European Journal of Orthodontics 30 (2008) 147–152
doi:10.1093/ejo/cjm120
Advance Access publication 8 February 2008

Conscious hypnosis as a method for patient motivation in cervical headgear wear—a pilot study

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SUMMARY The aim of the present study was to assess the efficiency of conscious hypnosis on patient cooperation. The subjects were 30 patients (14 females and 16 males) with a skeletal Class II division 1 malocclusion, divided into two equal groups, a control and a study group. The mean age was 10.78 ± 1.06 years for the hypnosis, and 10.07 ± 1.09 years for the control group. Both groups were treated with cervical headgear containing a timer module. The patients were also asked to record their actual wear time on timetables. The hypnosis group patients were motivated with conscious hypnosis while the control group were given verbal motivation by their orthodontist. The timer modules were read at every visit and compared with the timetables. Analysis of variance was used to determine the differences in measurements at each time point. For comparison of the groups, an independent *t*-test was used.

A statistically significant decrease ($P < 0.05$) in headgear wear was observed in the control group from the first to the sixth month; however, the difference in the hypnosis group was not significant. This result indicates that conscious hypnosis is an effective method for improving orthodontic patient cooperation. There was a low correlation between actual headgear wear indicated by the patient and that recorded by the timing modules, which showed that, timetables are not consistent tools for measuring patient cooperation.

Introduction

The most appropriate time for treatment of a skeletal Class II division 1 malocclusion is in the mixed dentition period, while growth potential is still active (Kopecky and Fishman, 1993; Tulloch *et al.*, 1997; Tung and Kiyak, 1998). Cervical headgear traction is a popular appliance for the early orthodontic treatment of such subjects (Cook *et al.*, 1994; Cole, 2002; Mäntysaari *et al.*, 2004). Considering the psychological characteristics of children in the mixed dentition, patient motivation should be encouraged in order to gain sufficient cooperation in the use of extra oral appliances. It is possibly an unwritten axiom in orthodontics that a good cooperator with headgear will obtain a better treatment result than a poor cooperator.

Patient cooperation is a common problem in cervical headgear treatment as well as with other extra oral appliances (Sinclair, 1994; Sinha *et al.*, 1996; Richter *et al.*, 1998; Mehra *et al.*, 1998; Karaman *et al.*, 2002; Turbill *et al.*, 2003). This cooperation includes correct care of orthodontic appliances, maintaining excellent oral hygiene, wearing the appliances as instructed, and keeping scheduled appointments (El-Mangoury, 1981; Mehra *et al.*, 1998). A non-compliant patient is less likely to achieve, satisfactory result, and more likely to require more time, and staff effort (Rubin, 1980). Lack of patient cooperation can undermine even the best treatment planning and mechanics (Jarabak, 1965).

There have been a number of behavioural studies regarding patient cooperation in orthodontic treatment (Weiss and Eiser, 1977; Alley, 1982; Remmel, 1982; Friedman and Litt, 1987). It has been commonly observed that a cooperative patient may turn into a non-cooperative patient or *vice versa* during treatment. Therefore, it is important to evaluate compliance during treatment in order to react when necessary.

Orthodontists make subjective assessments about their patient's actual level of compliance using methods such as molar mobility, cleanliness of headgear tubes and straps, ease of placement by the patient of the appliance, space creation between teeth, the amount of tooth movement compared with the pre-treatment models, and anchorage maintenance (El-Mangoury, 1981; Egolf *et al.*, 1990; Cureton *et al.*, 1993a; Mehra *et al.*, 1998). The use of a log (timetable calendar) for self-monitoring is common in medical practice (Barton *et al.*, 1999; Aittasalo *et al.*, 2006). There are several advantages to the use of self-monitoring techniques (Clemmer and Hayes, 1979; Cureton *et al.*, 1993a; Güray and Orhan, 1997; Cole, 2002; Doruk *et al.*, 2004), such as reinforcement of responsibility for performing the activity (Remmel, 1982) and the immediate feedback provided to the patient. It can be considered that some people fail to understand their own actions by reporting that they comply when they really do not (Cureton *et al.*, 1993a; Cole, 2002).

