Trance Logic, Age Regression, and Incomplete Responding: A Preliminary Investigation of Contextual Influences

Steven Jay Lynn, PhD*; John R. Weekes, PhD†; Matthew Milano, PhD‡; John Brentar, PhD§; Matthew D. Johnson, PhD||; Liam Condon, MA||

Fifty-four hypnotizable and 49 unhypnotizable simulating subjects were age regressed to age five and asked to write the sentence "I am participating in a psychological experiment" embedded in either "standard" suggestions for regression or in the context of a suggested dream. As predicted, hypnotizable subjects were sensitive to the context manipulation (i.e., dream vs. standard), evidencing more correct or "adult" spelling ("trance logic") during age regression when the dream context encouraged a melding of fantasy and reality. Simulators' performance was stable across conditions. Consistent with the hypothesis that incomplete responding is at the heart of incongruous spelling during age regression, the hypnotizable and simulating subjects who evinced the least compelling experiences of age regression were the most likely to spell "adult" words correctly (exhibit "trance logic"). Finally, none of the 31 subjects whose handwriting was rated as "child-like and primitive" spelled the word "psychological" correctly, providing clear evidence that subjects who were the most responsive to the age regression suggestion fail to exhibit trance logic.

INTRODUCTION

Since the time of Mesmer, hypnosis has featured prominently as a method for altering sensations, emotions, memories, and thoughts. Indeed, hypnosis can engender dramatic changes in consciousness produced by suggestions for hallucinations, amnesia, changes in motor responses, and alterations in pain and other physiological responses (see Lynn & Kirsch, 2006). Not surprisingly, clinicians have capitalized on the potential of hypnotic interventions to promote self-regulation in treating a variety of psychological disorders (e.g., anxiety, somatoform disorders; Lynn, Rhue, & Kirsch, 2010).

The profound changes in subjective experiences that sometimes follow suggestions beg explanation and have prompted clinicians and researchers to proffer diverse accounts of hypnotic phenomena, including the idea that hypnosis produces a special "state" of consciousness. In his classic 1959 paper, Orne concluded that one of the principal features of the hypnotic state is the ability to tolerate logical inconsistencies that would be disturbing in the wake state (p. 297). Orne defined trance logic as the "ability of the subject to mix freely his perceptions derived from reality with those that stem from imagination and are perceived as hallucinations…" and that "ignores everyday logic…" without any attempt to satisfy a need for logical consistency (p. 295). The more contemporary literature is replete with references to trance logic as a defining or important feature of hypnosis or the hypnotizable person (e.g., Beshai, 2004; Evans, 2001; Karlin, 2007; Kroger & Yapko, 2007; Spiegel & Spiegel, 2004), although the central role of trance logic as a distinctive feature of hypnosis is far from universally accepted.

Age regressed participants apparently do not literally (or accurately) relive the events of childhood (see Nash, 1987). Still, some age regressed individuals do behave incongruously, which has been taken as evidence of trance logic. The incongruous behavior most frequently examined in age regression studies is that of the regressed subject correctly spelling words that are beyond the cognitive abilities of a normal child at the target age. Whereas a number of investigations (Perry & Walsh, 1978; Nogrady, McConkey, Laurence, & Perry, 1983; Spanos, deGroot, Tiller, Weekes, & Bertrand, 1985) have reported significant differences between hypnotizable and simulating

*Department of Psychology, State University of New York at Binghamton, Binghamton, New York, 13902-6000, USA
e-mail: slynn@binghamton.edu
† Correctional Services of Canada
‡ Jury Focus, Inc.
§ Morrissey/Compton Educational Center & Stanford Medical School, Department of Psychiatry and Behavioral Sciences
|| State University of New York at Binghamton

IMAGINING PARTICIPANT

Individual who experiences imaginative suggestions administered in an "awake" context not associated with an hypnotic induction.

TRANCE LOGIC

The mixing of perceptions derived from reality with those that stem from imagination, ignoring both everyday logic and a need for logical consistency (Orne, 1959).

