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Improved Obstetric Outcomes Using Hypnotic Analgesia and Skill Mastery Combined With Childbirth Education

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The benefits of hypnotic analgesia as an adjunct to childbirth education were studied in 60 nulliparous women. Subjects were divided into high and low hypnotic susceptibility groups before receiving 6 sessions of childbirth education and skill mastery using an ischemic pain task. Half of the Ss in each group received a hypnotic induction at the beginning of each session; the remaining control Ss received relaxation and breathing exercises typically used in childbirth education. Both hypnotic Ss and highly susceptible Ss reported reduced pain. Hypnotically prepared births had shorter Stage 1 labors, less medication, higher Apgar scores, and more frequent spontaneous deliveries than control Ss' births. Highly susceptible, hypnotically treated women had lower depression scores after birth than women in the other 3 groups. We propose that repeated skill mastery facilitated the effectiveness of hypnosis in our study.

In the last three decades the rising popularity of childbirth education (Dick-Read, 1984; Lamaze, 1970) has been accompanied by a decline in the use of obstetric hypnosis (Werner, Schauble, & Knudson, 1982). This pattern can be traced, in part, to research that has shown two consistent outcomes.

First, women receiving childbirth education have obtained benefits that are generally superior to women who have not had childbirth classes. These outcomes include reduced medication, decreased perceptions of pain, greater marital satisfaction, and greater enjoyment of delivery (Charles, Norr, Block, Meyering, & Meyers, 1978; Genest, 1981; Leventhal, Leventhal, Shacham, & Easterling, 1989; Markman & Kadushin, 1986; Scott & Rose, 1976; Zax, Sameroff, & Farnum, 1975). Second, there has been little evidence to indicate that hypnosis is superior to childbirth education. Recent comparative studies (e.g., Freeman, Macaulay, Eve, Chamberlain, & Bhat, 1986; Venn, 1987) have shown that the documented benefits of hypnosis (Flowers, Littlejohn, & Wells, 1960; Moya & James, 1960) are comparable to the advantages gained from childbirth education.

Proponents of childbirth education have argued that their procedures do not involve hypnosis (Dick-Read, 1984; Lamaze, 1970). If so, then the advantages of childbirth education and hypnosis may be associated with separate processes. Thus, a treatment combining childbirth education and hypnosis could produce greater benefits than either treatment alone. In our study we evaluated the effects of hypnosis as an adjunct to childbirth education.

We also incorporated the skill mastery component of stress inoculation into childbirth education (Meichenbaum, 1977; Turk, Meichenbaum, & Genest, 1983). Skill mastery involves repeated exposure to a mild form of an appropriate stressor until subjects develop a psychological "immunity" through skillful coping. We used an ischemic pain task (IPT) to evaluate the analgesic effects of hypnosis during training (Smith, Egbert, Markowitz, Mosteller, & Beecher, 1966).

Our study has three features that contrast with shortcomings in research design in many previous studies (Beck & Hall, 1978). Only one of the aforementioned studies of obstetric outcome used random assignment of subjects (Freeman et al., 1986). A second problem has been the lack of blind ratings of obstetric outcome. Our study used random assignment of subjects and blind ratings. The third drawback to most studies of obstetric hypnosis is that the hypnotic susceptibility of subjects was not determined. According to neodissociation theory, only highly susceptible subjects should be able to benefit from hypnosis (Hilgard, 1977). In our study, high and low susceptibility groups were crossed with the hypnosis and control conditions in a factorial design.

The following measures were the primary evaluations we used: (a) pain threshold for the IPT, (b) pain ratings of labor and delivery, (c) durations of Stage 1 and Stage 2 labor, (d) use of medication during labor and delivery, and (e) Apgar (1953) scores. In addition, we used the Minnesota Multiphasic Personality Inventory (MMPI) for screening out pregnant subjects at psychological risk, and we evaluated postpartum MMPI scores (Dahlstrom, Welsh, & Dahlstrom, 1972).

