THE CONTROL OF SURFACE SKIN TEMPERATURE THROUGH HYPNOSIS
AND HYPNOTIC AGE REGRESSION

DISSERTATION

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By

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A total of 60 male and female subjects scoring between 0-5 and 8-12 on the Harvard Group Scale of Hypnotic Susceptibility: Form A underwent hypnosis procedures, hypnosis and age regression procedures to age 10, or were read an article about hypnosis. All subjects then listened to 20 minutes of directed imagery for warming and cooling the hands. Skin temperature was monitored on both index fingers. Dependent measures were the difference between each subject's highest temperature and baseline temperature, the difference between each subject's baseline temperature and lowest temperature, and the latency of change from baseline to highest temperature, and the latency of change from the beginning of cooling imagery to lowest temperature.

Results indicated that the age regression group achieved significantly warmer temperatures than the control group and that the age regression group remained significantly warmer than the two other groups during the cooling imagery. Results also indicated that these skin temperature responses generalized to the nondominant hand.
The data were interpreted as suggesting that those subjects exposed to the age regression procedures may have been more relaxed than the other groups. Another interpretation suggested the cooling imagery may not have been accessing common or pleasant experiences of the subjects.
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THE CONTROL OF SURFACE SKIN TEMPERATURE THROUGH HYPNOSIS AND HYPNOTIC AGE REGRESSION

Hypnosis as a treatment technique and research tool has a long and controversial history in the fields of medicine and psychology. Over the years it has waxed and waned in terms of its popularity with the professional community and the public. Today, 47% of the general APA membership have had some training in hypnosis and overall, psychologists hold favorable attitudes toward hypnosis as a therapeutic strategy and as a research tool (Kraft & Rodolfa, 1982).

The fascinating, yet elusive nature of this topic has resulted in a large volume of literature from many theorists attempting to promulgate the definitive theory underlying hypnosis. Equally voluminous is the literature concerning the uses and misuses of hypnosis as a treatment technique. Despite the massive amount of literature devoted to hypnosis, results from empirical studies have been inconsistent. One area that has a large body of both case report and empirical literature is the use of hypnosis in the control of blood flow. Most of the research in this area is poorly controlled (Sarbin & Slagle, 1979), yet the potential effectiveness of this use in many medical and psychophysiological disorders merits detailed and well controlled observation.
Further, recent research suggests that age regression may be a useful aspect of hypnosis in vascular control. Thus, it would seem highly desirable to examine in a well controlled manner whether there are significant gains in vascular control through the use of hypnosis and age regression.

The following section will examine hypnosis from a theoretical and an applied perspective. First, there will be a review of the literature concerning various representative theories of hypnosis both past and present. This will be followed by an examination of the literature concerning the clinical applications of hypnosis, the use of hypnosis in the control of skin temperature, and recent literature on age regression. This section will terminate with a summary and statement of the hypothesis of this study.

**Early Contributions to Theories of Hypnosis**

While it appears that hypnosis has been practiced in one form or another throughout history, the medical use and scientific research on hypnosis had its beginnings with Franz Mesmer toward the end of the 18th century. Mesmer believed that illness was caused by an imbalance of magnetic fluid in the body and that health could be restored by using magnets to redistribute the fluid (Udolf, 1981). His contribution was not in hypnotic technique, which was quite unwieldy, but in his insistence on a scientific explanation for the demonstrated effects (Shor, 1979).

The Marquis de Puységur was a pupil of Mesmer. It was his work which led to the common misconception that sleep is
an essential aspect of hypnosis. He used verbal suggestions of relaxation and calmness as opposed to Mesmer's nonverbal techniques. This resulted in an artificial somnambulism, or a sleeping trance (Udolf, 1981).

James Braid was the next individual to make significant contributions to the scientific study of hypnosis. Braid, a physician in England in the early to middle 19th century is credited as the first to document his view that the hypnotic subject is the source of the skill essential for hypnosis to occur and not the hypnotist as had been previously thought (Frankel, 1976). He focused on the importance of psychological, rather than physiological processes as the basis for hypnosis (Shor, 1979), and defined the essence of hypnosis as a narrowing of the subject's perceptual field by concentrating on a single idea (Udolf, 1981).

Jean Charcot, a neurologist in the late 19th century saw hypnosis as a neuropathological state related to hysteria. He is historically important for completing the process begun by Braid by making hypnosis acceptable to the medical community (Udolf, 1981). A student of Charcot, Pierre Janet, associated hypnosis and hysteria as Charcot had, but stressed the process of dissociation as underlying hypnosis rather than a neuro-physiological cause (Frankel, 1976).

Toward the end of the 19th century, Hippolyte Bernheim and Ambroise Auguste Liebeault both advanced the belief that hypnosis was the effect of suggestion and that it could be demonstrated in healthy, as well as disturbed individuals.
Modern Theories of Hypnosis

Theories concerning the nature of hypnosis may be categorized on a state-nonstate continuum. State theorists believe that an altered state of consciousness (i.e., the hypnotic trance) is instrumental in eliciting behaviors commonly referred to as hypnotic. These theorists conceptualize hypnosis as a state of increased suggestibility. An example of a non-state theory of hypnosis is that of Theodore Barber (1969).

Barber has done extensive research in the area of hypnosis since the late 1950's. Barber takes a behaviorist's position and disagrees with theorists postulating a special trance state. Rather, Barber suggests that behaviors produced in the typical hypnosis experiment are due to antecedent variables found in a wide variety of interpersonal situations. These include: instruction-suggestion variables, such as the wording and tone of direct suggestions, subject variables, such as his attitudes toward hypnotism and his expectations, experimenter variables, such as his role behavior, and subject-experimenter interpersonal variables (Barber, 1969). Barber's approach is to quantify these variables and examine their relationship to "hypnotic" phenomena through the experimental method. Barber believes that most of the achievements in hypnosis are within the range of normal human capabilities and considers unnecessary the postulate that a hypnotic trance enables one to carry out cognitive processes more proficiently (Frankel, 1976).
Another non-state theorist of hypnosis is Sarbin (1950) who promotes a "role" theory of hypnosis. According to Sarbin, there is nothing that sets hypnosis apart from other psychological phenomena. Sarbin suggests that the hypnotic subject is playing a role defined for him by the instructions and suggestions of the hypnotist. According to this view, success at taking the role depends on the subject's role expectations, perceptions, and role relevant skills as well as his self-role congruence and sensitivity to role demands (Frankel, 1976).

One theorist who takes a special state view of hypnosis is Ronald Shor. Shor (1970) distinguishes between a trance (everyday occurrences such as being absorbed in a task, or when drowsiness leads to sleep), and hypnosis which involves an interaction between a subject and a hypnotist. Shor looks at consciousness as a dynamic process. Consciousness is a mobile frame of reference in the background of attention which interprets and gives meaning to experience. According to Shor, when one is oriented to a small range of preoccupations and the generalized reality orientation fades, one is said to be in a trance. Hypnosis, then, is a "special instance of trance achieved by motivated role taking and directed to a small range of preoccupations by the hypnotist" (Frankel, 1976, p. 36-37).

Ernest Hilgard (1974) has generated a large body of research in support of his neodissociation theory of hypnosis. Hilgard postulates a series of cognitive control systems operating at any one time in a given individual. Hilgard further suggests
that these cognitive subsystems are relatively self-sustaining or "functionally autonomous" once they are activated. These cognitive subsystems are hierarchically arranged so that while one is being acted upon, the others are latent. Hilgard's dynamic theory states that hypnosis effects a change in the executive and monitoring functions of the ego. Hypnosis, in essence, changes the hierarchy of subsystems or splits off a subsystem from it's relationship to other subsystems (Hilgard, 1979). This is the process of dissociation. Hilgard suggests that dissociative phenomena are common and not a consequence of a pathological state. Hilgard also suggests that dissociative experiences occur to different degrees. This last statement places Hilgard somewhere between the nonstate theories like that of Barber and the various state theorists. According to Hilgard's theory, the greater the degree of dissociation experienced by someone, the more likely he is to describe it as a change in consciousness or as a change in mental state.

Milton Erickson was an innovative force in hypnosis and its use in psychotherapy. Erickson tended to be atheoretical and pragmatic in his approach, and thus, never formulated an overall theory of hypnosis (Erickson, Rossi, & Rossi, 1976). Erickson's method of induction and his approach to psychotherapy attempted to move past his client's learned, distorted waking patterns of thought that have caused him to seek treatment in the first place. The circumvention of problematic patterns is accomplished by inductions that use material that is personally relevant to each
client. According to Erickson, the induction leads to a break in the continuity of what the subject is experiencing. The break occurs by disrupting or moving past the habitual conscious patterns that make associative connections between experiences. Once accomplished, Erickson felt the client was open to new experiences and free to "permit the vast reservoir of his unrecognized potentialities to operate" (Erickson et. al., 1976, p. 298).

Erickson supports the state theory of hypnosis. Hypnosis is viewed by Erickson as a highly motivated, inner directed, and focused state of self attention. He explains the differences between his findings and Barber's view of hypnosis as a "waking state" by pointing to the differences in induction methods used in typical hypnosis experiments versus his own methods in therapy. According to Erickson, the typical experimental induction procedure includes many verbal, sensory, and psychodynamic associations common to both trance and waking situations. These common associations bridge the gap between the two states and reduce their discontinuity. Erickson would then agree with evaluations of the typical experimental situations by theorists like Barber who view trance and waking conditions as continuous with no evidence of a special state of trance. It is in the clinical therapeutic setting where material used is personally relevant and meaningful that the differences become apparent (Erickson et. al., 1976).
As the preceding paragraphs would indicate, there have been in the past and there are at present a variety of conflicting theories attempting to explain the phenomenon called "hypnosis." Instead of trying to come to a consensus about the theoretical nature of hypnosis, other research has focused on the question of where hypnosis is more effective than other treatments or in what areas is hypnosis clearly shown to be an effective treatment technique. The literature concerning research on the clinical applications and psychophysiological effects of hypnosis is helpful in addressing the effectiveness of hypnosis.