AGE REGRESSION

The response to a suggestion to re-live an earlier time in life such as childhood.

SIMULATOR

An individual selected for low hypnotizability who is instructed to role-play the responses of an excellent hypnotic subject as a means of assessing experimental demand characteristics.

(i.e., unhypnotizable role playing) participants, other investigations have not reported significantly more incongruous writing or incongruous responding in response to other trance logic tasks, for hypnotic "reals" than for simulators (Peters, 1973; Stanley, et al., 1986) or imagining (nonhypnotized) participants (see Lynn & Rhue, 1991; McConkey, Bryant, Bibb, & Kihlstrom, 1991).

The current study tests an account of incongruous responding that rests on the idea that what some researchers have considered to represent logical incongruity instead represents "incomplete responding" (Spanos, 1986; Stanley et al., 1986) in both hypnotized and imagining participants. This hypothesis holds that the correct spelling of "adult" words (e.g., "psychological") during age regression, hypnotic or otherwise, is associated with incomplete role involvement in the experience of being a child. Even very hypnotizable and imaginative participants find it difficult to experience complete subjective involvement in demanding test suggestions such as hallucinating a person or object (e.g., Rhue & Lynn, 1987; Spanos, Mullens, & Rivers, 1979; Spanos et al., 1985; Spanos & Radtke, 1982; Wagstaff, Toner, & Cole, 2002). Relatedly, thinking, feeling, and believing wholeheartedly that one is a child is not an easy task for an age regressed participant. Accordingly, a disruption in feeling like a child can account for the "adultlike" (i.e., "trance logic") responding of certain "regressed" participants. Whereas age-regression calls for a reinstatement of childhood experience, the request to perform like an adult (e.g., write "big" words like "psychological") may undermine participants' involvement in the role called for by the suggestion. Consistent with this hypothesis, measures of response completeness have been found to correlate negatively with incongruous writing ("adult" spelling) during age regression (Spanos et al., 1987), and real-simulator differences are most consistently observed on indices (e.g., transparency of hallucination; incongruous writing, duality reports during age regression) where the criterion for trance logic involves responding to that suggestion in an incomplete fashion (see Spanos, 1986; Stanley et al., 1986 for reviews).

According to the incomplete responding account, it is not necessary to postulate constructs such as "trance logic" to explain the hypnotic or nonhypnotic experience of hypnotizable participants who spell "adult" words correctly during age regression. From the participant's perspective, "correct" spelling of words during age regression represents an active, constructive attempt to respond to suggestions. Accordingly, the

experience appears "incongruous" only from outside the framework of the participant's phenomenal world (for a related argument see Sheehan & McConkey, 1982).

An alternate account of real-simulating differences on trance logic measures (e.g., Stanley et al., 1986; Spanos, 1986; Spanos, deGroot, et al., 1985; Spanos et al., 1987; Spanos & Radtke, 1981; Wagstaff, 1981, 1991) emphasizes the divergent instructional sets and task demands that real versus simulating participants encounter (see also Cox & Bryant, 2008). The central task of simulation is to avoid detection as a faker. Never having experienced hypnosis, simulators assume that suggestible participants respond in a fully childlike manner (i.e. spell incorrectly) and therefore tend to not display trance logic. Thus, hypnotizable participants' honest report of their incomplete involvement in the role or experience called for by the suggestion, combined with simulators role playing to convey "complete" responses, provides a plausible account of real-simulator differences.

In contrast to previous research using retrospective reports of involvment, we used handwriting to index role involvement. If the participants with the most adult-like handwriting (incomplete involvement) are the most likely to spell words correctly during age regression (i.e., exhibit "trance logic"), it would provide support for the hypothesis that incomplete responding can account for "trance logic" behavior. In contrast, if trance logic were based on complete responding to the age regression suggestion, we would expect that participants that exhibit the most child-like handwriting, would be most likely to spell words correctly (i.e., exhibit trance logic).

