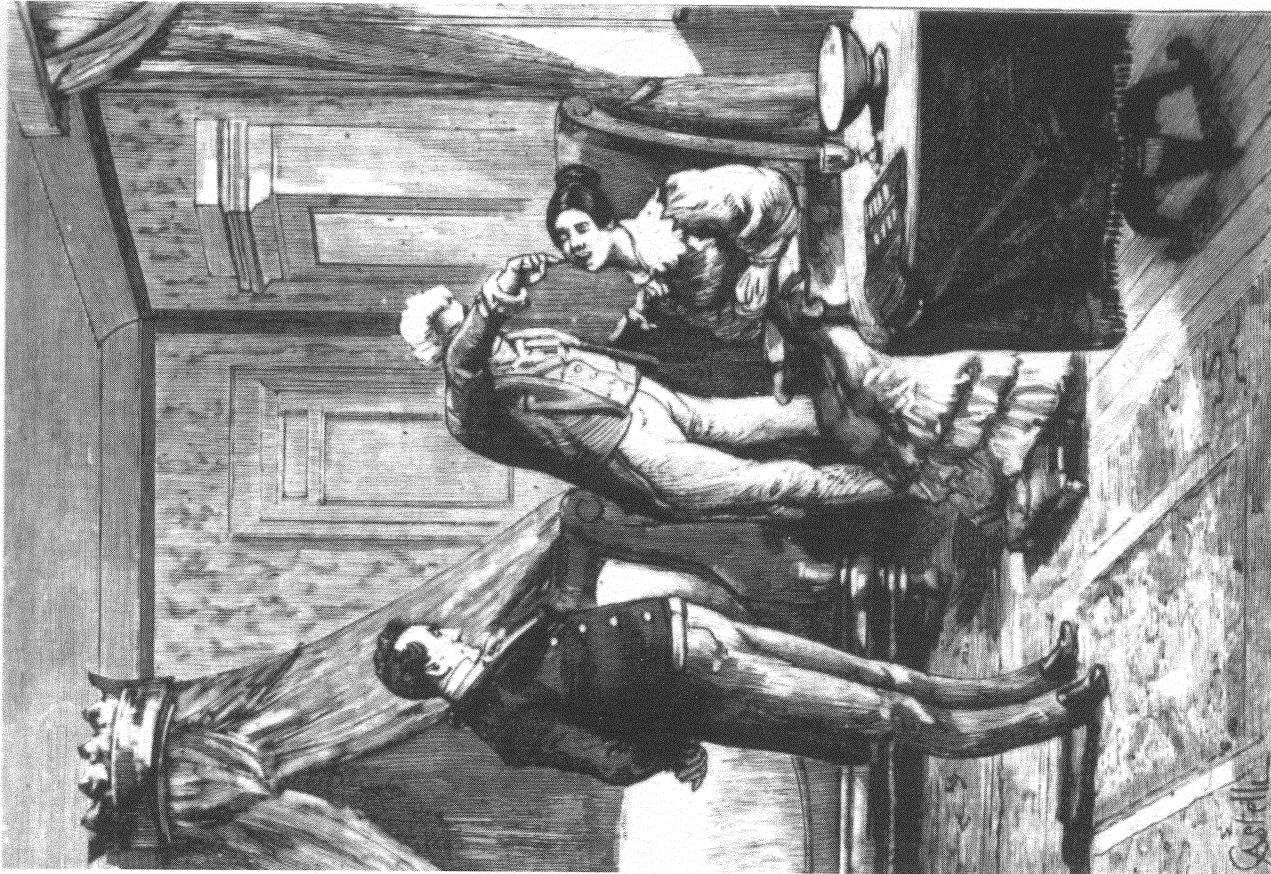




*The first documented extraction of a tooth under hypnosis
performed by J.E. Oudet on 14.11.1836
(from the library of Walter Bongartz)*

Hypnosis in Dentistry: Historical Overview and Current Appraisal

John F. Chaves

■ Hypnosis has provided one of the few systematic means of harnessing the powerful and complex emotional and cognitive forces that are uncovered in the dental operator. Yet its full potential for clinical application in dentistry remains under-explored and not fully documented. Its initial application in acute pain management in the early 19th Century was followed by fluctuating interest as the professional standing of the technique became haltingly established. While dentists frequently rediscovered the efficacy of hypnotic-like interventions in their practices - often appearing in disguised form - it is only in the last 50 years that serious efforts have been made to document the clinical benefits of hypnosis across a wide range of applications. The rather mystical notion of a hypnotic trance state, an unduly restrictive view of its spectrum of application, limited training opportunities, together with the belief that it is unduly time-consuming, has limited its acceptance in dentistry. Recent theoretical developments, coupled with increasing evidence of its clinical efficacy suggests that it is worth reexamination.

Powerful and complex emotional forces are routinely unleashed in the dental operation. Patients may experience intense anxiety derived from many sources. They fear pain, loss of control, appearing foolish by regressing to infantile behavior, and being negatively evaluated by office staff for having these feelings, or for their lack of attentiveness to their oral health. Although often not expressing these thoughts and feelings overtly, when asked, almost half of all patients admit catastrophizing during their appointments: engaging in patterns of thinking and imagination that amplify and distort the fearful and worrisome aspects of their experience (Chaves & Brown, 1987). At the same time, the high stress patients experience leads them to seek an affiliative bond with their dentist and to wish to be cared for and about and to be protected (Goldenberg, 1993). These complex thoughts and feelings are so archetypal, that their expression provides a ready basis for much of the anxiety-driven humor that has centered on the dental profession.

