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Managing Orthodontic Appliances in Everyday Life: A Qualitative Study of Young People's Experiences with Removable Functional Appliances, Fixed Appliances and Retainers

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Abstract

Objective: To compare young people's experiences of wearing a range of orthodontic appliances.

Design: A cross-sectional, qualitative study with purposive sampling.

Setting: UK dental teaching hospital.

Participants: Twenty-six orthodontic patients aged 11-17.

Methods: Patients participated in in-depth semi-structured interviews. All interviews were transcribed verbatim and analysed thematically.

Results: Young people reported physical, practical and emotional impacts from their appliances. Despite these reported impacts, participants described 'getting used' to and, therefore, not being bothered by their appliance. Framework analysis of the data identified a multi-dimensional social process of managing everyday life with an appliance. This involves addressing the 'dys-appearance' of the body through physically adapting to an appliance. This process also includes psychological approaches, drawing on social networks, developing strategies and situating experiences in a longer-term context. Engaging in this process allowed young people to address the physical, practical and emotional impacts of their appliances.

Conclusion: This qualitative research has identified how young people manage everyday life with an appliance. Understanding this process will help orthodontists to support their patients.

Keywords

Quality of life and orthodontics, health services and quality of life aspects, psychological aspects of orthodontics, sociological aspects of orthodontics

Background

Previous research has identified physical, social and psychological effects of different orthodontic appliances. Fixed appliances impact on everyday life, in terms of aesthetics, functional limitations, diet, oral hygiene and socially (Mandall et al., 2006). Oral health status and quality of life are negatively affected during treatment, but improve afterwards (Chen et al., 2010; Zhang et al., 2008). Pain from fixed appliances reduces after a few days (Abed Al Jawad et al., 2012; Stewart et al., 1997). There is less research on removable functional appliances and retainers, although the ability to remove one's appliance for eating, cleaning and when talking to others may result in different impacts. Speaking while wearing a removable appliance was more difficult than with a fixed appliance (Stewart et al., 1997). Both Hawley and vacuum-formed retainers (VFR) have been reported to cause discomfort, with VFRs causing less embarrassment

to patients (Hichens et al., 2007). Patients wearing both types report limited aesthetic concerns (Pratt et al., 2011).

Qualitative research has explored young people's everyday experiences with orthodontic appliances. One study that included fixed and functional/removable appliances, and retainers, found that young people reported restricted food choice and impacts on the eating process (Carter et al., 2015). Studies that investigated the lived experience of braces and retainers found some negative impacts including pain, difficulty eating and problems due to breakages (McNair et al., 2006; Perry et al., 2018). These authors argued that young people tolerate negative aspects because they are motivated by the benefits of undergoing treatment. However, this research does not compare these appliances to removable functional appliances, which may be experienced differently. Furthermore, while young people may 'tolerate' negative impacts, it is not clear what this involves.

Orthodontic treatment takes place in a social context. Patients participate in everyday activities involving other people, are part of various social networks and wear their appliances in a society where cultural ideas circulate about teeth, braces and young people. Although treatment occurs at the level of the individual body, the physical body is connected to the social world (Shilling, 2008). The way people experience their individual oral health is influenced by this social world (Gregory et al., 2005). Thus young people's embodied experiences can be shaped by the external world in which they engage in orthodontic treatment. This may influence how young people manage the impact of orthodontic appliances.

Currently little is known about how young people manage the impacts they report from removable functional appliances (Twin Blocks), fixed appliances and retainers. This paper explains the social process of 'managing everyday life with an appliance'.

Aim

The aim of this study was to discover how removable Twin Block, fixed appliances and retainers affect the daily lives of young people and develop a questionnaire to measure the impact of any type of appliance. The development and validation of the questionnaire will be reported on elsewhere. The interviews illustrate how young people talk about their experiences of different types of orthodontic appliance. It was noted during analysis that participants across all three sub-studies spoke about not being bothered by their appliances, downplaying various impacts. The aim of this paper is to specifically explore this finding, drawing on sociological theory.

Methods

This was a cross-sectional, qualitative study. Ethical approval was granted by North East – Newcastle and North Tyneside Research Ethics Committee (ref no: 16/NE/0367; date of approval 7 November 2016).