A second aim of this study was to examine the effect of the context in which the age regression suggestion is presented. Whereas previous research (McConkey & Sheehan, 1980) has evaluated the cue-characteristics that augment or diminish "logical responding," trance logic studies have not examined whether adult-like spelling may be affected by whether the suggestion is worded in such a way as to facilitate a literal regression to childhood or a melding of fantasy and reality. In the current study, we compared a standard age regression suggestion with a suggestion to age regress in the context of a hypnotic dream. We hypothesized that the dream suggestion would facilitate accurate spelling (i.e., trance logic), given that the contents of dreams are often contralogical and dreaming legitimizes "logical contradictions." Because simulating participants would continue to view the spelling task as a test of their ability to age regress under either set of

suggestions, we predicted that the dream suggestions would not facilitate simulators' accurate spelling during age regression.

METHOD

PARTICIPANTS

We screened approximately 950 participants (age range 18–25; median age = 19) with the Harvard Group Scale of Hypnotic Susceptibility (HGSHS:A, Shor & Orne, 1962) from the Psychology Department subject pool, and who volunteered for course credit, to obtain the experimental participants. We selected hypnotizable participants from a pool of 117 hypnotizable participants (HGSHS:A 10 and above) and simulating participants were selected from a pool of 93 unhypnotizable participants (HGSHS:A 3 and below). To provide an even more stringent selection criterion, hypnotiizable participants were also required in the experimental session (see below) to pass a visual hallucination suggestion to see a styrofoam cup by scoring a 2 or more on the 5-point Likert-type scale, "To what extent were you able to see the second cup as a "lifelike" cup? Just like the real cup?" (1 = not at all; 3 = to some extent; 5 = to a great extent).

Given that the study involved age regression, and was conducted in a group context, it was required that participants come from intact families, and that both parents were living. This was advertised on sign-up sheets, and announced as a requirement at the beginning of the screening and experimental sessions. Participants who met these criteria all agreed to be contacted again in the first session for another part of the study and participated in a second experimental session, again for course credit.

In order to test hypotheses pertinent to age regression and trance logic, it was also necessary to insure that hypnotizable participants truly experienced age regression. Therefore additional requirements for inclusion required were that participants: (1) indicate they were 5-years-old when asked to write their age during age regression, and (2) evidence a minimal "child-like" handwriting change on a measure described below to unambiguously pass the suggestion. Accordingly, only participants who met these minimal criteria were included in the analyses. Fifty-four hypnotizable participants (HGSHS:A M = 10.69, S.D. = .80) met these criteria and the hallucination criterion, and 49 simulating participants (HGSHS:A M = 2.10, S.D. = .69) met these criteria. All participants indicated postexperimentally that a 5-year old could not spell the word "psychological" correctly (Yes/No format).

TREATMENT OF REAL AND SIMULATING PARTICIPANTS

In the experimental session, the real and simulating participants were treated identically, except the simulating participants were (prior to the age regression session) read instructions adapted from M.T. Orne (1971) and the project coordinator conversed with susceptible participants about their previous hypnotic experience. Simulators were informed that when they participated in a second group hypnosis induction their task would be to convince the hypnotist that he/she was an excellent hypnotic subject capable of experiencing deep hypnosis. To properly motivate simulators, they were informed that if the hypnotist at any time, for any reason, detected their deception he would tap them on the shoulder and excuse them from the experiment. So that simulators would not be able to identify the "real" co-participants in the study, participants were informed that the instructions would be administered to other small groups of participants. Participants (reals and simulators) were then led to another room where the experimental procedures were administered by a hypnotist blind to participants' identity. The hypnotist was not involved in the screening phase of the research.