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We hypothesized that (a) women in the hypnosis group would have better outcomes than women in the control group and (b) highly susceptible women in the hypnosis group would have the best outcomes relative to the other three groups.

Method

Subjects

During the end of the second trimester of pregnancy, 63 nulliparous, married, White women began participating. All subjects were referred by five personal physicians from the same obstetrical private practice group affiliated with the same hospital. Referrals were limited to women ranging in age from 18 to 35 years (M = 25, SD = 4.0). In addition, referrals had no reported history of (a) psychiatric hospitalization, (b) depression during pregnancy, or (c) obstetric risk (e.g., miscarriage, preeclampsia, diabetes, etc.). The study did accept women with borderline hypertension. Women referred to the study were told that they could participate in an intensive childbirth training program that would supplement their regular childbirth classes. Three referrals were later excluded from the study because each had one or more pretreatment scores > 70 on the MMPI. All 60 of the remaining subjects agreed to participate. Not one of these 60 subjects was lost due to prematurity, Caesarean birth, or other complications. Subjects had at least a 12th-grade education (M = 14th grade, SD = 1.9).

Apparatus and Materials

Psychological assessments. Subjects answered the MMPI, Form R (Dahlstrom et al., 1972), during pretreatment assessment and within 72 hr after delivery. Subjects also completed the Harvard Group Scale of Hypnotic Susceptibility, Form A (Shor & Orne, 1962), during pretreatment assessment. Subjects with susceptibility scores of 0–6 were assigned to the low susceptibility group; subjects with scores of 7–12 were assigned to the high susceptibility group. Subjects answered the McGill Pain Questionnaire (MPQ) when rating the pain of childbirth (Melzack, 1975). The MPQ has good psychometric properties, and validity studies have shown that the MPQ ratings correlate with reports of pain thresholds and the use of analgesic drugs (Melzack, 1975; Reading, 1983). Instructions for the MPQ were modified slightly when subjects described anticipated pain from childbirth. The MPQ was scored on the following scales: (a) Present Pain Intensity, (b) Sensory Distress, (c) Affective Distress, (d) Evaluative Distress, and (e) Miscellaneous.

Obstetric assessments. Data on the use of medication, length of labor (Stages 1 and 2), and type of delivery were recorded by a nurse attending the birth. Stage 1 labor was recorded as the length of labor between 5 and 10 cm cervical dilation. Reliable reports of the length of earlier labor were impossible to obtain because many women in the hypnosis condition were admitted to the hospital dilated between 4 and 5 cm. Apgar scores at 1 min and 5 min postpartum were also recorded by one of the five referring obstetricians who delivered the baby (Apgar, 1953). The Apgar is a composite rating of the neonate's physical condition on the basis of five criteria: heart rate, respiration, muscle tone, reflex irritability, and skin color. Each criterion is rated on a scale of 0–2 with an optimum composite score of 10. The Apgar has very good interobserver agreement, and validity studies have shown that the Apgar correlates negatively with both infant mortality rates and with various forms of fetal distress (Apgar, Holaday, James, Weisbrot, & Berrien, 1958; Quilligan, 1985). Attending nurses and obstetricians had no knowledge of the group assignments of subjects.

Ischemic pain task. Trimline sphygmomanometers (Pymah Corporation) were used in the IPT, which involved the submaximum tourniquet technique (Smith et al., 1966).

Training tapes. Women in the control condition were given a cassette tape recording of *Practice for Childbirth* (Bing, 1973). Control tapes contained standard neuromuscular relaxation exercises in which women were asked to let go of tension in sequential muscle groups throughout the body from the feet to the face. Suggestions of heaviness, limpness in the muscles, effortless breathing, and general drowsiness were made during the muscle relaxation exercises. Control tapes also contained directions concerning (a) focal point visualization for distraction, (b) pushing, and (c) breathing techniques (cleansing breaths, superficial breathing, transitional breathing, and abdominal breathing) to be used during labor. Control women practiced their breathing techniques while being guided through simulated contractions and delivery of their baby.