Clinical Applications of Hypnosis

The clinical use of hypnosis has spread to a wide range of medical, psychophysiological, and psychological disorders. There are conflicting reports in the literature about the efficacy of hypnosis as a treatment for these different disorders. This confusion may be due to a variety of reasons including: a heavy use of single case reports, a focus on symptom removal rather than focusing on basic etiology of the disorder (Frankel, 1976), and wide variation in the actual treatment techniques used in conjunction with hypnosis (Wadden & Anderton, 1982). One distinction that may help clarify the differential effectiveness in the hypnosis literature is dividing the "self-initiated" and "nonvoluntary" disorders. It appears that nonvoluntary disorders are generally treated more successfully with hypnosis than are self-initiated disorders (Wadden &
Anderton, 1982). Self-initiated disorders include obesity and cigarette smoking, while examples of nonvoluntary disorders are pain, warts, and asthma. In a recent review of the literature, Wadden and Anderton (1982) concluded that the available evidence suggests hypnosis does not improve relaxation over other methods, and it neither increases the vividness, nor enhances the control over visual imagery. Other disorders that are commonly treated with hypnosis yet research has failed to support include: obesity, cigarette smoking, and alcoholism. Other research suggests that hypnosis is effective in treating several skin disorders, asthma, and that it may be effective in increasing breast size (Edolf, 1981).

Tremendous attention in the literature has been paid to human physiological responses during hypnosis. Much of this research stems from an attempt to prove the existence of a trance state with definite physiological as well as behavioral and psychological correlates (Barber, 1969). Other research efforts involving hypnosis and the measurement of physiological systems are a result of an attempt to demonstrate the effectiveness of hypnosis in controlling autonomic nervous system activity which is not normally under voluntary control.

Bauer and McCanne (1980) collected data on real and simulating subjects over seven consecutive days and found no significant differences between the two groups in terms of heart rate, electrodermal responding, respiratory rate, frontalis EMG, and occipital EEG activity. The authors interpret their findings
in support of the position that the hypnotic state does not produce unique or specific physiological changes. In an extensive review of the literature, Barber (1961) concludes that there are no physiological changes that occur automatically solely by virtue of being in a state of hypnosis.

Thus, it appears that the highly reliable differences in subjective experience noted for hypnotized and simulating subjects are not paralleled by clear cut differences in autonomic or central nervous system activity (Bauer & McCanne, 1980, p. 160).

One area that has been greatly researched with conflicting results is that of skin temperature control with hypnosis (Sarbin & Slagle, 1979). Besides the obvious potential gains of demonstrating control of blood flow through changing skin temperatures (medical and dental bleeding), there is research suggesting that skin temperature control may be an effective treatment for migraines (Adams, Feuerstein, & Fowler, 1980). Skin temperature research has also been studied for its potential in supporting the special state theory of hypnosis, as well as the efficacy of hypnosis in controlling human physiology.

Hypnotic Regulation of Skin Temperature

There have been many reports in the literature claiming tremendously successful control of blood flow with hypnosis (e.g., Clawson & Swade, 1975). In a review of the literature through 1978, Sarbin and Slagle (1979) conclude that while vaso-constriction and vasodilation with hypnosis have been demonstrated,
"the absence of control studies makes it impossible to determine the effects of symbolic stimulation, role demands, and expectations without hypnosis" (p. 278). A representative review of studies prior to and since 1979 will support this statement and demonstrate that it holds true for research since that date as well.

Frischolz and Tryon (1980) conducted a study to determine the relationship between hypnotizability and the ability to learn thermal biofeedback and control of skin temperature. The authors measured hypnotic susceptibility and compared two groups: feedback and no feedback. Susceptibility measures were based on both the Stanford scale (SHSS) Form C, and the Hypnotic Induction Profile (HIP). Subjects were given a five minute period to attempt raising their finger temperature as much as possible with no feedback. After a five minute relaxation period, subjects were then given 10 minutes to try to raise their finger temperature with feedback.

The authors found no significant relationships between no feedback or feedback skin temperature and either susceptibility scale score. They interpret this to indicate that there is no significant relationship between hypnotizability and the ability to learn thermal biofeedback.

There are a few issues which lead one to question these conclusions. The authors did not report a significant difference between the feedback and no feedback groups. If there was indeed no significant difference between the groups, then
thermal biofeedback as defined in this study was not learned. In order to show that hypnotizability is not related to the ability to learn thermal biofeedback, one must demonstrate the learning in the absence of hypnotizability, or across all levels of hypnotizability. This was not done by Frischhold and Tryon (1980). The question may also be raised of what effect a formal hypnotic induction procedure would have had on the results. If one takes a special state view of hypnosis, then the susceptibility scales simply measure one's ability to enter a state which then may potentiate different behaviors such as skin temperature control. It would seem much more fruitful to measure susceptibility and involve the trance situation.

Many articles cite a study by Roberts, Kewman, and MacDonald (1973) as evidence that hypnosis facilitates control over digital skin temperature. Roberts et al., report that from five to nine individual one hour sessions were required for subjects to produce a significant difference in skin temperature in one hand relative to the other in a direction specified by the experimenter. An examination of the original report reveals several methodological flaws evident in most early reports of significant skin temperature control via hypnosis. The study involves a very small number of subjects (six) and only one group (high susceptibility) was used.

There were no comparison groups involving either low susceptibility or waking controls. The results therefore could
be due to a number of alternative explanations (such as demand characteristics) and the real sources of variance therefore are unclear.

Barabasz and McGeorge (1978) in a study concerning hypnosis and biofeedback reported evidence supporting the efficacy of hypnosis in modifying skin temperature. The study compared the following groups: a group receiving typical biofeedback without autogenic phrases or formal verbal suggestions, a relaxation control group, a false feedback control group, and a group exposed to a "passive hypnotic" induction. The authors note that the induction procedure was considered to be non-authoritarian and the word "hypnosis" was not used with the subjects at any time. The authors report that while there were no significant differences between the first three groups in terms of skin temperature changes, the fourth group (hypnosis) demonstrated a significant change in digital skin temperature.

There are a few methodological considerations in this study which would lead one to question the validity of the authors' conclusions concerning the efficacy of hypnosis in skin temperature control. The authors did not measure hypnotic susceptibility of their subjects prior to the experiment, nor did they measure hypnotic depth after the subjects experienced "hypnosis." In this type of situation, one can not state with any degree of certainty that a state of hypnosis was in fact induced (Wadden & Anderton, 1982).
The authors stress the nonauthoritativeness of their induction procedure and the avoidance of the word hypnosis in an apparent attempt to minimize demand characteristics in their experimental manipulations. They did report using suggestions of a "a deep state of relaxation" (p. 30) and "let it take you deeper and deeper" (p. 31). In any case, there were no control groups which may have clarified the differential effects of hypnosis itself from the demand characteristics of the hypnosis treatment group. The hypnosis group was also given verbal reinforcement for temperature responses in the desired direction for every change of two tenths of a degree fahrenheit. The verbal feedback served the same purpose as any mechanical biofeedback—it gave the subject information concerning physiological responses. This in essence changed the hypnosis group to a hypnosis and biofeedback group.

Crosson (1980) investigated skin temperature control during hypnosis using four different techniques: biofeedback, suggestion and imagery, a combination of biofeedback, suggestion and imagery, and a false feedback control group. These four groups each took part in four experimental sessions during which temperature was measured on the middle finger of the dominant hand and the forehead. A difference score between the two sites was used in the analyses. Prior to the sessions, hypnotic susceptibility of the subjects was rated using the Harvard Group Scale and subjects were classified as high (9-12), medium (6-9), or low (0-5) in susceptibility. Results indicated that only the two groups of subjects receiving biofeedback
demonstrated any evidence of learned control of skin temperature. Suggestion and imagery were not effective means of creating temperature changes. It was further concluded that susceptibility to hypnosis was not significantly correlated with temperature changes in the treatment groups which were effective in demonstrating temperature control.

There were problems with this study which may explain why negative results were found for both the lack of temperature control by the suggestion group and the lack of a significant correlation between susceptibility and temperature control. The author, after dividing subjects into high, medium, and low susceptibility groups, assigned equal numbers of each susceptibility level to each treatment group. Because the groups were not divided by level of susceptibility in the analysis, there could be no determination of the effects of susceptibility on treatment. It may also be asked if all of the subjects were indeed hypnotized. Those people scoring low on susceptibility scales rarely, if ever, respond to direct hypnotic inductions with anything more than simulated hypnotic behavior (Orne, 1979). The study then is comparing the effects of biofeedback, suggestions and imagery—hypnosis, nor susceptibility have anything to do with the results. Also, instead of correlating susceptibility with temperature change individually, the author performed the correlation across experimental groups. As mentioned above, collapsing the different susceptibility levels together in each
group wipes out any significance that may have been due to susceptibility.

Piedmont (1981) attempted to examine the influence of hypnosis on the regulation of peripheral skin temperature when using biofeedback. He added an interesting change in the typical experimental procedure by having subjects lower skin temperature rather than raise it. This was done to both test the theory that hypnosis is nothing more than relaxation and to counteract the typical tendency of peripheral skin temperature to rise during hypnotic inductions. The author concluded that hypnosis in conjunction with thermal regulation techniques exerts a significant influence over physiological responding. He further concluded that the results do not support the hypothesis that hypnosis alone would be sufficient to attain significant changes in skin temperature. Due to the design and several methodological flaws in his study, it is unclear how the author reached this conclusion. There was no experimental group that experienced only hypnosis without biofeedback. Without such a comparison group, it is unclear how he reached this conclusion. Also, the author did not measure susceptibility until after subjects had been assigned to groups. Without controlling susceptibility, and with no reports of susceptibility scores of subjects in the two groups, it is unknown as it was in the Barbasz and McGeorge study if the subjects actually experienced hypnosis or not. All that can be said is that the hypnosis group was read an induction and the control group was not.
It has been suggested (Holroyd, Neuchterlein, & Shapiro, 1982) that there is a positive relationship between hypnotizability and the ability to learn physiological regulation (Andreychuk & Skriver, 1975). Andreychuk and Skriver found that after treatment, high susceptible subjects had a lower headache index (self-report) than low susceptible subjects. Unfortunately, the authors do not report any measures of physiological change in their subjects. Therefore, the physiological regulation was inferred by Holroyd et al. The self-report results may not have been reflected in actual physiological measures. Several authors (Holroyd et al., 1982; Case, Fogel, & Pollack, 1980) have found that high susceptible subjects believe their hypnotic ability facilitated their performance even though no significant differences were demonstrated in the actual physiological measures.