In order to more accurately monitor cooperation, several studies have tried to measure orthodontic patient compliance using electronic measuring devices (Northcutt, 1975;

Mitchell, 1976; Cureton *et al.*, 1993b; Güray and Orhan, 1997; Cole, 2002; Bos *et al.*, 2003; Doruk *et al.*, 2004). The first reported use of a headgear-timing device was by Northcutt (1974). This timing headgear design was a sophisticated, miniaturized electronic clock that counted the number of hours that a headgear was worn. Mitchell (1976) used the timer headgear on patients with a history of poor cooperation and gained sufficient improvement in patient cooperation.

Cureton *et al.* (1991) developed a timing device based on a small quartz calendar watch concealed in a headgear strap and activated by a small switch attached to a traction module. Later, Güray and Orhan (1997) created their own timing headgear device. Many studies have found that these timing devices are useful in measuring patient cooperation during orthodontic treatment with removable appliances (Cureton *et al.*, 1993a,b; Cole, 2002; Doruk *et al.*, 2004). Cole (2002) used a commercially available timing headgear [Compliance Science System (CSS)] on 20 patients to encourage motivation. Doruk *et al.* (2004) also used the CSS to evaluate the efficacy of timer modules on patient cooperation.

A number of educational and psychological principles are adaptable to orthodontic practice in order to gain patient compliance. Many orthodontists will use their experiences as parents as a model for the management of cooperation problems. Others may use their parents' and teachers' behaviour as guiding principles. These approaches include yelling, berating, threatening, and ridiculing the patient to improve his/her performance (Fields, 1980). In many practices, parents are called in, and they join the doctor in harassing and ridiculing the offending child. In some cases, this strategy works, although more often the elastics or removable appliances will be worn only while the patient is in the presence of the threatening adult (Rubin, 1983). Another method is the reward or punishment system (White, 1974; Richter *et al.*, 1998).

Since none of these approaches is reliable in gaining patient cooperation, alternative methods are required. Hypnosis, and other techniques closely associated with hypnosis, can be used for fearful and apprehensive patients. Anxiety and pain are among the most common indications for hypnosis in dental practice. Clinical situations in which hypnosis or a closely related technique could be used are impression taking, bonding, debonding, extraction of very loose primary teeth (Rinchuse and Rinchuse, 2001), and for increased patient motivation.

Hypnosis is a communication tool, which could be used to improve patient cooperation by increasing self-belief. Hypnosis was used as a therapeutic modality in the aftermath of World War II, because it helped in the treatment of post-traumatic stress from combat. In 1985, the American Medical Association recognized hypnosis as a legitimate treatment method (Crasilneck and Hall, 1985). Since then, it has been used not only to deal with psychological trauma and pain control, but also in influencing mind–body interactions (Rhue *et al.*, 1993).

Hypnosis is named after the Greek god for sleep (Hypnos), although the actual state of hypnosis is very different from sleep. Hypnosis is essentially a psychophysiological state of aroused, attentive, receptive focal concentration with a corresponding diminution in peripheral awareness (Cotanch *et al.*, 1987; Somer, 1991; Lu, 1994; Faymoville *et al.*, 1999; Müezzinoğlu, 2003; Hermes *et al.*, 2004). The capacity for this state varies among individuals (Barber, 1956; Ateş, 1997; Moore *et al.*, 2002). This capacity may be genetically determined or perhaps learned early in life, and it can be tapped into and invoked in three ways: (1) Spontaneously, (2) in response to a signal from another person (formal hypnosis), and (3) in response to a self-induced signal (self-hypnosis; Spiegel and Spiegel, 1978). Children are more inclined to hypnosis than adults due to their imaginary capability. Evidence indicates that hypnotic responsivity in children younger than 8 years of age differs significantly from that of older children and adults (Vandenberg, 2002).