Women in the hypnosis condition were given a cassette tape recording of the hypnotic induction, which was presented live during their first hypnosis session. The induction was performed by a licensed clinical psychologist on the staff of the hospital where the deliveries occurred. The induction contained the following suggestions: general relaxation, heaviness in muscles in the feet spreading through the body to the face, deepening with deep slow breathing and backward counting (SB & BC), enjoyment of childbirth, additional deepening with SB & BC, voices in the labor and delivery room producing increased relaxation, labor as joyous work, additional deepening with SB & BC, tingling and subsequent numbness in the dominant hand, numbness spreading like Novocaine into dominant wrist and arm, transfer of this analgesia to any part of the body during labor, postpartum well-being and healing, improvement in relaxation skills with continued practice, and awakening with counting forward.

All subjects were told to practice with their tapes daily. We monitored tape usage by having subjects turn in a weekly report at the beginning of each of the last five treatment sessions. There was no difference in tape usage among groups (M = 23, SD = 6.6).

Procedure

Throughout the study all subjects concurrently attended six additional childbirth education classes provided by their physicians. In addition to providing information about childbirth, these regular classes emphasized the relaxation, distraction, and breathing techniques described in the control tape. Husbands were encouraged to attend these regular classes.

Pretreatment. Individual pretreatment screening and instruction occurred during the early portion of the third trimester of pregnancy. Prior to obtaining written consent, Teresa M. Harmon described a summary of the six additional treatment sessions and explained the IPT. All women were told that learning how to cope with the pain of the IPT could help them cope with the pain of childbirth. Subjects were also informed that they would be given a test of hypnotic susceptibility and that hypnotic procedures might be used as part of their additional childbirth preparation. Subjects completed the MMPI and also rated the type and degree of pain expected from childbirth on the MPQ. Subjects then received the pretreatment IPT. Finally, subjects were given the Harvard Group Scale of Hypnotic Susceptibility administered by Harmon.

After determining susceptibility, subjects were randomly assigned to either the hypnosis or control condition. Subjects were not informed that there were two treatment conditions; all were told that they would be receiving additional specialized childbirth training. The treatment rationale for hypnosis subjects contained a description of the potential benefits of hypnosis using the IPT. The treatment rationale for control subjects did not mention hypnosis. Instead, the control rationale contained a description of the potential benefits of specialized childbirth preparation using the IPT.

Treatment sessions. Treatment was conducted over six 1-hr weekly

sessions in the same hospital. The subjects participated in groups of 15. Harmon and a registered nurse conducted each session. Husbands were not present.

Control subjects listened to the control tape at the beginning of each treatment session. These women were then given two trials of the IPT using the dominant arm (Smith et al., 1966). The sphygmomanometer cuff was attached above the elbow and inflated to 250 mm Hg. After 1 min, subjects were asked to form a fist and then release it at 2 s intervals for 40 s. Afterward, each subject relaxed her hand for the remainder of the 3-min trial. Control women were asked to concentrate on their breathing exercises, general relaxation, and focal point visualization during the IPT. All subjects were instructed to signal with their free hand when they first perceived pain (this latency was recorded as the pain threshold). Subjects could also discontinue the procedure by signaling again when the discomfort became too great.

Subjects in the hypnosis group heard the live hypnotic induction during Session 1 and heard the taped induction at the beginning of Sessions 2–6. Subsequently, hypnotic subjects performed the same IPT as the control subjects. During the IPT, hypnosis subjects were asked to concentrate on the suggestions of hypnotic relaxation and analgesia for the dominant arm.

Throughout treatment, women in both groups were told that their specialized training should produce greater relaxation, less pain, and a more enjoyable childbirth.

Within 24 hr of delivery, each woman rated the type and degree of pain she experienced during childbirth on the MPQ. Subjects also completed the MMPI within 72 hr of delivery. Postpartum scales were administered by Harmon, and subjects returned completed postpartum scales to a marked box in the nurses' station.