Hypnosis has provided one of the few systematic efforts to harness these feelings and to channel them in a therapeutic way for the benefit of patients and staff alike. A wide variety of clinical reports and a much smaller number of controlled studies support its potential value in the dental setting (Chaves & Dworkin, in press). Yet there have been many barriers to the full acceptance of hypnosis in dentistry. Exaggerated claims of efficacy, especially as a routine substitute for chemical analgesics in acute pain management, and the belief that hypnosis is too time-consuming have discouraged some practitioners from using it in appropriate ways and exploring its potential in other clinical applications. In addition, the field has been disadvantaged by limited empirical research, and by curious theoretical notions, like the hypnotic trance state, that make it seem mystical and occult to patients and practitioners alike (Smith, 1965). Yet, I hope to show there are now compelling reasons to reassess the role of hypnosis in dentistry. In this paper I first attempt to put the use of hypnosis in dentistry into historical context to help clarify the factors that have helped to shape attitudes and expectations about its use in dentistry. Next, I turn to current perspectives and future possibilities for hypnosis in dentistry, in light of recent experimental findings and theoretical developments.

Historical perspectives

Psychology, medicine, and dentistry have been the primary professions to focus on the clinical applications of hypnosis. In medicine and psychology, hypnosis has recently passed through a golden era, characterized by a very significant research effort, important theoretical developments, and a wide spectrum of clinical application (Rhue, Lynn, & Kirsch, 1993; Spanos & Chaves, 1989). Measured against these developments, the evolution of hypnosis in dentistry must be seen as both surprisingly limited and disappointing (Chaves & Dworkin, in press).

During the early 1800s, dental procedures were among the most commonly reported clinical applications of hypnosis. Dental extractions were no more pleasant to contemplate than they are now, and were much more prevalent. Moreover, the absence of effective local anesthetics and analgesics meant that considerable pain could be involved. So it is not surprising that early reports indicating that the process could be made more tolerable attracted attention. In one of the earliest accounts Jean-Victor Oudet, a Parisian physician, extracted a tooth from a hypnotized patient in 1836 (Fourmestiaux, 1934).

In the same year, in the United States, Benjamin West, a Boston area medical student, reported a case of a 12 year old girl named Louisa whose decayed molar was said to have been extracted by a Dr. Harwood, 10 minutes after she had been hypnotized by Monsieur B. F. Bugar. Bugar was emphatically described as "not a professor of magnetism" (West, 1836), a pejorative reference to itinerant "professors of magnetism" who wandered the New England countryside giving demonstrations that were roundly criticized in the most prestigious medical journals of the time (Smith, 1847).

Contemporary accounts of these early applications of hypnosis sometimes imply

that the dental procedures were accomplished painlessly. Those who consult the original literature find that often, this was not the case. The West report, to cite one example, was recently described by Gravitz as follows: "Although the patient was aware of what was happening, the youthful patient reported and clinically indicated neither discomfort nor pain" (Gravitz, 1988, p. 204). One the other hand, in the original report, it was noted that during the procedure the patient showed "a flush over the whole face and a slight quivering of the lip, with a countenance indicative of considerable pain" (p. 351). In addition, when asked to provide an explanation for her failure to cry, the patient stated that "I never cry on such occasions" (p. 351). This proclamation did not prevent West from concluding that this was a successful demonstration of the analgesic properties of mesmerism, although the original report places much more emphasis on the patient's claim of postoperative amnesia for the extraction than on the claim of analgesia. The importance of the distinction between hypnotic analgesia and hypnotic amnesia was frequently overlooked in these early accounts as was the wide range of individual differences in response to pain. In addition, pain was an expected part of medical and dental treatments, leading to a different social context for pain and different expectations for its management than exist today (Caton, 1985; Rey, 1993).

Inaccurate and incomplete portrayals of some of these early clinical uses of hypnosis in dentistry have helped create needless obstacles of the successful integration of hypnotic techniques into modern dental practice. Although recent reviews of the clinical and experimental literatures do make clear that hypnosis can play an important role in acute and chronic pain management (e.g. Chaves, 1993; Holroyd, 1996) dental practitioners who come for training in hypnosis often have extraordinary expectations for its routine use as a complete substitution for pharmacological anesthetics. Yet, this is not the primary use of hypnosis in dentistry, as we shall see.

Suffice it to say, for the moment, that there were in the early literature what might be characterized as partial successes in controlling dental pain as well as some failures. Ironically, one of the failures became conspicuously important in the history of pain management. Horace Wells, the Connecticut dentist who first attempted to demonstrate the use of nitrous oxide as an analgesic in dentistry was motivated to search for that alternative, in part, because he was an abysmal failure as a mesmerist (Winter, 1991)! Unfortunately, he was also unaware that nitrous oxide, while a useful anxiolytic, is rather a weak analgesic. He experienced a devastating humiliation when he attempted to demonstrate the use of nitrous oxide for a tooth extraction at the Massachusetts General Hospital. During the procedure his patient cried out in pain, although he later denied feeling pain (Westhorpe, 1996).

