the vividness of their kinesthetic and visual imagery. Finally, they are told to estimate (on a “1” to “10” scale) how helpful the hypnotic session was going to be for their problems and concerns.

The hypnotic induction consists of a “body scan” (progressive relaxation but without the tensing), and a “mind calm:” counting back from “10” to “1” while the mind becomes more calm and empty. After the mind calms, participants are asked to go on vacation in their mind and experience a hypnotic dream. After this mental vacation (the imagoic suggestibility item) participants are asked to raise their left index finger (the finger raising item) to obtain a measure as to whether they may have fallen asleep, or been unresponsive, at this point in time.

Participants are subsequently told that their eyes are “heavy like lead” and are asked to try to open their eyes (the eye catalepsy item). Participants are then told to sit quietly and “just continue to experience the state you are in right now.” After the 2-minutes sitting quietly period, participants are asked to pause for 15 seconds and make a mental note of what they were experiencing during that time. Participants are then counted out of the induction.

After deinduction, subjects subsequently complete the 53-item PCI in reference to the 2-minute sitting quietly period during the hypnotic induction and the debriefing questionnaire. The 53 items of the PCI assess subjective experiences across 12 major dimensions and 14 minor dimensions. These (sub)dimensions 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), imagery (amount and vividness), attention (direction and absorption), memory and arousal.

The PCI has been found to be reliable and valid for mapping phenomenological experiences in response to such stimulus conditions as eyes open and closed sitting quietly, hypnotism, progressive relaxation, breathing, drumming and trance postures, and even fire walking (Forbes & Pekala, 1993, 1996; Maurer, Kumar, Woodside, & Pekala, 1997; Pekala & Levine, 1981, 1982; Pekala & Wenger, 1983; Pekala, Steinberg, & Kumar, 1986; Pekala & Ersek, 1992/93; Woodside, Kumar, & Pekala, 1997). The PCI has been found especially useful in mapping the subjective states associated with hypnotism and it has been shown to have adequate construct/criterion validity (Barnes, Lynn, & Pekala, 2009; Forbes & Pekala, 1993; Kumar & Pekala, 1988, 1989; Kumar, Pekala, & Marciano, 1996; Hand, Pekala, & Kumar, 1995; Kumar, Pekala, & McCloskey, 1999; Pekala, 1991a, 2002; Pekala, Forbes, & Contriasani, 1988;

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 having 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” = raised finger; “2” = did not raise finger), and their self-report as to whether they fell asleep on a 4-point scale: “1” = fell asleep; “4” = did not fall asleep.3

The finger response and the fell asleep items were included in the PCI-HAP to determine if participants, especially in a group setting, may have become unresponsive during the hypnosis. An item near the end of 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.’” This item measures a participant’s self-reported hypnotic depth (srHD). An additional item also asks how helpful hypnotism is going to be to help them with their “problems, issues, and concerns” (post-hypnotic therapeutic efficacy).

Procedure

Participants were seen for two counterbalanced assessment/treatment sessions spaced about a week a part. Participants were paid $10 for their participation in either study. Participants were paid $10 for a follow-up interview in Study 2; no such remuneration was given in Study 1.

The first half of each session consisted of assessment with either the PCI-HAP, or a questionnaire that asked about anxiety, anger, beliefs, etc. Part way through the first study the pre-assessment form was added to the PCI-HAP. The pre-assessment form was used with all subjects for Study 2. The second half of each session consisted of treatment: either self-hypnosis training for anxiety/anger reduction and relapse prevention, or self-hypnotic training for self-esteem and serenity enhancement. For the purposes of this paper only the PCI-HAP results are addressed.

Results

The following section reviews the results starting first with preliminary analyses, and then correlational and regression analyses to address the several purposes of the study. Anova analyses were also computed to supplement the regression analyses.

Preliminary Analyses

Since data came from two studies, MANOVAs were completed to determine if there were significant differences across the variables as a function of Studies (1 and 2) and Order (first or second session – since the two sessions were counterbalanced). This preliminary analysis was done to determine if the two data sets could be combined to obtain a larger sample size. Dependent variables included in the analyses were: srHD, imagoic suggestibility, hypnoidal state, finger response, eye catalepsy, negative effects, fell asleep, pre-hypnotic estimated hypnotic depth, pre- and post-hypnotic therapeutic expectancy, and pre-hypnotic visual and kinesthetic imagery vividness. There was neither a significant main effect for
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Study, Wilks’ Lambda = 0.87, F(12, 108) = 1.30, p = .22; nor for Order, Wilks’ Lambda = 0.91, F(12, 108) = 0.85, p = .60. The interaction between Study and Order was also not significant, Wilks’ Lambda = 0.89, F(12, 108) = 1.15, p = .33.

Because the assessment of expectancy was an important part of the current study and the pre-assessment form measured both pre-hypnotic estimated depth (“how deeply hypnotized do you expect to be when we try to hypnotize you today?”), and pre-hypnotic expected therapeutic efficacy (“how helpful do you think self-hypnosis training is going to be to help you with your problems, issues, or concerns?”), separate 2 (Order) x 2 (Prior Hypnotism) ANOVAs were also computed for these two variables with Order and Prior Hypnotism (“Have you ever tried to be hypnotized before: Yes or No,” - an item on the pre-assessment form) as the independent variables. For pre-hypnotic estimated hypnotic depth there were neither significant main effects for Order, F(1, 120) = 2.17, p = .14, nor Prior Hypnotism, F(1, 120) = .14, p = .80; nor was the interaction significant, F(1, 120) = .60, p = .60. For pre-hypnotic expected therapeutic efficacy, the main effects for Order, F(1, 120) = 3.32, p = .07, and Prior Hypnotism, F(1, 120) = .03, p = .87) were not significant; nor was the interaction significant, F(1, 120) = 1.52, p = .22. Due to the aforementioned nonsignificant MANOVA and ANOVA results, the data from the two studies were pooled for all subsequent analysis.

