Hypnotic Devices May Be More than Placebo

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The history of hypnosis is replete with examples of efforts to increase hypnotic susceptibility (usually assessed by responsiveness to suggestions following an induction). These efforts can generally be divided into manipulation of preinduction variables such as beliefs (e.g., Barber & Calverley, 1964), expectancies (e.g., Kirsch, 1985), rapport (e.g., Greenberg & Land, 1971), sensory restriction (Barabasz, 1982; Wickramasekera, 1969, 1970), and biofeedback of EEG alpha production, muscle tension, etc. (e.g., London, Cooper, & Engstrom, 1974; Wickramasekera, 1973), as well as manipulation of during- or postinduction variables such as the use of deepening techniques like fractionation or the use of deceptions such as suggestions to experience events that the hypnotist actually furnishes (e.g., Page & Handley, 1992). It is the latter type of variable (i.e., during-induction) that is presently of interest.

In early times, a number of devices were believed to have a special ability to facilitate the induction of hypnosis, a prime example being Mesmer’s magnets and his use of the *baquet*. However, with the advent of hypnosis research, these devices ultimately proved to have no inherent facilitation properties other than a general placebo effect.
effect (i.e., if a subject believes in the efficacy of such a device and expects it to work, there is a greater likelihood that it will indeed work). For example, Dittborn and Shor (1968) failed to replicate an earlier study by Hammer and Arkins (1964) that found photic stimulation at 10-11 c.p.s. (EEG alpha rhythm) in conjunction with a verbal induction produced greater hypnotizability than a verbal induction alone or a verbal induction in conjunction with photic stimulation at 30 c.p.s. As the former authors stated, “There is no evidence that any particular fixation object is superior to any other,” and further that they don’t “…possess any special potency in producing hypnosis other than their effectiveness in aiding attentional sets and reinforcing the expectations of the participants in the hypnotic interaction” (p. 166). Note, however, that this is not to underestimate or minimize the power and usefulness of the placebo effect (Wickramasekera, 1969; 1977a; 2000).

A private practitioner and a coauthor of this paper (S.R.) brought to our attention a combination of two devices that appeared to facilitate hypnosis in previously intractable patients, and we collectively decided to test their efficacy experimentally. The devices, employed concurrently during an induction, were the “Sleep Machine” manufactured by Radio Shack (with the “Hawaiian surf” selected), and the “Shealy Relaxmate” glasses, containing small blinking red lights (with the frequency set in the theta range). The rationale for the enhanced effectiveness of the former device seemed apparent: the surf rhythmic sounds providing the common threads of monotony and repetition in hypnotic inductions, might help a person relax and become more comfortable with the possibility of experiencing hypnosis. The rationale for the enhanced effectiveness of the glasses set at theta frequency stemmed from a few possibilities. One was an earlier study by Wickramasekera (1977b) that dealt with the modification of hypnotizability and theta feedback training. More recently, a study by Graffin (1991) had produced two relevant findings. First, high hypnotizables demonstrated greater frontal and temporal theta at preinduction baseline than lows. Second, all participants showed increases in occipital and parietal theta during induction. The results regarding theta activity suggested that highs may possess a greater capacity for selective attention and imagery than lows, and that during hypnosis, all participants may experience an increase in these capacities. Even more recently, Brady and Stevens (2000) were able to increase both EEG theta activity and hypnotic susceptibility scores in a small group through the use of binaural-beat sound stimulation in the theta frequency range.

The hypothesis of the study was that low-susceptible participants (preselected by their score on a group susceptibility scale) exposed to the combination of devices during a hypnotic induction would produce greater responsiveness than controls on an individually administered susceptibility scale. Specifically, the predicted order of effect is: Theta + Wave > Theta + Tone ≥ Delta + Wave > Delta + Tone > Control. The actual mechanism by which the theta frequency light might enhance hypnotizability is unknown, but one speculative possibility might be that when the flashing is synchronized with natural theta production, it increases one’s susceptibility to the induction of hypnosis. (A crude analogy might be to the situation where a flashing light at certain frequencies has the potential to precipitate seizures in some susceptible individuals.) Another possibility would be that the glasses might either increase theta production (or artificially supplement it) in low-hypnotizable participants, making them
more closely resemble those who are high in hypnotizability.