HYPNOTIC INDUCTION AND SUGGESTIONS

Participants were tested in small groups (5–10 participants) and seated in such a way that prevented observation of other participants' writing. A second experimental assistant was present during the experiment (also unaware of participants' group assignment) to pass out forms and observe participants for any untoward reactions. The hypnotist administered the Stanford Profile Scale induction (Weitzenhoffer & Hilgard, 1963) for hand and arm heaviness and eye closure, revised for group presentation. Deepening suggestions of walking down a spiral staircase were also used following the induction and after each suggestion. The following suggestions were then administered, in a fixed order: (a) hands moving apart as a "warm up;" (b) age regression; (c) positive hallucination of a cup (see Stanley et al., 1986); (d) "countering"—participants received suggestions for hand levitation following an instruction to resist responding (see Lynn, Nash, Rhue, Frauman, & Stanley, 1983). After participants completed a postexperimental questionnaire, the assistant returned and the simulators ceased role-playing. Participants who wanted to talk about their experience of hypnosis were given an opportunity to do so.

Age regression tasks

In both the "standard" and "dream" age regression suggestions, participants were told that the hypnotist would help them return to an earlier age (5). Although participants received eye closure instructions previously, they were told that they would be asked to open their eyes and to write something down, but this would not disrupt their hypnosis or interfere with their ability to experience themselves as 5 years old (A pencil and paper had been placed on each subject's desk at the beginning of the experiment). They also were informed that they would always be able to hear the hypnotist and respond, even though they experienced themselves as a child in a different circumstance. The suggestions for the dream condition closely paralleled the suggestions in the standard condition, except no allusion was made to a dream in the latter condition. More specifically, in the dream context, age regression was accomplished by informing participants that they could return to an earlier age by "having a dream about that time... a real dream... just the kind you have when you are asleep at night." The suggestion was framed in the context of sleep and dreaming throughout, and references to spelling were equated across dream and standard conditions.

Counting was used to facilitate the intensity of the sleep and dream suggestions. In both contexts, suggestions for falling "even deeper asleep" preceded age regression to feel "safe, secure, and peaceful" as a 5-year-old, "seeing, hearing, tasting, touching, sensing as a 5-year-old child, as you were when you were 5 years old, at home with your mother. To be small again, to be very young, to have small hands and feet, to be young, and on this day feeling very secure, very comfortable, very much at ease, so good to be alive." Participants received counting from 5 to 1 to deepen and enhance the regression. When participants were 5 years old, with their "Mommy," they were told she had some words for them to spell.

In the dream context, the suggestions regarding the dream were incorporated as follows: "Now you *can dream about* (vs. experience) your mother asking you to spell something, *dream now about* (vs. experience) her asking you to spell—listen very carefully, very carefully to the words she says, words you can hear Mommy saying to you, you can hear her asking you to spell these words, Mommy has some words for you to spell. The words are "I am participating in a psychological experiment"... spell these words, 'I am participating in a psychological experiment', for Mommy now on the piece of paper that is in front of you. You can do this without it disrupting your *hypnotic dream* (vs. experience of hypnosis) open your eyes just long enough to spell the words and to write down how old you are in your *dream* (vs. hypnosis) do this now, open your eyes, spell the words and write down how old you are in your *dream* (vs. hypnosis)." Following suggestions for eye closure, the age regression suggestion was terminated by counting from 1 to 5, with suggestions to return fully to the present. "Mommy" was the focal point of the age regression suggestions in order to facilitate the experience of regression and as a precaution against a negative experience.

Dependent measures

The first measure of "trance logic"—the typical measure reported in the literature—was the correct spelling of the word psychological during age regression. Because a more sensitive, continuous measure of correct spelling is desirable, we devised a second measure: (1) the "spelling" measure consisted of the sum of the three words "participating", "psychological", "experiment"; if participants substituted the word "hypnosis" for "psychological", or "experiencing" for "participating", they also received an index point for correct spelling. The range of scores was 0-3. Excellent interrater agreement rates were obtained for the spelling of the words "participating" (97%), "psychological" (95%), "experiment" (95%), "hypnosis" (100%), and "experiencing" (100%). Differences were resolved by discussion. Both raters were blind regarding the participants' status; one of the raters was blind to the hypotheses under consideration.