Wells' dental partner, W. T. G. Morton witnessed this failure and conducted his now famous demonstration with ether two years later and the rest, as they say, was history. But not quite. For a short period of time there was an intense and fascinating struggle between those who advocated the use of mesmerism to control surgical pain, and those who advocated the use of inhalation anesthesia. The eventual outcome of the struggle

was not obvious at the beginning. Prestigious physicians and surgeons of that era were found on both sides of the issue. Moreover, both nitrous oxide and ether one the one hand, and mesmerism on the other had acquired somewhat sullied reputations because of their recreational use. The fact that mesmerism rarely was fatal, unlike inhalation anesthetics, could not be ignored!

Political rather than scientific considerations probably played a critical role in the initial outcome. One of the most important of these considerations involved the implications of these different procedures for the physician/dentist-patient relationship. While mesmerism empowered the patient, both to ratify the analgesia and to choose practitioners whose theories of disease and therapy were compatible with their own, inhalation anesthesia empowered the practitioner and rendered the patient a passive recipient of treatment (Jewson, 1974, 1976; Winter, 1991). The outcome of this brief struggle reinforced a model of beneficent paternalism that came to characterize the physician-patient relationship for the next century and is currently the focus of considerable debate (Balint & Shelton, 1996). Recent calls for more patient-centered care in dentistry suggests the need to revisit that issue in dentistry as well (Field, 1995).

The critical phase of the initial debate about hypnosis was short-lived. The predictability of inhalation anesthesia, coupled with its ability to be utilized with a substantial proportion of the population, and its congruence with the emerging role of health care providers quickly settled the issue. An important positive consequence for hypnosis, however, was that the locus of the debate about its merits shifted. While the struggle in the mid 1800s was initially between laymen, the itinerant "professors" of mesmerism, and health professionals (Smith, 1847), toward the end of the 1800s the debate about the efficacy of hypnosis was located largely within professional communities. By 1892, a subcommittee of the British Medical Association issued a report on hypnotism that, while critical of speculative theories regarding its underlying mechanisms, acknowledged its effectiveness in "relieving pain, procuring sleep, and alleviating many functional ailments" (Subcommittee of the Psychological Medicine Group Committee of the British Medical Association, 1955, p. 192).

In the late 1800's interest in medical and dental applications of hypnosis increased, both in the United States and Europe. In 1890, Henry Carter and W. Arthur Turner, two dentists in Leeds, England, gave what were described as "sensational" clinics before various British Medical gatherings (Stein, 1930). These demonstrations often involved the extraction of teeth. Turner reportedly extracted 40 teeth from patients who had been hypnotized by James Bramwell (Winter, 1989). Presentations like these were repeated throughout Europe and the United States. Various professional dental organizations began to take an interest, and occasionally take a stand in support of such dental applications. Subsequently, World Wars I and II provided opportunities for a wide range of application of hypnosis in medicine and dentistry especially on those occasions when chemical analgesics and anesthetics were unavailable.

Hypnosis in disguise

During the first half of the Twentieth Century, dentists repeatedly discovered and documented the power of psychological factors in reducing the pain and anxiety associated with dental treatment (Chaves & Rosenstiel, 1975). However, in making these serendipitous discoveries, they have routinely failed to recognize the essential psychological mechanisms underlying the phenomena they observed. Moreover, when the correct mechanisms were uncovered, the characteristic response of the profession has been to abandon the technique. Let us look at a couple of examples.

One of the first such examples was the discovery of the "blue ray" (Anonymous, 1905). This phenomenon was first described in 1905 by Camille Redard, a Swiss physician who worked in dentistry and who already had an established reputation for his research on local anesthetics (Faulioner & Keys, 1965). Redard discovered that he could attenuate pain associated with dental treatment by asking patients to focus their eyes on a blue light while their head and the lamp were covered with a blue satinette cloth for a brief "induction". The resulting analgesia was brief, but provided an opportunity for some high speed dentistry with a satisfactory outcome for most patients. Within the first 5 years of its discovery there was animated debate about the value of the procedure and appreciable speculation about the neurophysiological basis of this unexpected suppression of pain by light (Buckley, 1911; Hillard, 1905; Raiche, 1908). Eventually, it was decided that this was simply another form of hypnosis and there is no further discussion of the "blue ray" in the dental literature after 1911.

In 1959, the phenomenon of audio analgesia was discovered, the result of a collaboration between a Boston area dentist and an engineer at MIT (Gardner & Licklider, 1959). Their report seemed to suggest that an analgesic effect could be observed if dental patients were exposed to intense white noise (bands of noise containing all audible frequencies). The initial results were promising. Clinical reports, based on more than 300 cases promised that around 70% of patients could tolerate a wide range of operative dental procedures with no chemical analgesia. The search for a neurophysiological basis for this unexpected suppression of pain by sound soon followed (Licklider, 1961), but with well controlled studies that soon appeared, it became clear that suggestion and distraction were the primary factors that accounted for the success of the phenomenon (Bartlett, 1967; Howitt & Stricker, 1966; Kirsch, 1973; Stricker & Howitt, 1965). Owens (1966) concluded that "the audio-analgesia machine is more or less of a farce, because one is using the machine to induce hypnosis" (p. 529). Similarly, Bartlett (1967, p. 275) described audio analgesia as "pseudomechanical hypnosis". The increasingly expensive audio analgesia machines with their high fidelity components were soon relegated to dental attics around the world, their efficacy notwithstanding.

