IMAGERY VIVIDNESS BEFORE AND DURING THE PCI–HAP: A Partial Replication

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Abstract: This study sought to replicate an earlier study wherein imagery vividness before and during a phenomenological hypnotic assessment procedure was assessed, while also measuring trance (hypnoidal) state effects and several other variables. Correlational and regression analyses for that study suggested that imagery vividness during hypnotism was predicted by combined imagery vividness before hypnotism and trance (altered) state effects during hypnotism. The present study procured a larger sample employing a similar design and a similar subject pool. With the current study, although trance state effects and imagery vividness before hypnotism still significantly predicted hypnotic imagoic suggestibility (imagery during hypnotism), the variance accounted for was appreciably less. The meaning of these results as a function of the methodology used is discussed.

A preliminary study published in the 2010 issue of the International Journal for Clinical and Experimental Hypnosis (Pekala, Maurer, Kumar, Elliott-Carter, & Mullen, 2010) explored the relationship between imagery vividness before and during a phenomenological assessment procedure, the Phenomenology of Consciousness Inventory–Hypnotic Assessment Procedure (PCI–HAP; Pekala, 1995a, 1995b; Pekala & Kumar, 2000, 2007) while also assessing trance state effects. Trance was operationalized via the hypnoidal state score (Pekala, 1995a, 1995b), an estimate of Weitzenhoffer’s (2002) conceptualization of hypnosis or trance (Pekala, Kumar, et al., 2010a, 2010b; Pekala & Maurer, 2013). This measure of hypnosis was computed from a 53-item state instrument called the Phenomenology of Consciousness Inventory (PCI; Pekala, 1982, 1991a) and is called a hypnoidal state score (see Pekala, 1995a, 1995b; Pekala & Kumar, 2000, 2007; Pekala, Kumar, Maurer, 2010).

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Elliott-Carter, & Moon, 2006; Pekala, Kumar, et al., 2010a, 2010b, for a review of this concept).

Correlational and regression analyses from this study suggested that imagery vividness during hypnotism\(^1\) (i.e., hypnotic imagic suggestibility—see below) was best predicted by combined (visual and kinesthetic) imagery vividness before hypnotism and trance (altered) state effects (as measured by the hypnoidal state score). The results were more pronounced when individuals who were found to be nonresponsive (as measured by a finger-response item) during the hypnotic assessment were eliminated. Additionally, when adding in the PCI-HAP attributional variables into the regression equation, self-reported hypnotic depth now accounted for much of the variance, although hypnoidal state and prehypnotic combined imagery were still included in the regression equation. Because of the preliminary nature of that study, the present study sought to replicate the aforementioned results with a larger sample, using a similar methodology and a similar participant sample.

*The Prior Study’s Methodology and Subject Sample*

The PCI-HAP is a state instrument for measuring hypnotic responsivity from a predominantly phenomenological perspective. The PCI-HAP includes a preassessment, a hypnotic induction, and a postassessment. Participants in the Pekala, Maurer, et al. (2010) study were chronic drug and alcohol users. All participants were seen for two counterbalanced sessions spaced a week apart. Each session consisted of two parts: an assessment protocol and a self-hypnosis training protocol. One of those assessment sessions consisted of the administration of the PCI-HAP.

For the PCI-HAP preassessment form, participants respond if they were hypnotized before, how deeply hypnotized participants felt they would be (estimated hypnotic depth), the vividness of their kinesthetic and visual imagery, and how helpful participants felt hypnotism was going to be for their problems (therapeutic expectancy). Also assessed in the other counterbalanced assessment session were nonhypnotic imagic suggestibility, a subset of Kirsch and Braffman’s (2001) imaginative suggestibility, and imagery vividness via a five-item inventory.

\(^1\)Weitzenhoffer (2002), concerned about having a good definition of hypnosis, distinguished between hypnosis and hypnotism: “I will otherwise generally reserve the term hypnosis for the state, 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). Weitzenhoffer considered hypnotism to be a result of a combination of suggestibility and “hypnosis” or trance state effects. (For the purposes of this article, we will adhere to Weitzenhoffer’s distinction between hypnosis and hypnotism.)
The PCI–HAP hypnotic induction consists of relaxation instructions called a body scan (progressive relaxation but without the tensing); a hypnotic deepening procedure called a mind calm (counting from 10 to 1 while letting the mind become calm and empty); a suggestion to have a very vivid dream while being on vacation (hypnotic imagoic suggestibility); raising of one's finger when asked to do so (fingerring response item) to measure possible sleeping/nonresponsiveness during hypnotism; an eye-catalepsy item; and a 2-minute sitting quietly period. The PCI (Pekala, 1982, 1991a) is completed retrospectively (after deinduction) in reference to the 2-minute sitting quietly period embedded near the end of the session. The PCI measures 12 major and 14 minor dimensions of phenomenological experience and has adequate reliability and validity (Pekala, 1991a, 1991b, 1995a, 1995b, 2010, 2011; Pekala & Kumar, 2000; Pekala, Kumar, et al., 2010a, 2010b).

The hypnotic-dream item on the PCI–HAP asks the participant “to go on a vacation somewhere to a beautiful place and have a very relaxing and very wonderful time.” The dream item measures the individual’s imagery vividness during hypnotism, given the importance of such imagery (J. Hilgard, 1979; Lynn & Sherman, 2000; Sheehan, 1979) in generating hypnotic effects. This item measures what we call imagoic (imagery-based) suggestibility: a subset of Kirsch and Braffman’s (1999, 2001) hypnotic imaginative suggestibility: “Imaginative suggestions” as “requests to experience an imaginary state of affairs as if it were real” (2001, p. 59).

The debriefing form, completed after the deinduction, also asks if participants opened their eyes during the eye-catalepsy item, if they raised their finger when asked to do so (fingerring response item), their self-report as to whether they fell asleep (sleep-state item), their posthypnotic self-reported hypnotic depth (srHD) score, and posthypnotic estimated therapeutic efficacy.