One of the most well controlled studies on hypnotic susceptibility and skin temperature elevation is that of Friedman and Taub (1982). The authors used the real/simulator model and measured finger temperature during three thermal imagery training sessions to see if there was a significant decrease in reported migraine headaches in female patients. The authors cite previous studies which support the hypnotic enhancement of thermal changes and their subsequent effect on migraines, but the authors state that these studies were generally single or multiple case studies with no reporting of temperature measurement. The authors go on to state that "the literature in
general has not offered consistent findings with regard to the relationship of hypnosis to finger temperature elevation in any type of subjects" (p. 179). The results of their study suggested that there was no significant relationship between hypnotic susceptibility and the ability to elevate finger temperature with thermal imagery. An observation of the baseline and trial temperature values in the Friedman and Taub study indicates that generally, finger temperatures were relatively high to begin with (90.0 - 94.4). It may have been unrealistic to expect a significant increase above these baseline values, i.e., a ceiling effect may have been exhibited. One improvement may be to have subjects attempt to demonstrate temperature control by both increasing and decreasing skin temperature.

In summary, results in the literature concerning the control of skin temperature with hypnosis have been conflicting and the literature generally contained poor methodology. Most early reports are the results of single case studies with no controls for demand characteristics of the experimental conditions, susceptibility, or other nonspecific effects. More recent attempts to clarify the relationships between susceptibility, hypnosis, and control of skin temperature were also replete with methodological problems and lack of control groups. Still there is no clear understanding of the relationships mentioned above. It would, therefore, be useful to investigate these relationships with the appropriate controls and methodology to
clarify the relationship between susceptibility, hypnosis and the control of skin temperature.

Age Regression

Udolf (1981) reported two theories generally put forth in the literature attempting to explain the occurrence of age regression phenomena. One theory suggested that during age regression, all experiences subsequent to the suggested period were ablated from the subject's memory and he or she returned to the characteristic patterns of thought and behavior of the age level suggested. The other theory suggested that the age regressed subject engaged in role playing or tried to comply with the experimenter's suggestions by acting out the part.

One area of age regression research has been concerned with comparing subjects' eidetic imagery in the age regressed and non-age regressed states (Walker, Garrett, & Wallace, 1976; Spanos, Ansari, & Stam, 1979). The authors believed the eidetic imagery ability peaks very early in life and drops off with age. Studies reported conflicting results of subjects' improved performances on tasks measuring eidetic imagery following age regression procedures. Other studies (e.g., Raikov, 1980) have noted various physiological responses indicative of early infancy in highly susceptible subjects reportedly regressed to that time in their lives.

The findings in past research on hypnotically induced age regression have been equivocal when group performances were
compared on tasks including: drawings, Rorschach responses, memory, performance on IQ tests, Piagetian tasks, and perceptual tasks (Solomon & Goodman, 1971; Nash, Johnson, & Tipton, 1979). For example Solomon and Goodman compared adult waking Rorschach performances, waking adults remembering performances, simulated hypnotic age regression subjects, and actual hypnotically age regressed subjects on developmental level scores and various Rorschach indices. The authors found no significant differences between groups. Solomon and Goodman interpret their findings as supporting the role playing theory of age regression. As mentioned previously, role playing theory suggested that the subject alters performance purposefully to coincide with his or her conception of behavior appropriate to the suggested age level. Actual cognitive processes remain unaffected and "forgotten" behaviors or events from the past are reproduced no better than in the awake or simulating conditions.

Gard and Kurtz (1979) conducted a study on age regression attempting to rectify the poor control of variables and the methodological problems found in previous studies on the topic. They used the real/simulator model with low susceptible subjects coached to "fool the experimenter" by simulating hypnotic behavior. The authors compared subjects' performances on three tests of cognitive ability: Stanford-Binet, Draw-A-Person, and Bender Gestalt. The tests were administered to all subjects prior to and following hypnotically induced or simulated age regression. It was predicted that hypnosis with age regression
would produce a greater shift toward younger cognitive functioning that would simulated age regression.

Results for each of the three tests indicated that simulating subjects performed cognitively at a younger level than did the hypnotized subjects. Therefore, it was concluded that there was no measureable cognitive difference between subjects attributable to hypnotic age regression. The authors also noted, however, that subsequent subject reports of their experiences while under the age regression condition tended to support the notion that there are temporary alterations in affective states and that hypnosis may vivify certain experiences and behaviors that are more childlike in nature. (p. 275-276).

The hypnotically age regressed subjects reported profound changes in their feelings and memories which simulators did not report.

Fellows and Creamer (1978) used a 2 x 2 factorial design (high/low susceptibility; induction/task motivational instructions) to investigate the roles of hypnosis, hypnotic age regression, and hypnotic induction in producing age regression phenomena. The authors compared the groups' performances on the Goodenough-Harris Drawing Test and a subjective measure of the reality of the experience for the subject. Performances were also compared to age norms of the suggested age and to drawings of some randomly selected children of the same age as that suggested to the age regressed subjects. One finding of the Fellow and Creamer study was that
the subjective ratings of the reality of the age regression for both high and low susceptibility groups were significantly higher in the induction than in the motivation condition. This supports the view that the main factor differentiating hypnotic age regression from non-hypnotic age regression is the subjective experience (p. 169).

Nash, Johnson and Tipton (1979) reported evidence supporting the phenomenon of age regression in the area of affective responding. The authors, working from an object relations model a la Winnicott (1953), compared real subjects (those high in susceptibility) and simulators (those low in susceptibility) on three measures which tapped the use of a transitional object in the two to six year age range. The results supported the authors' hypothesis that the demand characteristics of the hypnotic procedure alone could not produce the responses demonstrated by the age regressed subjects. The authors suggest that the real (hypnotized) subjects in fact experienced a meaningful hypnotic age regression. Among other differences, hypnotized subjects were significantly different from simulators in the intensity of their affective responses. Intensity was measured subjectively by two individuals. An interesting addition would have been to measure this affective intensity on the physiological level.

Summary

Age regression appears to be a valid phenomenon as demonstrated in the areas of affective responding, subjective
feelings and experiencing. Other research suggests that hypnotizability as measured by response to standardized susceptibility scales reaches its peak in the ages from nine to 12 (Morgan & Hilgard, 1973) or the seven to 14 (London & Cooper, 1968) age range. Keeping in mind the findings of Fellows and Creamer (1978) that subjective ratings of the age regression were high in both high and low susceptibility groups, it appears that one way to maximize susceptibility is to age regress subjects to some point between the nine to 14 years age range. The standardized susceptibility scales measure a limited range of the subject's responses to hypnotic suggestion. It seems possible from the literature reviewed that if one is regressed to age nine or 10, responsiveness to hypnotic suggestions may increase. Further, one way this may be exhibited and thus examined empirically is by comparing responses to suggestions aimed at changing digital skin temperature across groups of age regressed and non-age regressed subjects.

Purpose

The purpose of the present study was to replicate previous attempts to examine the interrelationships between susceptibility, hypnosis and the ability to control digital skin temperature. This study also examined the efficacy of age regression in improving skin temperature control. Specifically, it was hypothesized that there would be significant differences between waking subjects, subjects exposed to an hypnotic
induction, and subjects exposed to hypnosis and age regression procedures to age 10 on the dependent measures of skin temperature change and the latency of these changes. It was hypothesized that age regressed subjects would demonstrate significantly greater change in skin temperature than hypnotized subjects who would also show significantly greater change than the control group subjects on the same measure. It was further hypothesized that subjects with high susceptibility to hypnosis would demonstrate greater skin temperature change than subjects low in hypnotic susceptibility, and that high susceptible subjects would demonstrate temperature changes significantly faster than subjects in the low hypnotic susceptible group.

Method

Subjects

A total of 29 males and 31 females between 17 and 48 years of age and registered as students or staff at North Texas State University were used in the present study. Subjects were recruited from undergraduate courses in psychology and by an article advertising the study in the school newspaper. Of these subjects, 30 scoring in the 8 to 12 range, (\(\bar{X} = 9.33\), S.D. = 1.21) and 30 scoring in the 0 to 5 range, (\(\bar{X} = 3.87\), S.D. = 0.97) in hypnotic susceptibility as measured by the Harvard Group Scale of Hypnotic Susceptibility: Form A (HGSIH) constituted the final subject pool. Two subjects (one high susceptible and one low susceptible) were deleted from certain analysis due to missing data.
Materials

Med Associates temperature monitoring equipment (See Appendix A).

Med Associates compatible printer.

Wooden tongue depressor.

Surgical tape.

Cassette player.

Measures

The Harvard Group Scale of Hypnotic Susceptibility (HGS HS) Form A developed by Shor and Orne (1962), was used for group testing of hypnotic susceptibility (McConkey, Sheehan, & Law, 1980). The HG SHS is a 12 item scale which can be administered to groups of unlimited size, and takes approximately 70 minutes to complete. Twelve different behaviors are requested of the subjects as part of a hypnotic induction. Afterwards, the subjects utilize self-report scoring to indicate their performance of the 12 behaviors. Responses to each item are scored either present or absent. For each item the subject indicates performing, one point is received. A score of 0 indicates very low hypnotic susceptibility and a score of 12 indicates very high hypnotic susceptibility.

Bentler and Hilgard (1963) report that the self scoring of the HGS HS:A correlated .83 with independent observers' scoring of the subjects' responses. Bowers (1982) administered the HGS HS:A and a different measure of hypnotic susceptibility—the Stanford Group Scale (SGS HS)—to a group of subjects and found that subject responses to the two scales correlated .71.
Tellegen (1978) reports that the HGSHS:A was administered to a group of subjects who later completed a self-report measure of the depth of the hypnosis they experienced. Scores on the two scales correlated highly (.83). This suggests that the HGSHS:A has utility in measuring one's capacity to experience hypnotic phenomena.

Miller (1980) administered the HGSHS:A to 111 subjects who were also given a behavioral test of non-hypnotic or general suggestibility. Results indicated that scores on the HGSHS:A were positively correlated with performance on the behavioral test of suggestibility.

Thus, it appears that the HGSHS:A is a reliable measure that has utility in measuring suggestibility and, in particular, hypnotic susceptibility.