Descriptive Statistics and Correlational Analyses

Table 1 lists the means and standard deviations of the variables of interest in the study. Table 2 lists the correlation matrix for the following scores: srHD, PCI pHGS (hypnoidal state), imagery vividness dream item (imagoic suggestibility), and the other PCI-HAP pre-assessment and post-assessment items. A pre-hypnotic combined expectancy score was computed averaging the pre-hypnotic estimated hypnotic depth score and the pre-hypnotic therapeutic efficacy score, as was a total combined expectancy score (which was the average of the pre-hypnotic combined expectancy score and the post-hypnotic therapeutic efficacy score).

The highest correlation obtained with the srHD score was imagoic suggestibility (r = .68, p < .001). The next highest correlations were with total combined expectancy (r = .62), post-hypnotic therapeutic efficacy (r = .53), and pre-hypnotic combined expectancy (r = .51). This was followed by the hypnoidal state (r = .48) score, and the eye catalepsy item (r = .45). Pre-hypnotic estimated hypnotic depth (r = .43), pre-hypnotic expected therapeutic efficacy (r = .41), and pre-hypnotic kinesthetic (r = .35) and visual (r = .34) imagery were also significantly correlated (p < .001) with the srHD score (see Table 2).

Regression Analyses

Preliminary Assumption Testing.

Preliminary analyses were completed to check if the data were in accord with the assumptions of linearity, normality, and homoscedasticity of the independent variables required for the regression analyses. Visual inspection of the data suggested that the assumptions of linearity and homoscedasticity were met for all variables. Table 1 shows the skewness for all the variables. All variables had a skewness of less than an absolute value of about .60 (average absolute value of .39), suggesting relative normality for the independent variables used in the regression analyses. Visual inspection of the distributions suggested that the distributions of the variables were relatively mesokurtic (Newton & Rudestam, 1999). Hence no data transformations were deemed necessary on the aforementioned variables.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
</tr>
</thead>
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<td>1. Self-Reported Hypnotic Depth (srHD)</td>
<td>5.19</td>
<td>2.71</td>
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<td>2. Hypnoidal State (pHGS Score)</td>
<td>5.42</td>
<td>1.46</td>
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<td>3. Imagoic Suggestibility (Imagery Vividness Dream Item)</td>
<td>4.81</td>
<td>3.08</td>
<td>0.27</td>
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<tr>
<td>4. Finger Response Item</td>
<td>1.34</td>
<td>0.47</td>
<td>0.76</td>
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<tr>
<td>5. Eye Catalepsy</td>
<td>1.52</td>
<td>0.50</td>
<td>-0.08</td>
</tr>
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<td>6. Fell Asleep Item</td>
<td>2.84</td>
<td>1.06</td>
<td>-0.26</td>
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<tr>
<td>7. Negative Effects</td>
<td>1.98</td>
<td>0.16</td>
<td>-6.24</td>
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<td>8. Pre-Hypnotic Estimated Hypnotic Depth</td>
<td>5.93</td>
<td>2.57</td>
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<td>9. Pre-Hypnotic Visual Imagery Vividness</td>
<td>6.06</td>
<td>2.77</td>
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<tr>
<td>10. Pre-Hypnotic Kinesthetic Imagery Vividness</td>
<td>5.54</td>
<td>2.81</td>
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<td>11. Pre-Hypnotic Expected Therapeutic Efficacy</td>
<td>6.94</td>
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<td>12. Pre-Hypnotic Combined Expectancy</td>
<td>6.44</td>
<td>2.06</td>
<td>-0.28</td>
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<td>13. Post-Hypnotic Therapeutic Efficacy</td>
<td>6.67</td>
<td>2.58</td>
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<td>14. Total Combined Expectancy</td>
<td>6.55</td>
<td>1.94</td>
<td>-0.46</td>
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\(^{1}n = 123\)
### Table 2: Pearson Correlation Matrix for the PCI-HAP Variables

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<th>3</th>
<th>4</th>
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<th>10</th>
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<th>12</th>
<th>13</th>
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<td>2. Hypnotic State (pHGS) Score</td>
<td>.48 (57)</td>
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<tr>
<td>3. Imagoic Suggestibility (Imagery Vividness Dream Item)</td>
<td>.68 (72)</td>
<td>.36 (45)</td>
<td>1.00</td>
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<tr>
<td>4. Finger Response Item</td>
<td>.06 (20)</td>
<td>-.07 (08)</td>
<td>.14 (19)</td>
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<tr>
<td>5. Eye Catalepsy Item</td>
<td>.45 (15)</td>
<td>.30 (30)</td>
<td>.34 (08)</td>
<td>-.25 (26)</td>
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<td>6. Fell Asleep Item</td>
<td>.12 (08)</td>
<td>.35 (27)</td>
<td>.05 (06)</td>
<td>-.29 (32)</td>
<td>.19 (18)</td>
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<td>7. Negative Effects</td>
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<td>-.04</td>
<td>-.03</td>
<td>.00</td>
<td>-.05</td>
<td>.02</td>
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<td>8. Pre-Hypnotic Estimated Hypnotic Depth</td>
<td>.43</td>
<td>.19</td>
<td>.34</td>
<td>.18</td>
<td>.21</td>
<td>-.01</td>
<td>-.23</td>
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<tr>
<td>9. Pre-Hypnotic Visual Imagery Vividness</td>
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<td>.15</td>
<td>.25</td>
<td>.05</td>
<td>-.09</td>
<td>.42</td>
<td>1.00</td>
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Suggestibility, Expectancy, and Trance State Effects
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<td>10. Pre-Hypnotic Kinesthetic Imagery Vividness</td>
<td>0.35</td>
<td>0.19</td>
<td>0.34</td>
<td>0.15</td>
<td>0.18</td>
<td>0.00</td>
<td>-0.12</td>
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<td>0.83</td>
<td>1.00</td>
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<td>11. Pre-Hypnotic Expected Therapeutic Efficacy</td>
<td>0.41</td>
<td>0.35</td>
<td>0.22</td>
<td>0.13</td>
<td>0.21</td>
<td>0.07</td>
<td>-0.18</td>
<td>0.41</td>
<td>0.46</td>
<td>0.48</td>
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<td>12. Pre-Hypnotic Combined Expectancy</td>
<td>0.51</td>
<td>0.32</td>
<td>0.34</td>
<td>0.19</td>
<td>0.25</td>
<td>0.04</td>
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<td>0.86</td>
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<td>0.53</td>
<td>0.82</td>
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<td>0.40</td>
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<td>0.10</td>
<td>0.27</td>
<td>0.00</td>
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<td>0.22</td>
<td>0.31</td>
<td>0.27</td>
<td>0.43</td>
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<td>14. Total Combined Expectancy</td>
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<td>0.38</td>
<td>0.17</td>
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<td>0.60</td>
<td>0.49</td>
<td>0.47</td>
<td>0.72</td>
<td>0.79</td>
<td>0.87</td>
</tr>
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</table>

