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Dental 'Phobia

By HENRY LAUTCH

Although a number of papers have been written emphasizing the need for conservative dentistry and describing various ways of dealing with patients fearful of dental treatment, little systematic attention has been paid to understanding the basis of this impediment. A fear of dental treatment is, indeed, so common that it can almost be considered normal unless of such a degree as to interfere with much needed dental care. Thus, in the U.S.A. Freidson and Feldman (1958) reported that 51 per cent of a large and representative sample did not visit a dentist regularly. Out of these 9 per cent reported that their reluctance to do so was based on fear. Similarly, Kegeles (1963) reported that fear of dental treatment significantly reduced the number of preventive dental care visits, independent of social class. Shoben and Borland (1954) found that unfavourable family dental experience and unfavourable family attitudes towards dentistry were the only factors which discriminated between fearful and non-fearful dental patients.

In view of these findings it is perhaps odd to discover that psychiatrists are seldom if ever called upon to assist their dental colleagues by investigating the basis of fear of dental treatment and evolving measures for overcoming it. In this study, therefore, an attempt is made to investigate the background and precipitating factors which underly dental phobia. Personal and family background are explored, and the results of a comparative assessment of these factors and of personality traits in both those with a phobia of dental treatment and in a control group are described.

For present purposes dental phobia is defined as a special kind of fear out of proportion to the demands of the situation, which will not respond to reason, is apparently beyond voluntary control and leads to avoidance of dental treatment where this is really necessary.

Method

The total number of patients studied was 68. Of these 34 were diagnosed as showing dental phobia as defined above; they all initially insisted being given general anaesthesia being unable even to bear the sight of the dental instruments. They were contrasted with a control group consisting of 34 other patients who immediately agreed to treatment under local anaesthesia and who were matched for sex and age.

Each of the study group patients was first seen together with a relative in order to establish as cordial a relationship as possible and in order to attempt to reduce anxiety by reassurance. The purpose of the investigation and the reason for seeing a psychiatrist was also explained. Subsequently the patient was seen alone and as full as possible a medical, dental and psychiatric history obtained. Inquiry was also directed towards the psychiatric history of family members and their attitudes to dentistry. In several instances the interview had to be temporarily suspended on account of the patient's anxiety, and the relative recalled as an aid to reassurance. Following the interview all patients completed the Eysenck Personality Inventory. Although it had been hoped to administer certain tests for rating anxiety (which were in fact performed in a few cases) this had to be abandoned, as the majority of subjects could not tolerate a further prolonged interview. Manifest anxiety was therefore assessed clinically.

Following psychiatric investigation each patient was examined by the dental surgeon, but in 12 instances only after considerable time and effort had been spent in persuading the patient to sit in the dental chair. Indeed in the study group 7 patients had been referred by other dentists to the dental hospital especially for treatment under general anaesthesia because of their inability to tolerate dental treatment without this. Both these and the other phobic patients were accompanied by a relative or friend who had been instrumental in persuading them to come. In contrast, all patients in the control group attended unaccompanied.

Results

The sex and age distribution of both groups

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of patients is shown in Table I. The difference in ages between the two groups was not significant ($t = 0 \cdot 34$). The ratio of males to females is 1:1·6. There was also no difference in the socio-occupational class of the two groups as rated on the Registrar-General's classification ($t = 1 \cdot 088$ n.s.).

TABLE I
Age and sex distribution of patient sample

Subjects	Number of patients	Males	Females	Age range	Mean
Study group	34	13	21	16–54	27·7
Control group	34	13	21	17–49	26·9

No very great differences in medical history were discernible between the two groups, except for the fact that 4 of the study group gave a history of epilepsy, none in the control group. Five of the study group were also recorded as currently receiving medication either with phenobarbitone or sodium phenytoin or both or with chlordiazepoxide.

Nine of the female patients in the study group and 3 of the controls gave a history of neurotic traits in childhood. Six in the study group had subsequently undergone some form of psychiatric treatment; only 2 of the controls had done so. Four mothers of female patients in the study group also had a history of having had psychiatric treatment.

Apart from some kind of positive psychiatric history, 8 female patients in the study group currently presented a clinical picture of diffuse anxiety in addition to phobia of dental treatment. Four more had other phobic symptoms also, whereas the remaining 22 patients had a monosymptomatic phobia of dental treatment only. In the control group, 4 females had a slight fear of dental treatment not regarded as amounting to a phobia; 3 of these had other mild phobic symptoms. A history of an exaggerated fear of dental treatment in other family members and their relationship to the patient was uncovered in 9 instances in the case of the group of phobic patients as opposed to 3 in the control group.