Hypnosis, often referred to as conscious hypnosis, is a natural phenomenon and can best be described as a state of relaxation and concentration combined with a state of heightened awareness. Conscious hypnosis was first defined as a state throughout which the brain is active without any feeling of sleepiness and is at the same time capable of receiving only the desired suggestion (Müezzinoğlu, 1982, 2003). There is no question of being controlled or manipulated: nobody can be made to do anything that they do not want to do by using hypnosis.

Conscious hypnosis leads to stronger concentration and more focused attention, and thus to better acceptance and greater effectiveness to suggestions (Ersoy and Hancı, 1999).

Basically, conscious hypnosis can be divided into two very different treatments: analytic therapy and suggestion therapy, which is used in patient management in dental care. This is a straightforward method used to control simple problems such as smoking, nail biting, weight control, confidence boosting, etc. (Spiegel and Spiegel, 1978).

During hypnotherapy, the hypnotherapist uses his/her voice to induce the patient into the state of hypnosis. Rather than the therapist in some commanding or dictorial manner instructing the patient on how to change, the therapist, only helps guide the patient to his own resolution, based upon what that patient seeks to achieve (Barber, 1956).

Conscious hypnosis has been used in managing anxiety and pain during dental treatment (Gatchel, 1992; Peretz *et al.*, 1996; Shaw and Welbury, 1996; Patel *et al.*, 2000; Willemsen, 2003).

The aim of this study was to investigate the efficacy of conscious hypnosis on orthodontic patient cooperation and the accuracy of patient recorded headgear wear.

Subjects and methods

Forty consecutive patients with a skeletal Class II division 1 malocclusion presenting maxillary prognathism were selected from the state-funded patient list. Three patients aged over 12 years of age were eliminated from the study while the parents of seven patients refused participation. The remaining 30 patients (14 males, 16 females) were divided randomly in two equal groups (control and study). A secretary, who was not aware of the severity of the malocclusions, wrote the names of all patients on a list. Those with odd numbers comprised the study group and those with even numbers the control group. The mean age was 10.78 ± 1.06 years for the hypnosis group and 10.07 ± 1.09 years for the control group.

The subjects in both groups were treated by the same orthodontist (GT). The study group patients were motivated at each monthly visit, with conscious hypnosis for 20 minutes by a hypnotist. The control group patients were given only verbal motivation by their orthodontist for 15 minutes at every visit.

The subjects in both groups were instructed to wear their headgear for 16 hours per day and to record their actual wear time on a timetable. Each subject received the same commercially available timing headgear (CSS, Ortho Kinetics Corporation, Vista, California, USA); which consisted of a microprocessor-controlled timing module embedded in one of the headgear traction modules. The patients in both groups were not informed that their monthly headgear wear time was being recorded. The timer device begins a timing cycle when the module is placed under tension and stops timing when tension is released.

At each monthly visit, the module was placed in an infrared reader and the data on the module were transferred to a computer using Affirm Software V 4.2 (Ortho Kinetics Corporation, Vista, California, USA). Data received from the modules of the hypnosis and control groups were compared. In addition, the timetables were collected from the patients. In order to investigate the reliability of the timetables, the number of hours reported by the patients was compared with the number of hours recorded by the modules for each group separately.

Cooperation could only be monitored for a period of 6 months due to the limited battery life of the timer modules.

Statistical analysis

Statistical analysis was performed using the GraphPad Prisma Software Version 3.0 for Windows (San Diego, California, USA). In addition to standard descriptive statistical calculations (mean and standard deviation), for each treatment month, analysis of variance was used to determine the differences in measurements at each time point. For comparison of the control and hypnosis groups at each visit, an independent *t*-test was used. The statistical significance level was established at $P < 0.05$. The results were evaluated within a 95 per cent confidence interval.

Results

Table 1 shows the comparison of actual headgear wear, measured by the timer modules, for each group. A statistically significant decrease ($P < 0.01$) of headgear wear was observed in the control group from the first to the sixth month; however, the difference in the hypnosis group was not significant ($P > 0.05$; Table 1).