Results

Separate 2 (treatment condition) × 2 (susceptibility) multivariate analyses of variance (MANOVAs) were conducted on the following sets of data: (a) maternal pain ratings for labor and delivery, (b) obstetric measures, and (c) the standard 13 MMPI scales. When a MANOVA indicated a significant effect, the univariate differences contributing to this effect were analyzed using analysis of variance (ANOVA). Pretreatment data and pain threshold measures for the IPT were analyzed separately using ANOVA. All MANOVAs and ANOVAs were conducted with the statistical program Multivariance (Finn, 1976).

Pretreatment Measures

Patients in the four groups did not differ on the following pretreatment measures: (a) MPQ ratings of expected pain from childbirth, $M = 4.3$, (*horrible to excruciating*) on the Present Pain Intensity scale, $SD = 0.8$; complete range = 1 (*mild*) to 5 (*excruciating*); (b) pain thresholds for the IPT; and (c) the standard 13 scales of the MMPI.

Pain Threshold for the IPT

Pain threshold measures were obtained during pretreatment assessment and each of the six treatment sessions. Threshold scores (in seconds) were blocked for statistical analyses in the following fashion: The pretreatment threshold comprised the first score. Each of the remaining three scores was the mean of the threshold measures for Sessions 1 and 2, 3 and 4, and 5 and 6, respectively. The threshold scores were analyzed using a 2 (treatment condition) × 2 (susceptibility) × 4 (sessions) mixed

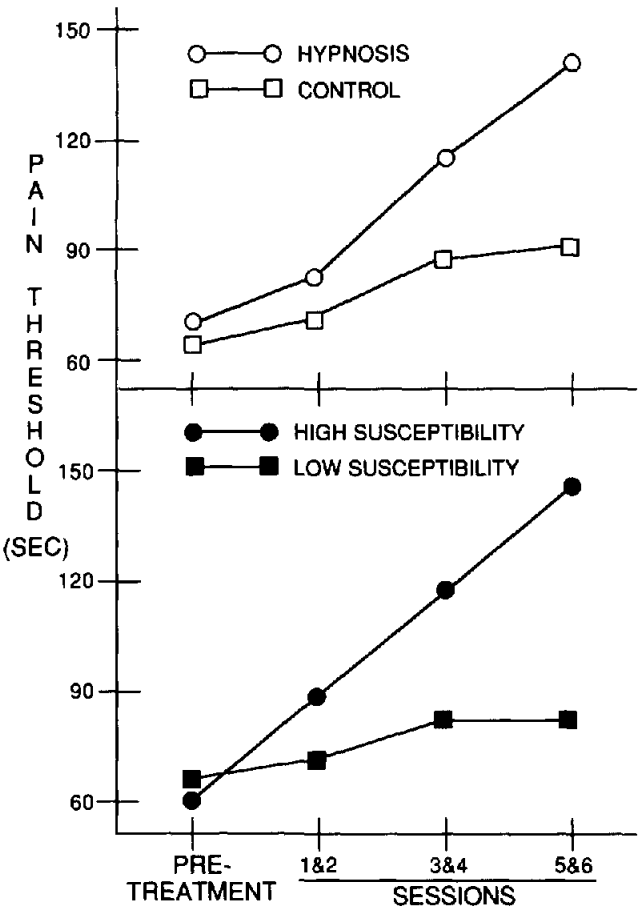

Figure 1. The upper panel contains the mean pain threshold scores for hypnosis and control subjects for the ischemic pain task. (The lower panel contains the mean pain threshold scores for high susceptibility and low susceptibility subjects for the ischemic pain task.)

ANOVA with repeated measures on the sessions variable. Because heterogeneity of variance was observed in this analysis, $F_{max}(14, 14) = 10.76$, $p < .01$, the alpha level was set at the .01 level of significance.