An attempt was made to discover the ages at which first and subsequent dental treatments were carried out, together with a subjective account of experiences, whether or not anaesthesia was used and where the treatment had been carried out. Coincidentally, 18 of each group of patients first underwent treatment in a school clinic and 16 of each group in a dentist's surgery.

All 34 members of the phobic group had suffered what they deemed to have been a traumatic experience at the hands of the dentist on at least one occasion during childhood, whereas only 10 of the control group had done so ($\chi^2 = 3 \cdot 404$ $0 \cdot 1 > p > 0 \cdot 05$ n.s.). Four of the study group then avoided dentists and had no further treatment until incorporated in the current study and when aged 20, 27, 30 and 33 years. Of the remaining 30, all claimed to have had a second traumatic experience at the dentist's hands, as opposed to only 1 of the 34 control cases. This difference is highly significant ($\chi^2 = 56 \cdot 05$ $p < 0 \cdot 0001$).

The ages of the patient at the time dental treatment was first carried out is shown in Fig. 1. The ages at the time of the first and second treatments regarded as traumatic is shown in Fig. 2. The traumatic experience was described by subjects as physically painful, frightening or as a feeling of oncoming disaster. Those given nitrous oxide were disturbed by having an anaesthetic mask placed over the face without warning or explanation and had a sense of suffocation and a fear of the unexpected. In the Study group, 4 patients fainted on recovery, 9 felt unwell with nausea and vomiting.

Following one traumatic experience in the phobic group the probability of undergoing another within the next 2 or 3 visits was found to be about 10 times ($p = 1 \cdot 0$) that of the control group ($p = 0 \cdot 1$). Having had one traumatic dental visit, the difference in the probability of the next one being traumatic in the study group ($p = 0 \cdot 833$) compared to the control group is almost as great ($p = 0 \cdot 1$). After two traumatic visits the probability of the third being traumatic also is again very high in the study group ($p = 1 \cdot 0$) and nil in the control ($p = 0 \cdot 0$). The second trauma dis-

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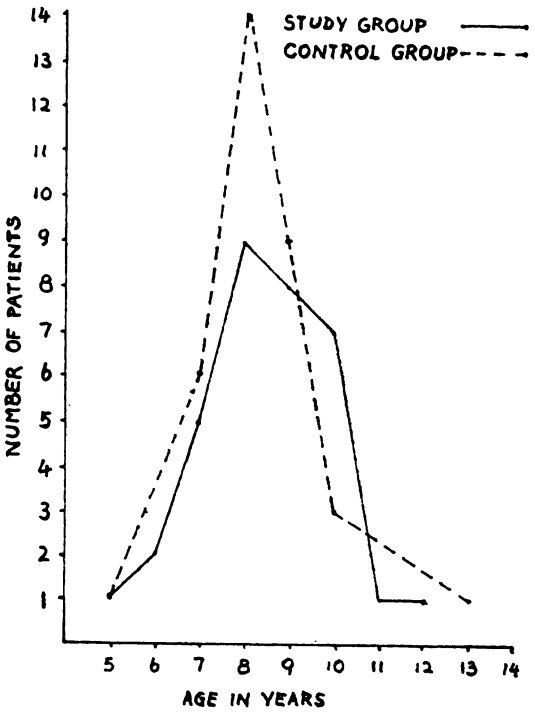


FIG. 1.—Ages of patients at the time of first dental treatment.

tinctly separates the two groups. However, the further recurrence of traumatic dental experiences was not inevitable. For example, case 15, following two traumatic experiences, underwent uneventful dental treatment with intravenous barbiturate and local anaesthetic, following which he no longer avoided dental treatment but still remained a little apprehensive.

Table II illustrates the range and mean number of years between the last dental treatment and the time of attendance at the dental hospital and inclusion in the study.

TABLE II
Length of time between last dental treatment and inclusion in the study

Subjects	Range in years	Mean
Study group ..	1–12	4·9
Control group ..	0·5–7	2·1

$t = 4{\cdot}303$, $p < 0{\cdot}01$.

A significant difference is apparent between the two groups as is the duration of pain before seeking treatment at the hospital (Table III).