Prior Study Results Concerning Hypnotic Imagoic Suggestibility and Its Relationship to Other Variables

For that prior study (Pekala, Maurer, et al., 2010), Pearson r correlation coefficients were computed with all subjects ($n = 84/85$) and also when deleting subjects who failed the finger-response item ($n = 53$). Table 1 shows the correlations for the hypnotic-dream item with the other PCI–HAP pre-/postassessment items, the PCI hypnoidal state score, nonhypnotic imagoic suggestibility, and the five-item imagery vividness questionnaire. It is presumed that individuals who did not raise their finger (the finger-response item) when asked to do so were unresponsive (possibly have fallen asleep) during the preceding hypnotic dream. (The finger-response item was specifically added to the PCI–HAP to control for individuals who may have fallen asleep or have become unresponsive during the induction.)
Table 1
**Correlations of Variables With Hypnotic Imagoic Suggestibility**

<table>
<thead>
<tr>
<th>Variable</th>
<th>All Subjects $r$</th>
<th>Deleted Subjects $r$</th>
</tr>
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<tbody>
<tr>
<td>1. Hypnotic Imagoic Suggestibility</td>
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<td>1.0</td>
</tr>
<tr>
<td>2. Hypnoidal State Score</td>
<td>.44**</td>
<td>.63***</td>
</tr>
<tr>
<td>3. Eye-Catalepsy Item</td>
<td>.21</td>
<td>.47***</td>
</tr>
<tr>
<td>4. Fell-Asleep Item</td>
<td>-.04</td>
<td>-.14</td>
</tr>
<tr>
<td>5. Negative Affect</td>
<td>-.03</td>
<td>-.08</td>
</tr>
<tr>
<td>6. Self-Reported Hypnotic Depth</td>
<td>.61***</td>
<td>.72***</td>
</tr>
<tr>
<td>7. Therapeutic Expectancy</td>
<td>.25*</td>
<td>.28*</td>
</tr>
<tr>
<td>8. Estimated Hypnotic Depth (from preassessment)</td>
<td>.32**</td>
<td>.25</td>
</tr>
<tr>
<td>9. Visual Imagery Vividness (from preassessment)</td>
<td>.39***</td>
<td>.55***</td>
</tr>
<tr>
<td>10. Kinesthetic Imagery Vividness (from preassessment)</td>
<td>.43***</td>
<td>.58***</td>
</tr>
<tr>
<td>11. Estimated therapeutic Efficacy (from preassessment)</td>
<td>.26*</td>
<td>.40**</td>
</tr>
<tr>
<td>12. Nonhypnotic Imagoic Suggestibility</td>
<td>.20</td>
<td>.31*</td>
</tr>
<tr>
<td>13. Imagery Vividness (five-item inventory)</td>
<td>.21</td>
<td>.35*</td>
</tr>
<tr>
<td>14. Finger-Response Item</td>
<td>-.17</td>
<td>-</td>
</tr>
<tr>
<td>15. PCI Imagery Vividness</td>
<td>.63***</td>
<td>.62***</td>
</tr>
<tr>
<td>16. PCI Imagery Amount</td>
<td>.59***</td>
<td>.67***</td>
</tr>
<tr>
<td>17. Combined Imagery Vividness (from preassessment)</td>
<td>.43***</td>
<td>.59***</td>
</tr>
<tr>
<td>18. Combined Expectancy (from preassessment)</td>
<td>.34**</td>
<td>.39***</td>
</tr>
<tr>
<td>$n$</td>
<td>84/85</td>
<td>53</td>
</tr>
</tbody>
</table>


*p < .05. **p < .02. ***p < .001.

Correlations (with hypnotic imagoic suggestibility) increased for almost all items when deleting subjects who failed the finger-response item (see Table 1): Hypnoidal state increased from .44 to .63; prehypnotic visual imagery vividness increased from .39 to .55; prehypnotic kinesthetic imagery vividness increased from .43 to .58; combined prehypnotic imagery vividness increased from .43 to .59; the eye-catalepsy
item increased from .21 to .47; and nonhypnotic imagic suggestibility increased from .20 to .31.²

Some of these correlations were rather large. A correlation of .63 was found between the vividness of one’s dream during hypnotism and the PCI-HAP’s measure of trance (à la Weitzenhoffer, 2002), the hypnotoidal state score. A correlation of .59 was found between combined visual and kinesthetic imagery during the preassessment and subsequent hypnotic dream imagery vividness. When using regression analyses to predict the vividness of the imagery during the hypnotic dream from the PCI-HAP items (and a few additional items), left in the regression equation were the following: hypnotoidal state (standardized coefficient of .47) and combined imagery vividness (from the preassessment: standardized coefficient of .39). These two variables generated an R of .73, accounting for 53% of the total variance.

What these results suggested was that imagery vividness before hypnotism was related to the vividness of a hypnotic dream during hypnotism, accounting for almost 35% of the variance. These results should be contrasted to the research looking at imagery outside of hypnosis and hypnotizability, which found the relationship to be weak and unreliable (DeGroh, 1989; Glisky, Tataryn, & Kihlstrom, 1995; Kogon et al., 1998; Sutcliffe, Perry, & Sheehan, 1970; Wagman & Stewart, 1974). Although imagery before hypnotism is not necessarily related to hypnotizability as measured by the standardized cognitive-behavioral trait instruments, such as the Harvard Group Scale (Shor & Orne, 1962) or the Stanford C (Weitzenhoffer & Hilgard, 1962), the present results suggest that such imagery vividness is significantly correlated with subsequent imagery vividness during a hypnotic-dream item, especially when those individuals who were unresponsive (as assessed by the finger-response item) during the hypnotic induction are eliminated.