Another measure used in the present study was the MMPI-168 which is a short form of the standard Minnesota Multiphasic Personality Inventory (Dahlstrom, Welsh, & Dahlstrom, 1975). The MMPI-168 consists of the first 168 items in the standard MMPI, Form R. There are several advantages in using the short form and there appears to be little, if any, loss in reliability over the long form (Overall, Higgins, & DeSchweintz, 1976). Correlations between standard MMPI scores and those from the MMPI-168 for various populations (including college students) have ranged from .77 to .97 (Green, 1980). The test is convenient and quick which adds to its appeal as a screening test for this study. The standard MMPI test booklet and response sheets can be used
and the test can be scored with the standard scoring stencils. Tables are available to transform MMPI-168 raw scores to estimates of the conventional clinical scale scores.

Overall and Gomez-Mont (1974) used a sample of 339 MMPI test records drawn from a wide range of psychiatric and medical patients to compare the results obtained by scoring only the first 168 items (MMPI-168) with the test profile already on record. The authors found that after correcting the MMPI-168 raw scores with regression equations, the simple product moment correlation between the MMPI-168 T-scores and those from the original MMPI were quite high. The correlations ranged from a low of .79 for scale nine (Ma) to a high of .97 for scale one (Hs). The authors conclude that "most of the reliable variance represented in the longer MMPI is also adequately represented in the first 168 items" (p. 318).

Overall, Butcher and Hunter (1975) compared the discriminant validity of the MMPI-168 with that of the standard 373 item short form in their use as general psychiatric screening instruments. The authors used the MMPI records of 431 subjects of various diagnostic categories drawn from state hospital, university hospital, inpatient alcohol treatment unit, and outpatient drug rehabilitation unit populations. A normal comparison group consisted of the MMPI records of 400 college students. Results indicate that the MMPI-168 was as accurate as the standard MMPI in discriminating group membership based on the presence of one or more T-scores above 70. The
contingency coefficient for the MMPI-168 was .47 while that of the standard MMPI was .46. The authors conclude that "the MMPI-168 has the potential for providing just as valid general psychiatric screening results as does the . . . standard MMPI" (p. 399). Thus it appears that the MMPI-168 is a reliable short form of the standard MMPI and that it's utility as a screening device is well-suited for use in the present study.

Finally, a background information questionnaire specifically designed for this study was administered to all participants. This measure consists of questions designed to identify relevant parameters of the group sampled (see Appendix B).

Procedure

Initial Screening. Prior to participation in the experimental procedures, potential subjects took part in an initial screening procedure. At that time, subjects completed the MMPI-168 and the HGSHS:A. Those subjects scoring high (8 and above) or low (5 and below) in susceptibility and deemed acceptable for the study as defined by the absence of T scores above 70 and Scales F and 9 on the MMPI-168 were included in the present study. Subjects were not given any information concerning the nature of the skin temperature task required of them either during the initial screening, or at any other time prior to their participation in the experimental procedures.

Subjects were randomly assigned to either the age regressed, hypnosis, or waking control conditions by an assistant who also scheduled all sessions. The experimenter who interacted
with the subjects was blind as to each subject's susceptibility score.

**Experimental Procedure Common to All Subjects.** When each subject arrived for participation in the study, they were escorted by the experimenter into a room containing an easy chair and the biofeedback equipment. The temperature of this room was kept at a constant 72 degrees farenheit across all subjects. The experimenter seated the subject in an easy chair and gave him the following instructions:

This is a study concerning hypnosis and imagery. In a few moments, I will tape these little devices called thermistors to your index fingers. They will not hurt you in any way. They are simply gauges which will measure the amount of blood flowing through your fingers. That information will be recorded by the machines here. After the gauges are taped to your fingers, I will tape these wooden splints to your hands to keep your index fingers straight and relatively still. Do you have any questions about what I have said up to this point?

When the initial instructions were completed and subject questions were answered, the experimenter taped the thermistors along the thumb side of the most distal section of the index fingers on both the subjects' hands. The thermistors were held in place by porous surgical tape, wrapped at an angle to reduce the possibility of restricting blood flow (Gaarder & Montgomery, 1981). This was done before the subject filled out
the background information questionnaire to allow for a stabilization period during which the subject adjusted to the room temperature and the thermistors adjusted to the subject's skin temperature. Finger position relative to other fingers can artifactually influence skin temperature (Gaarder & Montgomery, 1981). To avoid this artifact, after completing the demographic questionnaire, the subjects' index fingers were taped to splints running from the palm to just above the section of the index finger on which the thermistors were secured. The splints kept the subjects' index fingers straight so that other fingers would not influence the thermistors.

When the thermistors and the splints were secured, and the subject had completed the demographic questionnaire, the subject's hands were placed on the arm rests of the chair. The subject was then given the following instructions:

Please keep your hands in the position I put them in. I also ask that you now find a comfortable position in the chair. In a few moments, you will be listening to a tape recording which will ask you to try to imagine some things --to form some mental images. I ask that you sit quietly and do not say anything unless I specifically ask for a verbal response. If one of your arms happens to move from its original position, I may reach over at some point and return it to its original position. Is all of this clear? Do you have any questions?
When the subject's questions were answered, those subjects preassigned to the hypnosis group were administered an hypnotic induction and deepening procedure. The induction (Appendix C) is a modified version of a direct induction by Kroger (1976). The deepening procedure (Appendix D) is adapted from Nash et. al., (1979).

Subjects in the age regression group were administered the induction and deepening procedure plus procedures for inducing and later removing age regression to age 10 (Appendix E). These procedures are modified versions of those used by Gard and Kurtz (1979).

Subjects in the control group were read a passage about hypnosis of comparable length to the induction and deepening procedures (Appendix F). This passage was used by Piedmont (1981) with his control group to introduce a constance of conditions across experimental groups. The passage (Golemen, 1977) was used for the same purpose in the present study.

When these procedures were completed, the experimenter then established a skin temperature baseline. Temperature readings were automatically recorded every 10 seconds which constituted an average of the subject's skin temperature over those 10 seconds. Baseline was considered achieved when subject's skin temperature did not vary more than .5 degrees farenheit above or below a particular temperature over a two minute period.
When baseline was established, the experimenter said:

Now I am going to start the tape that will have someone ask you to think of some things. Please keep you eyes closed and follow his instructions as you have mine.

The tape that the subjects then listened to contained 20 minutes of directed imagery procedures for warming and cooling the hands. These procedures are modified versions of those used by Friedman and Taub (1982). A transcript of this tape is reproduced in Appendix G.

The subjects were asked to keep their eyes closed from the induction until the debriefing to minimize distractions which may lead to physiological reactions. Eye closure should also facilitate the age regression. As Shor (1979) has pointed out:

Keeping the eyes closed keeps the fantasizing from the kind of interactions with the environment that occur in daily life and retains it instead in a context more akin to dreaming . . . during the time of the age regression experience, the subject must believe in its reality value. He must accept the age regression as a real event as far as his conscious experience of it is concerned. If instead, the age regression fantasy is embedded within a conscious awareness of its unreality, then it is nothing but imaginative make-belive which . . . is not true age regression (p.115).

Temperature readings were taken every 10 seconds during the 10 minutes of warming and 10 minutes of cooling imagery.
At the completion of the directed imagery tape, the experimenter reversed any hypnotic and age regression procedures administered at the beginning of the session. The thermistors and splints were then removed from the subject's hands.

The subject was given a minute to become fully alert and then he was given the following debriefing:

Can you tell me at this time, what the hypothesis of this study is? The purpose of this study is to examine the relationship between hypnotic susceptibility, hypnosis, age regression, and the control of skin temperature. To explore this, a few days ago you took a test measuring your own ability to experience hypnosis. On the day of participation in the study, like today for you, all subjects are randomly assigned to one of three different groups. Some people are administered an hypnotic induction. Others are administered an induction plus instructions for age regression. Still others are read an article about hypnosis which should have no effect on them. As I said, it was already determined by chance prior to your arrival which procedures you would be exposed to. The purpose of the questionnaire you filled out earlier was simply to obtain a description of the sample we are using. The information you gave on the questionnaire and your performance here are strictly confidential--no names will be used in the study. I would very much appreciate it if you do
not discuss this study with your friends and acquaintances since they may take part in the study at a later date. Having prior knowledge about the study may have an effect on how people respond during the experiment and we really need to avoid that. Do you have any questions? Thank you very much for your help and cooperation.

Data Analysis

Skin temperature responses were analyzed by a 3 x 2 factorial design. The first dimension was treatment: hypnosis procedure, hypnosis and age regression procedures, and waking control. The second dimension was susceptibility: high and low. The dependent measures in the present study were: subjects' highest skin temperature during warming imagery subjects' lowest skin temperature during cooling imagery, and latency of change from baseline to highest temperature, and latency of change from beginning of cooling imagery to lowest temperature. In addition, temperature responses were compared across hands to determine if the subjects' responses to the imagery generalized to the nondominant hand. These measures were chosen considering an extensive review of the relevant literature by Simkins (1982). According to Simkins, there appears to be considerable latitude in the dependent measures used in skin temperature research. "in temperature research, the variety of response measures are numerous . . . (and) . . . there is no agreed upon standard for reporting such information (p. 4)."
**Results**

The dependent measures in the present study were: the difference score between each subject's highest temperature during warming imagery and his baseline temperature (highest - baseline = hot temperature), the difference score between each subject's baseline temperature and his lowest temperature achieved during the cooling imagery (baseline - lowest = cold temperature), the latency of change from baseline to highest temperature, and the latency of change from the beginning of cooling imagery to lowest temperature, (hot latency and cold latency respectively). Difference scores were used to control for pretreatment differences across groups due to differences in baseline temperatures. Tables 1 through 4 contain means and standard deviations of baseline, absolute temperatures, difference scores, and response latencies of the sample used in the analyses.

