International Journal of Paediatric Dentistry 2005; **15:** 429–436

Magic trick: a behavioural strategy for the management of strong-willed children

B. PERETZ[1] & G. GLUCK[2]

[1]*Department of Pediatric Dentistry, The Hebrew University Hadassah School of Dental Medicine, Jerusalem, Israel and* [2]*Division of Reconstructive Dentistry and Comprehensive Care, Department of General Dentistry, New York University College of Dentistry, New York, New York, USA*

Summary. *Objective*. The purpose of this study was to compare the effectiveness of using a magic trick to persuade strong-willed children who refuse to sit in the dental chair at the first visit with more conventional methods like tell-show-do (TSD).

Methods. Seventy children aged 3–6 years of age who were identified as manifesting strong-willed behaviour were selected for this study. The children were randomly assigned to be managed either by a magic trick distraction or by TSD. There were 35 subjects in each group. The following variables were recorded for each child: time from the beginning of the session to sitting on the dental chair (in minutes); ability to perform a dental examination (yes or no); and Frankl's behavioural category.

Results. Children who were shown a magic trick (Magic+) sat significantly faster on the dental chair than children who were not shown the magic trick (Magic–) (141·2 ± 71·5 and 221·7 ± 110·7 s, respectively). In addition, radiographs could be taken in significantly more Magic+ children (91% and 54%, respectively). When time till sitting on dental chair, radiographs taken and Frankl's behavioural categories were examined by gender, age, first time at the dentist and by parent assessment, the following pattern emerged: (1) Children in the Magic+ group sat on the dental chair significantly faster than children in the Magic– group. (2) Radiographs could be taken for more Magic+ children. (3) The Magic+ children demonstrated more cooperative behaviour (Frankl's categories 3 and 4).

Conclusion. This study demonstrates that a magic trick is able to facilitate two types of cooperative behaviour: (1) it expedites the movement of the child into the dental chair; and (2) it enables the dentist to take radiographs more easily.

Introduction

Uncooperative behaviour in the dental setting is most typically attributed to behavioural manifestations of anxiety [1]. While there is no doubt that anxiety plays a major role in the dental behaviour of many children, there may be other causes for the uncooperative behaviour observed in the dental setting. Forehand and Long [1] have labelled children who exhibit high levels of uncooperative behaviour as being strong-willed (as well as independent, persistent and confident). These children are likely to be noncompliant, stubborn, argumentative and defiant. In the dental situation, they may express refusal to enter the operatory, refuse to open their mouths for oral examination or push the dentist away. Such uncooperative behaviour has been rated by dentists as being most problematic in the dental chair [2]. Major consequences of such strong-willed uncooperative behaviour may include a delay in or

Correspondence: B. Peretz, Department of Pediatric Dentistry, The Hebrew University Hadassah School of Dental Medicine, PO Box 12272, Jerusalem, Israel. E-mail: benny@cc.huji.ac.il

termination of treatment before completion, or a decrease in the quality of care provided [3].

The roots of strong-willed behaviour are different. Most often, this behaviour is a consequence of anxiety. These children might be screening their anxiety with hostility. However, researchers have also found a child's temperament to account for uncooperative behaviour. Some children have a 'difficult' temperament from infancy that is reflected in problems such as restlessness, intensity, distractibility, moodiness and difficulties with adaptability [4].

Dealing with an anxious or a temperamentally difficult child is often a difficult process. Parents and caregivers may easily fall into certain practices or 'traps' which can exacerbate the child's problem behaviours, particularly noncompliance [5].

The dental literature does not make reference to 'strong-willed children'. It deals with paediatric patient management issues in general and specific behaviour (disruptive behaviour) that manifests in the paediatric dentistry setting. No specific management techniques have been suggested to apply to strong-willed children, *per se*.

The American Academy of Pediatric Dentistry (AAPD) has recommended a number of behaviour management methods. As is evident, these procedures vary in invasiveness. The AAPD guidelines list the following behaviour management techniques: tell-show-do (TSD), positive reinforcement, voice control, nonverbal communication, distraction, parental presence/absence, hand-over-mouth, and also nitrous oxide/oxygen inhalation sedation, medical immobilization, sedation and general anaesthesia [6].