The other interesting result from this study concerned the finding that as one’s level of trance increased (as measured by the hypnotoidal state score), so did one’s imagery vividness during hypnotism. Although many clinicians report that they use hypnotism to help enhance imagery vividness (Pekala, Maurer, et al., 2010), research by Sheehan (1979) and Coe, St. Jean, and Burger (1980) more than 30 years ago found conflicting results concerning imagery enhancement during hypnotism vis-à-vis other conditions. However, just because one assigns an individual to a hypnotism condition (as was done in those earlier studies) does not mean that such individuals “enter hypnosis” or are in “a hypnotic trance” during such a condition. Research by the undersigned (Pekala & Kumar, 2000, 2007) suggests that the subjective

²Since the finger-response item occurs immediately after the hypnotic dream, failure to raise one’s finger when asked to do so calls into question whether the participant was awake/aware during the hypnotic dream.
experience of various individuals, and even highly hypnotizable types (let us say, those individuals scoring 10 or above on the Harvard or the Stanford C) can be quite variable, and the only way available, to date, to estimate trance depth in a reliable and valid manner is with the PCI via the hypnoidal state score (see Pekala, 2010, 2011; Pekala & Maurer, 2013).

The Hypnoidal State Score Versus the Self-Reported Hypnotic Depth Score

The hypnoidal state score appears to be tapping a different construct from one’s report of how deeply hypnotized a person feels themselves to be during hypnotism, a construct operationalized by the self-reported hypnotic depth (srHD) score of the PCI–HAP. When self-reported hypnotic depth was added in the regression equation in this earlier study, hypnotic imagoic suggestibility was now best predicted by the srHD score (standard coefficient of .42), with hypnoidal state (standard coefficient of .25) and prehypnotic combined imagery vividness (standard coefficient of .28) remaining in the regression equation but accounting for less of the variance than the srHD score. Total $R^2$ was now 63% (53% of the variance when the srHD score was not included). The fact that the hypnoidal state score was still included in the regression equation means that it is accounting for variance different from that accounted for by the srHD score.

A cross-validation comparison study by Pekala and Maurer (2013) suggested that that research adds “some support to the self-reported hypnotic depth score as a [sic] attributional measure of a participant’s assessment of their hypnotic depth, and the hypnoidal state score as an estimate of Weitzenhoffer’s conceptualization of ‘trance’” (p. 104). The hypnoidal state score is a phenomenological measure of trance depth that correlates with actual Harvard (Pekala & Kumar, 1984, 1987) and Stanford C scale (Hand, Pekala, & Kumar, 1995) total scores and has discriminant validity (Pekala, Forbes, & Contriasani, 1988/1989) in distinguishing low to high hypnotic types across several different stimulus conditions (hypnotism, progressive relaxation, deep abdominal breathing, eyes closed sitting quietly).

The hypnoidal state score is in need of neurophysiological validation, that is, the hypnoidal state score correlating with possible neurophysiological measures of trance, such as EEG recordings during the default mode network (Greicius, Krasnow, Reiss, & Menon, 2003; Raichle et al., 2001). However, the hypnoidal state score also appears to correlate with how asleep one feels oneself to be, which is consistent with Weitzenhoffer’s definition of trance: “[Trance] denotes various states of being that have the appearance of consciousness but seem to differ from normal consciousness . . . as being a sleeplike, or a half awake, half asleep state” (Weitzenhoffer, 1989, p. 298). “Decreased sensitivity or responsiveness to external stimuli, including a total lack of it, is
usually considered a characteristic feature, as is a shift from voluntary to automatic activity” (Weitzenhoffer, 1989, p. 298).

In that cross-validation study (Pekala & Maurer, 2013), the more the participants felt that they were asleep, the higher the hypnoidal state score, as supported by the correlation of .35 ($p < .001$) between hypnoidal state and the sleep state item. We believe this communality of hypnosis or trance, and sleep, is also supported by the inclusion of the sleep-state item in the several regression equations for predicting the hypnoidal state score (but not the self-reported hypnotic depth score) in that 2013 cross-validation analysis.

**THE PRESENT STUDY**

The present study sought to replicate the aforementioned results with a new, but similar, subject pool of individuals with drug/alcohol problems, and a similar, but not identical, design. Because that earlier study was composed of a small ($n = 53$) sample, the present study sought to replicate the results with a larger sample.

**METHOD**

*Participants*

Participants were 169 individuals from a substance abuse residential rehabilitation treatment program (SARRTPs) who were enrolled in a study on relapse prevention. Informed consent was procured; participation was voluntary. Eliminating participants with incomplete data or a PCI reliability index of greater than 2.30 resulted in a sample size of 143.

*Materials*

Participants from the substance abuse treatment units, within which they were matriculated and as part of a study on relapse prevention, completed a variety of questionnaires before discharge. One of those involved the aforementioned hypnotic assessment procedure (PCI-HAP; Pekala, 1995a, 1995b, 2002; Pekala & Kumar, 2000, 2007). Additionally, in the counterbalanced assessment session when the PCI-HAP was not administered, the participants completed an item that assessed nonhypnotic imagoic suggestibility. For that item, participants were asked to close their eyes and imagine being on vacation in their

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3This study was approved by the Institutional Review Board and the Research and Development committees of the hospital wherein the research was conducted.
favorite place. Hence, this item was near identical to the PCI-HAP dream item during hypnotism but completed when participants were just sitting quietly with their eyes closed (without a hypnotic induction). During that session, subjects also completed a five-item imagery questionnaire, consisting of items concerning being on vacation, an apple, the face of a friend, a warm fireplace, and eating one’s favorite meal.

The PCI-HAP was reviewed earlier in this article (and the reader is referred there). The PCI serves as an integral part of the PCI-HAP. Over the years, 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, breathing, progressive relaxation, hypnotism, drumming and trance postures, and fire walking (Forbes & Pekala, 1993; Maurer, Kumar, Woodside, & Pekala, 1997; Pekala & Ersek, 1992/1993; Pekala & Levine, 1981, 1982; Pekala, Steinberg, & Kumar, 1986; Pekala & Wenger, 1983; Woodside, Kumar, & Pekala, 1997). Over the last 2 decades, Pekala and colleagues (Kumar & Pekala, 1988, 1989; Kumar, Pekala, & Cummings, 1996; Kumar, Pekala, & Marcano, 1996; Kumar, Pekala, & McCloskey, 1999; Pekala, 1991b, 2002; Pekala & Kumar, 1984, 1986, 1987, 1989, 2000; Pekala, Kumar, & Marcano, 1995; Pekala & Levine, 1981, 1982; Pekala & Wenger, 1983) have used this approach to assess and quantify states and altered states of consciousness.