\(^1n = 123\)

\(^2 r > .18 (p < .05); r > .24 (p < .01); \text{ and } r > .29 (p < .001)\)

\(^3\)Correlations in parentheses represent correlations from an earlier study that were reported in Pekala et al., 2006.
Main Regression Analyses.

Several stepwise regression analyses were completed using forward regression and an alpha-to-enter and leave of .15, the default value (Wilkinson, 1998). The first regression analysis attempted to predict the srHD scores from the PCI-HAP pre-assessment and post-assessment variables including the hypnoidal state score (but not including the post-hypnotic therapeutic efficacy score or any combined expectancy scores). Stepwise regression analyses generated a multiple $R$ of .78 ($R^2 = .61$) in predicting self-reported hypnotic depth. Left in the regression equation were (standardized regression coefficients are in parentheses): imagoic suggestibility (vividness of the hypnotic dream) (.47); hypnoidal state (altered state trance effects) (.18); eye catalepsy effects (.17); and pre-hypnotic expectancies concerning both estimated hypnotic depth (.14); and therapeutic expectancy (.15) (See Table 3.) (Single interactions were also assessed for all pairs of variables left in the regression equation. None were significant.)

Because partial regression coefficients partial out the variance associated with the other variables entered into the regression equation, they indicate “with a good deal of confidence, whether specific predictors make contributions to the criterion that are unrelated to the contributions made by the other variables” (Grimm & Yarnold, 1995, p. 41), hence allowing for a comparison of “the relative contributions of each predictor to the overall effect” (p. 41) of the variance accounted for by the regression. The aforementioned results suggest that of the 61% of the variance accounted for by the regression analysis much of that effect was due to imagoic suggestibility (the imagery vividness dream item). The two expectancy items (estimated hypnotic depth and expected therapeutic efficacy) together with the hypnoidal state score and the eye catalepsy item accounted for the rest.

Another set of regression analyses were completed (see Table 4) identical to the first set of regression analyses mentioned above, but substituting the pre-hypnotic combined expectancy score for the pre-hypnotic estimated hypnotic depth and the pre-hypnotic expected therapeutic efficacy scores and adding in post-hypnotic therapeutic expectancy to the list of independent variables. The post-hypnotic therapeutic efficacy variable was not used previously in the regression equation, because as with self-reported hypnotic depth, it was one of the last variables that the participants were asked to estimate during the post-assessment, and hence, can be conceived as more of an outcome or attributional (see below) variable than a predictor variable. Left in the regression equation were: imagoic suggestibility, hypnoidal state, pre-hypnotic combined expectancy, the eye catalepsy item, and also post-hypnotic therapeutic efficacy for an $R$ of .80 and an $R^2$ of .65 (see Table 4). Single interactions were also assessed for all pair of variables left in the regression equation. None of the interactions were found to be significant.

The final set of regression analyses used the aforementioned variables, but now the total combined expectancy score was substituted for the pre-hypnotic combined expectancy score and the post-hypnotic therapeutic efficacy score. In the regression equation were: imagoic suggestibility, total combined expectancy, hypnoidal state, and the eye catalepsy item for an $R$ of .80 and an $R^2$ of .65 (see Table 5). (Single interactions were also assessed for all pair of variables left in the regression equation. None of the interactions were found to be significant.) Imagoic suggestibility accounted for the largest percentage of the relative variance, followed by total combined expectancy, with the eye catalepsy item and the hypnoidal state score accounting for smaller percentages.

ANOVA Analyses and Visual Depiction of the Results.

To visually illustrate for the reader the additive (and statistically noninteractive)
Table 3: Predicting Self-Reported Hypnotic Depth (srHD) from the PCI-HAP Variables

<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^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imagoic Suggestibility (Imagery Vividness Dream Item)</td>
<td>0.677</td>
<td>0.458</td>
<td>0.42</td>
<td>0.47</td>
<td>49.47</td>
<td>0.000</td>
</tr>
<tr>
<td>Pre-Hypnotic Therapeutic Expectancy</td>
<td>0.729</td>
<td>0.531</td>
<td>0.18</td>
<td>0.15</td>
<td>5.31</td>
<td>0.023</td>
</tr>
<tr>
<td>Hypnoidal State (pHGS) Score</td>
<td>0.753</td>
<td>0.567</td>
<td>0.34</td>
<td>0.18</td>
<td>7.56</td>
<td>0.007</td>
</tr>
<tr>
<td>Eye Catalepsy Item</td>
<td>0.769</td>
<td>0.591</td>
<td>0.92</td>
<td>0.17</td>
<td>7.21</td>
<td>0.008</td>
</tr>
<tr>
<td>Pre-Hypnotic Estimated Hypnotic Depth</td>
<td>0.779</td>
<td>0.607</td>
<td>0.15</td>
<td>0.14</td>
<td>4.62</td>
<td>0.034</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td>-2.16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^1F and p are values for independent variables left in the regression equation.