The qualitative research comprised of three sub-studies exploring the impact of: removable Twin Block functional appliances, fixed appliances and retainers. Each project had a primary researcher: ACH (Twin Blocks), CG (Fixed appliances) and TF (Retainers). The primary researcher recruited participants, designed the topic guide and conducted the interviews.

Recruitment

Patients were recruited from an orthodontic department of Charles Clifford Dental Hospital, located in Sheffield, a large city in the north of England. The aim was to include patients of different genders between 11 and 17 years, who had been undergoing treatment for different lengths of time across three main groups of functional appliances, fixed appliances and retainers. Rather than employing a formal sampling framework, sampling was adjusted throughout recruitment in order to achieve this. Patients with syndromes, complex medical history or cleft of the lip and palate were excluded, as were patients who were unable to speak fluent English.

Patients and parents were approached by the researchers who explained the study and provided age-appropriate information sheets. Parents were contacted one week later. If they agreed to participate, an interview was arranged. Written informed consent was obtained from parents and participants. Researchers did not approach any patients who they had previously treated.

Interviews

Semi-structured interviews were carried out, using topic guides designed to ascertain young people's experiences of wearing their orthodontic appliance. Each topic guide covered treatment history, expectations of treatment and impact of the appliance. Topic guides were developed following initial literature reviews by each primary researcher in order to address relevant issues. Questions were open to encourage detailed responses.[1] The topic guides were designed to be used flexibly and participants were encouraged to expand on points raised (for example, being asked 'could you tell me a bit more about what you mean by [x]'). The primary researchers adapted the topic guides to reflect emerging themes.

All primary researchers attended interview training with the Social Research Association and were observed conducting a pilot interview by JEK. All interviews took place at participants' homes. At least one parent was present for 16 interviews. Interviews ranged in length from 15 to 67 minutes.[2] Participants received a £25 gift voucher to thank them for taking part. Interviews were recorded using a digital recorder. Interviews were transcribed verbatim by an external company (Dictate2us) and reviewed by the primary researcher. The primary researchers determined that theoretical saturation had been achieved.

Analysis

Data were analysed using inductive thematic analysis (Gibbs, 2007). The primary researchers read the transcripts several times to achieve familiarisation. Data were coded using computer aided qualitative data analysis software (NVivo 11®, QSR International, Doncaster, Australia).

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[1] Some closed interview questions were asked to establish details of the situation. These were followed by open questions to explore participants' experiences in depth. Participants did not report any difficulties understanding the interview questions, and a review of the transcripts indicated comprehension of what they were asked.

[2] The recording of one interview (TB5) failed after 7 minutes, but data from the beginning of the interview have been used in analysis. On average, the shortest interviews were in the fixed appliance sub-study (27 minutes) and the longest in the retainer sub-study (45 minutes). The interviews in the Twin Block and retainer sub-studies included questions on existing resources, which lengthened these interviews. Some retainer interviews were also longer due to participants discussing different types of appliances.

Codes were categorised into broader themes relating to the experiences of each type of appliance. Analytical notes were made to describe each theme, including illustrative quotations and reflexive comments. Analysis of the sub-studies was reviewed by JEK.

JEK, a sociologist, also achieved familiarisation with the transcripts for all three sub-studies and coded them independently. Codes were categorised into broader themes and analytical notes were made to describe each theme. At this stage, the theme of 'not being bothered' emerged. This was explored through comparisons across accounts to reflect different perspectives (Noble and Smith, 2015). This was then refined into 'downplaying impact'. This thematic analysis was compared to the initial analysis of the sub-studies and developed into a final framework, focusing on how impacts of all appliances were managed (Ritchie et al., 2003). This framework was discussed by JEK, SJL and PEB, each bringing different perspectives and ensuring the framework reflected the data. Data relating to experiences prior to wearing an appliance (reasons for seeking treatment, finding out about retainers) was not included in this framework. Thematic differences between appliances were noted and are illustrated below (for example, with regard to the sub-theme 'being noticed').

Findings

26 participants were recruited in total (see Table 1). 65% of participants were female, which is similar to orthodontic patients at Charles Clifford Dental Hospital (60% female). 24 participants were White British, one was White French and one was Asian British (of Pakistani heritage). The overall sample included a mix of genders, ages and time undergoing treatment across the three main groups of functional appliances, fixed appliances and retainers.