So that spelling and handwriting ratings would not be confounded, a separate set of raters rated handwriting changes, with subjects' writing photocopied and any misspelled words whited out. Handwriting changes were rated on a 0–3 scale, with 0 = no handwriting change (excluding the subject from inclusion in the analyses); 1 = perceptible but small handwriting change with childlike characteristics (i.e., larger letters, use of printing); 2 = pronounced handwriting change; 3 = primitive, truly "regressed" writing (e.g., large, poorly formed letters, or block letters, barely legible childlike handwriting). Handwriting was compared to prehypnotic samples based on responses to a demographic questionnaire, and to a posthypnotic questionnaire in which participants were asked to write about their thoughts, feelings, and actions in response to each of the suggestions. Raters were in perfect agreement on 83% of the ratings, and never differed by more than 1 scale point. Raters' scores were summed together.

Table 1. Number of Participants/Condition Correctly and Incorrectly Spelling "Psychological"

	Context			
	Dream		Standard	
	Correct	Incorrect	Correct	Incorrect
Group				
Hypnotizables	18	15	5	16
Simulators	7	16	10	16

RESULTS

There was a moderate-strong relationship between adult-like handwriting and the number of words spelled correctly during age regression for both hypnotizable ($r = .64$, $p < .001$) and simulating ($r = .59$, $p < .001$) participants. None of the hypnotizable ($n = 12$) or simulating participants ($n = 19$), in either the dream or the standard suggestion groups, who evidenced an extreme score on the measure of childlike handwriting, spelled the word "psychological" correctly.

Table 1 depicts the number of participants in the dream versus group context who spelled "psychological" correctly vs. incorrectly. We conducted a backward elimination log-linear analysis to examine whether there was an interaction between context (dream vs. standard) and group (hypnotizable vs. simulating participants) across the dichotomous measure of correct (i.e., trance logic) versus incorrect (i.e., not indicative of trance logic) spelling. The best fitting model was the three-way interaction $G^2 (1) = 4.00$, $p = .046$. To investigate the nature of this significant interaction, we conducted chi-square analyses.

As predicted, chi-square analysis revealed that for hypnotizable participants, there was a greater frequency of correct (i.e., trance logic) spelling of psychological in the dream (54.54%) versus the standard (23.81%) context, whereas there was a higher frequency of incorrect (i.e., no trance logic) spelling in the standard (76.19%) than in the dream (45.45%) context, $X^2 (1) = 4.96$, $p = .047$, two tailed). Moreover, although a greater frequency of hypnotizable participants spelled "psychological" correctly (i.e., trance logic) in the dream (54.54%) versus standard condition (23.81%), there was less variation across the dream (30.43%) and standard (38.46%) conditions for the simulating participants, $X^2(1) = 5.74$, $p = .024$, two tailed). The means and standard deviations of the real and simulating participants in the dream and standard suggestion contexts for the continuous measure are presented in Table 2. Planned comparisons (two-tailed) were performed on the continuous data and indicated that whereas hypnotizable participants in the dream context spelled more words correctly than hypnotizable participants in the standard context, simulators spelling remained stable across suggestion contexts. The t values and significance levels are presented in Table 2. Notably, an analysis of variance (ANOVA) confirmed the presence of a significant interaction between suggestion context and hypnotizable-simulation codition, $F (1,99) = 4.73$, $p = .032$, whereas no significant main effects for suggestion context, $F (1,99) = 1.51$, n.s., or participants (hypnotizable vs. simulator), $F (1,99) < 1$, n.s. were evident.

DISCUSSION

Our study is the first to show that behavior purported to index trance logic is vitiated in participants who exhibit a "complete" or fully childlike response to an age regression suggestion, in terms of handwriting change. Not a single subject who met our most stringent criterion for responding to the age regression suggestion (i.e., primitive, childlike handwriting) spelled the word "psychological" correctly. Furthermore, a moderately high correlation between incomplete responding to the age regression suggestion (adult-like handwriting) and correct spelling was secured. Thus, the participants who evinced the most role consistent response to an age regression suggestion, were in fact the *least* likely to spell "adult" words correctly. That a similar relationship held for simulating participants suggests that spelling words correctly during age regression is incompatible with enacting or experiencing the role of a truly "regressed" subject, and in this sense may reflect demand characteristics.

