

SCIENTIFIC  
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Consumer centred research ... What do  
they think?

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The British Orthodontic Society invites outstanding contributors from the field of Orthodontics to give the guest lecture in memory of George Northcroft. In 2004 the guest lecturer was Professor Kevin O'Brien. The paper which follows was presented as the Northcroft Memorial Lecture 2004 at the British Orthodontic Conference.

Invited paper

## Introduction

In this article, I will outline the potential role of consumer-orientated research in orthodontics. This is a relatively complex area and I shall base this essay around the following main sections:

- Measurement in orthodontics
- Consumer viewpoint of benefits and risks of orthodontic treatment
- Socio-psychological factors
- Consumer co-operation and treatment process
- Qualitative research

## Measurement in orthodontics

The first stage in this review is to evaluate our current research methods in terms of the nature of the of research and outcome measures that have been adopted. I hand-searched the orthodontic literature published in 2003–2004 in *American Journal of Orthodontic and Dentofacial Orthopedics*, *Journal of Orthodontics*, *European Journal of Orthodontic* and *Angle Orthodontist*. The papers were then classified according to the type of the research and whether the outcome measures adopted were relevant to consumers of care. The results of this review are shown in Table 1.

This revealed that the most commonly published projects were retrospective investigations that are based on the convenience of locating stored records, particularly cephalometric radiographs. That is, the question has been formulated after the data (i.e. records) are collected. While there are some randomized controlled trials, it is interesting that only 5% of the published papers used measures that were relevant to the consumers in our care. One reason for our reliance on 'provider'-based outcomes is the dominance of retrospective-based research because if a study is to use data that is relevant to consumers, then it has to be prospective.

Unfortunately, even this rudimentary scan of the orthodontic literature reveals that we mostly measure cephalometric and dental changes with several different types of analysis or occlusal indices. Does this matter? I would suggest that it does because our tendency to concentrate on skeletal and dental morphology has resulted in research that, arguably, lacks meaning. For example, how many consumers of our care know (or care) about their ANB? They are much more likely to express concerns about their severe dental crowding or 'sticking out' front teeth. So ... what should we measure?

It is, therefore, reasonable for us to consider the use of consumer-centred measures. These are measures that reflect consumer values, and are relevant to the functional and social requirement of any 'disease'. This is particularly relevant to orthodontics because identification of need or the benefits of treatment are influenced by our idiosyncratic judgement. One view point that we can adopt is to consider David Locker's model of dental disease in a social context and consider whether this is relevant to orthodontics.<sup>1</sup>

## Disease impairment disability handicap

We can apply this model to malocclusion. If we take a patient with a malocclusion, for example, a severe overjet greater than 10 mm. We could consider that the

**Table 1** The type of research revealed from the literature search

Type of project	Percentage
Retrospective cephalometric	60
Materials	20
Animals (dogs)	9
Consumer-centred	5
RCT cephalometric	1

prominent incisors are an impairment that may result in the patient being teased by their peers. This then leads to embarrassment, which may be so severe that it is a psychological disability. Then the child could avoid contact with groups or all of their peers resulting in social handicap. Orthodontic treatment is then directed at 'curing' the prominent incisors, resulting in a resolution of the disability. Importantly, if we are to adopt this model to evaluate any benefits of orthodontic treatment, then this will not be achieved by measuring dento-skeletal morphology—we need to measure consumer values.