The first technique mentioned, TSD, is simple and usually works. The technique dictates that, before anything is done, the child is told what will be done and then shown by some sort of simulation exactly what will happen before the procedure is started [7]. Tell-show-do is the basic, most common behavioural management technique for paediatric dental patients, and it is a behaviour-shaping technique. It implies training in how to cope with the dental situations which children will meet. While most paediatric patients are very easy and quick to familiarize with dental treatments, some children are very difficult to shape and a lot of time needs to be devoted to this in these cases [8].

Allen and Stokes [9] and Allen *et al*. [10] and successfully used escape and reward strategies during restorative treatment on 3–6-year-old children who presented with disruptive behaviour. Kuhn and Allen [11] discussed the use of contingent distraction and contingent escape techniques. Distraction techniques attempt to divert the patient's attention from what may be perceived as unpleasant [6]. The objective is to decrease the perception of unpleasantness, and to avert negative or avoidance behaviour. It can be used with any patient.

Reframing, relaxation techniques, the use of suggestions, and breathing and blowing out air have all been described as techniques containing elements of distraction which were successful in the management of dentally anxious children [12–16]. All these techniques were used with the child in the dental chair, but none of them offered solutions for strong-willed children who refused to sit in the chair.

Forehand and Long [1] have suggested that strong-willed children should be categorized separately and that an authoritarian approach should be applied in the treatment of these children. This approach would involve the dentist, the child and the parents. The following parameters would need to be addressed: planning; establish rules which would be explained to the child at the beginning of treatment and then at regular intervals; the dentist would project a warm, supportive and reinforcing approach throughout; and the dentist would avoid dwelling on uncooperative behaviour. Patient cooperation would be reinforced throughout the treatment. Resorting to invasive procedures would occur only when the core approach was not working.

Most kinds of behaviour management problems may be prevented if enough time and thought are invested. The techniques usually demand minor use of time in most children. However, for strong-willed children, this part of the dental treatment may be extremely time-consuming [8].

A useful way of dealing with strong-willed behaviour in the dental situation may be by performing magic tricks for the children. A magician is an actor who pretends he is doing the impossible. The most common trick is to make objects or people disappear and reappear. If the audience's attention can be controlled, the magician needs only some sleight of hand and very little apparatus. Distraction of the mind may be just as necessary as distraction of the eye. In the case of strong-willed children, the attention of the child is drawn away from the actual dental situation and cooperation may be achieved.

The purpose of this study was to compare the effectiveness of using a magic trick to persuade strong-willed children who refuse to sit in the dental

chair at the first visit with more conventional methods. Magic, for the purposes of this study, was defined, according to *Webster's New Universal Unabridged Dictionary* as 'the art of producing illusions as entertainment by the use of sleight of hand, deceptive devices, etc.…' Magic would be shown to the strong-willed child before she or he was seated in the dental chair.

Subjects and methods

Seventy children aged 3–6 years of age who were identified as manifesting strong-willed behaviour were selected for this study. These children were selected at the first elective examination appointment in a private clinic if they exhibited any of the following: loud refusal to enter the room and/or refusal firmly to sit in the dental chair despite their parents' requests. Children in need of emergency treatment were excluded from the study. During anamnesis (taken by the dentist), accompanying parents were routinely asked to assess the child's behaviour (favourable or unfavourable). Children were randomly assigned to be managed either by magic trick distraction or by TSD (35 children in each group). Parents were informed about the behavioural approaches and agreed.

The magic trick group (Magic+)

The children in this group were asked to stand by their parents. They were asked their names empathically. The same magic trick was performed for all children by the dentist, consisting of the following: they were shown a 'magic book'; pictures could be erased magically and drawn again. After being shown the trick, they were asked to show their teeth and to sit in the dental chair.

The tell-show-do group (Magic–)

The TSD group was managed using the more conventional empathic attitude, age-orientated TSD and positive reinforcement. All children were asked their names and to count their fingers (for the 3-year-olds). The children were shown their fingers with the mirror and then they were shown their teeth with the mirror. The following variables were recorded:
1 the time from the beginning of session to sitting on the dental chair for each child (in seconds, measured by the dental assistant);
2 radiographs (periapical of the upper incisor region or bite-wings, taken by the dentist) (yes or no); and
3 Frankl's behavioural category [17] as rated by the dentist. Frankl's behavioural categories are routinely done for every child and include the following: (1) definitely negative – refusal of treatment, crying forcefully, fearful or any other overt evidence of extreme negativism; (2) negative – reluctant to accept treatment, uncooperative, some evidence of negative attitude but not pronounced, i.e. sullen, withdrawn; (3) positive – acceptance of treatment, but cautious at times, willingness to comply with the dentist, at times with reservation, but patient follows the dentist's directions cooperatively; and (4) definitely positive – good rapport with the dentist, interested in the dental procedures, laughing and enjoying the situation.