^2n = 123
Table 4: Predicting Self-Reported Hypnotic Depth (srHD) from the PCI-HAP Variables Using the Pre-Hypnotic Combined Expectancy and the Post-Hypnotic Therapeutic Expectancy Variables

<table>
<thead>
<tr>
<th>Subscale</th>
<th>R</th>
<th>R²</th>
<th>Unstandardized Coefficient</th>
<th>Standardized Coefficient</th>
<th>F Value¹</th>
<th>p Value²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imagoic Suggestibility (Imagery Vividness Dream Item)</td>
<td>0.677</td>
<td>0.458</td>
<td>0.397</td>
<td>0.45</td>
<td>50.88</td>
<td>0.000</td>
</tr>
<tr>
<td>Post-Hypnotic Therapeutic Efficacy</td>
<td>0.757</td>
<td>0.574</td>
<td>0.234</td>
<td>0.23</td>
<td>13.04</td>
<td>0.000</td>
</tr>
<tr>
<td>Pre-Hypnotic Combined Expectancy</td>
<td>0.783</td>
<td>0.614</td>
<td>0.255</td>
<td>0.19</td>
<td>9.63</td>
<td>0.002</td>
</tr>
<tr>
<td>Eye Catalepsy Item</td>
<td>0.797</td>
<td>0.635</td>
<td>0.782</td>
<td>0.14</td>
<td>5.61</td>
<td>0.020</td>
</tr>
<tr>
<td>Hypnoid State (pHGS Score)</td>
<td>0.804</td>
<td>0.647</td>
<td>0.236</td>
<td>0.13</td>
<td>3.97</td>
<td>0.049</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.1388</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹F and p are values for independent variables left in the regression equation.
²n = 123
Table 5: Predicting Self-Reported Hypnotic Depth (srHD) from the PCI-HAP Variables Using the Total Combined Expectancy Variable

<table>
<thead>
<tr>
<th>Subscale</th>
<th>R</th>
<th>R²</th>
<th>Unstandardized Coefficient</th>
<th>Standardized Coefficient</th>
<th>F Value ¹</th>
<th>p Value ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imagoic Suggestibility (Imagery Vividness Dream Item)</td>
<td>0.677</td>
<td>0.458</td>
<td>0.398</td>
<td>0.45</td>
<td>52.14</td>
<td>0.000</td>
</tr>
<tr>
<td>Total Combined Expectancy</td>
<td>0.782</td>
<td>0.611</td>
<td>0.486</td>
<td>0.35</td>
<td>29.64</td>
<td>0.000</td>
</tr>
<tr>
<td>Eye Catalepsy Item</td>
<td>0.796</td>
<td>0.633</td>
<td>0.781</td>
<td>0.14</td>
<td>5.73</td>
<td>0.018</td>
</tr>
<tr>
<td>Hypnoid State (pHGS Score)</td>
<td>0.803</td>
<td>0.645</td>
<td>0.234</td>
<td>0.13</td>
<td>3.98</td>
<td>0.048</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td>-2.364</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹F and p are values for independent variables left in the regression equation.
²n = 123
nature of the regression results, the variables of hypnoidal state, imagoic suggestibility, and pre-hypnotic combined expectancy, were divided into three groups of low, medium, and high scorers. For hypnoidal state, groups consisted of lows (scores of 4.5 or less; \( n = 27 \)), mediums (4.5 to 6.5; \( n = 49 \)), and highs (greater than or equal to 6.5; \( n = 47 \)). For imagoic suggestibility, groups consisted of lows (4.5 or less; \( n = 37 \)), mediums (4.5 to 6.0; \( n = 57 \)), and highs (greater than or equal to 6.0; \( n = 29 \)). For pre-hypnotic combined expectancy, groups consisted of lows (less than 5.5; \( n = 43 \)), mediums (5.5 to 8.0; \( n = 48 \)), and highs (greater than or equal to 8.0; \( n = 32 \)). For the eye catalepsy item 59 participants opened their eyes; 64 did not. (Separate ANOVAs were computed for Hypnoidal State by Expectancy, and also Imagoic Suggestibility by Eye Catalepsy so as to not visually complicate depiction of the results.)

A 3 (Hypnoidal State Group) by 3 (Pre-Hypnotic Combined Expectancy Group) ANOVA was completed with self-reported hypnotic depth as the dependent variable. Significant main effects were found for Hypnoidal State, \( F(2, 114) = 12.53, p < .001 \), and Expectancy, \( F(2, 114) = 12.52, p < .001 \). The interaction, \( F(4, 114) = 0.64, p = .64 \), was not significant. Figure 1 illustrates the main effects. A 2 (Eye Catalepsy: pass/fail) by 3 (Imagoic Suggestibility) ANOVA was also completed with self-reported hypnotic depth as the dependent variable. Significant main effects were found for Eye Catalepsy, \( F(1, 117) = 13.58, p < .001 \), and Imagoic Suggestibility, \( F(2, 117) = 15.19, p < .001 \). The interaction \( F(2, 117) = 0.93, p = .40 \), was not significant. Figure 2 illustrates the main effects. Figures 1 and 2 illustrate the additive nature of the relationships between the srHD score and the aforementioned PCI-HAP variables.

Figure 1: Self-Reported Hypnotic Depth as a Function of Hypnoidal State and Pre-Hypnotic Combined Expectancy
Correlational Results

The results of the present study, with correlations of .68 and .48 between self-reported hypnotic depth, and imagoic suggestibility and hypnoidal state, respectively, replicated results of an earlier study by Pekala et al. (2006) which found slightly higher rs of .72 and .57 among the three variables. When looking at the pre-assessment variables (not assessed in the earlier, Pekala et al. 2006, study), four pre-assessment variables (estimated hypnotic depth, visual and kinesthetic imagery vividness, and expected therapeutic efficacy) were all significantly correlated with the srHD score (rs of .34 and above, \( p < .001 \)).

The significant correlation of .48 between the PCI hypnoidal state score and the self-reported hypnotic depth score suggests that these two items are measuring overlapping (sharing 23% of the variance), yet differing, constructs. This interpretation is supported by considering differences in the magnitude of the correlations of hypnoidal state and hypnotic depth with imagoic suggestibility: .36 between hypnoidal state and imagoic suggestibility but .68 between srHD and imagoic suggestibility. Whereas the self-reported hypnotic depth score has 46% of the variance in common with imagoic suggestibility, the hypnoidal state score has only 13% of the variance in common with imagoic suggestibility.