Among the retainer wearers nine wore VFRs, four wore a Hawley-type retainer, two wore fixed, bonded retainers and one wore a Frankel III as a retainer. Due to this, we have less data on the experience of wearing fixed bonded retainers and therefore may not be fully representing the views of young people with these appliances. Some participants had been provided with more than one appliance.

Table 1: Recruitment

	Appliance			
	Twin Block appliance	**Fixed appliance**	**Retainers**	**Totals**
Gender				
Female	7	4	6	**17**
Male	3	2	4	**9**
Age				
11 – 15	9	4	5	**18**
16 – 17	1	2	5	**8**
Time in appliance				
< 6 months	2	0	5	**7**
6 months or more	8	6	5	**19**
Totals	**10**	**6**	**10**	**26**

The final analysis framework was based on two major themes: the impact of orthodontic appliances and managing everyday life with an appliance. Within the impact of orthodontic

appliances, there are sub-themes of physical impacts, practical impacts, emotional impacts and downplaying impacts. Within managing everyday life with an appliance, there are sub-themes of physical dimensions, psychological dimensions, social dimensions, developing strategies and orientation to the future. The sub-themes are discussed below with illustrative quotes from participants. TB indicates the participant wore a removable Twin Block at the time of the interview, F indicates a fixed appliance and R indicates a retainer. The quotes are from verbatim transcripts of interviews and are included to support the findings.

Impact of orthodontic appliances

Physical, practical and emotional impacts

Each sub-study identified physical, practical and emotional impacts. Physical impacts include pain, discomfort and other feelings reported by participants. Appliances can also impact practically, affecting speaking, eating, sleeping, participating at school and smiling. Finally, participants reported emotional impacts, which could be positive or negative. Table 2 illustrates notable impacts across the sample.

Appliance	Physical	Practical	Emotional
Twin Block appliance	Aching Painful Sore Rubbing on gums Feeling big	Removing to eat Speaking Sleeping Cleaning Smiling	Annoyed by appliance Self-conscious about appliance Shock at seeing appliance Upset about appliance Happy to start treatment
Fixed appliance	Aching Painful Sore Wires catching	Food getting stuck Cleaning Breaking Smiling	Annoyed by appliance Concerned about effect of appliance on teeth Excited about choice of colours
Retainer	Aching Rubbing on gums Tight Feeling big Feeling weird	Cleaning Forgetting to wear Speaking	Annoyed by appliance Self-conscious about appliance Relief at having fixed brace removed

Table 2: Physical, Practical and Emotional Impacts of Orthodontic Appliances

Downplaying impact

Participants in all sub-studies suggested that overall their lives were not affected by their appliances:

> '*Interviewer: Has it affected what you can do in the day to day?*
>
> *Participant: No, not really*.' (TB6)

This was particularly notable among retainer-wearers, most of whom only wore their appliances at night:

'*Wearing them at night, it's not like you're wearing it all the time is it so it doesn't really impact my life.*' (R9)

Participants in all sub-studies spoke about not being 'bothered' by their appliances and not thinking about them.

Impacts often improved over short periods of time (for instance, appliances stopped causing pain) or participants 'got used' to particular sensations. Most participants were ambivalent or even positive by the time of the interview:

'*Probably was more unhappy when I started but now I'm just fine with it, not really noticing it.*' (TB2)

As reported in Table 2, participants in all sub-studies noted physical, practical and emotional impacts from their appliances. Nevertheless, participants often referred to an impact and then stated that this was not that significant. For instance, TB9 had this exchanged with the interviewer:

Interviewer: Does it bother you that it's changed your speech?

Participant: Um, a bit, yeah.

Interviewer: Yeah

Participant: Not a lot though. I don't really mind 'cause my friends say that they don't mind as much anymore.

What the interviews show is that when talking about their appliances, young people *emphasise* that they are not personally affected to a significant extent; there might be annoyances, however, the person wearing the appliance does not want to dwell on these. In this paper, we want to explore what is happening when a young person speaks to downplay a particular impact in this way.

In order to understand how young people experienced their orthodontic appliances, it is important to put the interviews in a wider context. This involves considering how participants spoke about managing life with an appliance, and the factors that they felt acted as facilitators or barriers.

Managing everyday life with an appliance

The process of managing everyday life with an appliance occurs across different dimensions.