Student's *t*-test was used to obtain the mean time from the beginning of the session to sitting on the dental chair. Chi-square analysis was used to evaluate the other parameters. The level of significance was set at $P < 0{\cdot}05$.

Results

The age distribution of the children in both the Magic+ and Magic– groups is shown in Table 1. Most children in both groups were aged 3 and 4 years old.

Table 2 shows the time till sitting on the dental chair, radiographs taken and Frankl's behavioural categories for the whole groups. Children who were shown a magic trick sat significantly faster on the dental chair than children who were not shown the magic ($141{\cdot}2 \pm 71{\cdot}5$ and $221{\cdot}7 \pm 110{\cdot}7$ s, respectively). In addition, radiographs could be taken in significantly more children in the Magic+ group (91% and 54%, respectively).

Time till sitting on the dental chair, radiographs taken and Frankl's behavioural categories by gender, by age, by first time at the dentist and by parent assessment can be seen in Tables 3–6, respectively.

The following pattern can be seen in all tables: (1) Children in the Magic+ group sat on the dental chair

Table 1. Age distribution of the children: (Magic+) shown a magic trick; and (Magic–) not shown a magic trick.

Age (years)	Magic+ ($n = 35$)	Magic– ($n = 35$)	Total ($n = 70$)
3	12 (34%)	11 (31%)	23 (33%)
4	14 (40%)	16 (46%)	30 (43%)
5	7 (20%)	6 (17%)	13 (19%)
6	2 (6%)	2 (6%)	4 (6%)

Table 2. Time till sitting on dental chair, radiographs taken and Frankl's behavioural categories for the whole groups: (Magic+) shown a magic trick; and (Magic–) not shown a magic trick.

Variable	Magic+ ($n = 35$)	Magic– ($n = 35$)	Total ($n = 70$)
Mean time (± SD) till sitting on chair (s)	141·2 ± 71·5	221·7 ± 110·7*	181·4 ± 100·9
Radiographs:			
yes	32 (91%)	19 (54%)	51 (73%)
no	3 (9%)	16 (46%)†	19 (27%)
Frankl's behavioural category:			
2	3 (9%)	7 (20%)	10 (14%)
3 + 4	32 (91%)	28 (80%)	60 (86%)

*$P = 0{\cdot}001$.

†$P = 0{\cdot}0013$.

Table 3. Time till sitting on dental chair, radiographs taken and Frankl's behavioural categories by gender: (Magic+) shown a magic trick; and (Magic–) not shown a magic trick.

	Boys ($n = 37$)		Girls ($n = 33$)	
Variable	Magic+ ($n = 17$)	Magic– ($n = 22$)	Magic+ ($n = 20$)	Magic– ($n = 13$)
Mean time (± SD) till sitting on chair (s)	138·7 ± 72·3*	217·3 ± 103·3*	143·0 ± 72·6†	229·2 ± 126·1†
Radiographs:				
yes	14 (93%)	11 (50%)	18 (90%)	8 (62%)
no	1 (7%)	11 (50%)‡	2 (10%)	5 (38%)
Frankl's behavioural category:				
2	1 (7%)	3 (14%)	2 (10%)	4 (31%)
3 + 4	14 (93%)	19 (86%)	18 (90%)	9 (69%)

*$P = 0{\cdot}015$, *t*-test.

†$P = 0{\cdot}018$, *t*-test.

‡$P = 0{\cdot}016$, chi-square test.

Table 4. Time till sitting on dental chair, radiographs taken and Frankl's behavioural categories by age: (Magic+) shown a magic trick; and (Magic–) not shown a magic trick.

	3 years ($n = 23$)		4–6 years ($n = 47$)	
Variable	Magic+ ($n = 12$)	Magic– ($n = 11$)	Magic+ ($n = 23$)	Magic– ($n = 24$)
Mean time (± SD) till sitting on chair (s)	143·3 ± 80·8*	261·8 ± 100·2*	140·0 ± 96·6†	203·3 ± 112·3†
Radiographs:				
yes	11 (92%)	5 (45%)	21 (91%)	14 (58%)
no	1 (8%)	6 (55%)‡	2 (9%)	10 (42%)§
Frankl's behavioural category:				
2	1 (8%)	3 (27%)	2 (9%)	4 (17%)
3 + 4	11 (92%)	8 (73%)	21 (91%)	20 (83%)

*$P = 0{\cdot}005$, *t*-test.