The difference between headgear wear measured by the timer modules in both groups was significant at the third ($P < 0.01$) and fifth ($P < 0.05$) months (Table 1).

The low correlation between the headgear wear indicated by the patients and that recorded by the timing modules is given in Table 2. The control group reported 32.17 hours more wear than they actually used their headgear while for the hypnosis group, this was only 18.57 hours more than their actual use of the headgear.

Table 1 Comparison of actual hours of headgear wear time measured by the timer modules between the control and hypnosis groups. One-way analysis of variance and independent *t*-test ($n = 15$).

Timer	Control group	Hypnosis group	*t*	*P* value	Significance
	Mean ± SD	Mean ± SD			
Month 1	12.97 ± 5.18	11.69 ± 4.98	0.69	0.498	NS
Month 2	10.65 ± 3.98	12.98 ± 3.97	−1.6	0.120	NS
Month 3	8.92 ± 3.41	13.75 ± 5.29	−2.97	0.006	**
Month 4	10.23 ± 5.68	12.97 ± 4.72	−1.44	0.163	NS
Month 5	8.25 ± 5.31	13.22 ± 5.18	−2.59	0.015	*
Month 6	9.68 ± 4.43	12.13 ± 4.49	−1.51	0.144	NS
Difference	3.92	0.50			
P	0.0034	0.50			
Significance	**	NS			

*$P < 0.05$; **$P < 0.01$.

Table 2 Comparisons of reported and actual hours of headgear wear time in the control and hypnosis groups. One-way analysis of variance and independent *t*-test.

	Control ($n = 15$)					Hypnosis ($n = 15$)				
	Timer module (mean ± SD)	Timetable (mean ± SD)	*t*	*P* value	Significance	Timer module (mean ± SD)	Timetable (mean ± SD)	*t*	*P* value	Significance
Month 1	12.97 ± 5.18	15.53 ± 4.11	−1.5	0.144	NS	11.69 ± 4.98	16.77 ± 3.38	−3.27	0.003	**
Month 2	10.65 ± 3.98	15.45 ± 4.32	−3.16	0.004	**	12.98 ± 3.97	18.04 ± 2.72	−4.07	0.0001	***
Month 3	8.92 ± 3.41	14.55 ± 3.69	−4.35	0.0001	***	13.75 ± 5.29	18.51 ± 2.96	−4.04	0.005	**
Month 4	10.23 ± 5.68	15.64 ± 5.11	−2.74	0.011	*	12.97 ± 4.72	17.62 ± 3.84	−2.68	0.012	**
Month 5	8.25 ± 5.31	15.41 ± 4.98	−3.81	0.0001	***	13.22 ± 5.18	19.03 ± 2.51	−3.91	0.0001	***
Month 6	9.68 ± 4.43	16.29 ± 4.09	−4.25	0.0001	***	12.13 ± 4.49	17.97 ± 3.80	−3.84	0.0001	***

*$P<0.05$; **$P<0.01$; ***$P<0.001$; ns, not significant.

Discussion

Cervical headgear is popular for early treatment of skeletal Class II malocclusions during the mixed dentition. Jacobson (1979) emphasized that treatment of Class II division 1 malocclusions should be undertaken in the early mixed dentition. Cooperation has been accepted as an important factor in orthodontic treatment outcomes, especially when extra oral appliances are used. Kleck *et al.* (1974) stated that children attach great importance to body image and their physical cues may determine social acceptance. It is obvious that extra oral appliances will affect body image and this could be a reason for not wearing headgear. In order to overcome this cooperation problem, the patient should be properly motivated. Lack of adequate patient cooperation is not only a treatment response problem but can be a source of frustration and anxiety for the orthodontist. Lack of patient cooperation can disrupt even the best treatment planning and mechanics (Jaraback, 1965).

