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Good vibrations: Do electric massagers work?

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Abstract

Health, leisure and beauty activities are increasing in popularity in the United Kingdom, with a particular emphasis on self-help and alternative health practices. One product type that has increased sales with this expansion is the hand held electric massager. These are products that use vibration as a means of alleviating muscular strains and pains, as well as promoting relaxation. Paradoxically these products are extremely popular as gifts, but are discarded after an initial period of use.

Products that respond to real user needs will be successful in the market. Designers cannot guess or assume such needs; they must immerse themselves within the user experience to effectively ascertain user needs. Research has become a fundamental activity within design to support evidence-based decision-making, ensuring that answering real user needs is central to product development.

The research team was commissioned by a British manufacturer of electrical consumer products (including massagers) to investigate user attitudes and perceptions of existing products, to try to identify areas of user dissatisfaction. The manufacturer also concerned about a possible stigma attached to these products because of an association with sex aids.

In stage one, the research team of an industrial designer and design researcher consulted on a one-to-one basis with a sample group of users and health/beauty therapists. The team identified a significant problem with users perceptions and experience of existing massagers. Many products had a number of operational disadvantages and this combined with doubtful efficacy to lead to users becoming disillusioned with them.

At stage two, the research team expanded to include a health psychologist and professional therapist, setting up focus group discussions for product handling and evaluation with expert physiotherapists, occupational therapists and neurologist. There was universal agreement that most existing products had little therapeutic benefit and in

the hands of untrained users they might actually aggravate the conditions they were meant to alleviate.

This stage exposed some fundamental differences of opinion between the professional therapists and manufacturers of existing products about the appropriateness of various operating principles. Most therapists employ manual massage as a reliable and effective technique for rehabilitation and relaxation. They were unconvinced that electrical vibration produced comparable results and were concerned about the harmful effects of vibration on muscle and nerve tissue. Although the manufacturer involved was keen to secure product endorsements from key professionals, this proved impossible to achieve with existing products. This stage did result in the identification of promising directions for future product development in collaboration with users resulting in a range of conceptual designs, which may form the basis for future products.

This paper provides an interesting account of the differing perceptions that various constituencies bring to bear on the product design and evaluation process. Identifying these differences provides the basis of an effective integration of user needs, manufacturer requirements, designers' skills and sound therapeutic practice. It provides valuable insight to support the development of more effective hand-held massagers for the future, but also acts as a model of product development practice in the wider context.

Keywords: electric massagers, user-centred design, supra-functionality

Introduction

Products satisfy needs beyond the functional. The emotional domain within user-product interaction provides insight into user experience and aspirations. It is not enough that a product functions well. It also needs to reflect the lifestyle and supra-functional needs of the individual. These supra-functional needs can include social, cultural, emotional, aspirational and spiritual (McDonagh-Philp and Lebbon 2000). When searching the shelves in the retail outlet for a product, its actual function has less impact that its appearance. The use of colour, texture, form, product language (product semantics), cultural cues and branding has a significant influence upon the individual at the point of purchase. If a product performs well but does not respond to a users needs, then product bonding and emotional attachment becomes less likely. For manufacturers, it is not only important to sell products be also develop product loyalty. Therefore, now that adequate product functionality is the norm, supra-functional factors are recognised as even more important (Weightman and McDonagh 2003).

The growth of health and beauty activities in the United Kingdom

With the increase in popularity of leisure, health and beauty activities, the retail sales of hand-held massagers reached a value of £2.7 million in the UK during 2000 (MINTEL 2001). As awareness of the uses of such products grows in the UK, so the purchasing and ownership is likely to increase. Many consumers are becoming more open to the concept of promoting relaxation and treating their own symptoms of pain and stiffness as

an alternative to the use of drugs or medicine and so increasing favour self-help remedies. Before this study was conducted, the use of hand-held massagers would appear to have met this need.

Existing massagers

A massager is a hand-held object that applies vibration to the surface of the skin. This vibration tends to be applied to relieve muscular tension/strain and/or encourage relaxation. The majority of the products on the market tend to be either battery operated or mains powered. For this study a sample of eight electronic products was used (refer to Table 1) ranging from those that combined aromatherapy oils and heat to promote relaxation (Morphy Richards 'Essential' and Visiq infra-red body massager) to the more sport orientated products, that use strong vibrations to relieve aches and strains (Remington 'Sports Thumper' and Scholl 'Massage Master').