**Method**

**Participants**

Participants were 54 undergraduates (25 males, 29 females) in introductory psychology classes who scored 3 and lower on a shortened 10-item version of the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A) of Shor and Orne (1962), previously employed by Hilgard, Crawford, Bowers, and Kihlstrom (1979). Ages ranged from 17 to 47 with a mean of 22.8 years ($SD = 7.55$).

**Procedure**

Participants were randomly assigned to one of five groups. During a second (individual) session, all participants were administered the Stanford Hypnotic Susceptibility Scale, Form B (SHSS:B) of Weitzenhoffer and Hilgard (1959). In an effort to minimize experimenter bias (see Wickramasekra, 1969), an assistant, matched to the sex of the participant to prevent a previously found interaction (Page & Handley, 1991), and blind to the hypothesis of the study, was present during all inductions to cast the deciding vote in the event any item was not clearly passed or failed. One group was a standard control ($n = 18$) in which participants were not exposed to either device. A delta frequency (at a setting determined to be 2 c.p.s.) was selected as a control to the theta condition (determined to be 6 c.p.s. as calibrated by video-taped analysis of number of blinks per second based on number of frames taped per second), while a 105 c.p.s. tone was the control for the “wave” sound condition. Four groups ($n = 9$ for each) received the following combination of conditions: Theta + Wave, Theta + Tone, Delta + Wave, and Delta + Tone. Upon completion of the induction and prior to administering the first SHSS:B item, the Relaxmate glasses were removed and sound intensity slowly decreased until off. Following hypnosis and prior to debriefing, participants completed the Realness Rating Scale (RRS), a 5-point scale for each SHSS:B item (with 0 indicating the experience was not at all like a real one and 4 indicating that it was almost exactly the same as a real experience) that was modeled after that of Barber and Wilson (1978/1979) for the Creative Imagination Scale.

**Results**

Table 1 shows the pre- and posttest means and standard deviations for all groups.

In order to rule out the possibility that any initial pretest hypnotizability differences produced differential effects on posttest scores, an analysis of covariance (ANCOVA) was carried out with the pretest HGSHS:A score as the covariate. Results indicated that pretest HGSHS:A score was not a significant covariate for either SHSS:B score, $F (1, 48) = 2.65, p = .19$, or for total RRS, $F (1,48) = .46, p = .50$.

The data were also analyzed using a 5 X 2 MANOVA comparing the performance of the five groups on the two dependent measures (SHSS:B score and total RRS score). The analysis indicated that there was a significant effect of Groups for both the SHSS:B and the RRS scores [$F (4, 54) = 3.04, p < .03; F (4, 54) = 2.58, p = .05$, respectively]. Table 2 shows the tests of between-subjects effects. Post hoc comparisons that were made using Tukey HSD test indicated that there was a significant
difference between Delta + Tone and Control groups for both SHSS:B scores \((p < .02)\), and also for RRS scores \((p < .03)\).

**Discussion**

It was not surprising that the pretest HGSHS:A did not have a significant effect on either SHSS:B or RRS scores given that only participants with low HGSHS:A scores were selected for the study. Since only one comparison between groups was significant (for both SHSS:B scores and total RRS scores), that being the Delta + Tone significantly greater than Control, the hypothesis derived from clinical observation of Theta + Wave being superior was not confirmed. In fact, this group was expected to produce just slightly more effect (due to placebo) than the Control group. Results therefore do not replicate those of Brady and Stevens (2000), possibly due to procedural differences in the mode of theta presentation (visual v. auditory).

Why the Delta + Tone group was superior to the Control group is not known, although it is remotely possible that it may have been simply a chance significance. If it was indeed more than just a placebo effect significant by chance alone, the underlying mechanisms are as yet unknown.

A few words concerning the limitations of the present study are appropriate. First, no equipment for measuring EEG was available to the authors—its use could have served as a manipulation check of sorts to determine if the glasses were in fact capable of having an impact on actual EEG activity. Second, since the superiority of the Delta + Tone group was unpredicted and may have been a chance significance, an independent replication in the future to confirm this finding would be in order.

**References**


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Wickramasekera, I. (2000). How to produce not only powerful but, more importantly, reliable placebo healing and analgesia. *Advances in Mind-Body Medicine, 16*, 211-216.