There are many ways of motivating orthodontic patients, such as the use of timetables, reward and punishment methods as well as behaviour modification and improving clinician–patient relationship (White, 1974; Portnoy, 1997; Richter *et al.*, 1998; Cole, 2002). Despite the use of these methods, motivating orthodontic patients is still a challenge.

The use of hypnosis as an alternative method in medicine has gained popularity in last two decades. Clinical situations in which hypnosis, or a closely related technique, could be used are: impression taking, bonding, debonding, and extraction of very loose primary teeth. Since there is no evidence-based study indicating the relationship between hypnosis and patient motivation, this study was performed.

Northcutt (1974) reported that cooperation increased when patients were informed that their headgear wear was being recorded at every appointment. In this study, the patients in both groups were not informed that their monthly headgear wear times were monitored in order to observe the pure effect of motivational approaches.

The actual headgear wear observed in the control group reduced with time (Table 1), indicating that patient cooperation decreases with time during treatment if the patient is not properly motivated (Sinha *et al.*, 1996). In the present study, verbal motivation performed by the orthodontist was not sufficient to achieve sufficient patient cooperation. On the other hand, no significant decrease was observed in headgear wear in the hypnosis group during treatment (Table 1). This finding indicates that conscious hypnosis is an effective method of patient motivation.

By comparing the actual and reported headgear wear times for both groups, it was found out that most patients in both groups recorded more headgear wear on their timetables than actually occurred (Table 2). The control group reported 32.17 hours more headgear wear than that recorded with the timer module. The hypnosis group reported only 18.57 hours more. This might be explained by the hypnosis group patients marking their headgear wear on the timetables more acurately than the control group patients. This finding is similar to the results of Cole (2002) and Cureton *et al.* (1993b). As the measurement of cooperation by timetables is subjective, it highlights the belief that timetables are not reliable for measuring patient cooperation during treatment.

Measurements recorded with the timer modules could be carried out for only 6 months due to the life of the battery. A longer evaluation period may have produced different results.

Conclusion

Patient cooperation with orthodontic instruction tends to decrease over the period of treatment with extra oral appliances, regardless of the type of compliance demonstrated early in therapy. This pilot study indicates that conscious hypnosis is an effective method for improving orthodontic patient cooperation. Timetables are not robust tools for measuring patient cooperation during treatment. Due to the small sample size in this study, the results must

be interpreted with caution and further research with larger groups is required.

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References

Aittasalo M, Miilunpalo S, Kukkonen-Harjula K, Pasanen M 2006 A randomized intervention of physical activity promotion and patient self-monitoring in primary health care. Preventive Medicine 42: 40–46

Alley T R 1982 Social and applied aspects of perceiving faces. Lawrence Erlbaum Associates, Hillsdale.

Ateş M 1997 Hipnoz ve dişhekimliğindeki uygulamaları. Diş Hekimliği Dergisi 25: 161–166

Barber T X 1956 A note on hypnositability and personality traits. International Journal of Clinical and Experimental Hypnosis 4: 109–114

Barton K A, Blanchard E B, Veazey C 1999 Self-monitoring as an assessment strategy in behavioral medicine: clinical assessment applications of self-monitoring. Psychological Assessment 11: 490–497

Bos A, Hoogstraten J, Prahl-Andersen B 2003 On the use of personality characteristics in predicting compliance in orthodontic practice. American Journal of Orthodontics and Dentofacial Orthopedics 123: 568–571

Clemmer J E, Hayes E W 1979 Patient cooperation in wearing orthodontic headgear. American Journal of Orthodontics 75: 517–524

Cole W 2002 Accuracy of patient reporting as an indication of headgear compliance. American Journal of Orthodontics and Dentofacial Orthopedics 121: 419–423

Cook A H, Selke T A, BeGole E A 1994 Control of the vertical dimensions in Class II correction using a cervical headgear and lower utility arch in growing patients. American Journal of Orthodontics and Dentofacial Orthopedics 106: 376–388

Cotanch P H, Harrison M, Roberts J 1987 Hypnosis as an intervention for pain control. Nursing Clinics of North America 22: 699–704

Crasilneck H B, Hall J A 1985 Clinical hypnosis principles and applications, 2nd edn. Grune and Stratton, Orlando.