In addition, a sample of non-electronic products was included within the study to demonstrate the wide range of products available through mainstream retail outlets (refer to Table 2). The majority of this sample is hand held with the exception of the foot massager.

Manufacturers interest and brief

A British manufacturing company had initiated the project to address concerns about the apparent lack of usage of these products after purchase. Usually purchased as gifts, they were being used once or twice before being stored away. They perceived the target user was female and come from the lower socio-economic categories. Massagers are regarded either as a luxury item to promote relaxation or more specifically to treat a sports injury. Hasdogan (1996) has recognised that purchasing products as gifts for others attracts priorities such as brand and cost, rather than function and ease of use. Therefore, the focus for this study concentrated on the final user not the purchaser.

The manufacturer also expressed the desire for an endorsement from a high profile professional to help boost sales. Such endorsements from celebrity chefs and hairdressers have already been instrumental in increasing cooking and hair styling products.

What was it that prevented the users from interacting with these products? Why did they feel the need to store these products away from sight?

Stage one research

The research team comprised of an industrial designer and design researcher. Following user-centred design methodologies the team placed actual users as the central focus of the research activities.

An initial pilot study was conducted in the Department of Design and Technology at Loughborough University. The aim of this stage was to elicit information from product users to feed directly into the designing process of a new generation of products (Bruseberg and McDonagh-Philp 2001). As products that we surround ourselves with tend to satisfy needs beyond the functional, the study also explored users needs such as aspirational, cultural and emotional. This study took place over a ten-week period and involved an industrial design undergraduate student, sponsored by a research bursary and industrial support[1], who carried out design research to elicit user feedback on a range of products, available through mainstream retail outlets in the UK. A design audit was conducted which was followed up by users (n=10) evaluating the products (visually and through product handling) within their own home environment. Each participant completed a feedback booklet, which explored their perception of the product visually, through handling, use of colour and finally providing the product with a personality profile (McDonagh *et al* 2002). Explain what it is

The findings revealed a significant lack of consumer confidence in the product. These products are generally marketed to promote well-being through relaxation, de-stressing and relieving muscle tension. However, user surveys determined that the vibration was often ineffective and sometimes painful during use and afterwards. The vibrating function made the product too noisy and disturbing to promote relaxation. Lack of instructions and guidance and insufficient explanation of contra-indications make these massagers potentially dangerous when operated by users within limited anatomical knowledge (Cooper and McDonagh 2001).

This stage revealed that these products might have a stigma attached to them. The massage effect is generated by vibration, which tends also to be associated with sex aids. In addition, the actual size and weight of the products were found to be too big and heavy to be used comfortably. Solo use and massage is difficult thus limiting the benefits of the massage. Users did not tend to read the instructions prior to use, and relied upon the product semantics to direct them. Product semantics is the way in which the product communicates how it is used. Therefore, the user should intuitively understand how to hold it, turn it on and off, and be able to interact relatively quickly. Prior user knowledge and experience of similar products is often relied upon along with developing products. The use of colour, form, texture and signage can contribute to the user developing understanding interaction with the product. Due to poor product semantics with these products, misuse and a general lack of product understanding was experienced. Product attachment and emotional bonding did not develop and contributed to the products early redundancy.

Participants raised a number of concerns these include the following:

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- Due to the length of the power lead, they had to sit close to a plug socket rather than a location of their choice (on their sofa or bed). They would have preferred a longer power lead.
- The visual language of the products was not clear or easy enough to understand. Some participants struggled to switch products on or off.
- Users tended to disregard the instructions and interact immediately with the product
- Such products were perceived to carry a stigma with them and participants would not feel comfortable having them on show within their home environment
- Felt the products were too big (over scale)
- Perceived the products to be too heavy (difficulty in holding and directing product) The products ranged from 0.6 – 1.5kg, which becomes a significant weight when attempting to reach particular parts of the body.
- The products aimed at sporting injuries were perceived as overtly masculine and aggressive due to their product semantics (colour, form and 'feel')

These findings raised various areas of concern for the research team. Further insight was sought from a small sample of professional masseurs. They raised the following points.