Physical dimension: Getting used to it

Participants spoke about 'getting used to' their appliances:

'*I've kind of got used to it now. I don't think about it anymore.*' (F4)

Participants who had 'got used' to one appliance reported that their bodies had adapted, and when they had braces removed or got a new retainer, their bodies had to adapt again:

> '*You've always had the brace and sort of it's a bit weird to like eat because you don't have them on. You sort of got used to like eating around them but now you don't have them* […] [your teeth] *ache a bit because you don't have a brace on anymore.'* (R7)

Psychological dimension: Perseverance, compliance and realistic expectations

Managing everyday life with an appliance required a particular attitude according to participants: keeping going and not giving up (perseverance). This was particularly evident in the Twin Block interviews:

> '*It hurt my teeth at first but you just have to keep on doing it.*' (TB10)

This was reflected in the advice participants would give to others:

> '*I just try to tell her* [friend with fixed braces] *to stick with it and it'll come off eventually because that's what I keep telling myself as well.*' (F2)

Participants spoke about their appliance-wearing compliance. For those wearing removable appliances, the main issue was how often they wore their appliances:

> '*I don't want my teeth to move back at all. I don't want the gap. And I feel like they'll move back if I don't wear them.*' (R2)

For participants with Twin Blocks, being compliant had the potential to speed up the overall process. Retainer-wearers spoke about wanting to avoid re-treatment. The idea of having invested time, money and effort can help to motivate participants to be compliant.

Participants also explained how being mentally prepared to wear orthodontic appliances, and having realistic expectations about physical, practical and emotional impacts, made their experiences easier to manage:

> '*It did help because there are a lot of things that, like, if...that he told me, that if he hadn't told me, would have, kind of, been a shock to the system, like, how much they ached and when, like, you first get them, they push on your jaw.*' (TB3)

In these interviews, participants reported that these mental attitudes helped them to manage everyday life with an appliance.

Social dimension: External support, shared experiences and being noticed

Participants and parents were often positive about the care they received from their orthodontists and recognised that they had access to ongoing assistance. Several visited the orthodontist to get their appliance fixed:

> '*Sometimes like it* [the fixed brace] *went out of place and dug in to your skin but then you'd*

just go straight back to the dentist and get it sorted out.' (R3)

This allowed participants to manage physical impacts, beyond those that were an expected part of wearing an appliance.

Parents, siblings and friends could help participants address physical and practical impacts (e.g. discomfort, or forgetting to wear an appliance) by providing support and advice:

> '*When he* [participant] *first started getting ulcers and everything,* [older brother] *was very supportive and showing how to use the wax weren't it, and things like that.*' (parent, F3)

Friends also helped address emotional impacts (annoyance, embarrassment) by being empathetic or by not teasing the participant:

> '*I'd feel embarrassed* [wearing it around my friends]*, but my best friends, they wouldn't like tell everyone. They'd keep it inside.*' (R5)

Participants also valued sharing the experience with friends:

> '*We could all relate to like the same stuff and like we could all talk to each other about something… I'd just say like, "oh it's like really aching me today" and like "it's like really hard to speak in it today" and stuff like that. And they'd be like, "oh, it's doing the same to me as well."*' (TB8)

Knowing that other people were going through the same experience could help psychologically.

Participants with Twin Blocks spoke about how appliances could draw attention, which was often unwanted:

> '*My lips open when I've got them in because it opens your mouth, and then people like look at me as if I'm a weirdo.*' (TB9)

This included being stared at, being asked questions and being teased. Participants with Twin Blocks were concerned about how 'obvious' their brace was. This could lead to non-compliance (not wearing one's appliance in certain social situations, for instance). Fixed appliances were described as 'normal', while retainers were less 'obvious' as they were worn at home.

Developing strategies

Participants across all sub-studies employed practical strategies, which helped them to 'get used to' their appliances and manage impacts. They took practical steps to manage pain and discomfort:

> '*If it was bad, I took a paracetamol to calm it down.*' (TB3)

Participants with removable appliances used reminders and routines to ensure they wore and cleaned their appliances regularly:

> '*I brush my teeth before I put it in, so. Well, we go upstairs and then I have it in, take it out, read my book and then when I go to sleep I put it back in*.' (R1)

As forgetting to wear one's retainer was a common practical impact, these strategies helped participants to be compliant (along with support from family and friends).