The PCI has been especially useful in mapping the subjective experience of hypnotism and has been shown to have adequate construct, discriminant (Kumar & Pekala, 1988, 1989; Kumar, Pekala, & Marcano, 1996; Kumar, Pekala, & McCloskey, 1999; Pekala, 1991b; Pekala & Forbes, 1988; Pekala & Kumar, 1986, 1989; Pekala et al., 2006; Pekala & Nagler, 1989; Pekala et al., 1986), and predictive validity (Barnes, Lynn, & Pekala, 2009; Forbes & Pekala, 1993; Hand et al., 1995; Pekala, 1991b; Pekala & Kumar, 1984, 1987) for measuring phenomenological experiences associated with hypnotism.

After completing the PCI, the participant completes a postassessment form rating the vividness of their hypnotic dream imagery on a 1–10 intensity scale, with 1 = just a thought, no image at all and 10 = as real and vivid as actually being there. This 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 = yes, I fell asleep, 4 = no, I did not fall asleep.\footnote{For the data analysis, the scoring for the finger-response item and the sleep-state item were reversed to allow for more intuitive interpretation of the results.}

The latter two items (the finger response and the sleep state) were included in the PCI-HAP to determine if participants, especially when
tested in groups, may have become unresponsive during hypnotism, assessing, respectively, a behavioral and subjective (self-report) measure of possible sleep. The next-to-last item on the debriefing form asks 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 (the srHD) score. A final item also asks how useful hypnotism might be to help them with their problems or concerns (posthypnotic therapeutic efficacy).

Procedure

Participants were seen for two counterbalanced assessment/treatment sessions spaced 2 days apart (the previous study—Pekala, Maurer, et al., 2010—had the sessions spaced a week apart). Participants were paid $10 for their participation in either study. Participants were paid $10 for a 2-month follow-up interview concerning relapse. The first half of each session consisted of assessment with either the PCI-HAP or a questionnaire that asked about symptoms like anxiety, anger, and also beliefs, etc., along with the nonhypnotic imagoic suggestibility item and the five-item imagery vividness questionnaire. 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 article, only the PCI-HAP results will be addressed.

Results

Preliminary Results

Because there were two counterbalanced sessions, multivariate analyses of variance (MANOVAs) were computed with session order as the independent variable and the dependent variables shown in Table 1. The main effect for order was not significant (using Variables 1 through 16 from Table 1). Combined imagery vividness and expectancy scores, respectively, were computed for the two imagery vividness and the two expectancy items from the preassessment by averaging these items (and are listed in Items 17 and 18 of Table 2) to generate a composite measure of preassessment imagery vividness and also preassessment expectancy.

Correlations

Pearson correlation coefficients were computed for all participants between hypnotic imagoic suggestibility (the hypnotic-dream item) and
Table 2
Correlations of Variables With Hypnotic Imagoic Suggestibility: Pekala, Maurer et al. (2010) Versus Present Study

<table>
<thead>
<tr>
<th></th>
<th>Pekala, Maurer, et al. 2010</th>
<th>Present Study</th>
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<tr>
<td></td>
<td>All Ss r  Deleted Ss r</td>
<td>All Ss r  Deleted Ss r</td>
</tr>
<tr>
<td>1. Hypnotic Imagoic</td>
<td>1.00  1.00</td>
<td>1.00  1.00</td>
</tr>
<tr>
<td>Suggestibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Hypnoidal State Score</td>
<td>.44** .63***</td>
<td>.20* .31**</td>
</tr>
<tr>
<td>3. Eye-Catalepsy Item</td>
<td>.21  .47***</td>
<td>.09  .21*</td>
</tr>
<tr>
<td>4. Sleep-State Item</td>
<td>-.04 -.14</td>
<td>.13  .05</td>
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<td>5. Negative Affect</td>
<td>-.03 -.08</td>
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<td>.61*** .72***</td>
<td>.67*** .71***</td>
</tr>
<tr>
<td>Depth</td>
<td></td>
<td></td>
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<tr>
<td>7. Therapeutic Expectancy</td>
<td>.25* .28*</td>
<td>.50*** .56***</td>
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<tr>
<td>8. Estimated hypnotic Depth</td>
<td>.32** .25</td>
<td>.23** .27**</td>
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<td>(from preassessment)</td>
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<td>9. Visual Imagery Vividness</td>
<td>.39*** .55***</td>
<td>.33*** .34***</td>
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<td>(from preassessment)</td>
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<td>10. Kinesthetic Imagery</td>
<td>.43*** .58***</td>
<td>.37*** .35***</td>
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<td>Vividness (from preassessment)</td>
<td></td>
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<tr>
<td>11. Estimated Therapeutic</td>
<td>.26* .40**</td>
<td>.21* .28**</td>
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<td>Efficacy (from preassessment)</td>
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<td>12. Nonhypnotic Imagoic</td>
<td>.20  .31*</td>
<td>.38*** .36***</td>
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<td>Suggestibility</td>
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<td></td>
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<tr>
<td>13. Imagery Vividness</td>
<td>.21  .35*</td>
<td>.32** .23*</td>
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<td>(five-item inventory)</td>
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<td></td>
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<tr>
<td>14. Finger-Response Item</td>
<td>-.17</td>
<td>-.23**</td>
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<td>15. PCI Imagery vividness</td>
<td>.63*** .62***</td>
<td>.55*** .56***</td>
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<td>16. PCI Imagery Amount</td>
<td>.59*** .67***</td>
<td>.54*** .53***</td>
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<td>.36*** .39***</td>
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<td>Vividness (from preassessment)</td>
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<td>18. Combined Expectancy</td>
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<td>.25** .31**</td>
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<td>(from preassessment)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*p &lt; .05. **p &lt; .02. ***p &lt; .001.</td>
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the other PCI-HAP pre/postassessment items, the PCI hypnoidal state score, nonhypnotic imagoic suggestibility, the five-item imagery vividness questionnaire, and additional PCI variables, as shown in Table 2 (see the right two data columns – “Present Study” – “All Ss” and
"Deleted Ss" columns). For comparison purposes, the same correlations for the Pekala, Maurer, et al. (2010) study are listed to the left. When looking across all participants, the highest correlation ($r = .67$) was with the self-reported hypnotic depth score. The next highest items were the PCI imagery vividness item ($r = .55$) and the PCI imagery amount item ($r = .54$) followed by therapeutic expectancy ($r = .50$).