In both the blue ray and in audio analgesia, a profoundly important power had been observed at work, but the incorrect attribution of that power to the devices at hand obscured the important psychosocial factors that were operating. Moreover, the relentless pursuit of the neurophysiological mechanisms underlying these phenomena made

it more difficult to develop ways of optimizing their effects using the psychological variables that were at the heart of their success. A similar argument can be raised about acupuncture analgesia and electroanalgesia (Chaves, 1975, 1989; Chaves & Barber, 1974, 1976) although space does not permit a full exploration of that possibility here.

Contemporary status - The last 50 years

In the United States, a psychologist by the name of Thomas Burgess, called by some dentists the "father" of hypnosis in dentistry" (Kuhner, 1979, p. 3), influenced a group of dentists in the Midwest to begin using hypnosis (Burgess, 1951). His efforts led to the founding of the American Society of Psychosomatic Dentistry in 1948, which established its own code of ethics, and the Journal of Psychosomatic Dentistry (later the American Society for Psychosomatic Medicine and Dentistry). Other non-dentists involved with the Society included W. T. Heron, a psychologist and L. R. Wolberg, a psychiatrist (Burgess, 1978).

During the last 50 years surveys of the scientific literature in hypnosis have revealed an ongoing interest in hypnosis in dentistry (Nash, Minton, & Baldrige, 1988), although many fewer publications, especially experimental studies, seem to have appeared in the dental literature than in the medical and psychological literatures. The corpus of the dental hypnosis literature includes a large number of brief tutorials and advocacy pieces, (e. g. Bartlett, 1968; Bourassa, 1990; Shaw, 1955; Simons, 1985). Interestingly, many of these tutorials emphasized the value of what is called "informal hypnosis," basically the use of hypnotic-type suggestions without a formal induction procedure (e.g. Bartlett, 1968). It seems clear that dentists quickly realized that many of the clinical benefits associated with hypnosis could be achieved by systematic use of suggestion without a formal induction procedure. Benson (1974), for example, noted that all dentists routinely incorporate suggestion into their practice. Moreover, he contended that there is "no clear line of demarcation between waking and hypnotic suggestion" (p. 28). Owens (1966), on the other hand, sharply distinguished between these two uses. Shaw (1955; p. 96) argued that "the principles of suggestion are essential to dental practice at all times, whether we use the hypnotic sleep state or not". Shaw even makes a point of enclosing the phrase 'put to sleep' in quotes, reminiscent of the use of quotes around the word "hypnosis" by T. X. Barber, a pioneer in the development of the cognitive-behavioral theory of hypnosis (Barber, 1969).

At the same time a considerable battle was being fought in the experimental hypnosis literature over whether or not the induction procedure added anything to the use of suggestion when used with motivated subjects (Barber, Spanos, & Chaves, 1974). Dentists during this era were discovering that clinically significant levels of analgesia that could be achieved with combinations of nitrous oxide and music, as well as by certain cognitive strategies like "mental abstraction" and the subtle use of suggestion in the operatory, including such delicate turns of phrase as "Hand me the soft drill" (Cherry & Palin, 1948, p. 396).

Kuhner (1962) noted that the traditional concept of hypnosis as a "sleep state" and the employment of a formal induction "seriously limits its practical and general clinical applicability" (p. 93). He argued that these approaches failed to recognize the importance of dealing with the special needs of individual patients and also to overcome culturally based or personal aversion to hypnosis. He also acknowledged a reduction of social and emotional distance between dentist and patient that accompanied the use of hypnosis. To investigate the effects of clinical experience with hypnosis he undertook a survey of 40 dentists who had three or more years of clinical experience with hypnosis. He found that 60% had gradually increased their use of hypnosis, 20% had reduced and another 20% had eliminated it (largely because it was not accepted among their peers). That acceptance was further diminished by a study by a highly visible but controversial article that seemed to suggest that dentists who used hypnosis were rather neurotic (Borland & Epstein, 1961)! This portrayal was subsequently criticized (Richardson, 1980), but may have had a chilling effect on dentists interested in applying hypnosis clinically.

Nevertheless, some dentists were not intimidated and continued to recount their clinical successes for their colleagues. Jacoby (1960) provided summary statistics describing the use of hypnosis in his general dental practice. He report the results of 1214 hypnodontic sessions covering surgical, operative, prosthodontic, periodontic and endodontic applications. Jacoby recognized the widespread perception among dentists that the use of hypnosis took too much time (e.g. Seidner, 1972; Simons, 1985). He advocated the use of a tape recorder as a time saver (Jacoby, 1960). In spite of the perceived time limitations, some private practitioners reported using hypnosis with up to 80% of their patients (Kleinschmidt, 1971).

What has been described as a "breakthrough in the utilization of hypnosis in dentistry" (Fourie, 1988) occurred when J. Barber described the successful utilization of hypnosis for analgesia in 99 out of 100 unselected dental patients (J. Barber, 1977). This report was based on a yet unpublished doctoral dissertation (J. Barber, 1976). Although the report appears to have been quite influential outside of the scientific community, it has been viewed as highly controversial and its conclusions are not consistent with those of previous studies (e.g. Gottfredson, 1973) and have been discredited in other, better controlled investigations (e.g. Gillett & Coe, 1984). Moreover, efforts to apply these techniques to pain control outside of dentistry have also failed to confirm the extreme claims made for them (e.g. Crowley, 1980; Snow, 1979; Van Gorp, Meyer, & Dunbar, 1985).