As illustrated in the upper panel of Figure 1, there was a two-way interaction of Treatment Condition × Sessions on pain threshold, $F(3, 168) = 16.24$, $p < .001$. Follow-up trend analyses indicated a significant interaction of treatment condition with the linear function of session scores, $F(1, 168) = 41.92$, $p < .001$. Interactions with the quadratic and the cubic functions of session scores were not significant. Hypnotically trained subjects had higher pain thresholds than control subjects during Sessions 3 and 4, $F(1, 58) = 18.08$, $p < .001$, and 5 and 6, $F(1, 58) = 58.60$, $p < .001$.

There was a similar two-way interaction of Susceptibility × Sessions on pain threshold, $F(3, 168) = 26.94$, $p < .001$. As illustrated in the lower panel of Figure 1, there was an interaction of susceptibility with the linear function of session scores, $F(1, 168) = 80.61$, $p < .001$. Again, interactions with higher order functions were not significant. Regardless of treatment condition, highly susceptible women had higher pain thresholds than less susceptible women during Sessions 3 and 4, $F(1,$

58) = 30.38, $p < .001$; and Sessions 5 and 6, $F(1, 58) = 56.40$, $p < .001$. There was no significant three-way interaction in this analysis.

MPQ Ratings of Childbirth

All five scales of the MPQ were included in the MANOVA of MPQ ratings of childbirth.

There was a significant multivariate main effect of treatment on MPQ ratings, $F(5, 52) = 4.27$, $p < .01$. Subsequent ANOVAs indicated that on the Present Pain Intensity scale, hypnotic subjects labeled labor as *distressing* ($M = 2.9$, $SD = 0.7$) whereas control subjects labeled labor as *distressing to horrible* ($M = 3.6$, $SD = 0.6$), $F(1, 56) = 13.66$, $p < .001$. Hypnotic subjects also reported less pain than control subjects on all other MPQ scales: Sensory Distress, $F(1, 56) = 10.44$, $p < .01$; Affective Distress, $F(1, 56) = 8.14$, $p < .01$; Evaluative Distress, $F(1, 56) = 5.35$, $p < .05$; and Miscellaneous, $F(1, 56) = 6.11$, $p < .05$.

There was also a significant multivariate main effect of susceptibility on MPQ ratings, $F(5, 52) = 6.33$, $p < .001$. Subsequent ANOVAs indicated that on the Present Pain Intensity scale, highly susceptible women labeled labor as *distressing* ($M = 3.0$, $SD = 0.6$), whereas less susceptible women labeled labor as *distressing to horrible* ($M = 3.5$, $SD = 0.7$), $F(1, 56) = 8.51$, $p < .01$. Highly susceptible women also reported less pain on the following MPQ scales: Sensory Distress, $F(1, 56) = 4.12$, $p < .05$; Affective Distress, $F(1, 56) = 15.33$, $p < .01$; and Miscellaneous, $F(1, 56) = 4.31$, $p < .05$. The MANOVA test of the interaction between treatment condition and susceptibility on MPQ scores was nonsignificant.

Obstetric Outcomes

Four dependent variables were included in the MANOVA for obstetric outcomes: lengths of Stage 1 and Stage 2 labor and Apgar scores at 1 min and 5 min. Obstetric outcomes are shown in Table 1.

There was a significant multivariate main effect of treatment condition on obstetric outcomes, $F(4, 53) = 8.29$, $p < .001$. The other multivariate main effect of susceptibility and the multivariate interaction were nonsignificant.

Subsequent ANOVA tests indicated that hypnotic training was associated with shorter Stage 1 labors, $F(1, 56) = 35.24$, $p < .001$, and higher Apgar scores at 1 and 5 min, Fs(1, 56) = 31.37 and 16.43, respectively, ps $< .001$. Table 1 also illustrates significant effects of hypnosis on the other obstetric measures. Hypnotically prepared women had more spontaneous deliveries than control women, $\chi^2(1, N = 60) = 4.69$, $p < .05$. Also, fewer hypnotically trained women received medication, $\chi^2(1, N = 60) = 16.07$, $p < .001$. Specifically, compared with hypnotically trained women, larger proportions of control women received tranquilizers, $\chi^2(1, N = 60) = 11.47$, $p < .001$; narcotics, $\chi^2(1, N = 60) = 13.87$, $p < .001$; and oxytocics (used to stimulate contractions), $\chi^2(1, N = 60) = 25.91$, $p < .001$.