TABLE III
Duration of pain

Subjects	Range in days	Mean
Study group ..	2–90	17·3
Control group ..	0–14	3·0

$t = 4{\cdot}214$, $p < 0{\cdot}01$.

All patients in the study group suffered toothache of variable intensity for which they took self-prescribed proprietary analgesics, averaging 2–3 tablets at 2–4 hourly intervals. In contrast, 24 of the controls had much milder pain, more intermittent in nature and of shorter duration. In only 6 was the pain moderately severe leading them to take analgesics.

Phobic subjects had great difficulty in stating first what aspects of dentistry they feared, but they feared treatment overall. Only when pressed to commit themselves did they rate pain and an injection in the mouth equally, and these were followed by fear of the anaesthetic mask, the sight of instruments and the noise of the drill. In the control group 11 females and 1 male disliked injections in the mouth but did not object to injections elsewhere in the body. Next in dislike they rated pain. Two did not like the anaesthetic mask.

FURTHER INVESTIGATIONS

These include a clinical assessment of anxiety level, personality testing (EPI) and an investigation of pain threshold.

The degree of anxiety was rated on a five-point scale: I—nil; II—slightly anxious but prepared and able to tolerate treatment under local anaesthesia; III—moderately; IV—severely; V—panic-stricken. All those in the last three groups at first adamantly refused treatment except under general anaesthesia. The difference in rating between the two groups was obviously highly significant and can be seen in Table IV.

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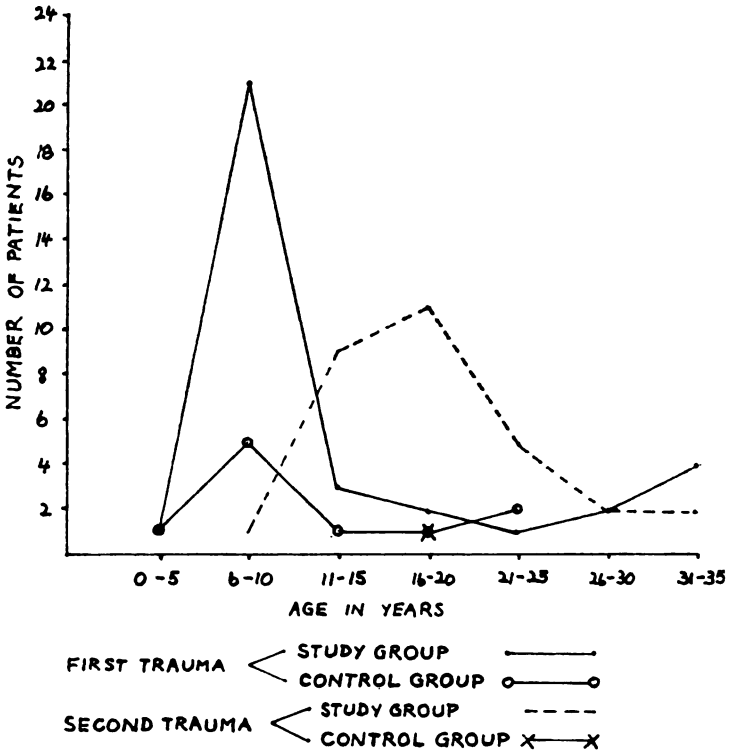


FIG. 2.—Ages of patients at the time of first and second dental traumata.

TABLE IV
Anxiety scores

Rating scale	I	II	III	IV	V
Number in study group ..	0	0	10	16	8
Number in control group ..	30	4	0	0	0

The result of personality assessment using the EPI demonstrated a marked and significant difference in the neuroticism and extraversion scores in the two groups (see Table V).

Pain threshold was tested using a variable stimulus/constant time method of applying an

TABLE V
Eysenck personality inventory

Subjects	Number of patients	Extraversion		Neuroticism	
		Mean	Standard deviation	Mean	Standard deviation
Study group ..	34	10·4	3·9	15·7	3·0
Control group ..	34	14·2	2·9	8·4	3·5
Normal population*	2000	12·07	4·37	9·07	4·78
Anxiety neurotics*	108	9·45	4·04	15·79	5·06

* Eysenck and Eysenck (1964).
Tests of significance (student's 't'—two tailed test).
Study group v. control group for Extraversion $t = 6·149$, $p < 0·01$.
Study group v. control group for Neuroticism $t = 6·467$, $p < 0·01$.
Females in the study group v. females in the control group for neuroticism $t = 2·925$, $p < 0·01$.