†$P = 0{\cdot}025$, *t*-test.

‡$P = 0{\cdot}05$, chi-square test.

§$P = 0{\cdot}024$, chi-square test.

significantly faster than children in the Magic– group. (2) Radiographs could be taken in more Magic+ children. (3) The Magic+ children demonstrated more cooperative behaviour (Frankl's categories 3 and 4).

Significance was observed by gender among boys, by age among the 3-year-olds and the 4–6-years-olds, among children who came to the dentist for the first time, and among children whose parents predicted that their behaviour would be 'uncooperative'. With respect to the last finding, all the Magic– children among the group whose behaviour was assessed as uncooperative by the parents did not allow the dentist to take radiographs.

Discussion

The results of this study demonstrate that there were significant behavioural changes in strong-willed

Table 5. Time till sitting on dental chair, radiographs taken and Frankl's behavioural categories by first time at the dentist: (Magic+) shown a magic trick; and (Magic–) not shown a magic trick.

	First-timers (n = 48)		Second or more (n = 22)	
Variable	Magic+ (n = 25)	Magic– (n = 23)	Magic+ (n = 10)	Magic– (n = 12)
Mean time (± SD) till sitting on chair (s	131·2 ± 56·0*	202·6 ± 105·1*	166·0 ± 99·8†	258·3 ± 114·8†
Radiographs:				
yes	24 (96%)	15 (65%)	8 (80%)	4 (33%)
no	1 (4%)	8 (35%)‡	2 (20%)	8 (67%)
Frankl's behavioural category:				
2	1 (4%)	3 (13%)	2 (20%)	4 (33%)
3 + 4	24 (96%)	20 (87%)	8 (80%)	8 (67%)

*P = 0·005, t-test.
†P = 0·06, t-test.
‡P = 0·018, chi-square test.

Table 6. Time till sitting on dental chair, radiographs taken and Frankl's behavioural categories by parent assessment: (Magic+) shown a magic trick; and (Magic–) not shown a magic trick.

	Good assessment (n = 36)		Bad assessment (n = 34)	
Variable	Magic+ (n = 17)	Magic– (n = 19)	Magic+ (n = 18)	Magic– (n = 16)
Mean time (± SD) till sitting on chair (s)	120·0 ± 0*	195·9 ± 102·9*	161·1 ± 96·6†	252·5 ± 114·8†
Radiographs:				
yes	17 (100%)	19 (100%)	15 (83%)	0
no	0	0	3 (17%)	16 (100%)‡
Frankl's behavioural category:				
2	0	1 (5%)	3 (17%)	6 (38%)
3 + 4	17 (100%)	18 (95%)	15 (83%)	10 (50%)

*P = 0·003, t-test.
†P = 0·017, t-test.
‡P = 0·0001, chi-square test.

children who participated in the magic experience. First, less time was required in moving the strong-willed child from the parent to the dental chair. Secondly, radiographs could be taken more easily when children had been shown the magic trick.

A possible explanation is that, while performing the magic trick, the dentist is quickly drawing the attention of the child away from the dental situation. The dentist may be perceived as an ally – a playful and approachable figure – and cooperation may be achieved.

The right hemisphere of the brain may be engaged in understanding the way the magic works. The brain is composed of two hemispheres, the left and the right, and specific functions have been attributed to each. The left hemisphere in right-handed people is characterized as verbal, voluntary and regional [18]. Language, speech analysis and problem-solving are mediated on this side. The right side can be classified as nonverbal, submissive and emotional. Skills such as art and music are right-hemisphere activities. Imagination is also thought to be right hemispheric.

Imagination is an essential requisite of hypnotic responsiveness or response to suggestion. Successful suggestions directly address the right hemisphere and/or bypass the left. The processing of messages through the hemispheres is determined by the nature of the language or the content of the messages [19]. Theoretically, the magic trick addresses the right hemisphere without allowing mediation through the left hemisphere (the hemisphere of rationality and analysis). Furthermore, the right side of the brain is more developed in children in this age group. For some children, magic can also be challenging to their intellect (left hemisphere) and may pique their curiosity. In this study, the observed impact of the magic trick was apparently lost on children who returned for a second appointment.