As mentioned, the PCI–HAP was constructed with an item (the finger-response item) to determine if some individuals were unresponsive during the assessment. Individuals, who, when asked to raise their finger did not, were presumed to have been unresponsive and may have possibly fallen asleep or been on the verge of sleep (see below), and consequently their data are suspect concerning the immediately preceding hypnotic dream.

Pearson correlation coefficients were computed (see the far right column of Table 2 titled “Deleted Ss”), but deleting subjects who failed the finger-response item ($n = 111$). The highest correlation was again self-reported hypnotic depth ($r = .71$), followed by PCI imagery amount and therapeutic expectancy (both having $rs = .56$) and the PCI imagery amount item ($r = .53$).

Correlations were similar between the two studies for about half of the comparisons. Significantly different correlations between the earlier and present study occurred for the following two variables: hypnoidal state (the correlation dropped from .63, $p < .001$, to .31, $p < .01$; significantly different at $p < .02$), and therapeutic expectancy (correlation increased from .28, $p < .05$, to .56, $p < .001$; significantly different at $p < .05$). Correlations for visual and kinesthetic (combined) imagery vividness dropped from .59, $p < .001$, to .39, $p < .001$, (not significantly different: $p > .05$); the eye-catalepsy item correlation also dropped from .47, $p < .001$, to .21, $p > .05$ (not significantly different: $p > .05$).

**Regression Analyses**

Regression analyses were completed to predict hypnotic imagoic suggestibility from the preassessment combined imagery vividness item, the hypnoidal state score, the sleep state item, the negative affect item, the eye-catalepsy item, the combined hypnotic expectancy item, the nonhypnotic imagoic suggestibility item, and the five-item imagery vividness questionnaire, using only participants who passed the finger-response item. Similar regression analyses were done in the Pekala, Maurer, et al. (2010) study. (The self-reported hypnotic depth score was not initially included in the regression analyses, since it can be regarded as an attributional variable, Pekala, Kumar, et al., 2010a; Pekala & Maurer, 2013). The regression equation used a forward stepwise algorithm with an alpha-to-enter and alpha-to-remove of .15 (Wilkinson, 1998). Left in the regression equation were preassessment combined
Table 3
Predicting Hypnotic Imagoic Suggestibility From the PCI–HAP Items and Several Additional Items (Excluding Participants Who Failed to Pass the Finger-Response Item)

<table>
<thead>
<tr>
<th>Subscale</th>
<th>R</th>
<th>R²</th>
<th>Unstandardized Coefficient</th>
<th>Standardized Coefficient</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preassessment</td>
<td>.381</td>
<td>.145</td>
<td>.286</td>
<td>.250</td>
<td>6.737</td>
<td>.011</td>
</tr>
<tr>
<td>Combined Imagery Vividity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypnoidal State Score</td>
<td>.454</td>
<td>.207</td>
<td>.475</td>
<td>.237</td>
<td>7.510</td>
<td>.007</td>
</tr>
<tr>
<td>Nonhypnotic Imagoic</td>
<td>.493</td>
<td>.243</td>
<td>.235</td>
<td>.215</td>
<td>5.176</td>
<td>.025</td>
</tr>
<tr>
<td>Suggestibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.009</td>
<td></td>
</tr>
</tbody>
</table>

Note. n = 111. F and p are values for independent variables left in the regression equation. Variables left out of the regression equation: sleep response item, negative affect item, eye catalepsy item, prehypnotic combined hypnotic expectancy, five-item imagery vividness questionnaire.

imagery vividness, the hypnoidal state score, and nonhypnotic imagoic suggestibility, for an R of .493 (R² = .243). Standardized regression coefficients across the three variables were rather similar, suggesting that each of the three variables were adding similar variance proportions to the total score. Table 3 shows the regression analysis.

Because “partial regression coefficients can 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), the standardized regression coefficients from the aforementioned regression analysis (see Table 3) suggest that participants’ imagery vividness of the hypnotic dream was a function of the vividness of their imagery before hypnotism (standard coefficient of .25), the hypnoidal state score or trance depth (standard coefficient of .24), and nonhypnotic imagoic suggestibility (standard coefficient of .22). The standardized coefficients allow for “the relative contributions of each predictor to the overall effect” (Grimm & Yarnold, 1995, p. 41) to be compared, suggesting that all three variables are accounting for similar proportions of the variance associated with the hypnotic-dream item.