### Consumers' viewpoints of the risks and benefits of treatment

In order to develop this argument further, we should start by considering the consumer's viewpoint of the benefits of orthodontic treatment. Any review of orthodontic 'publicity' material or websites shows that the main reasons for providing orthodontics is to improve or change a person's dental health status or socio-psychological well being. However, little research has been carried out into this area from the point of view of the consumer and I shall just highlight two projects. The first of these was a project that was directed at discovering the perceptions of referred patients on the potential benefits of the care that they were seeking.<sup>2</sup> This study was carried using a sample of 196 parents and their children who had been referred for treatment in the Greater Manchester area. When they attended for an appointment, they completed a questionnaire prior to being seen by the orthodontist. The questionnaire had been developed in two stages. The first was an open-ended telephone survey of prospective patients in order to generate questions from a consumer perspective. These questions were then incorporated in a final questionnaire that was completed by the patients and parents. We found that the prospective consumers had perceptions of the benefits of treatment that were not supported by evidence; for example, they felt that their teeth would be easier to clean and more resistant to decay, they would be more resistant to TMJ disorders and the result of treatment would be permanently stable. These findings are important because it appears that consumers have expectations that are not realistic and are unlikely to result from treatment.

In another investigation we attempted to validate the child perception questionnaire on a population of 324 children in schools in the North West of England.<sup>3</sup> This is a new instrument developed by Jokavic and Locker, which aims to evaluate the child's perception of signs and symptoms that are associated with oral health.<sup>4</sup> This questionnaire has four domains, namely:

- oral symptoms;
- functional limitations;
- emotional well being;
- social well being.

The results revealed that high CPQ scores were associated with girls, the Dental Health Component of IOTN and whether the child felt that their teeth needed straightening. Importantly, the main effects were associated with the domains of emotional and social well-being. This reflects the orthodontic factors that are probably associated with Locker's model. In conclusion, it appears from this research that malocclusion has a substantial effect on child quality of life; however, many of our patients and parents have an unrealistic expectation of the benefits of orthodontic treatment.

### Socio-psychological factors

It is very surprising that one of the most frequently cited benefits of orthodontic treatment has been so sparsely investigated. A search of the literature and the Cochrane database has revealed that there have only been two prospective studies into this area. These are both studies concerned with the early treatment of Class II malocclusion with functional appliances. The first of these outlined the findings of a randomized trial of bionator treatment.<sup>5</sup>

In this study, the self-concept of 208 subjects with Class II malocclusion was measured before treatment using the Piers-Harris Self-Concept Scale. A subset of 87 of these children were measured again following 15 months of orthodontic growth modification treatment. Although mean self-concept scores were found to be above the population norms, no relationship was found between the self-concept scores and the child's overjet. Importantly, treatment did not have an effect on the self-concept scores. The authors concluded that children with Class II malocclusion do not generally present for treatment with low self-concept and, on average, self-concept did not improve following orthodontic treatment. However, because the investigators did not intend to reduce the overjets of the early treatment group of patients (Indeed, this was only reduced by a mean of 2 mm), it could be that the aesthetic appearance of the children's teeth was not changed enough to have an impact upon self-concept.

This study has recently been repeated in the UK.<sup>6</sup> One-hundred-and-seventy-four children aged 8–10 years old, with Class II division I malocclusion, were randomly allocated to be treated with a Twin Block or to an untreated control group. Data were collected at the start of the study and 15 months later. Results

revealed that early treatment with Twin Block appliances resulted in an increase in self-concept and reduction of negative social experiences. The subjects also reported treatment benefits that may be related to improved self-esteem. While these two studies are, to a degree, contradictory, as the second study resulted in a reduction of the child's overjet and the first did not, we can suggest that there may be a socio-psychological effect of orthodontic treatment. Whether this is stable in the long term is unclear and these studies have been extended to evaluate if this effect was simply transitory until definitive Phase II treatment was provided.

### Co-operation and consumer perception of appliances

As we all know, the question of factors influencing co-operation is, perhaps, the 'holy grail' of orthodontic treatment. Paradoxically, the dearth of prospective research in this area is surprising. In our recent investigation into the effectiveness of different types of functional appliance, we randomly allocated 214 children into two groups.<sup>7</sup> One-hundred-and-four children were treated by the fixed Herbst appliance and 110 received treatment with a removable Twin Block appliance. We found that non-compliance with the Herbst was 13% and for the Twin Block it was 33%. There was a clear difference between these two appliances. Another factor that influenced co-operation was socio-economic deprivation, the more deprived the child, the lower the co-operation. In this study, we also measured the child's perception of their appliance with a questionnaire that was issued 6 months into treatment. We found that the children felt that the Twin Block was worse than the Herbst for influencing their speech, changing their sleep pattern, influencing their school work and making them feel embarrassed. Interestingly, the children who could not complete treatment had greater problems with eating, influence on school work and being embarrassed with their families. In conclusion, it could be suggested that the Herbst was more effective from the consumers' viewpoint.