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electric shock, increased in discrete steps, to the crown of the left upper incisor. The subject was asked to raise his hand when the shock at first became painful. Pain threshold was measured by the highest level of current at which the subject first experienced pain. The results are summarized in Table VI. It will be seen that, compared in four different ways, differences emerged in every instance, the pain threshold being significantly lower in the study as opposed to the control group, in all females in either group as opposed to all males, and in both males and females in the study as opposed to the control group when considered separately.

TABLE VI

Pain threshold

Subjects	Mean	t	p
Control group ..	3·29	3·3	0·01
Study group ..	2·34		
All males ..	3·54	3·6	0·01
All females ..	2·46		
Study males ..	2·73	3·0	0·02
Control males ..	4·23		
Study females ..	2·17	2·4	0·05
Control females ..	2·78		

DISCUSSION

The sample in this study represents two opposite groups of dental patients; those with severe phobia of dentistry and others without such an impediment. There is, no doubt, a large proportion of patients who have some fear of dental treatment not amounting to phobia who occupy the intermediate position between these two groups and who, though apprehensive, are still able to accept conventional dental treatment.

Acquisition of fear is complex. Overwhelming stimuli have traumatic effects on anyone, other stimuli are harmless for most persons but may be traumatic for those who are predisposed. Such predispositions may have a constitutional root. A subject is also more vulnerable to trauma when tired, exhausted or sick. Another decisive difference is whether or not, at the time of trauma, motor reactions are possible. The blocking of external motor activity increases the possibility of a breakdown. Thus trauma is a relative concept: factors of mental economy dependent on constitution as well as previous experiences and on the actual conditions before and during trauma which determine what degree of excitation overtaxes the individual's capacity. Events that have not been anticipated are experienced more forcefully and a latent neurotic disposition may be mobilized by trauma.

In this study all patients in the study group and only 10 of the controls had a traumatic experience on first attending the dentist. Following this they developed some fear of dentistry but were still prepared to have further dental treatment except those 4 female patients who had already had other phobic symptoms before their first dental traumatic experience. This was probably due to stimulus generalization of previous phobias, thus increasing general fearfulness and therefore reduction of capacity to withstand a traumatic experience. In all others a second dental traumatic experience was needed to give rise to a phobia of dentistry.

Phobias can develop at any period of life, but in this study the majority of patients developed dental phobia in childhood and adolescence and only a few as adults. This is in accord with the concept of a sensitive or facilitatory period of development during which the child is particularly responsive to certain stimuli. First exposure to a totally novel situation causes anxiety in children. They normally adapt rapidly, though if an original traumatic experience is subsequently reinforced they are likely to develop a phobia for that particular situation. However, lack of psychological preparation, explanation of what is to happen and reassurance, especially with anxious children, as well as an unsympathetic and forceful approach by the dentist, dental nurse or anaesthetist, also the promise of painless dental treatment which in fact becomes painful are seeds for development of dental phobia.

All the phobic patients in this study remembered the traumatic experience vividly, and whenever reference was made to anything associated with dentistry, whether in thought

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or reality, it produced vivid images of the traumatic experience accompanied by anxiety. Freud (1897) called such vivid images 'untamed memories'. When affects associated with trauma are worked through, the memories become 'tamed', that is, reduced in intensity and sensory quality. Later studies of persons involved in accidents, disasters, etc. supported Freud's ideas of re-experiencing the trauma. He labelled the trauma the 'repetition compulsion'. Davis (1966) described human response to trauma and outlined the series of phases of psychic activity that commonly follow traumatic experience. These phases consist both of periods of extreme repression and periods of compulsive psychic and behavioural repetition of trauma. Thus it appears that dental traumatic experience must be considered a most important aetiological factor in phobia of dentistry, since it preceded this condition.

Though there is no evidence that genetic inheritance plays a significant part in the development of phobias, a minority of phobic patients have relatives with the same phobia, but this may reflect the role of modelling rather than genes. Genetic endowment could act through intermediary mechanisms such as constitution and temperament. Though dependent personality forms a fertile soil for phobia, it is by no means a necessary condition for their formation, as phobic patients often have normally sociable and independent personalities before their phobias begin (Prince and Putnam, 1912; Marks and Gelder, 1965). This is well borne out by the findings of the present study.