Cureton S L, Regennitter F, Orbell M G 1991 An accurate, inexpensive headgear timer. Journal of Clinical Orthodontics 25: 749–754

Cureton S L, Regennitter F J, Yancey J M 1993a Clinical versus quantitative assessment of headgear compliance. American Journal of Orthodontics and Dentofacial Orthopedics 104: 277–284

Cureton S L, Regennitter F J, Yancey J M 1993b The role of the headgear calendar in headgear compliance. American Journal of Orthodontics and Dentofacial Orthopedics 104: 387–394

Doruk C, Ağar U, Babacan H 2004 The role of the headgear timer in extra oral cooperation. European Journal of Orthodontics 26: 289–291

Egolf R J, BeGole E A, Upshaw H S 1990 Factors associated with orthodontic patient compliance with intra oral elastic and headgear wear. American Journal of Orthodontics and Dentofacial Orthopedics 97: 336–348

El-Mangoury N H 1981 Orthodontic cooperation. American Journal of Orthodontics 79: 604–622

Ersoy M A, Hancı İ H 1999 Hipnoz ve Adli Hipnoz. Hekim ve Yaşam 6: 1214–1215

Faymoville M E, Meurisse M, Fissette J 1999 Hypnosedation: a valuable alternative to traditional anesthetic techniques. Acta Chirurgica Belgica 99: 141–146

Fields R S 1980 Influencing patient cooperation. Journal of Clinical Orthodontics 14: 417–421

Friedman I M, Litt I F 1987 Adolescents' compliance with therapeutic regimens. Journal of Adolescent Health Care 8: 52–57

Gatchel R J 1992 Managing anxiety and pain during dental treatment. Journal of the American Dental Association 123: 37–41

Güray E, Orhan M 1997 Selçuk type headgear-timer (STHT). American Journal of Orthodontics and Dentofacial Orthopedics 111: 87–92

Hermes D, Trübger D, Hakim S G, Sieg P 2004 Perioperativer einsatz von medizinischer hypnose. Der Anesthesist 4: 326–333

Jacobson A 1979 Psychology and early orthodontic treatment. American Journal of Orthodontics 75: 511–529

Jarabak J 1965 Management of an orthodontic practice, Chapter 7. The C.V. Mosby Company, St. Louis, pp. 150–181

Karaman A I, Basciftci F A, Gelgor E 2002 Ortodontik tedavi gören hastalarda headgear ve ağız içi elastik kullanımının hasta kooperasyonu üzerine etkisi. Türk Ortodonti Dergisi 15: 108–115

Kleck R E, Richardson S A, Ronald L 1974 Physical appearance cues and interpersonal attraction in children. Child Development 45: 305–310

Kopecky G R, Fishman L S 1993 Timing of cervical headgear treatment based on skeletal maturation. American Journal of Orthodontics and Dentofacial Orthopedics 104: 162–169

Lu D P 1994 The use of hypnosis for smooth sedation induction and reduction of postoperative violent emergencies from anesthesia in pediatric dental patients. Journal of Dentistry for Children 6: 182–185

Mäntysaari R, Kantomaa T, Pirttiniemi P, Pykalainan A 2004 The effect of early headgear treatment on dental arches and craniofacial morphology: a report of a 2 year randomized study. European Journal of Orthodontics 26: 59–64

Mehra T, Nanda R S, Sinha P K 1998 Orthodontists' assessment and management of patient compliance. Angle Orthodontist 68: 115–122

Mitchell J I 1976 It's time for the timing headgear. Journal of Clinical Orthodontics 10: 919–929

Moore R, Broadsgaard I, Abrahamsen R 2002 A 3 year comparison of dental anxiety treatment outcomes: hypnosis, group therapy and individual desensitization vs. no specialist treatment. European Journal of Oral Sciences 110: 287–300