Regression Results

Trance state effects, imagoic suggestibility, and expectancy can be operationally defined and measured with the PCI-HAP. These are concepts that various authors and theorists (Barber, 2000; Brown & Fromm, 1986; Cardeña, 2005; Holroyd 2003; Kirsch, 1991, 1997; Weitzenhoffer, 2002) have hypothesized to be related to hypnotism. This study examined their utility in predicting self-reported hypnotic depth scores.
Standardized coefficients allow us to determine the relative contribution made to the criterion by partialling out the contributions made by the other variables, hence permitting comparison of the relative contribution of each predictor to the overall effect. (Standard coefficients can add up to less, or more, than 100%. Hence, standard coefficients need to be examined in reference to each other, and the coefficient does not necessarily indicate the exact percentage of variance accounted for.)

Imagoic suggestibility accounted for the largest percentage of the relative variance across the various regression analyses, suggesting that imagoic suggestibility is a major component in people’s judgments of their hypnotic depth with the PCI-HAP. These results support the theorizing (among others) of Holroyd (2003), Barber (2000), Weitzenhoffer (2002), Lynn and colleagues (Lynn & Rhue, 1986, 1988; Lynn & Sherman, 2000), Sheehan (1979), and Kirsch and Braffman (1999, 2001) concerning the importance of fantasy and imagery, and hence, suggestibility (Schumaker, 1991) in understanding hypnotic depth as experienced by participants.

Pre-hypnotic expectancy, both estimated hypnotic depth and expected therapeutic efficacy, considered separately or together, accounted for a significant amount of the variance in the hypnotic depth scores, suggesting that the participant’s pre-hypnotic expectancies are relevant to their experience of hypnotic depth. This result supports the theorizing of Barber (2000), Kirsch (1985, 2000), Erickson (Erickson, Rossi, & Rossi, 1976), Holroyd (2003), and many clinicians concerning the importance of having a positive expectancy (Hammond, 1990) in reference to the experience of hypnotism.

Trance state effects (the pHGS scores) were left in the regression equation regardless of which types of regression analysis was done, supporting the theorizing (among others) of Holroyd (2003), Barber (2000), Weitzenhoffer (1989), Hilgard (1965), Cardeña (2005), Barabasz and Watkins (2005), and Kihlstrom (1997) concerning the importance of alterations in experience and consciousness in self-reported hypnotic depth. Loss of motor control, as evinced by the eye catalepsy item (the motor challenge item), was also left in the regression equation. This effect supports the theorizing of Woody, Barnier, and McConkey (2005) who suggested that hypnotism consists of a general factor and several component factors.

Current research looked at one particular aspect of “hypnotism,” the self-reported hypnotic depth score. This score can be regarded as an attribution (see below) that participants were asked to make in response to their experience of the PCI-HAP. Because it is a different construct from hypnotic susceptibility, it is unknown to what extent the results would be similar when assessing for susceptibility, as measured by the Harvard (Shor & Orne, 1962), the Stanford C, (Weitzenhoffer & Hilgard, 1962), or the HIP (Hypnotic Induction Profile; Spiegel & Spiegel, 2004), or the component processes of hypnotizability, as defined by Woody, Barnier, and McConkey (2005).

However, a study using the Harvard Group Scale (Mohl, Kumar, & Pekala, 2007) found that the a self-report hypnotic depth score correlated .67 with the total Harvard Group Scale score, and .73 with the hypnoidal state score obtained (from the PCI) in reference to the Harvard Group Scale. These results suggest some generalizability of the results of the present investigation with a different study. Another study (Barnes, Lynn, & Pekala, 2009) that used the PCI in reference to the Harvard Scale found a correlation of .62 between the Harvard Group Scale score and the hypnoidal state score, thus supporting the utility of the pHGS score as a measure of hypnotic responsivity.
Attributions, Self-Reported Hypnotic Depth, and Component Processes.

“Attributions are inferences that people draw about the causes of events, others’ behavior, and their own behavior” (Weiten, 2001, p. 659). Self-reported hypnotic depth can be seen as an attribution concerning how much individuals felt they were “hypnotized.” To the extent that there are various component processes associated with being hypnotized, individuals will utilize those processes that they feel were activated to determine the degree to which they felt hypnotized.

The present study is in strong support of Brown and Fromm’s (1986) observation that participants feel more deeply hypnotized to the extent that they were responsive to the suggestions and believed that there were alterations in their subjective experience. Higher scores on the imagoic suggestibility item were associated with the greatest percentage of the relative variance in predicting hypnotic depth and passing of the eye catalepsy item also had a significant impact on the feeling of being hypnotized. Expectancies further “color” the results, predisposing one to view events consistent with that expectancy (Kirsch, 2000). Also remaining in the regression analyses were trance state effects.

Because post-hypnotic expected therapeutic efficacy is also an attribution that participants make in response to their experience of being hypnotized, it was not added to the earlier regression equation (see Table 3). When it was added (see Table 4) it remained in the regression equation, along with pre-hypnotic combined expectancy, imagoic suggestibility, hypnoidal state, and the eye catalepsy item, resulting in a slight increase in the multiple $R^2$ of .65. Kirsch (1991, 2000) suggested that post-hypnotic expectancies can be quite important in understanding hypnotism. Hence, the current results suggest that such post-hypnotic expectancies account for part of the effect, for substance dependent individuals, in determining how hypnotized they felt they became.

When using the total combined expectancy score (averaging across the two pre-hypnotic expectancy items and the post-hypnotic expectancy item), almost two-thirds of the variance is again being accounted for by the regression equation ($R^2 = .65$). In this equation (see Table 5), by far the greatest amount of the relative variance (as assessed by the standardized regression equations) is associated with the vividness of the hypnotic dream, followed by expectancy, with passage of the eye catalepsy item and the hypnoidal state effects accounting for the rest. Both Holroyd (2003) and Woody, Barnier, and McConkey (2005) suggest that different factors or abilities are involved or combine in determining hypnotic responsivity. The lack of interactions between the variables left in the regression equations suggests that these effects are additive and not (statistically) interactive, at least as assessed by the PCI-HAP for the aforementioned regression analyses, which are illustrated by Figures 1 and 2.

Even though pre-hypnotic estimated hypnotic depth correlated .41 with pre-hypnotic expected therapeutic efficacy (see Table 2), both were included in the regression equation of Table 3. This suggests that each variable is assessing a somewhat different aspect of expectancy. Future research will need to more fully explore both pre-hypnotic estimated hypnotic depth and pre-hypnotic expected therapeutic efficacy.