Fears tend to run in families and are especially associated in mother and daughter. Hagman (1932) found a correlation of 0·67 between the number of fears reported by mother and child. In the study group 26·5 per cent and in the controls 8·8 per cent had at least one other member of the family with a phobia of dentistry. Of those in the study group 17·6 per cent were mother and daughter. This only applied to 2·9 per cent of the controls. Most workers report that girls have significantly more fears than boys (Dunsworth, 1961; Lapouse and Monk, 1959). MacFarlane *et al.* (1954) showed no sex difference in the incidence of fears until the age of 11, after which boys showed a more rapid loss of most fears, leaving girls on average with more fears after puberty.

It would thus seem that neurotic traits in childhood, previous psychiatric history, and fear of dental treatment in other members of the family, especially of the mother, are further predisposing factors in the development of dental phobia.

There was a striking difference in the score on the Eysenck Personality Inventory for Neuroticism and Extraversion between the two groups. The profile of the study group for N and E is almost identical to the standardization figures given by Eysenck (1964) for anxiety neurotics. The females in the study group account for most of the greater neuroticism in their group. This was contributed considerably by 8 female patients who presented a clinical picture of diffuse anxiety and 4 other female patients with other phobic symptoms apart from dentistry. As the patients were tested in a dental hospital, a situation which could be expected to evoke anxiety, the possibility that they rated their symptoms more than their personality traits cannot be disregarded. Kendell and DiScipio (1968), by adding instructions to disregard present illness, obtained significant changes in scores on the E.P.I. Do these high N and low E scores in the phobic patients in this study reflect a stable characteristic of the neurotic personality, or are they temporary manifestations affected by the acute phase of illness? The relationship of N and E personality factors to physical and medical illness is complex. Claridge (1967) regards N as a factor which determines arousal; that is, autonomic response to stimuli. Subjects with low N scores exhibit low arousability, whereas those with high scores show a high degree of arousability. Kissen (1964) considers that N score is related to emotional discharge. The position is complicated by observations made by the same author, who demonstrated that N score is not constant and may be increased by trauma of which pain is one component. It is possible, therefore, that high N scores in painful conditions may be due to presence of pain. Knowles and Kreitman (1965), using the Eysenck Personality Inventory with psychiatric patients,

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indicated that N and E scores are stable and that N but not E scores are influenced to a small but significant degree by changes in the patient's clinical state. Nevertheless, whatever factors are responsible for the high N and low E scores on the E.P.I. it would seem reasonable to assume that patients with such a personality profile are more likely to develop phobia of dentistry than control group patients whose scores are reversed. The significant difference between the groups regarding duration of pain before seeking treatment at the hospital suggests that severe anxiety and fear of dentistry is more disturbing than severe pain. For this reason it is perhaps not unexpected that the phobics had a higher mean number of years between the last dental treatment and the time of attendance at the dental hospital. The pain in several cases must have been very severe judging by the state of the teeth, supporting tissue, dental abscesses, etc.

Pain is a complex phenomenon and the intensity that is experienced is dependent on pain threshold which has individual variations further related to personality and mental and physical state. The phobics in this study had a lower pain threshold than the controls. Eysenck (1967) has produced considerable evidence that E scores are intimately related to sensory thresholds, which are lower for introverts than extraverts. Claridge interprets the role of E to be related to excitement, and suggests that it governs the psychological and social reaction to the state of arousal, thus linking it with N factor. Merskey *et al.* (1967) comment that extraverts complain more than introverts but introverts have a lower tolerance.

In spite of prolonged and often severe pain the phobics did not communicate their discomfort as freely as the controls, though it was quite evident to their relatives that they were in pain. Eysenck considers that extraverts have a higher rating of pain, and this reflects a tendency for them to exaggerate the painfulness of the situation, whereas introverts minimize it. Bond and Pearson (1969) found that patients who experienced pain and had high N and low E scores failed to communicate this to the nursing staff. This indicates high level of arousal or free emotional discharge coupled with introversion, indicating low sensory threshold but a limited reaction to the state of arousal.

All females in either group as opposed to all males appeared to have a lower pain threshold. Wilson (1967) reported a social expectancy that males are likely to report less pain and fear. The immediate self-prescribing of proprietary analgesics may be a reflection of low pain threshold.