Müezzinoğlu A E 1982 3877 cases under conscious hypnosis. Conscious Hypnosis Center, Ağaoğlu Yayınevi Tesisleri, Istanbul, pp. 7–13

Müezzinoğlu A E 2003 Tıbbi Hipnoz Kursları, 1. Basamak Temel Bilgiler, Ders Notları. Yeditepe Üniversitesi Diş Hekimliği Fakültesi, Yayinlari, Istanbul, pp. 7–42

Northcutt M E 1974 The timing headgear. Journal of Clinical Orthodontics 8: 321–324

Northcutt M E 1975 Updating the timing headgear. Journal of Clinical Orthodontics 9: 713–717

Patel B, Potter C, Mellor A C 2000 The use of hypnosis in dentistry: a review. Dental Update 27: 198–202

Peretz B, Katz J, Zilburg I, Shemer J 1996 Treating dental phobic patients in the Israel defense force. International Dental Journal 46: 108–112

Portnoy S 1997 Patient co-operation—how can it be improved? British Journal of Orthodontics 24: 340–342

Remmel P S 1982 Assessment of dietary compliance. American Journal of Public Health 72: 128–129 (editorial)

Rhue J W, Lynn S J, Kirsch I 1993 Handbook of clinical hypnosis, American Psychologic Association, Washington

Richter D D, Nanda R S, Sinha P K, Smith D W 1998 Effect of behavior modification on patient compliance in orthodontics. Angle Orthodontist 68: 123–132

Rinchuse D J, Rinchuse D J 2001 The use of educational-psychological principles in orthodontic practice. American Journal of Orthodontics and Dentofacial Orthopedics 119: 660–663

Rubin R M 1980 The uncooperative patient. Journal of Clinical Orthodontics 14: 176–177

Rubin R M 1983 Behavior modification for orthodontic cooperation. Journal of Clinical Orthodontics 14: 322–325

Shaw A J, Welbury R R 1996 The use of hypnosis in a sedation clinic for dental extractions in children: Report of 20 cases. Journal of Dentistry for Children 63: 418–420

Sinclair P M 1994 Cooperation. Journal of Clinical Orthodontics 28: 361–363

Sinha P K, Nanda R S, McNeil D W 1996 Perceived orthodontist behaviors that predict patient satisfaction, orthodontist-patient relationship, and patient adherence in orthodontic treatment. American Journal of Orthodontics and Dentofacial Orthopedics 110: 370–377

Somer E 1991 Hypnotherapy in the treatment of the chronic nocturnal use of a dental splint prescribed for bruxism. International Journal of Clinical and Experimental Hypnosis 39: 145–154

Spiegel H, Spiegel D 1978 Trance and treatment, clinical uses of hypnosis. American Psychiatric Press, Inc, Washington, pp. 33–34, 132–145

Tulloch J F C, Proffit W R, Phillips C 1997 Influences on the outcome of early treatment for Class II malocclusion. American Journal of Orthodontics and Dentofacial Orthopedics 111: 533–542

Tung A W, Kiyak H A 1998 Psychological influences on the timing of orthodontic treatment. American Journal of Orthodontics and Dentofacial Orthopedics 113: 29–39

Turbill E A, Richmond S, Wright J L 2003 Social inequality and discontinuation of orthodontic treatment: is there a link? European Journal of Orthodontics 25: 175–183

Vandenberg B 2002 Hypnotic responsivity from a developmental perspective: insights from young children. International Journal of Clinical and Experimental Hypnosis 50: 229–247

Weiss J, Eiser H M 1977 Psychological timing of orthodontic treatment. American Journal of Orthodontics 72: 198–203

White L W 1974 Behavior modification of orthodontic patients. Journal of Clinical Orthodontics 8: 501–505

Willemsen R 2003 Hypnosis techniques used to diminish anxiety and fear: a review of the literature. Revue Belge de Medecine Dentaire 58: 99–104