The correlation between post-hypnotic therapeutic efficacy and self-reported hypnotic depth was .53 (see Table 2), and post-hypnotic therapeutic efficacy was a significant predictor in the regression analyses depicted in Table 4. These results are quite consistent with Kirsch’s earlier research: “postinduction expectancies were very highly correlated with both behavioral ($r = .55$) and subjective ($r = .64$) measures of responsiveness” (1991, p. 458). The fact that post-hypnotic therapeutic efficacy remained in the regression equation (see Table 4) along with the combined pre-hypnotic expectancies, suggest that both variables are tapping somewhat different constructs.
When the pre-hypnotic combined expectancy score was averaged with the post-hypnotic therapeutic efficacy score, the correlation between self-reported hypnotic depth and total combined expectancy is now .62, and the standardized coefficient for this variable from the regression analyses (see Table 5) is .35. These results suggest that expectancy (as averaged across the pre- and post-hypnotic expectancy variables) is accounting for a major portion of the relative variance in predicting hypnotic depth. The authors are unaware of any previous research that assessed expectancies (concerning both estimated hypnotic depth and therapeutic efficacy) in a highly motivated clinical sample, let alone a study that generated an estimate of trance state effects. The present methodology allows for such effects to be quantified and statistically assessed.

Limitations of the Current Study

Assessment of “Easy Suggestions.”

The PCI-HAP was devised to be a predominantly state-based measure of subjective experience associated with hypnosis (Pekala, 1995a, 1995b; Pekala & Kumar, 2000, 2007; Pekala et al., 2010). It is different from the typical cognitive/behavioral measures of hypnotic susceptibility/suggestibility (such as the Harvard or the Stanford C) that are much more “trait” focused, although they are also prone to “state” effects (Kumar, Pekala, & Cummings, 1996), as the socio-cognitive theorists have demonstrated. As opposed to assessing “how hypnotizable a person may be,” the PCI-HAP assesses “hypnotic responsivity” at a particular moment in time across several domains: imagoic suggestibility, hypnoidal state, and expectancy.

Woody, in a personal communication (April, 2008), pointed out that the PCI-HAP measures hypnotic depth based on “a small set of quite easy suggestions (e.g., no cognitive distortions, negative hallucinations, etc.),” and hence it maps a rather narrow spectrum of the “hypnotic universe.” For this reason, it may be missing other aspects of hypnotic responsivity had more difficult suggestions been used, such as those from the Stanford, Form C. Had more difficult items been used, then the combined expectancy score may not have been associated with as much of the relative variance (as quantified by the standardized regression coefficient), as was found to be the case. The PCI-HAP was developed to be a relatively easy instrument to assess hypnotic responsivity, and more difficult items were avoided, so as not to develop a negative reactance of clients/research participants, or a “no set” (Hammond, 1990), as clients or research participants are first introduced to hypnosis. Consequently, it is unknown to what extent the results of the present study would replicate had more difficult suggestions been part of the PCI-HAP. This is definitely an area for additional research.

We believe the PCI-HAP is most likely tapping the “more easy” factor of hypnotic responsivity, as defined in Woody, Drugovi, and Oakman’s (1997) two component model of hypnotic performance. Other researchers (Kallio & Revonsuo, 2003, 2005) have suggested that the “essence” of hypnotism lies in understanding the very highly hypnotizable participant, the hypnotic virtuoso. Because the present study included participants across the wide range of hypnotic responsivity, not only was the importance of altered state effects with very high susceptibles not adequately addressed, but such effects with more difficult items, such as those on the Stanford C, were also unaddressed.

Use of the Harvard Group Scale of Hypnotic Susceptibility.

The Harvard Group Scale was used as the criterion measure of hypnotizability in generating the hypnoidal state score. The Stanford Hypnotic Susceptibility Scale: Form C (Weitzenhoffer and Hilgard, 1962) is usually considered the “gold standard” (Kihlstrom, 2008, p. 31).
for measuring such susceptibility. Consequently, the Harvard, due to its lower ceiling and the lack of more difficult cognitive items, suggests that it is probably not accessing to the fullest extent the “latent trait factor” hypothesized by Benham, Woody, Wilson, and Nash (2006) to underlie hypnotizability. We agree that this is very likely the case, and developing an additional measure of hypnotizability, possibly using the Stanford C (Weitzenhoffer & Hilgard, 1962), or the Waterloo-Stanford Group C (WSGC) Scale of Hypnotic Susceptibility (Bowers, 1993), appears warranted. However, a study has been published with the PCI in reference to both the Harvard and the Stanford scales (Hand, Pekala, & Kumar, 1995). Using the unstandardized regression coefficients obtained with the Harvard this regression equation was multiplied by the same (sub)dimensions raw scores that were obtained during a sitting quietly period during the Stanford. The Pearson $r$ between this Stanford pHGS score and the actual Stanford Scale total score was .86 ($p < .0001$). This suggested to the authors that the “phenomenological experiences during the Harvard and the Stanford are similar” (Hand et al., 1995, p. 131), and adds some support for the construct validity of the hypnoidal state score.

Possible Circularity in Measuring Hypnotic Depth: The Hypnoidal State versus the Self-Reported Hypnotic Depth Score.

An important issue to address concerns the possible “circularity” of trying to measure hypnotic depth via the self-reported hypnotic depth and also the hypnoidal state scores. We believe that the hypnoidal state score is assessing a different aspect of “hypnotic depth” than the self-reported hypnotic depth score, although they are significantly correlated ($r = .48, p = .001$).

The PCI was completed immediately after the hypnotic induction and before the completion of the debriefing questionnaire. Subjects were asked to complete the PCI inventory in reference to their subjective experience during the two-minute sitting quietly period near the end of the hypnotism. To the extent that participants did this reliably and validly, the PCI (sub)dimension results should accurately reflect what participants were experiencing at this time. (Because subjects who were unreliable at doing this were eliminated we know that the resulting subjects were reliable at introspection.)