Summary

A controlled study of 34 patients with dental phobia was carried out to explore predisposing and aetiological factors of phobia of dentistry. The ratio of males and females was 1:1·6, with no difference in the socio-occupational class of the two groups, neither was there a great difference in medical history except for the fact that 4 in the study group gave a history of epilepsy. Manifest anxiety was assessed clinically and rated on a five-point scale. The phobics had a significantly higher anxiety score, this was mainly contributed by 8 females with diffuse anxiety and 4 other females with other phobias apart from that of dentistry. All subjects completed the E.P.I. and the dental phobics had a profile for N and E almost identical to anxiety neurotics, while the controls were more extraverted than the general population. Dental trauma was found to be the most important aetiological factor in dental phobia and two such experiences distinctly separated the two groups. Other predisposing factors are discussed as well as the length of time between the last dental treatment and inclusion in this study, duration and intensity of pain and pain threshold.

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References

Bond, M. R., and Pearson, I. B. (1969). 'Psychological aspects of pain in women with advanced cancer of the cervix.' *J. psychosom. Res.*, **13**, 13–19.

https://doi.org/10.1192/bjp.119.549.151 Published online by Cambridge University Press

CLARIDGE, G. S. (1967). *Personality and arousal. A Psychophysiological Study of Psychiatric Disorder*. International Series of Monographs in Experimental Psychology (ed. H. J. Eysenck). Oxford: Pergamon Press.

DAVIS, D. R. (1966). *An Introduction to Psychopathology*. 2nd Ed. London: Oxford Univ. Press.

DUNSWORTH, F. A. (1961). 'Phobias in children.' *Canad. psychiat. Ass. J.*, **6**, 291–4.

EYSENCK, H. J. (1967). *The Biological Basis of Personality*. Springfield, Ill.: C. C. Thomas.

—— and EYSENCK, B. J. (1964). *Manual of the Eysenck Personality Inventory*. London.

FREIDSON, E., and FELDMAN, J. J. (1958). 'Public looks at dental care.' *J.A.D.A.*, **57**, 325.

FREUD, S. (1897). 'The origins of psychoanalysis.' Reprinted 1954. London: Imago, New York: Basic Books.

HAGMAN, E. (1932). 'A study of fears of children of preschool age.' *J. exp. Educ.*, **1**, 110–30.

HOLLINSHEAD, B. S. (1961). *The Survey of Dentistry*. Washington D.C., The American Council on Education.

KEGELES, S. S. (1963). 'Some motives for seeking preventive dental care.' *J.A.D.A.*, **67**, 90.

KENDELL, R. E., and DISCIPIO, W. J. (1968). 'Eysenck personality inventory scores of patients with depressive illnesses.' *Brit. J. Psychiat.*, **114**, 767–70.

KISSEN, D. M. (1964). 'The influence of some environmental factors in personality inventory scores in psychosomatic research.' *J. psychosom. Res.*, **8**, 145.

KNOWLES, J. B., and KREITMAN, N. (1965). 'The Eysenck Personality Inventory: some considerations.' *Brit. J. Psychiat.*, **111**, 755–9.

LAPOUSE, R., and MONK, M. A. (1959). 'Fears and worries in a representative sample of children.' *Amer. J. Orthopsychiat.*, **29**, 803–18.

MACFARLANE, J. W., ALLEN, L., and HONZIK, M. P. (1954). *A Developmental Study of the Behaviour Problems of Normal Children between 21 Months and 14 Years*. Berkeley and Los Angeles: Univ. of Calif. Press.

MARKS, I. M., and GELDER, M. G. (1965). 'A controlled retrospective study of behaviour therapy in phobic patients.' *Brit. J. Psychiat.*, **112**, 757–69.

MERSKEY, H., and SPEAR, F. G. (1967). *Pain, Psychological and Psychiatric Aspects*. London: Ballière, Tindall and Cassell.

PRINCE, M., and PUTNAM, J. J. (1912). 'Clinical study of a case of phobia: a symposium.' *J. abnorm. soc. Psychol.*, **7**, 259–303.

SHOBEN, E. J. JR., and BORLAND, L. (1954). 'An empirical study of the etiology of dental fears.' *J. clin. Psychol.*, **10**, 171.

WILSON, G. D. (1967). 'Social desirability and sex differences in expressed fear.' *Behav. Res. Ther.*, **5**, 136–7.

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