Although hypnotic techniques can play a significant role in chronic and acute pain management in dentistry, they are clearly not a panacea (Chaves & Dworkin, 1996). In addition, practitioners need to measure their successes with the procedure by comparison with the levels of success associated with specific applications as documented in the best well-controlled studies available. While there are many ways in which hypnotic techniques can be successfully integrated into dental practice, the greatest contribu-

tion of hypnosis in dentistry will not be as a substitute for safe and effective chemical analgesics with unselected patients.

Training and utilization

The limited availability of training has also affected the utilization of hypnosis in dentistry. Moss, Logan and Lynch (1962) made note of fluctuating interest in hypnosis in medicine and psychology, but failed to include dentistry in their survey. Scott (1979) surveyed training opportunities in hypnosis in 33 medical schools and 18 dental schools throughout the United Kingdom. Little formal training in hypnosis was being provided although all of the deans were supportive of its use.

Simpson, Dedmon, Logan and Jakobsen (1982) surveyed the teaching of hypnosis in 60 dental schools in the United States. They documented a steady increase in the number of schools teaching hypnosis from 12 in 1973 (Parrish, 1975) to 26 in 1980. Most courses were elective. Curriculum overcrowding was the most frequently cited reason for not teaching hypnosis in the 1980 survey. Freccia (1982) found that training in hypnosis was not widely available in dental schools. Generally the topic was being addressed in pharmacologically-oriented courses on anxiety and pain management and consisted mainly of isolated lectures. He reviewed 1150 CDE (Continuing Dental Education) programs listed in the 1979 issue of the Journal of the American Dental Association and found only 8 were devoted to hypnosis of which 6 were offered by dental schools. On the other hand, opportunities for training for undergraduate dental students seem more widely available in the United States than in England (Gandeche, 1990).

Wright, Giebartowski and McMurray (1991) conducted a survey of seven hundred and sixty Australian dentists to determine the frequency with which they utilized a variety of behavior management strategies for children who displayed anxiety or were behavior management problems. While 83.2% reported never using hypnosis, only 0.7% reported using it "very often". In general, younger dentists were more likely to use behavioral techniques for patient management, thought to reflect the recent inclusion of more training in behavioral science during undergraduate dental education. That trend was not confirmed for the use of hypnosis however.

McKnight-Hanes, Myers, Dushku and Davis (1993) surveyed a national random sample of 2000 general dentists and 1000 pediatric dentists looking at the use of behavior management techniques across practitioner type, age, and geographic region. Pediatric dentists employed a wider range of behavioral intervention strategies than other dentists. Hypnosis was used by 6% of pediatric dentists but only 2% of general dentists. Also 40-49 yrs old practitioners used the widest range of interventions.

The most recent available survey of dental schools in the United States and Canada (Clarke, 1996) found that 26% offered a course in clinical hypnosis (mean of 15.2 hours) and the number of schools in which a brief (1-2 hour) introduction to hypnosis was provided increased from 18% in 1980 to 30% in 1995. However, during this period the proportion of dentists maintaining membership in the American Society of Cli-

nical Hypnosis decreased from 14.9% to 4.4% of the total membership.

Of course, concerns about risks associated with hypnosis as well as indications and contraindications for the procedure have also been evident (Benson, 1974; Kleinhaus & Eli, 1987; Papermaster & Dobreneck, 1960; Rosen, 1960). Undoubtedly these concerns may have also muted interest to some degree, although most of what is written about the risks associated with hypnosis is very reassuring (Coe & Ryken, 1979). Used in a professional or educational context by trained individuals, hypnotic interventions are safe.

Brief tutorial papers on hypnosis continued to appear in the dental literature from time to time (Benson, 1974; Fier, 1980; Gunn, 1977; Smith, 1969a, 1969b; Wegner, 1979). Some of these written by dental students (e.g. Eason, 1968; Robinson, Schneider & Styles, 1972; Szikman, 1968) and still others by dental assistants and hygienists (Dip, 1988; Johnson, 1979; Schey, 1976;). In addition, audiotapes and continuing education courses have played a significant role in professional education (e.g. Chaves, 1979). The use of hypnosis by allied health care workers has not gained full acceptance by professional organizations and raises complex ethical issues which go beyond the scope of this paper. Nevertheless, these tutorials and clinical reports describe a wide range of application of hypnosis in dentistry to which I now turn.

Spectrum of application in dentistry

Those unfamiliar with dentistry may be unaware of the range of potential application for hypnosis in this field. The main areas of application can be summarized as follows:

1. *General patient relaxation*: Evidence suggests that the dental visit is stressful for most individuals. Fifteen to twenty percent of the population in the United States avoids dental care entirely and most of the rest can be classified as "normally reluctant" (Gerschman, Burrows & Reade, 1987; Golan, 1971, 1986; Gonella, 1982; Morse, Schacterle, Furst, & Bose, 1981; Peretz, 1996; Rustvold, 1994; Shaw & Niven, 1996; Simons, 1985; Schutt & Bernstein, 1986). Thus, the possible application of hypnosis as a general relaxation strategy certainly suggests itself. The potential benefits are strengthened when we consider the increasing medical and psychological fragility of patients receiving routine outpatient dental care these days. The cited reports and studies provide strong support for this application of hypnosis.