**Table 1**

Means and Standard Deviations for All Subjects Combined

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>86.3600</td>
<td>6.5245</td>
</tr>
<tr>
<td>Hot Temperature (absolute)</td>
<td>88.0067</td>
<td>6.2665</td>
</tr>
<tr>
<td>Cold Temperature (absolute)</td>
<td>85.9150</td>
<td>6.0624</td>
</tr>
<tr>
<td>Hot Temperature (difference)</td>
<td>1.6467</td>
<td>2.3519</td>
</tr>
<tr>
<td>Cold Temperature (difference)</td>
<td>.4450</td>
<td>2.7850</td>
</tr>
<tr>
<td>Hot Latency</td>
<td>333.7931</td>
<td>215.8344</td>
</tr>
<tr>
<td>Cold Latency</td>
<td>316.2069</td>
<td>223.1263</td>
</tr>
</tbody>
</table>
Table 2
Means and Standard Deviations Broken Down by Treatment

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control</th>
<th>Hypnosis</th>
<th>Age Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard Deviation</td>
<td>Mean</td>
</tr>
<tr>
<td>Baseline</td>
<td>85.84</td>
<td>6.57</td>
<td>87.74</td>
</tr>
<tr>
<td>Hot Temp. Absolute</td>
<td>86.81</td>
<td>7.04</td>
<td>88.88</td>
</tr>
<tr>
<td>Cold Temp. Absolute</td>
<td>84.74</td>
<td>6.91</td>
<td>86.34</td>
</tr>
<tr>
<td>Hot Temp. Difference</td>
<td>0.98</td>
<td>0.97</td>
<td>1.14</td>
</tr>
<tr>
<td>Cold Temp. Difference</td>
<td>1.10</td>
<td>1.60</td>
<td>1.41</td>
</tr>
<tr>
<td>Hot Latency</td>
<td>318.50</td>
<td>215.27</td>
<td>264.44</td>
</tr>
<tr>
<td>Cold Latency</td>
<td>281.50</td>
<td>232.72</td>
<td>366.11</td>
</tr>
</tbody>
</table>

Table 3
Means and Standard Deviations Broken Down by Susceptibility

<table>
<thead>
<tr>
<th>Variable</th>
<th>High Mean</th>
<th>High Standard Deviation</th>
<th>Low Mean</th>
<th>Low Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>87.84</td>
<td>5.98</td>
<td>84.88</td>
<td>6.81</td>
</tr>
<tr>
<td>Hot Temp.a</td>
<td>89.34</td>
<td>5.44</td>
<td>86.67</td>
<td>6.82</td>
</tr>
<tr>
<td>Cold Temp.a</td>
<td>87.38</td>
<td>5.48</td>
<td>84.45</td>
<td>6.35</td>
</tr>
<tr>
<td>Hot Temp.b</td>
<td>1.50</td>
<td>1.67</td>
<td>1.79</td>
<td>2.90</td>
</tr>
</tbody>
</table>
Table 3—Continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Susceptibility</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Standard Deviation</td>
<td>Low</td>
</tr>
<tr>
<td>Cold Temp.</td>
<td>.46</td>
<td>2.24</td>
<td>.43</td>
</tr>
<tr>
<td>Hot Latency</td>
<td>364.83</td>
<td>189.22</td>
<td>302.76</td>
</tr>
<tr>
<td>Cold Latency</td>
<td>350.34</td>
<td>227.12</td>
<td>282.07</td>
</tr>
</tbody>
</table>

^a absolute; ^b difference.

Table 4

Means and Standard Deviations of Baseline, Latency, Absolute and Difference Temperatures Broken Down by Treatment and Susceptibility

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Susceptibility</th>
<th>Hypnosis Susceptibility</th>
<th>Age Regression Susceptibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Baseline Mean</td>
<td>87.85</td>
<td>84.01</td>
<td>89.45</td>
</tr>
<tr>
<td>S.D.</td>
<td>5.36</td>
<td>7.25</td>
<td>6.36</td>
</tr>
<tr>
<td>Hot Temp. Absolute Mean</td>
<td>88.15</td>
<td>85.05</td>
<td>90.40</td>
</tr>
<tr>
<td>S.D.</td>
<td>5.44</td>
<td>7.96</td>
<td>6.60</td>
</tr>
<tr>
<td>Cold Temp. Absolute Mean</td>
<td>86.57</td>
<td>83.08</td>
<td>88.41</td>
</tr>
<tr>
<td>S.D.</td>
<td>5.24</td>
<td>7.37</td>
<td>6.30</td>
</tr>
<tr>
<td>Hot Temp. Difference Mean</td>
<td>0.90</td>
<td>1.05</td>
<td>0.95</td>
</tr>
<tr>
<td>S.D.</td>
<td>1.02</td>
<td>0.95</td>
<td>0.91</td>
</tr>
</tbody>
</table>
Table 4—Continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
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<tbody>
<tr>
<td></td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>Susceptibility</td>
</tr>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Cold Temp. Difference</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1.28</td>
</tr>
<tr>
<td>S.D.</td>
<td>1.69</td>
</tr>
<tr>
<td>Hot Latency</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>266.67</td>
</tr>
<tr>
<td>S.D.</td>
<td>196.34</td>
</tr>
<tr>
<td>Cold Latency</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>318.89</td>
</tr>
<tr>
<td>S.D.</td>
<td>215.85</td>
</tr>
</tbody>
</table>

Before examining the data relating to the hypotheses of this study, it was necessary to determine if there were sex differences in subjects' responses to warming and cooling imagery. To examine this, point biserial correlation coefficients between "sex" and the four dependent variables (hot temperature, cold temperature, hot latency, cold latency) were computed. None of the correlation estimates approached significance (Table 5). Therefore the remaining analyses were performed without differentiating along the sex dimension.

One hypothesis of the present study suggested that the age regression group would demonstrate significantly greater change in skin temperature than the hypnosis group which would also demonstrate greater change than the control group. It
was further hypothesized that high susceptible subjects would demonstrate greater change than low susceptible subjects.

Table 5

<table>
<thead>
<tr>
<th>Sex</th>
<th>Correlation</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>by Hot Temp. Difference</td>
<td>.0051</td>
<td>.969</td>
</tr>
<tr>
<td>by Cold Temp. Difference</td>
<td>.0713</td>
<td>.588</td>
</tr>
<tr>
<td>by Hot Latency</td>
<td>-.1257</td>
<td>.347</td>
</tr>
<tr>
<td>by Cold Latency</td>
<td>.0982</td>
<td>.463</td>
</tr>
</tbody>
</table>

In examining the hot temperature difference scores, a significant main effect for treatment was found. The univariate $F (2, 54) = 4.08$ was significant at the $p < .05$ level (Table 6). A Scheffe's post hoc analysis revealed that the age regression group achieved significantly warmer skin temperatures than the control group (Table 7). There were no significant differences between the age regression and hypnosis groups nor between the hypnosis and control groups.

In examining the cold temperature difference scores, again, a significant main effect for treatment was found. The univariate $F (2, 54) = 5.55$ was significant at the $p < .01$ level (Table 8). A Scheffe's post hoc analysis on these scores revealed that the age regression group demonstrated significantly warmer skin temperatures than both the control and the
Table 6

Analysis of Variance: Hot Difference Scores By Treatment by Susceptibility

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>2</td>
<td>42.67020</td>
<td>21.33510</td>
<td>4.0815*</td>
</tr>
<tr>
<td>Susceptibility</td>
<td>1</td>
<td>1.23267</td>
<td>1.23267</td>
<td>.2358</td>
</tr>
<tr>
<td>Susceptibility by</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>2</td>
<td>.17901</td>
<td>.08951</td>
<td>.017</td>
</tr>
<tr>
<td>Within Cells</td>
<td>54</td>
<td>282.26772</td>
<td>5.22718</td>
<td></td>
</tr>
</tbody>
</table>

Table 7

Scheffe's Post Hoc Analysis of Hot Temperature Difference Scores

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Hypnosis</th>
<th>Age Regression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>(.9762)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypnosis</td>
<td>(1.1368)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age Regression</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>(2.8350)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+group means

*p < .05.

hypothesis groups (Table 9). Again, there were no significant differences between the control and hypothesis groups.
Table 8
Analysis of Variance: Cold Temperature Scores by Treatment by Susceptibility

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>2</td>
<td>77.26962</td>
<td>38.63481</td>
<td>5.55020*</td>
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<td>Susceptibility</td>
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<td>.02017</td>
<td>.00290</td>
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<tr>
<td>by Treatment</td>
<td>2</td>
<td>4.42589</td>
<td>2.21294</td>
<td>.3179</td>
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<tr>
<td>Within Cells</td>
<td>54</td>
<td>375.89277</td>
<td>6.96098</td>
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</tr>
</tbody>
</table>

*p < .01.

Table 9
Scheffe's Post Hoc Analysis of Cold Temperature Difference Scores

<table>
<thead>
<tr>
<th>Age</th>
<th>Regression</th>
<th>Hypnosis</th>
<th>Control</th>
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<tbody>
<tr>
<td>Age Regression</td>
<td>(-1.1500)+</td>
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<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.0952)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypnosis</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.4053)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*group means

*p < .05.

The next hypothesis of this study was that there would be a significant difference between groups in the length of time it would take to achieve maximum temperature changes in both warming and cooling directions. Neither hot latency nor cold
latency approached significance for either the treatment or susceptibility dimension (Tables 10 and 11).

Table 10
Analysis of Variance: Hot Latency Intervals by Treatment by Susceptibility

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>2</td>
<td>219383.26109</td>
<td>109691.63054</td>
<td>2.62395</td>
</tr>
<tr>
<td>Susceptibility</td>
<td>1</td>
<td>55862.06897</td>
<td>55862.06897</td>
<td>1.33628</td>
</tr>
<tr>
<td>Susceptibility by</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>2</td>
<td>206259.27810</td>
<td>103129.63905</td>
<td>2.46698</td>
</tr>
<tr>
<td>Within Cells</td>
<td>52</td>
<td>2173810.90909</td>
<td>41804.05594</td>
<td></td>
</tr>
</tbody>
</table>

Table 11
Analysis of Variance: Cold Latency Intervals by Treatment by Susceptibility

<table>
<thead>
<tr>
<th>Source</th>
<th>D.F.</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>2</td>
<td>60357.23433</td>
<td>30178.61716</td>
<td>.58241</td>
</tr>
<tr>
<td>Susceptibility</td>
<td>1</td>
<td>67593.10345</td>
<td>67593.10345</td>
<td>1.30447</td>
</tr>
<tr>
<td>Susceptibility by</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>2</td>
<td>15347.88149</td>
<td>7673.94074</td>
<td>.14810</td>
</tr>
<tr>
<td>Within Cells</td>
<td>52</td>
<td>2173810.90909</td>
<td>41804.05594</td>
<td></td>
</tr>
</tbody>
</table>
There were no significant differences in hot temperature, cold temperature, hot latency, or cold latency for the susceptibility dimension, nor the interaction of susceptibility and treatment (Tables 6, 8, 10, and 11).