### Qualitative research

The first part of this discussion has been concerned with measures that we, as orthodontists have used in research. One important methodology that is becoming more popular in medical research is qualitative research. This is based upon data gathered from interviews and focus groups and is directed towards answering the

question 'why', rather than 'how'. Importantly, qualitative research can be combined with hard data to provide real meaning to research findings. This approach is somewhat different to that followed by 'traditional' empirical research. For example, we may be planning a study to evaluate co-operation with an orthodontic appliance, empirical research will be able to answer the question 'What is the co-operation rate with the ... appliance?', whereas qualitative research will be directed at the question 'Why do some people not co-operate with our new orthodontic appliance?'

Qualitative research has been adopted in two studies that had two slightly different aims. The first of these was carried out in the United States. In this study, focus groups of teenagers who had just completed orthodontic treatment attended structured interviews.<sup>8</sup> These interviews resulted in responses that were relevant to several main areas of the value of orthodontic treatment and undergoing orthodontic treatment. It was interesting that many of the responses did not reflect providers perceptions of treatment. For example, when they responded on the value of orthodontic treatment, responses were 'I like how straight my teeth are' and 'Really straight teeth remind me of used car salesmen. Not so straight teeth have character like British film stars'.

Responses to 'the value of orthodontic treatment' were equally surprising, for example:

*It is too hard to keep my teeth clean. They showed me how to do it and I never did them, but they said that I did a good job!*

*I ate caramels, tootsie rolls, just the way that I used to.*

*If I lost a bracket, I got it fixed, it was no big deal, I did not mind.*

When they considered undergoing orthodontic treatment, they responded:

*They need to realize that we are people. Teeth are attached to a person, but they do not realize it.*

*I think that they are more happy when the braces come off than we are.*

In a similar investigation based in Norway, another group of investigators interviewed 28 young adults who were about to start orthodontic treatment.<sup>9</sup> Their questions were directed at discovering why young adults decided to undergo orthodontic treatment. Their responses were grouped under several main domains. The most important was, arguably, body awareness. Their responses were interesting, but perhaps not too surprising:

*If someone has crooked teeth, then you think that he  
has not taken care of himself.*

*You want other people to think that you have a nice  
appearance.*

*Everyone's teeth looked crooked apart from mine.*

*Because I disliked my teeth, I feel ugly, I am so  
ashamed of it.*

From this study we can, therefore, conclude that this group of children were very concerned about their appearance. Importantly, they were massively influenced by peer group and media influences.

### So what?

At the end of every lecture or paper that we read, it is essential that we ask the 'so what' question. So, what are the conclusions of my subjective review of the literature. We can clearly state that most orthodontic treatment seems to 'work' and any differences between competing treatments are small, when measured by orthodontists values. The consumer viewpoint, importantly, gives us much more valuable information.

It is also essential for us to put this additional information in the context of the contemporary provision of orthodontic treatment. For example, we have to consider 'what will a patient understand?' or 'what will a research funding body understand?' or, even more importantly, 'what will a purchaser of orthodontic treatment understand?' These groups are much more likely to understand evidence that has been derived from a consumer point of view (length of treatment, pain and hassle), rather than orthodontists measures (lower incisor position or PAR score).

Orthodontics must do something, but we have not measured it yet. Importantly, if we are to justify

ourselves as a health care profession, we need to add consumer-centred measures to our 'orthodontic' ones.

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