2. *Discrete phobias*: Hypnotic techniques can facilitate dealing with specific foci of phobic anxiety: fear of pain and discomfort, dental injections, sights and sounds and smells of the operator, and gagging (Barsby, 1994; Clarke & Persichetti, 1988; Gershman, 1989; Golan, 1971, 1975; Manusov, 1990; McGuiness, 1984; Morse, Hancock, & Cohen, 1984; Wilks, 1994; Zach, 1989). Kleinhaus and Eli (1991) reported the successful treatment of a patient whose anxiety was based on a fear of loss of control in the dental operator. Morse (1983) reported the successful treatment of a patient with rubber dam claustrophobia.

Gokli and associates (Gokli, Wood, Mourino, Farrington, & Best, 1994) investigated hypnosis as an adjunct to the administration of local anesthetic in pediatric dental pa-

tients. They studied 29 children age 4-13 who had no previous dental experience. All patients were videotaped during injection which was later viewed blind by two evaluators who employed the North Carolina Behavior Rating Scale. Pulse rate and transcutaneous pulse oximetry was also measured. Results showed pulse rate significantly lowered under hypnosis. There was also less crying with hypnosis. Other disruptive behaviors were also reduced, but not significantly (leg movement, hands raised, orofacial physical resistance).

McAmmond, Davidson and Kovitz (1971) compared psychophysiological responses (skin conductance) and pain ratings of 27 fearful dental patients assigned to either hypnosis, relaxation, or control conditions and exposed to both pressure algometer pain and dental injectonal pain. Hypnosis was more effective than the control condition for subjects with high baseline pain ratings for the injection. Moreover, more of the hypnosis subjects returned for dental treatment during a five-month follow up.

3. *Improved tolerance for orthodontic or prosthodontic appliances:* The goal in these applications is to enhance motivation, increase tolerance, and decrease discomfort (Smith, 1969a, 1969b; Sondi, 1980). More well controlled studies are needed in these applications.

4. *Modification of maladaptive oral habits, including bruxing and clenching, tongue thrusting:* These therapeutic goals can be more readily achieved for some patients with the appropriate adjunctive use of hypnotic techniques (Golan, 1991; Goldberg, 1973; Somer, 1991; Clarke & Reynolds, 1991; Morse, 1982). In addition, hypnosis has been used to reduce tonic EMG activity resulting in a significant increase in interocclusal space (Manns, Zuazola, Sirhan, Quiroz & Rocabado, 1990).

5. *Reduction of the use of chemical anesthetics, analgesics, and sedation:* These applications have attracted considerable attention (Gheorghiu & Orleanu, 1982; Kleinhauz & Eli, 1993; LaCrosse, 1994; Lu, 1994b; Morse, Schoor, & Cohen, 1984; Neiburger, 1977; Stern, 1991). Fassbind (1983), for example, noted that hypnosis can be used in anxiety control and pain management, especially the prolongation of local anesthetics, but acknowledged that it is a mistake to think about hypnosis primarily as a substitute for local anesthetic. Schmieder and Schmierer (1990) explored the possible clinical uses of hypnosis in dentistry for pain management, and also attempted to characterize the nature of hypnosis.

Morse (1976) found that hypnosis could either eliminate or reduce the need for local anesthesia in patients undergoing endodontic treatment. Moreover, treatment time was only increased approximately 5 minutes, contradicting the widely-held notion that hypnosis is too time consuming.

6. *To supplement or substitute for surgical premedication:* This more limited application of hypnotic techniques for pain management has not received sufficient attention. Although less clinically ambitious than substituting for chemical analgesia, the probability of success in reducing pain and anxiety and enhancing patient comfort is significant (Neiburger, 1973; Lichfield, 1982; Kleinhauz & Eli, 1993; Stern, 1991). Stern

(1991) advocates the use of hypnosis as a form of psychosomatic premedication that can be especially helpful with "difficult" or anxious patients.

7. *To control salivary flow and bleeding:* Lucas (1975) discusses role of anxiety management in controlling blood loss from hemophiliacs. Recent data provided by Enqvist and colleagues at the Karolinska Institute measured a 30% reduction in the volume of blood loss during surgery compared to a matched control group when patients undergoing maxillofacial surgery listened to both pre- and perioperative hypnotic tapes (Enqvist, von Konow, & Bystedt, 1995a, 1995b). This reduction may have been mediated by lower blood pressure in the treated group.

8. *As a therapeutic intervention for chronic facial pain syndromes such as temporomandibular disorders (TMD):* There is significant clinical evidence for the effectiveness of hypnosis in the management of a variety of chronic pain syndromes including TMD (Chaves, 1979, 1985; 1989; 1993; 1994; Chaves & Dworkin, in press; Cohen & Hillis, 1979; Gerschman, Burrows & Reade, 1978; Gerschman, Reade, Burrows & Wright, 1980; Golan, 1989; Kunzelman & Dünninger, 1987; Rolfe, Gonella, Cortelletti, Prandi, & Borgarino, 1986; Stam, McGrath, & Brooke, 1984; Stam, McGrath, Brooke, & Cosier, 1986), as well as tic douloureux (Golan, 1971; Gurian, 1985; Robinson, Schneider, & Styles, 1972; Shapira, 1990).