The observation that differences existed between groups in baseline temperature lead to the correlation of baseline temperature with susceptibility scores. The Pearson Product Moment correlation (.23) was significant ($p < .05$). This indicated that higher susceptibility scores were predictive of higher baseline temperatures.

Temperature responses on the dominant and nondominant hands were divergent at baseline. During the imagery, these initial differences lessened and temperature responses on the two hands converged. An analysis of temperature responses across hands revealed this significant hand by trials interaction. This suggests that even though at baseline there was a systematic difference according to the hand used (dominant or nondominant), this difference was not statistically consistent or even apparent after training had been given (Wilks Lambda = .778, averaged $F = 3.547$, $p < .05$).

**Discussion**

The present study was an attempt to clarify reports in the literature concerning the relationship between hypnotic susceptibility, hypnosis, and skin temperature regulation. This was done by clearing up several methodological flaws in previous studies in an attempt to gain clearer
interpretation of the results. In addition, this study was an attempt to determine if age regression facilitates skin temperature regulation.

The present study added several improvements over previous attempts to assess the hypnotic regulation of skin temperature. Most previous reports in this area used single case studies or relatively small samples. The present study used a larger sample size ($N = 60$). In addition, many previous studies concerning hypnosis and skin temperature control failed to measure hypnotic susceptibility, or used only high susceptible subjects. The present study measured susceptibility prior to the experimental procedures and used both high and low susceptible subjects. Two no-treatment control groups (high and low susceptibility) were also added to strengthen the design. The control groups were read an article about hypnosis to control for time with experimenter and subject matter. The addition of the control groups made possible the comparison of the effects of the guided imagery with and without the hypnosis and age regression. Demand characteristics were further controlled by using high and low susceptible subjects. Low susceptible subjects rarely if ever respond to hypnotic procedures with anything more than simulated behavior (as stated previously). Any responses by the low susceptible subjects may therefore be looked upon as responses to the demand characteristics of their treatment group. The present study also attempted to avoid skin temperature ceiling effects by asking subjects to both
raise and lower their skin temperature. It was hoped that this last point might also distinguish between the effects of suggestion and the effects of relaxation which typically leads to an elevation in peripheral skin temperature.

The real/simulator model has come under recent attack for confounding hypnotic susceptibility and instructions given to subjects. In order to avoid this confound, the real/simulator model was not used in the present study. Low susceptible subjects were given the same instructions as the high susceptible subjects to avoid the problem of confounding susceptibility and instructions. Results of the present study indicate that the subjects undergoing age regression procedures to age 10 exhibited significantly higher skin temperatures in response to warming imagery than the control group. This tendency continued throughout the cooling imagery as well, with the age regression group remaining significantly warmer than both the hypnosis and control groups. Results also indicated that these skin temperature responses were not specific to the dominant hand as the imagery had directed. Instead responses also generalized to the nondominant hand.

The findings of this study indicated that susceptibility to hypnosis had nothing to do with physiological responses to imagery. It is interesting to note that susceptibility was a predictor of baseline temperatures. Low susceptible subjects had lower baseline temperatures than high susceptible subjects. This suggests that low susceptible subjects may have entered
the experimental situation with more apprehensions and higher anxiety than the high susceptible group. However, in response to the treatment suggestions there were no significant differences between high and low susceptible subjects in response to both warming and cooling directions. It appears that suggestions given in an hypnotic context indirectly controlled temperature responses by increasing relaxation.

Standard susceptibility scales such as the one in the present study have been used to predict the extent of one's response to hypnotic suggestion. It has generally been assumed that high susceptible subjects will demonstrate greater responsiveness to a suggestion than low susceptible subjects. If these assumptions are accurate then the results of this study indicated that suggestions given in an hypnotic context do not have an effect on temperature responses.

The data from this study suggest that the age regression group might have been more relaxed than the other group. The state of relaxation may have been strengthened by the ensuing warming imagery. Imagery involving warmth is typically used to induce a state of relaxation. In contrast, cold pressors are commonly used in experiments to induce psychophysiological stress. While this was not measured, it may be that the cooling imagery with its repetition of "cold, icy water" and "colder and colder" lead to a decrease in relaxation due to its similarity to this typically stressful situation. It is possible that the age regression group then was in a deep
enough state of relaxation not to be affected by the cooling imagery whereas the hypnosis group's relaxation may not have been so strong. This resulted in a slight decrease in the hypnosis group's skin temperature while the age regression group remained warm. However, this interpretation is highly speculative.

The results of this study have implications for the use of hypnosis and age regression procedures in situations where raising skin temperature is important. Recent research suggests that vasoconstriction is a major component of the sickling crisis in sickle cell anemia. Procedures resulting in vasodilation have been found effective in reducing both the frequency and the intensity of pain associated with the disease (Zeltzer, Dash & Holland, 1979). Perhaps hypnosis combined with age regression may facilitate vasodilation thereby leading to relief from pain for those suffering from sickle cell anemia.

Raynaud's disease is a disorder in which blood vessels of the hands or feet spasm causing decreased blood flow. If untreated, repeated attacks can lead to gangrenous ulcers and severe pain. While vasodilating drugs are sometimes useful, they provide at best only temporary relief of symptoms (Miller & Keane, 1972). Biofeedback has also been proven useful in the treatment of Raynaud's disease. Future research combining hypnosis with age regression may lead to findings of significant increases in warmth of the afflicted limbs. This, in turn, may effectively reduce pain and the risk of further damage to the limb.
There are weaknesses in the present study which should be addressed. This was an analogue study and thus, one cannot equate the motivational levels of the subjects in this study with that of real patients whose health or relief from pain may depend on their ability to respond to the imagery. Also, the presentation of warming and cooling imagery was not counterbalanced across subjects. All subjects were presented first the warming imagery and then the cooling imagery. This might partially explain the lack of findings for the cooling imagery.

Because of the previously mentioned potential stressfulness or discomfort associated with the cooling imagery, subjects may have been reluctant to engage fully in the cooling imagery. Thus, another improvement over the present study may be to embed cooling imagery in a pleasant context to reduce subjects' reluctance to engage fully in the imaging process. While a majority of the subjects were likely to have experienced some variation of the beach scene used in the present study, it is less likely that they have had direct experience with cold pressors. Imagery representing events which have been experienced by those participating in the experiment may seem more real to the subjects and thus lead to significant skin temperature responses. Thus, one more improvement may be to use different, more well known imagery for lowering skin temperature.
Further research is needed to determine if the temperature increases demonstrated in the present study can be replicated in actual clinical populations leading to significant improvements in conditions such as Raynaud's disease and sickle cell anemia. Research is also needed comparing temperature responses and levels of relaxation achieved through the age regression procedure used in the present study and standard relaxation training procedures. In addition, future research efforts could possibly benefit by controlling for demand characteristics inherent in the age regression procedures by including comparison groups regressed or progressed to different ages. Further research should also be aimed at determining if the skin temperature increases can be demonstrated in body parts other than the hand.

In summary, the findings of this study indicated that subjects undergoing an hypnosis procedure plus age regression procedures to age 10 achieved significantly warmer skin temperatures than the control group. Further, the age regression group remained significantly warmer than both groups during the cooling imagery, and these temperature responses generalized to the nondominant hand. It also appears that these results might have been due to relaxation associated with the hypnosis and age regression procedures.
Appendix A

Med Associates Components Used to Measure Surface Skin Temperature

ANL 410 - Temperature Signal Conditioner Module
ANL 940 - Analog to Digital Converter
ANL 141 - ECC Filter
ANL 300 - Threshold Comparator
DIG 210 - Precision Crystal Controlled Time Base
DIG 150 - One Shot
Logic 1 ANL 810 - Printer
Appendix B

Background Information Questionnaire

1. Age: _____ Sex: Male_____ Female____

2. Marital Status: single_____ separated_____ married_____ divorced_____

3. Classification: Freshman_____ Junior_____

Sophomore_____ Senior_____

Race: black_____ mexican-american_____

white_____ other (specify)_____

4. College Major:______________________________________________

5. Grade Point Average:________________________________________

6. Occupational Plans upon graduation:____________________________

7. What sort of sports do you enjoy participating in?____

8. Hobbies:____________________________________________________

9. Father's occupation:________________________________________

10. Mother's occupation:________________________________________

11. Father's educational level:___________________________________

12. Mother's educational level:___________________________________

13. Where are you from? (indicate city and state):_____

14. What would you estimate the population of your home town to be:

    under fifty thousand_____ over fifty thousand_____

Appendix C

Direct Induction Text

First I want you to look at a fixed spot. Choose one on the wall or ceiling and keep staring at it. As you keep staring at it, the first sensation that you will learn how to control is that of HEAVINESS. Your lids are getting VERY, VERY, HEAVEY. Getting HEAVIER and HEAVIER. Your eyes are beginning to blink (if eyes blink or subject swallows, say "See, you just blinked" or swallowed, as appropriate). Your eyes just blinked and you just swallowed, that is a good sign that you are going deeper and deeper relaxed. And now at the count of three if you REALLY wish to gain skill with hypnosis, you will gently control the closing of your lids, not because you have to but because you really want to. Don't close your lids too rapidly, but close them gently at the count of three. One, your eyes are closing, two lids are closing TIGHTER and TIGHTER together three, lids closed (if eyes don't close say, "Let your eyes close now"). And I really want you to feel that TIGHTNESS, good, this is still another sensation that you are gaining control over.

Now let your eyeballs roll up into the back of your head. Now let the eyeballs roll back down into their normal position. And as they return to their normal position you will notice that your lids are STUCK even TIGHTER and TIGHTER together.

Now I'd like to have you imagine that your entire body from your head to your toes is becoming very, very relaxed.
However, your body will not relax just because you tell it to do so. Rather, it will only relax if you pair this suggestion with the memory which once produced the desired response. Perhaps it would be nice if you would imagine yourself relaxing on a beach and listening to the waves roll in, one after another. You are relaxing DEEPER and DEEPER. And the more vividly that you can see ALL the typical sights and hear the waves of your particular beach the deeper relaxed you will go. And the more vividly that you can see yourself on that pleasant, relaxing beach, the deeper relaxed you will go. And the more vividly that you hear the peaceful and relaxing waves down at the shore the deeper relaxed you will go. You are doing fine, just fine. Your breathing is getting slower, deeper, more regular . . . slower, deeper and more regular.