Another factor which may be involved in explaining the results of this study is the nature of doctor–patient relationships. This is a primordial association that has been with us since time immemorial. Therefore, it is inevitable that archetypal images are activated in the course of treatment [20]. Archetypal

figures, such as the shaman or magician, are commonly projected. Thus, the magic is seen as a suggestion that the ancient sorcerer used to manipulate behaviour of members of the community. It is a world-view that is especially strong among young children.

This study expands the arsenal of behavioural options in dealing with strong-willed children. The authoritarian approach, as suggested by Forehand and Long [1], may be problematic. It involves the full cooperation of parents, and it requires considerable planning and structure. Several dental visits may be needed which involve indoctrination without treatment. This also adds considerable cost to the process.

One of the keys to treating children with the behaviours described above is to differentiate between uncooperative behaviours which are primarily a function of anxiety versus strong-willed behaviour. The problems of anxiety and strong will are not mutually exclusive, and there may be an overlap in terms of their psychological dynamics.

Disruptive behaviours, particularly from those lacking the ability to cooperate, are often prompted by a need to protest at an unpleasant situation and the impulse to protect oneself. Such behaviours, depending on age and cognitive ability, should be viewed as an attempt to cope with a frightening situation [21].

Management of anxiety and of strong-willed behaviours may be different. Anxious children must be calmed, but other strategies may mimic techniques used to manage the strong-willed child. The use of magic tricks can also relax an anxious child. Thus, the use of magic tricks can help in managing both anxiousness and strong will.

The challenge for both the clinician and the parent is to avoid unpleasant and unproductive confrontations from the outset. Efforts must be made to create a pleasant and supportive environment. Factors which persuade the child to accept treatment include the following: supporting the child's self-esteem; fostering a positive attitude toward care; and enhancing the quality and efficiency of dental personnel. Techniques such as TSD may not be sufficient to shape the behaviour of a strong-willed child.

The magic trick is a tool that distracts and relaxes the child, and enables the dentist to provide the necessary care. In this study, the use of the magic trick shortened the amount of time necessary to move the strong-willed child from the operatory into the dental chair and increased the cooperativeness of these children, as shown by the ability to take radiographs.

This study was focused on behaviour and no attempt was made to establish the underlying reasons for the initial strong-willed behaviour preventing treatment. It might have been useful to determine the levels of anxiety, but use of self-report questionnaires, the most common means of measurement, was likely to have been especially difficult in this group because their cooperation was so limited and this could have influenced the outcome.

What this paper adds

- The use of a magic trick facilitated cooperation in preschool children who at their first appointment refused to enter the examination room or sit in the dental chair.
- The use of a magic trick shortened the time from entering the examination room to sit in the dental chair, and increased cooperation in taking radiographs.

Why this paper is important to paediatric dentists

- A magic trick expands the arsenal of behavioural options when treating children with uncooperative behaviour during dental examination.

Conclusion

This study has demonstrated that a magic trick or the intervention of a type of play that stretches the imagination of the child is able to facilitate two types of cooperative behaviour. It expedited the movement of the child into the dental chair and it enabled the dentist to take radiographs more easily.

Résumé. *Propos.* Cette étude a eu pour objet de comparer l'efficacité de l'utilisation d'un tour de magie pour persuader les enfants à forte volonté qui refusent de s'asseoir sur le fauteuil dentaire lors de la première visite à celle de méthodes plus conventionnelles comme le dire-montrer-faire (TSD).
Méthodes. Soixante-dix enfantsâgés de 3 à 6 ans, identifiés comme manifestant un fort comportement, ont été sélectionnés pour cette étude. Les enfants ont été répartis au hasard dans le groupe tour de magie ou TSD, 35 dans chaque groupe. Les variables suivantes ont été enregistrées pour chaque enfant : temps écoulé entre le début de la séance et le moment où il s'assoit (en minutes), possibilité de réaliser un examen dentaire (oui ou non) et la catégorie de comportement de Frankl.