- Not prepared to endorse or recommend such products.
- Perceived them as harmful and discouraged clients from using them.

As a team of researchers (industrial designer, design researcher and ergonomist) we discovered the products did not live up to the expectations of users and further insight was needed.

Stage two

At this stage experts at Nottingham and Brunel universities were consulted and joined the research team, which now included a health psychologist and occupational therapist. Key experts in therapy, occupational and physio took part in two focus groups.

In light of the ergonomic issues associated with these products, the aim of the second stage was to conduct an in-depth qualitative investigation of health professionals' assessment of the usefulness of hand-held massagers. The research team chose to focus on the assessment of physiotherapists and occupational therapists for three reasons. Firstly, occupational and physiotherapists are involved in treating clients with sports injuries, and therefore, have expert knowledge and experience which make them well placed to evaluate these products. Secondly, in marketing these products, manufacturers often seek endorsements from professional groups. Thirdly, health professionals, such as occupational therapists and physiotherapists involved in rehabilitating people following injury or disease are likely to be asked for their opinion and to recommend a suitable massager to augment and enhance treatment (Westland 1993a, 1993b).

Occupational therapists and physiotherapists normally work together as members of multidisciplinary clinical teams, although their professional remits are somewhat different. Physiotherapists are concerned with the physical rehabilitation of people who

have sustained injury or disease whereas occupational therapists use the engagement of a person in meaningful activity or occupation in order to restore overall function (College of Occupational Therapists 2003). Occupational therapists see themselves as more holistic, addressing wider environmental issues of concern to their patients and clients whereas physiotherapists are concerned with restoring movement and function to an injured part of the body using a range of physical treatment techniques (Chartered Society of Physiotherapists 2002).

Focus group techniques were employed to elicit expert opinions and evaluations of products currently available on the market. The use of focus groups is a technique to generate discussion as a basis for product evaluation and development (McDonagh-Philp and Denton 1999; Langford and McDonagh 2003: 23-25). The focus group sessions in this study were facilitated by an industrial designer and an occupational therapist and included the evaluation of existing massagers.

Format of focus group sessions

Focus groups are groups of individuals that have been brought together to discuss specific topics. The method relies upon participants interacting and generating a synergetic effect (Driskell, Hogan and Salas, 1987; Hackman, 1983; Hampden-Turner, 1971; Shaw, 1971 and Kitzinger, 1994). Moderators are used to facilitate the activity, encourage discussion and interaction.

Each session lasted 1.5 hours and involved a range of activities, such as visual evaluation, product handling, product personality profiling (McDonagh *et al* 2002) and focus group discussion (Bruseberg and McDonagh-Philp 2001). The focus group sessions were video-recorded and photographed. The use of video recording enhanced the quality of the data, enabling an accurate interpretation of the process, as non-verbal and verbal communication could be observed. The participants (n=13) were relaxed in front of the camera and were also given the opportunity to express their views in writing, to minimise the possible effects of changed behaviour due to being filmed used in qualitative research (Bertoff 1994).

The subsequent discussions built on reflections of existing products. In the first focus group, joint moderators helped to diffuse the attention of the participants between two individuals, which facilitated and enhanced the overall group's contribution to the discussion.

There were nine therapists in the first group and four in the second group. Table 3 provides a profile of all the focus group participants. All therapists were experienced in their field and had informed knowledge of using massagers, some being involved in the provision of undergraduate and post-graduate courses within their discipline.

The recordings were transcribed and the data analysed by sorting verbatim material into emergent themes as described by (Dey, 1993). The analysis was guided by the original research themes, namely the response to products currently available on the market, ideas

for new products and the response to newly proposed designs. Written responses were collated, tabulated and analysed using descriptive statistics.