Young people engaged in everyday activities, such as eating, sleeping and attending school. Practical strategies were used to limit the impact of appliances on such activities. Participants with fixed appliances adjusted how they ate, or found ways to remove food stuck in their braces:

> '*I still manage to eat* […] *You have to cut it up a lot more.*' (F1)

Participants spoke or read aloud while wearing their Twin Blocks to minimise the practical impact on speech and the risk of embarrassment:

> '*Just talking with it in* [helps]*. Talking as much as I can.*' (TB2)

Employing practical strategies meant that participants were often not 'bothered' by their appliances.

Orientation to the future: Orthodontic treatment as 'worth it'

Participants suggested treatment was 'worth it' because it resulted in straight teeth, an improved appearance and more confidence. This could be an imagined future:

> '*You've just to think how you'll feel in a couple of years […] When you get it off and you see what a difference it's made*.' (TB1)

Young people in this study envisioned the result of orthodontic treatment positively, and this image worked to motivate them in the present.

Participants talked about the 'long-term':

> '*It'll help long-term and it's not just something that'll sort of be there for like two years and then go away,* [it will] *sort of stay forever and make me look better*.' (R4)

Despite negative impacts, they could also see wearing an appliance as being positive, because of the potential effect in the future.

Participants' experiences of orthodontic treatment are situated in the context of a 'journey' that is 'worth it'. Orthodontic appliances can have negative impacts for young people, but a focus on the longer-term helps to present these as a less significant.

Discussion

This paper outlines how young people manage everyday life with an appliance. This process occurs across different dimensions. Bodies 'get used' to appliances, so they are not noticed. Coping with physical, practical and emotional impacts involves psychological processes of perseverance, compliance and 'being prepared'. Strategies can be used to manage impacts. Families, friends and orthodontists can provide support. Avoiding unwanted attention also helps young people to manage everyday life; this is easier with fixed appliances (which are seen as 'normal') and retainers (which are less frequently worn around other people and are less 'obvious' than other appliances). Cultural understandings of orthodontic treatment as 'worth it' help young people to focus on the longer-term benefits, and view impacts as relatively short-term.

This can be theorised through the concept of 'dys-appearance' (Leder, 1990). While life is experienced through the body, the body is not necessarily the focus of experience. When eating, we may focus on the taste of food, rather than processes of biting, chewing, swallowing etc. However, the body can physically 'dys-appear' (appear in a dysfunctional way) if it fails to work as expected, or causes pain. The body can socially 'dys-appear' if it provokes a strong reaction in others and we experience negative emotions. At these moments, we act to return the body to an 'absent presence'; we want to be able to eat without focusing on the processes involved or the responses of others (Leder, 1990). Where possible, people act to relegate the body to the background (i.e. an absent presence) in order to engage in the world in the way they choose.

An appliance, which is fixed to a person's teeth, or temporarily placed over them, modifies the body. If an appliance causes pain or discomfort, makes everyday life more difficult or is experienced as 'embarrassing' or 'upsetting', these physical, practical and emotional impacts can cause the body to 'dys-appear'. Our research indicates that people look for ways to minimise this dys-appearance and 'get used' to an appliance. This included developing practical strategies and drawing on social networks. Appliances were less likely to socially dys-appear when they were not noticed, due to being seen as 'normal', or not worn in public. Social dys-appearance was a particular issue in the Twin Block sub-study.

In addition, we 'exert a degree of control over how we view ourselves and choose to act on our environment' (Shilling, 2008: 11). It is important to consider how patients adopt ways of thinking and mental approaches to their treatment. The themes of perseverance, compliance and being prepared emerged in all three sub-studies. This reflects existing research. Persevering involves staying focused and working towards successful completion of a goal. This has been identified among adult orthodontic patients (Tayer and Burek, 1981). Compliant patients adapt their behaviour in response to requests from their orthodontists. Suboptimal compliance is a recognised issue with removable functional appliances (Al-Moghrabi et al., 2017). Realistic expectations are also significant for determining patient satisfaction with treatment (Newton and Cunningham, 2013).