Résultats. les enfants auxquels on a montré un tour de magie (Magic+) se sont assis significativement plus vite dans le fauteuil dentaire que les autres enfants (Magic–) (141,2 ± 71,5 et 221,7 ± 110,7 secondes respectivement). De plus, des radiographies ont pu être prises chez significativement plus d'enfants Magic+ (91% et 54% respectivement). Quand le temps passé avant de s'asseoir, les radiographies prises et le comportement de Frankl ont été analysés par genre, âge, première fois chez le dentiste et par évaluation des parents, les caractéristiques suivantes ont été notées : (a) les enfants du groupe Magic+ se sont assis significativement plus vite que ceux du groupe Magic–; (b) des radiographies ont pu être prises chez plus d'enfants Magic–; (c) les enfants du groupe Magic– ont montré plus de coopération (catégories 3 et 4 de Frankl).
Conclusion. Cette étude montre que le tour de magie peut faciliter deux types de comportement de coopération: (a) accélération du mouvement de l'enfant vers le fauteuil et (b) possibilité de prendre des radiographies plus facilement.

Zusammenfassung. *Ziel*. Ziel dieser Studie war es, die Effektivität der Anwendung eines Zaubertricks zum Überreden von Kindern, welche sich bei einer Erstuntersuchung weigern auf dem Zahnarztstuhl Platz zu nehmen, zu vergleichen mit einer konventionellen Methode wie tell-show-do (TSD).
Methoden. Siebzig Kinder im Alter von drei bis sechs Jahren, die als willensstark eingestuft wurden, wurden für diese Studie ausgewählt. Die Kinder wurden zufällig einer Zaubertrick-Distraktion oder TSD zugeordnet, 35 je Gruppe. Die folgenden Variablen wurden für jedes Kind protokolliert: Die Zeit von Begrüßung bis zum Sitzen des Kindes auf dem Stuhl (in Minuten); die Möglichkeit eine klinische Untersuchung durchzuführen (ja oder nein); die Möglichkeit ein Röntgenbild anzufertigen (ja oder nein); die Einstufung auf der Verhaltensskala nach Frankl.
Ergebnisse. Kinder, die einen Zaubertrick vorgeführt bekamen (Magic+) saßen signifikant schneller auf dem Behandlungsstuhl als Kinder, welche keinen Zaubertrick vorgeführt bekamen (Magic–)(141.2 +/–71.5 versus 221 +/–110.7 s). Zusätzlich konnte bei signifikant mehr Kindern der Magic+ Gruppe ein Röntgenbild angefertigt werden (91% versus 54%). Wenn die untersuchten Variablen (Zeit bis zum Sitzen auf dem Stuhl, Röntgenbilder, Verhalten nach Frankl) nach Alter, Geschlecht, erstmaliger Besuch beim Zahnarzt sowie Beurteilung durch die Eltern konnte festgestellt werden:

(a) Kinder der Magic+ Gruppe saßen signifikant schneller auf dem Behandlungsstuhl als Kinder der Magic– Gruppe. (b) Bei mehr Kindern der Magic+ Gruppe konnten Röntgenaufnahmen angefertigt werden. (c) Die Magig+ Kinder zeigten mehr kooperatives Verhalten (Frankl Gruppen 3 und 4).

Schlussfolgerung. Diese Studie zeigte, dass ein Zaubertrick ermöglicht zwei Arten der Kooperation von Kindern zu verbessern: (a) Das Bewegen eines Kindes zum Sitzen auf dem Zahnarztstuhl und (b) das Ermöglichen von zahnärztlichen Röntgenaufnahmen.

Resumen. El propósito de este studio fue comparer la efectividad de usar un truco mágico para persuadir a niños de fuerte determinación que rechazan sentarse en el sillón dental en la primera visita, con los métodos más convencionales como el de explicar-enseñar-ejecutar (EEE).
Métodos. Se seleccionaron para este estudio 70 niños de entre 3 y 6 años de edad que se identificaron como manifestación de comportamiento de fuerte determinación. Los niños se asignaron aleatoriamente para ser tratados con distracción mediante un truco mágico o por EEE, 35 en cada grupo. Se registraron para cada niño, las siguientes variables: tiempo desde el inicio de la sesión hasta sentarse en el sillón dental (en minutos); posibilidad de realizar un examen dental (si o no); y la escala de comportamiento de Frankl.
Resultados. Los niños a los que se les enseñó un truco mágico (Mágico+) se sentaron significativamente más rápido en el sillón dental que los niños a los que no se les mostró el truco mágico (Mágico–) (141,2 ± 71,5 y 221,7 ± 110,7 segundos respectivamente). Además, a los niños significativamente más Mágico+, se les pudieron tomar radiografías (91% y 54% respectivamente). Cuando, el tiempo hasta sentarse en el sillón dental, toma de radiografías y la escala de comportamiento de Frankl, se examinaron por género, edad, la primera visita al dentista y por la valoración de los padres, se apuntó el siguiente patrón:

(a) Niños en el grupo Mágico+ se sentaron en el sillón dental significativamente más rápido que los niños en el grupo Mágico–, (b) En los niños más Mágico+ se pudieron tomar radiografías, (c) Los niños Magic+ demostraron más comportamiento cooperador (categorías 3 y 4 de Frankl).