Over 30 years ago Nisbett and Wilson (1977) suggested that introspective access is “not sufficient to produce generally correct or reliable reports” (p. 233). Smith and Miller (1978), in their rebuttal, suggested that assessment of cognitive processing may not be as inaccessible as Nisbett and Wilson indicate. Nisbett and Wilson may be partially correct when relating individuals’ attributions to their actions, but when asked to describe, not the reasons (the why), but the content (the what), of their subjective experience, people are much more accurate, as Ericsson and Simon (1980), Lieberman (1979), Kukla (1983), and Singer and Kolligian (1987) have demonstrated (Pekala, 1991a; Pekala & Cardeña, 2000). Because we are using a composite index of subjects’ experiences to generate the hypnoidal state score, it represents a means of assessing subjects’ phenomenological experiences during the sitting quietly period near the end of the hypnotism. The procedure allows us to estimate the “trance state” associated with hypnotism at that particular point in time, provided subjects accurately remember their experience, and then rate that experience in reference to the PCI reliably. We have shown elsewhere (Pekala, 1991a, Pekala & Kumar, 2000, 2007) that such assessment of phenomenological experience is valid in predicting state effects in response to hypnotism and other stimulus conditions provided the methodological guidelines for such retrospective phenomenological assessment are followed.

The results of this and our prior studies provide encouraging results that the hypnoidal state score (although needing more replication and validation) may further our understanding of
the nature of hypnotism. However, because depth of trance may be quite variable throughout the session we do not know how this level of trance compares with that level of trance during the hypnotic dream or the eye catalepsy item or for that matter, throughout the induction.

The srHD score is, in contrast, an attribution that individuals make in trying to estimate and summarize the nature of their hypnotic depth after their hypnotic experience. As Brown and Fromm (1986) and Tart (1970, 1979) have hypothesized, self-reported hypnotic depth appears to be a function of several variables. The aforementioned regression analyses are one means of trying to determine how subjects try to make that attribution. The present study’s results suggest that several variables (as assessed by the PCI-HAP) contribute to produce that attribution: pre- and post-hypnotic expectancies, suggestibility, passage/failure of the eye catalepsy item, and hypnoidal state effects. Those contributions appear to be additive and not statistically interactive. However, because of the nature of stepwise statistical regression (Newton & Rudstam, 1999), although the present study replicated results of a prior study (Pekala et al., 2006), the present study is also in need of additional replication, especially concerning the expectancy variables.

*The Use of Step-wise Regression Analysis.*

Step-wise regression analysis was chosen instead of simultaneous or hierarchical regression (Newton & Rudstam, 1999) so we could let the data “speak for themselves,” so to speak, without any a priori theorizing about which variables should be accounting for more of the variance. When “the goal is to maximaze R^2” and determine the best subset of independent variables “to predict the criterion to a high degree of accuracy” (Newton & Rudstram, 1999, p. 253), then step-wise regression is the multiple regression procedure to use. However, this model “is atheoretical, and the results tend to ‘overfit’ the data because they take advantages of chance relationships in the sample” (1999, p. 254). Hence, the results need to be replicated and cross-validated with other samples and across other laboratories.

*Context and Sensitization Effects.*

It is quite likely that various context effects were operative during this study. The pre-assessment form asked participants to estimate their hypnotic depth and the possible effectiveness of hypnotism. This may well have sensitized participants to the importance of expectancy in the study, and hence, possibly inflated the correlations that were obtained. Adding additional “filler” items to the pre-assessment form may be one way to reduce such an effect.

Participants completed the PCI in reference to a sitting quietly period embedded in the PCI-HAP induction protocol. Various items of the PCI ask about alterations in consciousness and experience, which may likewise have sensitized participants to the importance of such effects. Additionally, even the act of introspection may influence the results obtained, since introspection about subjective experience, especially concerning altered state effects, may affect the reported results, as Hunt and Chefurka (1976) suggested over 30 years ago.

Most importantly, the nature of the contents of consciousness associated with a particular stimulus condition are partly a function of the context in which they are assessed (Pekala, 1980, 1991a). This was also echoed over 100 years ago by the structural introspectionists:

In 1907 Angell attacked the “more extreme and ingenuous conceptions of structural psychology” as the result of “an unchastened indulgence in what we may call the ‘state of consciousness’ doctrine” (p. 64); a doctrine that yielded introspective data “dependent upon the particular exigencies and conditions which called them forth”(p. 67). (Pekala & Wenger, 1983, p. 251-252)
Because what a person experiences during a short stimulus interval will be partly a function of the context and instructional set given to the person, slightly different instructions and/or stimulus context effects may yield differing introspective reports. Hence the need to be cognizant of such effects and how they may influence the reported results especially in reference to the instructional sets of the present investigation. Much more research is needed concerning this retrospective phenomenological approach to mapping and quantifying subjective experience (Pekala, 1980, 1991a; Pekala & Kumar, 2000, 2007) to better determine the nature and extent of such context and sensitization effects.

**General Limitations of the Instrument.**

The PCI-HAP includes several single items mapping particular responses, i.e., the imagoic suggestibility score, the eye catalepsy, the finger response items, etc. Because it is impossible to measure the internal consistency of a scale composed of a single item, this suggests a major limitation of the instrument. More similar items were not added because the PCI-HAP was developed to be used in a private practice setting where time is at a premium. Future research may want to add additional similar items to better assess the internal consistency reliability of these particular response items.

Replication of the present study’s results using a similar regression analysis approach with a very similar study methodology with substance dependent individuals has been completed (Pekala & Maurer, 2010). The present study’s regression results were replicated with a different subject group using a very similar design suggesting that the lack of internal consistency reliability for the aforementioned variables did not affect replication, i.e., very similar $R$s were generated when similar regression analyses were completed. However, it is unknown to what extent these results might generalize to other types of populations such as college students, or in different stimulus environments, or with different instructional sets, etc. Future research is needed.