MMPI Scales

The MANOVA of the standard 13 MMPI scales indicated a significant main effect of susceptibility, $F(13, 44) = 2.38$, $p < .05$. The MANOVA tests of the main effect of treatment condition and the interaction were nonsignificant. Subsequent ANOVA tests of the susceptibility effect indicated that highly susceptible women scored lower than less susceptible women on the Depression scale, $F(1, 56) = 10.41$, $p < .01$. There was also a significant univariate interaction of treatment condition by susceptibility on the Depression scale, $F(1, 56) = 5.11$, $p < .05$. Table 1 shows that highly susceptible hypnosis women had lower Depression scores on the MMPI than women in the other three groups combined, $F(1, 56) = 14.92$, $p < .01$. Twenty-four percent of the women in these three groups had elevated depression scores (T score > 70). Not one of the highly susceptible, hypnotically prepared women had an elevated depression score.

Discussion

We found that hypnosis resulted in shorter Stage 1 labors, less medication, more spontaneous deliveries, and higher Apgar scores. We believe that the superior outcomes in the hypnosis condition were primarily the result of reduced perceptions of pain. This interpretation contrasts with previous research suggesting that outcomes such as reduced medication occur because women are more likely to tolerate perceived pain, not because these women experience less pain (Scott & Rose, 1976).

Childbirth education and hypnosis may well have increased pain tolerance in our study. However, the differences between hypnosis and control women on IPT thresholds and the MPQ Sensory Distress ratings lead us to believe that hypnotically prepared women also learned to reduce their awareness of pain. We propose that this reduction disrupted the typical cyclic escalation of pain (Bonica, 1963). As a result, the circular fibers of the cervix were able to dilate more easily, less medication was necessary, and Stage 1 labor was shortened.

The reduction of Stage 1 labor stands in contrast to reports of an increase in the duration of labor in hypnotically prepared women (Freeman et al., 1986; Werner et al., 1982). Timing of labor in our study began when subjects were 5 cm dilated; previous studies used self-reports to identify the onset of labor. Because different types of prenatal preparation (including lack of preparation) may differentially influence subjective estimates of the onset of labor, any self-reports of the length of labor may be biased.

Hypnosis did not affect Stage 2 labor in our study, although the passivity of hypnosis might be expected to prolong this active phase. It appeared that during Stage 2 labor the hypnotically prepared women were able to utilize the active coping skills (e.g., abdominal breathing and pushing) taught in their regular childbirth classes. Our results are consistent with those of Davidson (1962), who found that hypnosis shortened Stage 1 labor but had no effect on Stage 2 labor.

The main effects of susceptibility on IPT thresholds and MPQ ratings of labor were somewhat surprising. We had expected more statistical interactions favoring highly susceptible hypnosis women, not a preponderance of main effects. Such main effects of susceptibility can be interpreted from various theoretical perspectives (for an extended discussion see Miller & Bowers, 1986; Spanos, 1986). We prefer to believe (in a man-

Table 1
Mean Obstetric and Psychological Outcomes in Each Group

Measure	Condition			
	High susceptibility		Low susceptibility	
	Hypnosis Ss	Control Ss	Hypnosis Ss	Control Ss
Labor and delivery				
Stage 1, minutes[a]				
M	78.9	247.9	128.1	264.3
SD	55.3	63.9	141.5	112.0
Stage 2, minutes				
M	46.5	63.5	71.3	80.3
SD	27.0	26.0	40.9	31.9
Apgar, 1-min[a]				
M	8.0	7.1	8.1	6.9
SD	0.8	0.8	0.7	0.6
Apgar, 5-min[a]				
M	9.3	8.7	9.3	8.6
SD	0.6	0.5	0.7	0.5
Spontaneous delivery[b] (percentage)	87	60	73	40
Percentage of medication—Stages 1 and 2				
Overall[a]	40	93	53	100
Tranquilizers[a]	13	53	27	80
Narcotics[a]	7	53	20	73
Oxytocics[a]	33	93	27	100
MMPI Depression scale				
T score[c]				
M	49.3	58.4	63.7	60.9
SD	9.4	10.6	9.4	11.1