In this study, perseverance, compliance and having realistic expectations were seen as necessary in order to 'get used' to an appliance. Persevering with one's appliance, and wearing it in a compliant way, is also presented as a way of taking personal responsibility. This is associated with 'growing up' and adulthood (Hockey and James, 2003). These attitudes may be part of the rite of passage of undergoing orthodontic treatment (Longstaff, 2017). Participants who described 'being prepared' were supported by family, friends and professionals. They were

warned to expect some degree of pain and discomfort, and given advice about eating and cleaning. Not being prepared could have an emotional impact. Twin Block appliances could cause 'shock' due to the size and participants suggested that seeing a model in advance might help to prepare them. Clinicians could consider doing this in an appointment before the patient is due to have their appliance fitted.

Thought processes and practical strategies, while personal, are influenced by accepted world-views (discourses). A dominant discourse normalises particular actions, which become taken for granted (Foucault, 1972). Dominant discourses are reinforced through social institutions (e.g. the education system and the media). Taken-for-granted understandings can be identified in the *way* people talk. For example, orthodontic treatment can be understood as a rite of passage, not just straightening teeth (Longstaff, 2017).

Young people and parents illustrated a discourse of orthodontic treatment as 'worth it'. This discourse is supported by research reporting that oral health-related quality of life improves with treatment (Javidi et al., 2017). Participants emphasised the importance of persevering with treatment and doing so in a compliant way. They imagined a future self who is happy and looks 'better', having improved his or her teeth. This image of the future is a motivation to undergo orthodontic treatment in the present. The discourse of orthodontic treatment as 'worth it' shapes the way that young people talk about their experiences. If this is a dominant discourse, are there competing discourses? For example, are there young people who reject the idea that straight teeth are important? Research with those who have not undergone recommended orthodontic treatment would be useful.

Although young people take a longer-term perspective, this research also indicated everyday impacts. These could cause patients to disengage, if they are not able to manage these. Clinicians can help to facilitate the process of managing everyday impacts. Young people spoke positively about external support and developing strategies to manage physical impacts. Clinicians may want to discuss potential impacts with young people prior to treatment (e.g. difficulty speaking with a Twin Block brace), share strategies (e.g. practicing speaking) and encourage forward planning (e.g. talking to parents and friends about any worries and ensuring that emotional support is in place). Patients may be reassured by the reported experiences of other patients who found treatment initially difficult, 'got used' to their appliances, and who view their treatment as 'worth it' in the longer term.

Limitations

Participants were all undergoing orthodontic treatment. Although they described negative impacts from their appliances, these were not severe enough to discontinue treatment. In order to more fully understand the impact of orthodontic appliances on everyday life, research with young people who have prematurely stopped their orthodontic treatment would be useful.

Engagement with treatment may influence how a person adapts to an orthodontic appliance and their willingness to participate in research on this topic. Young people who are having a generally positive experience and are engaged with the process may be more willing to take part and this may have affected the findings. However, young people commented on areas for improvement in their treatment, which suggests a willingness to be open about their

experiences. The majority of participants had been wearing an appliance for over six months, and thus had more time to adapt to their appliances and develop strategies to manage impacts. This may have affected the findings. Nevertheless, the theme of 'getting used' to appliances was identified across the sample.

These sub-studies have highlighted how different dimensions may affect managing everyday life with an orthodontic appliance. However, the topic guides were not designed to measure factors prior to treatment (such as motivation for treatment, personality traits or perceived social interactions) or during treatment (such as engagement with treatment, relationship with clinician and level of parental and peer support). Further research utilising mixed methods could systematically address the relationship between these factors and experiences of adapting to different types of orthodontic appliance.

Involving participants in research is important for ensuring findings are credible. Although this research itself is designed to do this (involving young people in the development of a new questionnaire), young people could also have been involved in designing topic guides for interviews. Future research could also include respondent validation to check whether the final themes reflect their lived experiences (Noble and Smith, 2015).

Conclusion

Young people may downplay impacts of their appliances as part of managing everyday life with an appliance. This reflects a more general tendency for people to work on relegating the body to an 'absent presence' so they can focus on engaging in the world in the way they choose.

Managing everyday life with an appliance is a social process that occurs across different dimensions.

Young people 'get used' to appliances by persevering and employing strategies to manage physical, practical and emotional impacts. This process can be facilitated by social networks.

Orthodontic treatment is understood to have long-term benefits. This helps young people to persevere and manage everyday life, as impacts are seen as temporary and relatively short-term.

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