Now if you REALLY wish to go deeper, and gain more mastery over yourself so that YOU can gain other skills that you wish to enjoy, you will first learn how to raise your arm in a controlled fashion. Listen very carefully for the following instructions. Carry these out to the best of your ability. The better you control the raising of your (nondominant) arm the better you will be able to control other areas of your life. Raise it in the following fashion. Here are the instructions for the raising of your arm. Listen carefully for the instructions. Raise your (nondominant) arm about two or three inches at a time and then pause 20 or 30 seconds. During this pause, perhaps you might be willing to suggest
that as your arm lifts higher and higher; with each cogwheel-like movement it will get lighter and lighter—another sensation that you are controlling. And the lighter your arms gets as it rises, the deeper relaxed you will go. You will raise your arm at the count of three, not because you have to put because you really want to! Now do not raise it too rapidly . . . 1 . . . 2 . . . 3, slowly the arm is lifting, lifting, lifting, and as it lifts higher and higher with each movement notice how your arm is getting lighter and lighter. And as the arm gets lighter and lighter notice how your state of relaxation is getting deeper and deeper. You are doing fine.

Your breathing is getting slower, deeper, more regular. (At this point the arm is allowed to slowly rise. Occasionally say such things as: "lighter and lighter" and when the arm lifts, "that's right," and "higher and higher.")

As your arm is now approaching a straight, vertical, perpendicular position you will notice that you can develop still another sensation, that of STIFFNESS. Your arm is now lifting higher and higher to where your fingers, hand, forearm, and arm are all stretched straight toward the ceiling. Paradoxically, you will notice that the STIFFER your arm gets from the fingers to the hand, to the wrist, to the elbow, to the shoulder, the DEEPER RELAXED you will go.

Your arm is now stiff, very rigid, like a bar of steel from the fingertips down to the elbow to the shoulder. Notice the stiffness of your outstretched arm. You are doing fine.
Now, if you wish to control other sensations and gain still more mastery over your life, listen very carefully to the following suggestions. At the count of three you will slowly, ever so slowly, about an inch or two at a time allow your arm to fall to your side and with each two inches or so that it falls, your arm will become as limp as a wet noodle. It will become limper and limper as it slowly drops to your side. Is it not surprising how many sensations that you are gaining control over? Also, is it not remarkable how many sensations are built into your body? One . . . Two . . . Three. Now don't let the arm drop too rapidly. Allow it to drop VERY, VERY SLOWLY. And with each motion that your arm moves downward, perhaps, you might be willing to suggest to yourself that when your arm returns to your side or touches any part of your body, that will be a cue or signal for every MUSCLE and every FIBER in your body to develop complete relaxation. Now as your arm is about to reach your side or touch the chair, perhaps you could allow that to be a cue for every muscle in your body to relax completely.

Now you are in a very deep state of relaxation and I am going to give you several suggestions for terminating it. One route you will be able to control. The other route will be one that we can use here to help you gain the skills that you are seeking, provided that you give your permission. Whenever you are here to work with us, and it is appropriate, when one of us touches your right shoulder and says the word "relax," you will
promptly close your eyes, let your eyeballs roll up into the back of your head to prevent yourself from falling asleep. As you know, for many individuals lid closure can trigger the onset of sleep. We want to trigger the onset of super-alertness! Next you will let your eyeballs roll back down into their normal position and you will quickly drop into a deep state of relaxation.

Now as I count from one to five, I want you to become more awake. When I say the number five, you will open your eyes feeling wonderfully refreshed, alert, and wide-awake. 1 . . . waking up slowly . . . 2 becoming more aware of the environment . . . 3 feeling the circulation in your hands and feet, arms and legs . . . 4 almost awake, feeling refreshed . . . and 5, eyes open, wide awake and alert.
Appendix D

Spiral Staircase Deepening Procedure

Now I want you to imagine that you are standing on the top step of a beautiful spiral staircase. Picture this large, winding staircase in your mind. It is a large spiral staircase, just like one you might see in a large castle or a mansion, and you are standing on the very top step. In a moment, I am going to be quiet for a little bit. At that time, I want you to imagine walking slowly down the staircase, becoming much more hypnotized with every step. You will become much more deeply hypnotized with every step that you imagine taking down the staircase. Now, walk slowly down the stairs, and drift deeper and deeper into hypnosis with every step. You will sink deeper and deeper with every step (allow one minute).
Appendix E

Experimental Procedure for Age Regression

Age Regression Induction

Everybody knows that clocks can go forward, to register the passing of time, or backward, to indicate time going into the past. Sometimes, in the movies, pages are taken from a calendar, or clocks run backwards, to indicate the passing of time into the past. That's how it is with "outside" time—time you can't see. Everyone has a kind of biological clock that can really go forward or backward; that can really take you into the past. You can feel that inside clock, even without being quite aware of it, and we can turn it backward just by counting. Later, we can turn it back to the present just as easily.

In a little while, I am going to start counting from (subject's age) back to ten. As I count, the biological clock will start to run backwards and you can allow yourself to become smaller and smaller, and younger and younger, so that when I reach ten, you can be ten years old. With each count, you'll disregard all memory of the year number, so when we reach ten, you can allow yourself to think of nothing that has happened to you after age ten. That's the way the biological clock works. When we reach ten, you can really be ten. You can move, act and think ten years old; and you won't have to think of being any other age. No matter what you do, you can respond as a ten year old. When we reach ten, you will
recognize any voices you hear as voices of people you know and like. I want you to keep your eyes closed the whole time—as we count down to ten, the whole time you are ten years old and doing what is asked of you and while we count back up to your present age. During this whole time, there will be no need for you to open your eyes, so keep them closed but continue to pay attention to what is said to you the whole time.

Now, I'll start counting from (subject's age) to ten; when I reach ten you will be ten years old.

The experimenter will then start counting backwards slowly from the subject's age down to ten. The counting will be enhanced by interspersed suggested that the subject is becoming "younger and younger," "smaller and smaller."

Age Regression Removal

Now is the time to turn your inside biological clock forward instead of backward as we did before. When I start counting the biological clock will start to run forward and you can allow yourself to get bigger and bigger, older and older so that when I reach (subject's age) you will be (subject's age) years old. With each count, you will regain the memories that you disregarded as we counted backward earlier, so that when we reach (subject's age) you will know and remember everything that you knew and remembered when you first sat down in this chair today. You will also be able to remember everything that you did and were told to imagine while you were sitting here today. Now, I'll start counting from ten to (subject's age).
When I reach (subject's age) you will be (subject's age) with all the memories of what has happened to you.

The experimenter will then start counting forward slowly from ten up to the subject's age. The counting will be enhanced by interspersed suggestions that the subject is becoming "older and older," "bigger and bigger."
Appendix F

Passage Read to Control Groups

Hypnosis was once looked upon as a kind of parlor stunt, or worse, as a devil's devise to control men's minds. It is now solidly allied with psychiatry and medicine, and is steadily proving its usefulness as a clinical tool against pain, fear, and a host of physical disorders. The American Society of Clinical Hypnosis was founded in 1957 by a group of 20 professionals; within a year it had 1,060 members, a figure that has grown to 2,600 today. Yet scientists still cannot agree on what hypnosis is, or whether there is any such thing at all.

The fact is there is not objective way of identifying or measuring the hypnotic trance, although a skilled clinician can recognize one. A subject under hypnosis may or may not exhibit alteration in brain waves, eye movements, pulse or breath rate, or galvanic skin response depending on the hypnotist's suggestions and the subject's susceptibility.

People who are hypnotized for the first time are frequently disappointed to find that they experience nothing overwhelming. They feel mildly relaxed but they remain in touch with reality and in control of their thoughts. They may discover that the hypnotist's suggestions are quite resistible.

Contrary to what most people believe, a person under hypnosis need not fall asleep nor lose contact with his surroundings nor relinquish his will. He is often able to recall
everything that happened during a trance and willprobably
act perfectly normal. Indeed some people say that any
response elicited hypnotically could be achieved through
other means. Theodore Barber, a former stage hypnotist who
holds a Ph.D. in psychology, says that the famous theatrical
trick wherein the hypnotist enables his subject to lie rigid
with his head on one chair and his ankles on another is a
hoax. We assume that without hypnosis such a feat is impos-
sible, but Barber has had unhypnotized people do the same
thing.

But other experts dispute Barber, arguing there is such
a state as hypnotic trance, and hypnosis does work therapeuti-
cally. The fact that the state can’t be measured or identified
may simply mean that we have not found how to do this, not that
the state does not exist. Hypnosis as studied in laboratories
may be different from what occurs between patient and therapist.
In experimental studies, the researcher must use a standard
means of trance induction with every person. The trance induc-
tion instruction is often on tape; the hypnosit may never see
his subject.

The clinical hypnotist is under no such constraints. Like
an artist who is free to follow his creative urge, the clinical
hypnotist can use whatever method is most effective, and he can
work with the same person repeatedly until the patient experi-
ences a radical difference between trance and waking.
A hypnotic trance is undoubtedly an extension of common states of mind. We all undergo "everyday trance" from time to time, when we are deeply absorbed in reverie or preoccupied with what we are doing. In these moments we are fully focused, oblivious to what happens around us. The football fan watching the superbowl on TV, for example, is fully alert to the game, but unaware of his body sitting in the chair or his wife calling him to dinner.

The ability to be absorbed in this way is called "response attentiveness;" it marks one as a good candidate for hypnosis. A state hypnotist looks for signs of this full attentiveness as he surveys his audience for subjects. When a patient in therapy quiets down, concentrates, and responds readily, the therapist knows that he has become attentive, and ready to begin hypnosis.

Even among those who agree trance exists, there is little agreement on what exactly goes on during hypnosis. Some say it is a unique psychological state; others claim it is mere role playing, perhaps regression to childhood with the hypnotist as the parent. Another theory calls it a case of dissociation, with certain psychological functions going on autonomously, out of conscious control. Yet no one theory can explain everything that happens in hypnosis. The essence of the state eludes us. The fact remains that the best hypnotists are more like artists than technicians.

No wonder, then, that the roots of clinical hypnosis are obscure, probably more closely tied to religion and magic than
to science. It may be that the miraculous cures accomplished by the priests of Egypt and Greece were accomplished hypnotically. The power to heal by suggestion, or by "laying on of the hands," was generally ascribed to divine intervention until the 17th century when Athanasius Kircher, a German scholar came up with the idea that a natural force called "animal magnetism" was at work.