The PCI is completed in reference to a short sitting quietly period embedded in the PCI-HAP. Because the PCI and predecessor instruments were developed to assess subjective experiences associated with a short stimulus interval (Pekala, 1980; Pekala, 1991a), the PCI is a “state” assessment instrument (as opposed to the “trait” nature of the Harvard or the Stanford C). The PCI is assessing the fleeting and variable contents of mind or consciousness, which functionalists, such as Angell (1907) and James (1890/1950), pointed out over a 100 years ago, are quite evanescent. Hence, the test-retest reliabilities of the PCI (sub)dimensions are not as high as one would anticipate with the usual trait instruments that social scientists are accustomed to using.9

Although no test-retest data is available on the PCI (sub)dimensions, test-retest reliabilities, in reference to an eyes closed sitting quietly period, are available with a predecessor to the PCI, the PCQ (Phenomenology of Consciousness Questionnaire; Pekala, 1980; Pekala & Levine, 1981, 1982), which has many similar (sub)dimensions. Pearson $r$s averaged .43 across all PCQ major dimensions; considerably lower than the .70 usually deemed adequate for trait scales (Nunnally, 1976).

Hence, the nature of the stimulus context and setting, the instructional set, and even the mood of the person immediately before testing can influence the phenomenological results obtained with the PCI. More research needs to be completed using the PCI in reference to various instructional sets and context variables associated with particular stimulus conditions to better determine the reliability and validity of this approach for quantifying subjective experiences. Methodological and statistical issues related to assessing such subjective experiences can be found in Pekala (1991a), Pekala and Cardena (2000), and Pekala and Kumar (2007). The interested reader is also referred to: a) the interpretive manual (Pekala, 2009b) that was developed for using the PCI-HAP, which reviews some of these limitations in more detail, especially from a
clinical perspective; and b) a PowerPoint (Pekala, 2009b) presentation, which reviews how this empirical phenomenological approach to consciousness can help us better understand hypnotism, including the constraints and limitations of such an approach.

**Hypnotism and Alice in Wonderland: Towards an Integrated Understanding**

Alice in Wonderland (Carroll, 1960) fell down the rabbit hole, an abyss probably as confusing to Alice as hypnotism is to us. During a subsequent competition described in the novel, all participants were proclaimed to have won, and all were given prizes, highlighting the importance each participant had in the competition. Many researchers and clinicians too numerous to mention should all be commended for jumping into the rabbit hole!

The self-reported hypnotic depth score does indeed appear to be an attribution that is a function of several component processes, as many have theorized concerning hypnotism. Because some participants will make attributions concerning their level of hypnotic depth due to the vivid imagery experienced; others, due to their inability to open their eyes when asked to do so; and/or others, due to their subjective experiences of hypnotism, all colored by expectancy, it may not be surprising that hypnotism over the last two centuries has been defined to be everything from animal magnetism and altered states of consciousness, to “only” imagination or suggestion. Different suggestions, using different hypnotic assessments/interventions, and/or different contexts across participants of differing hypnotic responsivity, would likewise be deemed to alter attributions, and hence what it means for the individual to be hypnotized.

In addition, we believe that the mystery of hypnotism, and how it relates to the altered states of consciousness debate (Kallio & Revonsuo, 2003, 2005), can be more fully deciphered using the aforementioned phenomenological methodology (Pekala, 1980, 1991a; Pekala & Cardeña, 2000; Pekala & Kumar, 2000, 2007), in conjunction with traditional cognitive/behavioral methodologies employing the Harvard, the Stanford C, and the HIP. The provocative debates seen in our field (Frischholz, 2000; Hammond, 1998; Kihlstrom, 2003, 2005; Lynn, Kirsch, Knox, Fassler, & Lilienfeld, 2007, Lynn & Sherman, 2000) attests to the tremendous complexity associated with this most fascinating of enigmas. Perhaps such debates will eventually engender an equally provocative, but integrated, theoretical understanding of that mystery we call hypnotism.

**References**


**Footnotes**

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The PCI includes 5 items of similar or identical content that are used to generate a measure of how reliably participants completed the PCI. Scores above 2.3 are considered to be unreliable.

Copies of the PCI (Pekala, 1982, 1991b), the PCI-HAP (Pekala, 1995a, 1995b), the therapist and self-report pre- and post-assessment forms, the administration (Pekala, Kumar, & Maurer, 2009b) and interpretative (Pekala, 2009b) manuals, and the EXCEL scoring program are available at www.quantifyingconsciousness.com.

For the data analysis, the scoring for the finger raising item and the fell asleep item were reversed to allow for more intuitive interpretation of the results.

Excluding the dummy variables: the finger response and negative effects items.

Standardized coefficients, however, do not tell us of the unique variance accounted for by a particular predictor. For this semi-partial correlation analyses are needed. The unique variance attributable to a particular predictor is the change in $R^2$ when this variable is added to the regression equation, called a squared semi-partial correlation. Hence, the standardized regression coefficients can only tell us of their relative influence on the dependent variable. Such standardized coefficients are useful “when assessing the effects of different variables within a single regression equation or population” (Newton & Rudestam, 1999, p. 268) as was done here; such regression coefficients are not useful when comparing across populations.

Many theorists (see Schumaker, 1991) define suggestibility as more than just fantasy, imagery, or imagination. The aspect of suggestibility assessed by this study, imagoic suggestibility, we believe to be an important. However, we believe it is not the only aspect of suggestibility.

Because this study used only the upper and lower portions of the Stanford C distribution to compute this correlation, we believe the way the analyses were done inflated the correlation, and the correlation would have been lower had the full distribution been used.

Because all variables were measured during one session, the results, we believe, are pertinent to clinical situations where such measurements are typically obtained in one session. We believe those aspects of subjective experience, as measured by the PCI/PCI-HAP, are a function of organismic, contextual, and instructional variables, as the functional introspectionists (Angell, 1907; James, 1890/1950) have argued over a century ago.

One can question the relevance of comparing the test-retest reliabilities of the (sub)dimensions of the PCI to that of trait instruments, since the PCI dimensions are assessing “state,” as opposed to “trait,” effects. However, this difference is highlighted since the PCI, as part of the PCI-HAP, is measuring different, i.e., phenomenological, processes than the usual hypnotizability trait instruments.

The PowerPoint presentation can be obtained by emailing: pekalar@voicenet.com.

**Author’s Note**

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