Note. S = subject. MMPI = Minnesota Multiphasic Personality Inventory.
[a] Main effect of hypnosis, $p < 0.01$. [b] Main effect of hypnosis, $p < 0.05$. [c] Interaction of hypnosis with susceptibility, $p < .05$.

ner consistent with Bowers, 1976; Hilgard, 1977) that highly susceptible women lapsed into trance in both the hypnosis and control conditions. In this way, our results could be interpreted in the context of research showing that direct hypnotic suggestions of analgesia were more effective for pain relief than hypnotic suggestions of general relaxation (Stacher, Schuster, Bauer, Lahoda, & Schulze, 1975).

We designed our study to evaluate the usefulness of formal hypnosis as an adjunct to procedures commonly used for obstetric pain management. We did not design our study to test competing theories of the mechanisms responsible for psychological analgesia, so the main effects of susceptibility in our study could also be interpreted in a manner consistent with other social–psychological explanations of the mechanisms of analgesia (Spanos, 1986; Turk et al., 1983).

There was an interaction of susceptibility with treatment condition on the MMPI Depression scale. Suggestions of maternal well-being and enjoyment of the birth process were emphasized more in the hypnosis tape than in the control tape. So it is not surprising that only the highly susceptible, hypnotically treated women had less of the "baby blues."

We believe that it is unlikely that either (a) demand differences between treatment groups or (b) assessment bias functioned as artifacts primarily responsible for the hypnosis effects in our study. We gave positive expectancies to all women who experienced a treatment with at least two novel features (the IPT and the absence of husbands) compared with their regular childbirth classes. Also, to the best of our knowledge, subjects were not even aware that they were in an experiment.

Although Harmon conducted the treatments and administered the self-report measures and the IPT, assessment bias cannot easily account for the hypnosis effects on the less reactive obstetric measures recorded by blind raters. Indeed, the main effects of susceptibility on IPT thresholds and MPQ ratings in both the hypnosis and control groups argue against assessment bias favoring hypnosis.

There is an obvious limitation to the implications of this study. Our subjects were highly motivated volunteers who were willing to experience hypnotic procedures. All subjects participated in twice the typical amount of childbirth training. There is no certainty that using hypnosis in six standard sessions of childbirth training would produce the same level of effects in less motivated women.

We demonstrated that benefits can be obtained by incorporating hypnotic training into childbirth education. Hypnosis, like other treatments (e.g., extended relaxation training; Ha-

lonen & Passman, 1985), may function as a useful adjunct to childbirth education. No undesirable side effects of hypnosis were observed, although care should be taken to ensure that hypnotic procedures are conducted only by trained professionals. Also, we do not advocate the uniform use of hypnosis. Perhaps specialized hypnosis classes could be offered to women already participating in childbirth education.

Finally, we suspect that the benefits of hypnosis in this study were dependent on the repeated use of the IPT. The inclusion of the IPT is a major difference between this study and a recent randomized study that did not find benefits from hypnosis (Freeman et al., 1986). By using the IPT, hypnotic subjects were able to demonstrate to themselves increasing control over pain across the training sessions. It was obvious to us that this confidence carried over into the delivery room. Other pain tasks have been used in childbirth education (Worthington, 1982), but the benefits of skill mastery have not been systematically evaluated. We believe that the repeated use of the IPT was of great value in producing feedback regarding pain reduction. It is left to future research to determine whether the hypnotic procedures used in this study are as effective without the IPT.

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