In the next century a physician practicing in Vienna took the idea of animal magnetism and turned himself into a household word. Franz Mesmer believed that sickness and health were controlled by the balance of a universal, invisible fluid in the human body and that when illness occurred, this fluid could be returned to proper harmonious functioning by the use of magnets. With his magnets, Mesmer cured many patients of a variety of complaints. Strangely enough, they would usually go into convulsions during treatment, which Mesmer took as a sign that the magnetism was working. His explanation for his failures was that some people had a mysterious force in their bodies that defied his magnets.

Mesmer's real contribution to hypnosis was that he learned how to induce trance, but his outlandish claims for this power caused the medical profession to drive him out of Vienna. He arrived in Paris in the period of the French Revolution and set up a clinic that became all the rage among the wealthy. He presided over his healing sessions wearing a long silk robe and wielding an iron wand, which he claimed would cure practically anything. Some "mesmerists" were practicing all over France.
The French medical establishment was as quick to cry fraud as their Austrian counterparts had been. In 1784 a government committee, one of whose members was Benjamin Franklin, American Ambassador to France, pronounced Mesmer's cures to be figments of his patients' imaginations. The proof was simple. A patient could be induced to have the usual mesmeric convulsion even when he had not been magnetized. On the other hand, patients who knew nothing of magnetism in advance never did go into convulsions.

Another charge against Mesmer was that he used his arts to seduce women. The notion that the hypnotist is likely to be a dirty old man has lingered in the popular imagination.

In the early 19th century, the Marquis de Pusegur, one of Mesmer's followers, made an advance in hypnotic technique when he found that he could induce trance without causing the convulsions that Mesmer had taken to be necessary. But he still stuck by the vital fluids theory to explain whatever cures he managed to produce. By this time, there were mesmerists all over Europe, some of them respectable physicians, some of them quacks who made wild claims for the powers of animal magnetism. In 1837, a commission of the French Academy of Medicine dealt mesmerism a blow by proclaiming that there was no such thing as animal magnetism, and that any cures effected by mesmerism were brought about entirely by suggestion. Hypnotism fell into disrepute in medical circles. In 1864 a London physician named John Elliotson was dismissed from his
position at London's University College Hospital merely for proposing to make animal magnetism the subject of his annual oration at the University.

At about the same time, another English physician, James Braid, was experimenting with animal magnetism on his own. He decided it was a psychological effect, not a physical phenomenon as Mesmer had thought. He coined the word "hypnosis," from the Greek root meaning "to put to sleep," Braid was the first to make a credible case for hypnosis and its use in surgery. Hypnosis might well have gained wide use as an anesthetic, but chloroform, then coming into general use, was more reliable. The spiritualists of the day quickly took up hypnosis, and the art fell again into disgrace among scientists.

But this did not keep Jean Charcot, the famous French neurologist, from trying out hypnosis with some of his patients, and Charcot's work came to the attention of a young Viennese physician named Sigmund Freud. An early colleague of Freud's, Joseph Breuer, used hypnosis to treat hysterical paralysis and it was Breuer's work that inspired Freud to try it. Unable at one point to hypnotize one of his patients, Freud simply placed his hand on her head and asked her to repeat whatever came into her mind. In this way, without hypnosis, Freud was able to get at the critical early trauma that was causing her depression, and the technique of free association was born.

But Freud was more interested in other methods for getting at repressed memories. Hypnosis never became a common tool of
the psychoanalytic movement. Few psychiatrists learned to practice it, and hardly anyone was willing to defend it. Psychiatric textbooks mentioned it only as a quaint relic from the unscientific past.

Yet hypnosis has survived, and the reason is that it works—not always, not with everyone, not with everything, but well enough to make it live on. When the hospitals during World War I were flooded with shell shocked, psychological ravaged men, a pragmatic style of hypnosis came into being that was successfully used to treat muscle spasms, paralysis, and amnesia. During World War II hypnotism became a standard treatment for victims of battlefield neuroses, especially when a short term treatment was needed.

Not until long after the war, however, did hypnosis gain real credence among therapists, doctors, and dentists. There are now two professional groups for hypnotists: the American Society for Clinical Hypnosis, mentioned earlier, and the Society for Clinical and Experimental Hypnosis. In 1956, the American Medical Association pronounced that hypnosis was "valuable as a therapeutic adjunct," which meant hypnosis had finally arrived as a reputable tool of medical science.

But what is it good for, and who needs it? And who can and cannot profit from it? One of the chief uses of hypnosis today is as a painkiller. Major surgery, including even leg amputations, has been performed under hypnosis, though this is hardly common practice.
Hypnosis is more likely to be used in situations such as childbirth where the pain arises chiefly from fear and other psychological causes. Hypnosis has also proven useful in dentistry, particularly for patients who are terrified at the mere sight or sound of a dental drill.

Even severe and chronic physical pain will often respond to hypnosis. Patients with slipped disks, cancer, or arthritis may find that anesthetics are useless and may not wish to risk narcotic addiction or face neurosurgery to kill the pain. Hypnosis offers a cheap, nonaddictive, safe alternative. For example, it is used with more than half the patients at the Walter Reed Army Medical Center pain clinic. Among the other hospitals that offer hypnosis as one of their pain treatments are Columbia Presbyterian in New York, and the medical schools at Harvard, Stanford, and NYU.

Hypnosis will rarely cure the malady that is causing the pain. What it does is to alter the patient's perceptions of the pain. Pain is really two kinds of signals that blend into one: the physical sensation registered by the brain, and the psychological reaction to the sensation. Anxiety can serve to exaggerate pain, and hypnosis can be effective in reducing anxiety, or even in raising the pain threshold. Thus, hypnosis can be helpful with any ailment where tensions and anxiety are factors: allergies, hypertension, colitis, eczema, impotence, frigidity, asthma, migraine, insomnia, obesity, menstrual problems, and fatigue, to name but a few.
Hypnosis probably has its greatest success as a tool in psychotherapy. Many traditionally minded therapists will never consider using it, but others have made it part of their analytic technique. Lewis Wolberg, a New York analyst and author of several books on hypnosis, reports that it can help bypass some of the common blocks to psychoanalysis. For example, when a patient is unable to free associate, hypnosis can give him access to his unconscious.

Many kinds of therapists besides analysts are finding that hypnosis is an excellent tool for relieving psychological symptoms—an appealing advantage for short term patients. Behavior therapists, for example, may use hypnosis to relax their patients. Hypnosis alone, however, is seldom enough.

Hypnosis is usually used only in conjunction with other kinds of therapy, the mix in each case depending on the training of the therapist and the needs of the patient.

As to who can and cannot be hypnotized, three traits mark one as a potentially good hypnotic subject: the ability to focus attention and to concentrate, an openness to new experience, and a willingness to comply with suggestions. In one test of hypnotizability, the hypnotist may suggest that your arm is about to rise slowly; in another he may ask you to roll your eyeballs up as if looking at the middle of your forehead. Supposedly the more white that shows, the more receptive you are to hypnosis. A researcher at Stanford, Josephine Hilgard, believes that the best hypnotic subjects are those who have a
rich inner life. They often have had imaginary companions in childhood, enjoy reading, and are able to immerse themselves in whatever they are doing.

One very objective measure of hypnotizability was discovered only recently, and is still under debate. People with a high proportion of alpha waves (the slow brain waves characteristic of restful alertness) in their normal waking state seem to be good hypnotic subjects. Training in disciplines like meditation or acting can also help, since they increase concentration and receptiveness. Oddly enough, being hypnotized, even several times, does not in itself increase one's hypnotizability at all.

After 200 years of use, we still cannot say with certainty what hypnosis is nor exactly how it works. But somehow it does. Hypnosis has been redeemed from its ill repute of a century ago, and is here to stay.
Appendix G

Transcript of Imagery Tape - Warming and Cooling Imagery

As you sit there, quiet and still, with your eyes closed, allow yourself to imagine that you are placing your writing hand into a bowl of warm, steaming water, and experiencing a deep penetrating warmth in your hand and fingers. Picture the water, and the steam rising up from it, and experience the warmth, as it spreads from the water, into your hand and fingers. Continue to allow that warmth, from the water, to spread throughout your fingers, making them warmer and warmer...

One of the following every 10 seconds for a total of 10 minutes: "warmer and warmer..." "feeling the warmth..." "warm steaming water..." "warmth spreading throughout your fingers and hand." At the beginning of 11th minute:

Now, as you continue to sit there, quiet and still, with your eyes closed, allow yourself to imagine that you are taking your writing hand out of the bowl of warm water, and placing it into another bowl there beside the first. And as you are placing your hand into this bowl of cold, icy water, allow yourself to experience a deep, penetrating chill, in your hand, and in your fingers. Picturing the water and the pieces of ice floating in the water, and experiencing the deep chilling coldness, that spreads from the water, into your hand. Continue to allow the coldness from the ice water, to spread throughout your writing hand and fingers, making them colder and colder...
One of the following every 10 seconds for a total of 10 minutes: "colder and colder . . .;" "feeling the coldness . . .;" "cold icy water;" "coldness spreading throughout your fingers and hand." At the beginning of 21st minute:

Now, imagine that you are taking your writing hand out of the water, and now your hand is not in either bowl of water. Both of the bowls are gone now, and your fingers and hand, can now return to a comfortable temperature, one that feels good to you.
References


Friedman, H., & Taub, H. An evaluation of hypnotic susceptibility and peripheral temperature elevation in the treatment


Hilgard, E. R. Toward a neodissociation theory: Multiple cognitive controls in human functioning. Perspectives in Biological Medicine, 1974, 17, 301-316.


Sarbin, T. R. Contributions to role taking theory. I.
Simkins, L. Biofeedback: Clinically valid or oversold? The Psychological Record, 1982, 32, 3-17.
Tellegen, A. On measures and conceptions of hypnosis.  

Udolf, R. Handbook of hypnosis for professionals. New York:  

Wadden, T., & Anderton, C. The clinical use of hypnosis.  

Walker, N. S., Garrett, J. G., & Wallace, B. Restoration of  
eidetic imagery via hypnotic age regression: A preliminary  

Winnicott, D. W. Transitional objects and transitional  
phenomena: A study of the first not-me possession.  

Zeltzer, L. K., Dash, J., & Holland, J. P. Hypnotically  
induced pain control in sickle cell anemia. Pediatrics,  
1979, 64, 533-536.