9. *To complement the use of nitrous oxide:* Examples of this application have been provided by DiBona (1979), Thompson (1994) and Wikström (1981). In addition, Lu (1994a) described the use of hypnosis for smooth sedation induction and reduction of postoperative violent emergencies from anesthesia in pediatric dental patients. He noted that hypnosis combined with pharmacological sedation is still not popular because so few practitioners are trained in both techniques. Dworkin and his colleagues have demonstrated the powerful effects of waking suggestion in potentiating or negating the analgesics effects of nitrous oxide (Dworkin, Chen, LeResche, & Clark, 1983; Dworkin, Chen, Schubert, & Clark, 1983; Dworkin, Schubert, Chen, & Clark, 1986). Unfortunately, many dentists who use nitrous oxide seem unaware of the clinical importance of the suggestions that accompany its use.

10. *Enhanced compliance with personal oral hygiene recommendations:* Examples of these applications have been provided by Kelly, McKinty and Carr (1988). Additional research is needed to assess the efficacy of these interventions. Obviously the range of application of hypnosis in dentistry has been enormous. Unfortunately, many of the reported observations have been unsystematic. Frequently, neither the hypnotic procedures nor the suggestions employed have been described in detail and outcomes have not been evaluated in a systematic fashion. Thus, it is hard to assess and develop strategies to improve on the procedures that have been employed. As Flourie has noted hypnosis has often been an awkward add-on rather than a well-developed technique that has been smoothly integrated into dental practice (Fourie, 1988).

Recent developments

Research and theoretical developments during the last 50 years have led to a fundamental change in our understanding of the nature of hypnotic phenomena and a greater appreciation for their potential application within the health-care settings. Let us briefly review these developments and their implications for dentistry.

The enhanced suggestibility associated with hypnosis is increasingly coming to be viewed as a consequence of the social context in which hypnosis occurs rather than the consequences of an altered state of consciousness. We are only now beginning to understand the power of that social context. We have also come to understand that we have been underestimating greatly the ability of normal individuals to substantially alter or control their experiences - of pain, stress, etc. - by influencing what they expect, what they think about and what they imagine (Barber, Spanos, & Chaves, 1974; Spanos & Chaves, 1989). From this perspective, the notion of a mystical and ephemeral hypnotic state is no longer the focus of our concern. Instead we focus on those aspects of the hypnotic situation and context that can help shape patient expectations and engage them in optimal patterns of thinking and imagination to help them to achieve therapeutic goals. The clinical efficacy of hypnotic interventions has much more to do with strategies for devising suggestions that exploit that power of the psychosocial context and, at the same time, tap the cognitive and imaginal skills of the patient (Chaves, 1979; 1989; 1993).

Increasingly, the evidence suggests that the use of the term hypnosis and the use of hypnotic induction procedures helps to shape positive expectations in many patients and that this heightened expectation can enhance the efficacy of the therapeutic suggestions that follow. Meta-analytic studies of clinical psychological interventions with hypnosis show clearly that it augments the effectiveness of other psychological treatments (Kirsch, Montgomery, & Sapirstein, 1995). Moreover, quantification of the magnitude of the treatment effects size show that hypnosis compares favorably with other psychological treatments, including psychotherapy itself (Lipsey & Wilson, 1993). Thus, it is becoming clear that hypnotic interventions are quite powerful and clinically useful.

The kinds of patients who benefit most from these interventions are often those who experience the greatest levels of anxiety and stress; the catastrophizers. These are the patients who, left to their own devices, amplify the fearful and worrisome aspects of dental treatment (Chaves & Brown, 1987). The use of hypnotic procedures, coupled with therapeutic suggestions, helps them to relax, but even more importantly it supplies them with a kind of "cognitive prosthesis," a strategy for engaging in effective coping using thoughts and images consistent with the therapeutic goal. Of course, success in devising an appropriate cognitive prosthesis requires knowing the patients' cognitive deficits as well as their cognitive strengths, such as their capacity for vivid, absorbed imagining. Knowing how the patient has coped with stress and pain in the past can provide useful information that can be effectively integrated into a hypnotic procedure

(Chaves, 1989). Thus, hypnosis can not be used as a substitute for the development of a sound dentist-patient relationship based on the establishment of good rapport. Instead, it provides a possibility of structuring that relationship in a way that offers significant clinical benefits for those patients for whom they are most needed.

Summary and conclusions

The potency of psychological factors in the dental operator has been thoroughly documented over the years, however, they have not been effectively harnessed. The widespread acceptance of hypnosis as a strategy to harness those forces has been adversely effected by

1. a comparatively weak empirical foundation, not bolstered by well controlled studies,
2. the dominance of a mystical theoretical perspective to account for hypnotic phenomena,
3. exaggerated and misleading claims of clinical efficacy that create waves of enthusiastic acceptance followed by rebound disappointment and rejection,
4. efforts to apply hypnosis in ways that fail to maximize its potential clinical value, and
5. lack of training opportunities provided by those with a scientific foundation in the field.

There are tremendous opportunities here, for scientists and clinicians alike to create research and training opportunities related to the dental application of hypnosis. The recent recognition of the role of hypnosis in pain management by the NIH Consensus Task Force (Anonymous, 1996) may help to provide momentum for growth of related health care applications of hypnosis.

As scientists and clinicians, we need to become actively involved in research and training. In our roles as editors and reviewers, we need to restrain our colleagues when they express unbridled excitement based on uncontrolled or poorly controlled clinical observation. The immediate enthusiasm they engender will inevitably do more to harm our field in the long run. Our cause will be advanced with sound clinical research providing the needed foundation to redefine clinical practice.