Our results provided confirmation of the hypothesis that hypnotizable participants would be

Table 2. Means and Standard Deviations of the Measure of "Correct Spelling" (Sum of "Participating," "Psychological," "Experiment")

	Context			
	Dream		Standard	
	M	*SD*	*M*	*SD*
Group				
Hypnotizables	1.91 [a]	1.33	1.05 [b]	1.19
Simulators	1.26 [c]	1.25	1.50 [d]	1.27

Note: *t*-test (2-tailed) comparisons
a versus b: $t (52) = 2.51$, $p = .016$, $d = 0.68$
c versus d: $t (47) = -.66$, n.s., $d = 0.19$
a versus c: $t (54) = 1.84$, n.s., $d = 0.50$
b versus d: $t (45) = -1.26$, n.s., $d = 0.37$

affected by the context in which the age regression suggestion was delivered. When the dream context fostered a melding of fantasy and reality, hypnotizable participants were more likely to spell "adult" words correctly than when the standard suggestion context reinforced a more literal regression to childhood. Simulators' performance remained stable across suggestion contexts, as expected.

Contrary to a number of studies (Perry & Walsh, 1978; Nogrady, McConkey, Laurence, & Perry, 1983; Spanos, et al., 1985), real-simulator differences in correct spelling were not secured—apart from the sensitivity of hypnotizables to the context manipulation—suggesting the possible influence of demand characteristics in shaping the responses of the hypnotizable participants. Whereas research has not consistently found evidence for more "adult" spelling on the part of reals versus simulators (McConkey & Sheehan, 1980; Peters, 1973; Stanley, Lynn, & Nash, 1986), methodological variations might account for disparate findings across studies. For example, McConkey and Sheehan (1980) found that real-simulator differences were pronounced when the experimental procedures cued participants for "logical" (child-like) responses, relative to cues for illogical response (adult-like), when compared to a base condition in which no particular response was communicated as appropriate. The likelihood that we would find real-simulator differences might have been diminished because our methodology most resembled McConkey and Sheehan's "illogical" condition, with relatively strong cues for adult-like spelling.

We might have failed to secure differences between hypnotizable and simulating participants because testing simulators in a group format might have decreased involvement in the task of simulation. Because the hypnotist was not able to clearly observe participants' handwriting during the task, simulators' perception of the hypnotist's ability to penetrate their deceptions might have been compromised relative to simulators tested on an individual basis. Although simulators generally adopt a response set marked by suspicion and caution (Sheehan, 1971; Spanos, 1986; Spanos et al., 1983; Spanos et al., 1985; Stanley et al., 1986) when the presence of the hypnotist looms large in individual testing, the group context may well decrease motivation to simulate and constrain the development of a conservative response set. Accordingly, caution should be exercised in interpreting our findings regarding the lack of real-simulator differences: because we deviated from the standard real-simulator paradigm, our research should be considered exploratory in nature. We further suggest that future researchers incorporate both objective and subjective indications of involvement and absorption, in addition to more objective measures like those used in our study.

Although our research relied on only a single assessment of hypnotizability, we did select highly responsive participants required to pass a visual hallucination suggestion in addition to the suggestions on the hypnotizability scale. In addition, previous trance logic research (Stanley et al., 1986) found no difference in the rates of responses to suggestions that indexed trance logic—including age regression—when individuals were screened for hypnotizability on one or on two occasions, so long as individuals passed the criterion suggestion (e.g., indicated they were 5-years-old following age regression suggestions). In closing, our findings provide preliminary support for the "incomplete responding hypothesis" and the idea that hypnotized participants' seemingly incongruous behavior is explicable in terms of participants' motivated attempts to fulfill the cognitive and contextual requirements of the situation.

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