A final set of regression analyses were computed but now adding in the self-reported hypnotic depth and posthypnotic therapeutic efficacy scores (as was done in the earlier Pekala, Maurer, et al., 2010, study). Because these variables are assessed during the debriefing questionnaire, both items can be conceptualized as attributional variables, as participants evaluate their experience after hypnotism. Now left in the regression equation were the self-reported hypnotic depth score,
Table 4
Predicting Hypnotic Imagoic Suggestibility From the PCI–HAP Items and Additional Items (Excluding Participants Who Failed to Pass the Finger-Response Item)

<table>
<thead>
<tr>
<th>Subscale</th>
<th>$R$</th>
<th>$R^2$</th>
<th>Unstandardized Coefficient</th>
<th>Standardized Coefficient</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Reported Hypnotic Depth Score</td>
<td>.707</td>
<td>.500</td>
<td>.710</td>
<td>.630</td>
<td>43.56</td>
<td>.000</td>
</tr>
<tr>
<td>Five-Item Imagery Questionnaire</td>
<td>.730</td>
<td>.533</td>
<td>.551</td>
<td>.170</td>
<td>6.78</td>
<td>.011</td>
</tr>
<tr>
<td>Posthypnotic Therapeutic Efficacy</td>
<td>.740</td>
<td>.548</td>
<td>.232</td>
<td>.191</td>
<td>4.26</td>
<td>.042</td>
</tr>
<tr>
<td>Hypnoidal State Constant</td>
<td>.748</td>
<td>.557</td>
<td>-.229</td>
<td>-.114</td>
<td>2.13</td>
<td>.147</td>
</tr>
</tbody>
</table>

Note. $n = 111$. $F$ and $p$ are values for independent variables left in the regression equation. Variables left out of the regression equation: sleep response item, negative affect item, eye catalepsy item, prehypnotic combined hypnotic expectancy, prehypnotic combined imagery vividness, nonhypnotic imagoic suggestibility.

the posthypnotic therapeutic efficacy score, the hypnoidal state score, and the five-item imagery vividness questionnaire total score from the preassessment (see Table 4). Self-reported hypnotic depth is now accounting for most of the variance, as assessed by the standardized coefficients. The total variance accounted for ($R^2$) across the two studies was rather similar: 63% in the prior study; 56% in the present study.

**Discussion**

A Partial Replication of Results

About 40% of the correlations across the two studies were similar (see Table 2). However, correlations between imagoic suggestibility (the hypnotic-dream item) and prehypnotic combined imagery vividness and hypnoidal state, although still significant, fell an appreciable amount and were significantly different from the corresponding correlations found in the earlier study. In the earlier study about 40% and 35% of the variance concerning the relationship to the hypnotic-dream item was accounted for, respectively, by the hypnoidal state score and the preassessment combined vivid imagery score. That percentage dropped to 9% and 15%, respectively, for the current replication study. Although the correlations are still significant, the variance accounted for is now much lower. The lower correlations in the present study may be merely the result of the larger sample size, which resulted in
correlations more representative of the “true” correlations in the population at large. However, the results may also be due to other reasons.

**Differing results as a function of methodology.** One reason for this difference may concern the “state” nature of retrospective phenomenological assessment (RPA). When this methodology was developed several decades ago (Pekala, 1980, 1991b; Pekala & Levine, 1981, 1982; Pekala & Wenger, 1983), the various limitations of using introspection, what we now call phenomenological assessment (E. R. Hilgard, 1980), were reviewed. Because of the nature of consciousness and its highly fleeting and variable nature (Angell, 1907; Boring, 1929/1950, 1953; James, 1890/1950), it was theorized that reliably and validly assessing such subjective consciousness would be more difficult to assess than behavioral variables but not impossible (Kukla, 1983). By assessing subjective consciousness with standardized questionnaires, and done in reference to short, immediately preceding short time intervals (Pekala, 2009), it was felt that such retrospective phenomenological assessment could be found to be more reliable and valid (Pekala, 1980, 1991a) than was found more than a century ago with the type of introspection then practiced (Watson, 1913).

However, such a “state” assessment of subjective experience is different from the “trait” assessment of personality variables that psychologists are usually accustomed to measuring. Test-retest reliabilities for the PCI (sub)dimensions are less than what is usually found in trait instruments, that is, average $r = .43$ (Pekala, 1991b, p. 102) for the Phenomenology of Consciousness Questionnaire, a predecessor to the PCI, versus .70 (the usual lower cutoff considered acceptable for trait instruments). Because the PCI is a state instrument, it is more prone to context and instructional set effects associated with introspection than trait instruments. Additionally, because of the fleeting and highly variable nature of consciousness that the functionalists addressed over a century ago (Angell, 1907; James, 1890/1950), the phenomenological variability across individuals and across varying types of stimulus conditions may be appreciable. Earlier research (Pekala, 1980; Pekala & Levine, 1981, 1982; Pekala & Wenger, 1983) suggested that such variability appears dependent upon the instructional set, the context, and the nature of the stimulus condition assessed.

Slight differences in study designs between the earlier study and the current study may be partly responsible for the differences observed between the two studies. Whereas the prior study had the two counterbalanced sessions spaced a week apart, the present study had two sessions spaced only two days apart. In the present study, nonhypnotic imagoic suggestibility was included in the regression analyses when predicting hypnotic imagoic suggestibility (it was not in the earlier study). The correlation between nonhypnotic imagoic suggestibility
and hypnotic imagoic suggestibility was .31 (when assessed a week apart) for that earlier study. However, when nonhypnotic imagoic suggestibility was assessed within 2 days of hypnotic imagoic suggestibility, the correlation was slightly higher: .36 (see Table 2). That is probably why nonhypnotic imagoic suggestibility is now being included in the regression equation (see Table 3), along with the preassessment combined imagery vividness score and hypnoidal state (both of these variables were included in the regression equation of the earlier study). Kirsch and Braffman (1999, 2001) have made the case that nonhypnotic imaginative suggestibility accounts for much of the variance associated with hypnotizability. Although the present study does not support that perspective, it does suggest that nonhypnotic imagoic suggestibility (as assessed 2 days before/after a hypnotic assessment) accounts for about as much as the variance as does one’s imagery vividness of imagery of being in hot tub assessed about 20 minutes prior to the hypnotic-dream item (Items #12 and #17 from Table 2 “Present Study” column).

The drop in the correlation between hypnoidal state and hypnotic imagoic suggestibility (from .63 in the earlier study to .31 in the present study) was statistically significant. Could this also be related to the decreased time interval between the two hypnotic sessions? The second half of each of the two sessions consisted of a 30-minute hypnotic intervention wherein participants were administered a hypnotic induction and also a variety of hypnotic suggestions. Hence, for the present study, some participants completed the PCI–HAP 2 days after a hypnotic intervention. Although no assessment of hypnotic responsivity was done at that time, a hypnotic intervention was completed, and some participants may have felt, or not felt, they were “hypnotized” at that time.