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Key words: Hypnosis, dentistry, history, current appraisal

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Dental Anxiety Disorders and Hypnotizability

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■ *While modern pain control techniques and improved dental equipment have radically improved dental treatment, anxiety, fear and dental phobic disorders persist in the population. There is an emerging body of evidence relating hypnotizability to both the acquisition and management of dental phobic disorders. This paper reviews the evidence of such a relationship and discusses modern management of dental anxiety disorders.*

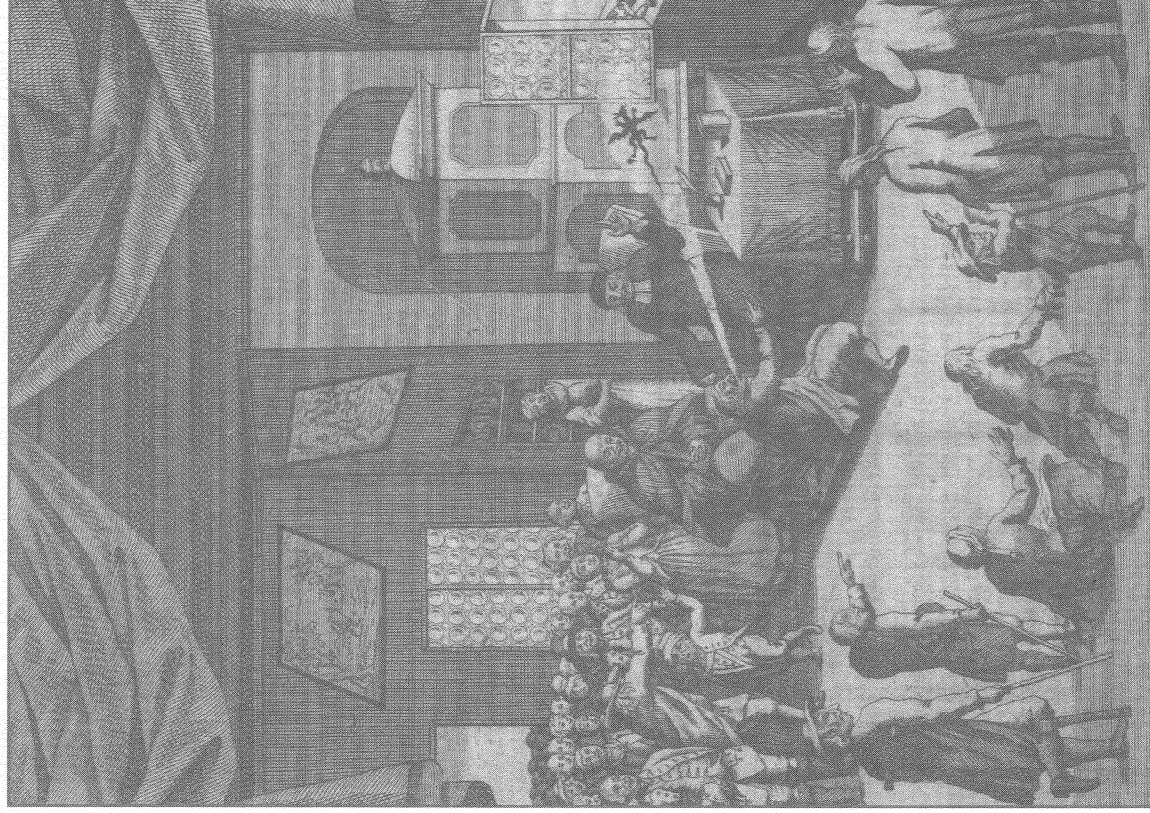
The attempts by dentists to use less painful methods in treating patients has a long and continuous history, both in hypnosis and in chemical anaesthesia. In 1842, ether was first used for dental extractions and in 1844 nitrous oxide was introduced into dental practice.

The first reported case of the dental use of hypnosis was in 1837, when Oudet, a French dentist, performed a dental extraction under hypnotic analgesia. In 1847, Ribaud and Kiario, two dentists of Portiers, France, removed a tumor from the jaw using hypnosis as the sole anaesthetic. The first recorded dental use of hypnosis appeared in the British Dental Journal in 1890 by Arthur Turner when 40 teeth were extracted from various patients.

The initial enthusiasm arising from these early successes was followed by the all too familiar alternating patterns of acceptance and rejection. Reasons for this included poor patient selection, the setting of unrealistic goals, ignorance, unsubstantiated claims, difficulties in the quantification of hypnotic phenomena and the uncertainty of both the medical and dental professions concerning its applications.

In spite of major advances in dental technology, anxiety, fear and pain are still issues of central concern for many patients. Recognition of these problems has led dentists, in recent years, to a renewed interest in psychological medicine, including psychotherapy, behavioural and cognitive therapy, relaxation techniques and hypnotherapy.

The dentists of today, who prefer to think of their task as more than the standard mechanical procedures associated with dentistry, emphasize the treatment of individuals who have presented with dental problems. Facing both acute and chronic pain problems, fear, tension, anxiety and hostility as part of their daily practice, hypnosis has



Not really an extraction but an exorcism of demons performed by father Johann Josef Gassner 1775 in Ellwangen, Germany. (from the library of Burkhard Peter)