Conclusión. Este estudio demostró que un truco mágico es capaz de facilitar dos tipos de comportamiento cooperador: (a) Facilitó el movimiento cooperador en el sillón dental y (b) posibilitó al dentista una mayor facilidad para la toma de fotografías.

References

1 Forehand R, Long N. Strong-willed children: a challenge to parents and pediatric dentists. *Pediatric Dentistry* 1999; **21**: 463–468.

2 Ingersoll TG, Ingersoll BD, Seine RJ, McCutcheon WR. A survey of patient and auxiliary problems as they relate to behavioral dentistry curricula. *Journal of Dental Education* 1978; **42**: 260–263.

3 Allen KD, Stark LJ, Rigney BA, Nash DA, Stokes TF. Reinforced practice of children's cooperative behavior during restorative dental treatment. *Journal of Dentistry for Children* 1988; **55**: 273–277.

4 Thomas A, Chess S. *Temperament and Development*. New York, NY: Brunner/Mazel, 1977.

5 Wierson M, Forehand R. Parent behavior training for child noncompliance. rationale, concepts, and effectiveness. *Current Directions in Psychological Science* 1994; **3**: 146–150.

6 American Academy of Pediatric Dentistry. Guidelines for behavior management. *Pediatrics Dentistry* 2002; **24**: 68–73.

7 Pinkham JR. Patient management. In: Pinkham JR, Casamassimo PS, Fields HW, McTigue DJ, Nowak A (eds). *Pediatric Dentistry: Infancy through Adolescence*. Philadelphia, PA: W. B. Saunders, 1999: 361–362.

8 Klingberg G, Raadal M. Behavior management problems in children and adolescents. In: Koch G, Poulsen S (eds). *Pediatric Dentistry: A Clinical Approach*. Copenhagen: Munksgaard, 2001: 62–66.

9 Allen KD, Stokes TF. Use of escape and reward in the management of young children during dental treatment. *Journal of Applied Behavior Analysis* 1987; **20**: 381–390.

10 Allen KD, Loiben T, Allen SJ, Stanley RT. Dentist-implemented contingent escape for management of disruptive child behavior. *Journal of Applied Behavior Analysis* 1992; **25**: 629–636.

11 Kuhn BR, Allen KD. Expanding child behavior management technology in pediatric dentistry: a behavioral approach. *Pediatric Dentistry* 1994; **16**: 13–17.

12 Peretz B. Relaxation and hypnosis in pediatric dental patients. *Journal of Clinical Pediatric Dentistry* 1996; **20**: 205–208.

13 Peretz B. Confusion as a technique to induce hypnosis in a severely anxious pediatric dental patient. *Journal of Clinical Pediatric Dentistry* 1996; **21**: 27–30.

14 Peretz B, Gluck GM. Reframing – reappraising an old behavioral technique. *Journal of Clinical Pediatric Dentistry* 1999; **23**: 103–105.

15 Peretz B, Gluck G. Assessing an active distracting technique for local anesthetic injection in pediatric dental patients. *Journal of Clinical Pediatric Dentistry* 1999; **24**: 5–8.

16 Peretz B, Bimstein E. The use of imagery suggestions during administration of local anesthesia in pediatric dental patients. *Journal of Dentistry for Children* 2000; **67**: 263–267.

17 Frankl SN, Shiere FR, Fogels HR. Should the parent remain with the child in the operatory? *Journal of Dentistry for Children* 1962; **29**: 150–163.

18 Waxman D. *Hartland's Medical and Dental Hypnosis*, 3rd edn. London: Bailliere Tindall, 1989.

19 Sackeim HA. Lateral asymmetry in bodily response to hypnotic suggestions. *Biological Psychiatry* 1982; **17**: 437–447.

20 Stevens A. *Private Myths: Dreams and Dreaming*. Cambridge, MA: Harvard University Press, 1995.

21 Nathan J. Managing behavior of precooperative children. *Dental Clinics of North America* 1995; **39**: 789–816.