Additional analyses were completed looking at these correlations (between imagoic hypnotic suggestibility and hypnoidal state) as a function of order. When the PCI–HAP was experienced first, the Pearson $r$ was .37 ($p < .01$), when it was experienced second (after a session of self-hypnosis training 2 days earlier), the correlation was .26, now no longer significant.

It is the authors’ conjecture that the nature of participants’ hypnotic experience (during the intervention session) may have influenced their experience of hypnotism in the subsequent assessment session (since there was only a 2-day time interval—as opposed to a week in the prior study), and hence their subjective experience of hypnotism during the intervention “colored” their perception/experience of hypnotism during the subsequent hypnotic assessment 2 days later.

*Expectancy Before and After a Hypnotic Assessment Protocol*

It is interesting to the authors that therapeutic expectancy assessed at the end of the debriefing questionnaire (how helpful participants
thought hypnotism was going to be for their problems and concerns) was much more highly correlated with imagoic suggestibility ($r = .56$, $p < .001$), in the second study than the first ($r = .28$, $p < .05$). And these two correlations were significantly different. Just as this correlation went up, the correlation between imagoic suggestibility and hypnoidal state, between studies, went down.

Kirsch (2000) has made expectancy an important variable in his conceptualization of hypnotism. In the Pekala, Maurer, et al. (2010) study posthypnotic therapeutic expectancy was accounting for only 8% of the variance associated with hypnotic imagoic suggestibility. However, in the present study posthypnotic therapeutic expectancy is accounting for about 31% of the variance, about four times that of the earlier study. Interestingly, hypnoidal state was accounting for four times more of the variance (40%) in the prior study as that of the present study (10%).

There does not appear to be much difference in preassessment expectancies (estimated hypnotic depth or estimated therapeutic efficacy) across the two studies (see Table 2), suggesting that the posthypnotic expectancies were more augmented in the current study. One of the controversies in the hypnosis field concerns the importance of expectancy in the results obtained across different studies and the experiments of investigators of differing theoretical persuasions (Barabasz & Watkins, 2005; Kihlstrom, 2008; Lynn, Kirsch, & Hallquist, 2008). Because these two studies were rather similar in design and type of participant, the authors did not expect such large differences across the two studies for the variables of therapeutic efficacy and hypnoidal state. Hence, the results need further replication and validation while looking more closely at order and context effects.

Accounting for the highest correlation across both studies was the self-reported hypnotic depth (srHD) score, sharing about 50% of the variance in common with imagoic suggestibility. Because the srHD score was completed at the end of the PCI–HAP protocol, we believe it is an attributional variable, reflecting the participant’s perception of their level of hypnotic responsiveness. The posthypnotic therapeutic efficacy (phTE) score is also an attributional variable, completed at the end of the debriefing assessment, measuring how helpful “self-hypnosis training is going to be to help you with your problems, issues, and concerns” (Pekala, Kumar, & Maurer, 2009, p. 18). With a correlation of .56, it also remained in the regression equation predicting hypnotic imagoic suggestibility. Obviously, very vivid imagery during the hypnotic dream would probably lead participants to expect that hypnotism was going to be helpful to them with their problems and concerns and, hence, its inclusion in the regression equation.
Other Results

Table 2 includes the two imagery items (Items 15 and 16: vividness and amount) from the PCI, assessed in reference to the sitting quietly period near the end of the hypnotic induction. Both items generated fairly robust correlations (.5 to .6) with hypnotic imagoic suggestibility across both studies. Whereas the imagoic suggestibility item occurred about halfway through the hypnotic induction, the PCI is completed retrospectively in reference to the 2-minute sitting quietly period near the end of the protocol, wherein participants are told to “continue to experience the state you are in right now” (Pekala et al., 2009, p. 11). Whereas the imagoic suggestibility item is rated according to how vivid one’s imagery was felt to be—“What number between ‘1’ and ‘10’ best represents how vivid your imagery was?” (Pekala et al., 2009, p. 19)—imagination generated during the 2-minute sitting quietly period would presume to be unstructured and rated on a similar scale (7-point Likert scale) from nonvivid to very vivid imagery (imagery vividness) or no imagery to a great deal of visual imagery (imagery amount). Hence, the correlations (between items from structured and unstructured stimulus sets) are found to be not only significant and similar but accounting for between 25% and 36% of the variance in common. Query of PCI–HAP participants suggests that if they reported a rather vivid and enjoyable “hypnotic dream” then they were likely to return to that imagery experience during the subsequent sitting quietly period. And obviously, if their hypnotic dream was rather devoid of imagery, or devoid of vivid imagery, the sitting quietly period was likewise to be similar. We believe this adds some support to the content validity of the PCI/PCI–HAP and its usefulness in understanding the hypnotic experience.

Hypnotism as a Domain Phenomenon

The present replication study, and the earlier preliminary study, suggests that one’s imagery vividness during hypnotism when asked “to go on vacation and have a wonderful time on a beautiful day” was found to be related to several different types of items. Both studies found imagery vividness outside of hypnotism to be related to one’s hypnotic dream during hypnotism. In the prior study, combined (visual and kinesthetic) imagery, as assessed in the PCI–HAP preassessment correlated .59 with imagoic suggestibility and .31 with nonhypnotic imagoic suggestibility. In the present study, those correlations were .39 and .36, respectively.

Hence, in either study, imagery experienced outside of hypnotism appears to be related to imagery (the hypnotic dream) experienced during hypnotism.

That earlier study also found one’s level of trance, as measured by the hypnoidal state score, to be related to one’s imagery during
hypnotism, accounting for about 40% of the variability of participant’s imagoic suggestibility. Although the present study saw that coefficient of determination drop to 10% (correlation of .31, p < .05), hypnoidal state effects were still significant and appeared in the regression analysis (see Table 3 of the present study). Hence, one’s level of trance, as assessed by the hypnoidal state score, appears to be related to the vividness of the imagery experienced during hypnotism, although this effect does not appear to be as strong.

Conclusions

This replication study, in conjunction with the prior study, suggests that (a) one’s imagery vividness outside of hypnotism appears to be related to one’s vividness of imagery during hypnotism and (b) one’s level of trance, as measured by the hypnoidal state score, also appears related to imagery vividness during hypnotism. This second variable appears to be a more “delicate” phenomenon, this probably being related to the more “state” nature of the hypnoidal state score and its ability to be influenced by order, context, and situational variables, more so than one’s imagery ability, which may be seen as more of a “trait” variable than the hypnoidal state score.

Kirsch’s prehypnotic expectancy effects, as assessed by the estimated hypnotic depth score, and the estimated therapeutic efficacy score, appear to also have some relationship to imagery vividness during hypnotism, although they are not as salient as the two postassessment expectancy variables. With the subsequent experience of hypnotism, postassessment hypnotic depth and therapeutic efficacy are now more highly related to imagery vividness during hypnotism, which would be expected: One’s experiences during hypnotism modify one’s expectancies of that experience.

The aforementioned results support the usefulness of the PCI–HAP in attempting to better understand hypnotism as a function of suggestibility, expectancy, and trance effects especially from a state perspective. Its usefulness will depend on further replication and validation. Differences between the present and the prior study suggest that order, context, and situational effects may influence the degree of relationship among the PCI–HAP variables.

As we revisit the usefulness of introspection or phenomenological assessment in better understanding the nature of hypnotism and other types of stimulus events/conditions (Cardena & Pekala, 2014), we would do well to not repeat the errors and the controversies of the past concerning introspection (Boring, 1953; Pekala, 1980, 1991b; Titchener, 1898; Watson, 1913). The use of standardized questionnaires,
like the PCI, and short time periods during which retrospective phenomenological assessment is completed, appear to have helped phenomenological assessment be more reliable and valid than introspection was found to be a century ago (Pekala, 1991b, 2009). However, how the usefulness and consistency of this methodology, as assessed in reference to the state nature of hypnotism, may vary as a function of situational variables and context and order effects and must await additional research.

ACKNOWLEDGMENTS

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REFERENCES


Lebendigkeit von Bildern vor und während der PCI–HAP: 
ein teilweiser Abgleich

Ronald J. Pekala und Ronald L. Maurer

Abstrakt: Diese Studie sollte einen Abgleich mit einer früheren Studie, in
der die Lebendigkeit von Bildern vor und während einer phänomenologischer
Erhebung erfolgte, durchführen. Gleichzeitig sollten Trance- (hypnotisch)
Effekte und diverse andere Variablen gemessen werden. Analysen
bezüglich Korrelation und Regression dieser Studie ließen darauf schließen,
dass die Lebendigkeit von Bildern während Hypnose durch kombinierte
Lebendigkeit der Bilder vor Hypnose und Trance-/veränderten Bewusstseins-
Zuständen während Hypnose vorhergesagt werden konnten. Die aktuelle
Studie umfasste eine größere Stichprobe bei gleichem Design und gleichem
Teilnehmerpool. In der aktuellen Studie war die Varianz merklich geringer,
obwohl Effekte der Trancezustände und die Lebendigkeit der Bilder vor der
Hypnose die bildliche Suggestibilität (Bilderleben während der Hypnose)
immer noch signifikant vorhersagte. Die Aussage dieser Ergebnisse wird als
Funktion der angewandten Methode diskutiert.

Stephanie Reigel, MD

Clarté de l’imagerie avant et durant l’Inventaire de la phénoménologie de la
conscience - Procédure d’évaluation hypnotique (PCI–HAP):
Une réplique partielle

Ronald J. Pekala et Ronald L. Maurer

Résumé: Les auteurs de cette recherche ont cherché à reproduire une étude
antérieure où la netteté de l’imagerie avant et durant un inventaire hypnotique
de la phénoménologie avait été évaluée, tout en mesurant les effets
de l’état (hypnoïde) de la transe et d’autres variables. Les analyses corréla-
tionnelles et de régression de cette étude semblaient indiquer que la netteté
de l’imagerie obtenue durant l’hypnose avait été prédite par la netteté de
l’imagerie avant l’hypnose et les effets de l’état (altéré) de transe durant
l’hypnose. La présente étude était basée sur des concept et groupe de sujets
similaires, quoique utilisant un échantillon plus important. Dans le cadre
de la présente étude, bien que les effets de l’état de transe et la netteté de
l’imagerie avant l’hypnose aient continué de prédire en grande partie la sugges-
tibilité imagoique (l’imagerie durant l’hypnose), la variance obtenue était
sensiblement moindre. La signification de ces résultats en tant que fonction
de la méthodologie employée fait l’objet de cet article.

Johanne Reynault

C. Tr. (STIBC)
Vivacidad de imágenes mentales antes y durante el PCI–HAP:
Una réplica parcial

Ronald J. Pekala y Ronald L. Maurer

Resumen: Esta investigación buscó replicar un estudio anterior en donde se evaluó la vivacidad de imágenes mentales antes y durante un procedimiento fenomenológico de evaluación hipnótica, mientras también se medían los efectos del estado de trance (hipnoidal) y varias otras variables. Análisis de correlación y regresión en ese estudio sugirieron que la intensidad de las imágenes durante hipnosis se predecía mediante la combinación de la vivacidad de las imágenes antes de hipnosis y los efectos del estado de trance (alterado) durante la hipnosis. El presente estudio consiguió una muestra más grande empleando un diseño y un grupo de muestreo similar. En este estudio, a pesar de que los efectos del estado de trance y la intensidad de las imágenes antes de hipnosis continuaron prediciendo significativamente la sugestionabilidad hipnótica imagógica (imágenes durante hipnosis), la varianza explicada fue apreciablemente menor. Se discute el significado de estos resultados en función de la metodología.

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Mexico