Results

When the participants were asked to reflect and comment on the massagers, the overall response was negative. A number of key themes emerged from the participants' responses, including:

- Preference for manual hand massage over the use of either manual or electronically operated products
- Preference for the manual objects over the electronic massagers
- Issues related to the design and manageability of the products
- Potential dangers related to the use of the products
- Concern over the way in which the products are marketed
- Issues related to the stigma commonly associated with many of the products

The use of manual products

All of the participants explicitly stated their preference for manual hand massage over the use of either manual or electric products. In particular, they felt very strongly that manual hand massage was a much more effective and sensitive method of massage. As a hand therapist pointed out:

> From my point of view I'd be a bit concerned really, because part of the whole thing about massage is that it's a kind of relationship between you and the person that's giving it to you and its about the feel and the touch and knowing what works and what doesn't work and knowing what to do and what not to do …

One occupational therapist described her experience of a sports massage to illustrate the difference between electric products marketed as sports massagers and a professional manual massage. In particular, she refers to the importance of expert knowledge in the application of an effective sports massage:

> It's also working with the terminology of the problem as well … the person explains to you each time what he's doing, or she's doing and why they are doing it and so that gives you professional reassurance that he or she knows what they are doing, whereas with those you just bang it on the muscle and hope for the best don't you.

Although there was an overall preference for manual massage, two of the participants were able to identify advantages related to using the smaller electrical products within their specialist field, as illustrated by the comments of one of the occupational therapists specialising in hand therapy:

> We use them a lot in the hand therapy unit, we use them for sensory retraining programmes, sensitisation, vibration, and we also use it for hand massage … so from our point of view yes it does have therapeutic application.

Preference for manual objects over the use of electrically operated products

Although the overall opinion was that using the hand is the most effective method of massage, the majority of therapists expressed a preference for the manual products when asked to recommend massagers for their patients. Comparisons were drawn between the manual and electric products to underline this preference, as cited by a physiotherapist:

> Personally speaking I like these little simple balls and gadgets that have a rubbery, softer feel … you can apply it very much on an individual basis. You can use it as firmly or as gentle as you like … I mean I know some of them have power controls … I just think these give a bit more flexibility in terms of application.

Overall design

A number of negative comments were made with regards to the design and manageability of the products. In particular, the participants referred to the size, weight and power of the larger electrically operated products. A respondent remarked:

> Too heavy for some of the patients I can think of … they are going to be very sort of heavy, very unwieldy, the actual degree of massage they give you is uncomfortable...

Some of the participants stated that they experienced discomfort as a result of the vibration produced by the electronic products. As one of occupational therapists pointed out:

> For me it was about two, three minutes afterwards with one of the products, it was still feeling really sort of uncomfortable…

Potential dangers

The strong vibrating forces from some of the larger electronic products were considered to be a potential danger by several participants. A number of concerns related to the use of the products with particular client groups:

> I work with old people … those products are quite forceful and they could quite damage them…

References were also made to the detrimental effect that the vibration might have on nerves:

> Nerves don't like being battered. I mean if you were to place that over a nerve you would certainly have a derogatory effect on the membrane, there's no doubt about that …

Marketing of the products

A number of concerns were expressed over the way in which the products are marketed. With the majority of the electric products claiming relaxation or therapeutic effects. Most of the participants agreed that the strong vibrating force and the amount of physical effort required to operate some of the machines would not be conducive to relaxation:

> I would have thought most people, if they wanted to get a machine like this, would think that they would just be really nice and relaxing … I mean that's the sort of idea I had until I switched them on.

As pointed out by one of the participants, a physiotherapist specialising in neurology, a vibrating action would achieve the opposite physiological effect.

> I think there is a fascinating point to be made about a machine which is supposed to relax you. In fact, if it does anything physiological it would do the opposite, because if you put vibration on … you would actually tone the muscle … so you are achieving the opposite effect … I think the physiological effect could be useful. I mean you could actually market it on the grounds that you were going to facilitate somebody's ability to contract a muscle, there's that scope.

Stigma

All but one of the participants referred to the stigma associated with many of the vibrating products. One of the occupational therapists referred specifically to the problem of stigma attached to the use of small hand held massagers within the hand therapy unit.

> As soon as you say you are going to have to use vibration, they say are you going to get your vibrator, massaging tool out … there are times when I do want a patient to have one at home when they are doing a sensory retraining programme and its very difficult to buy a hand sized vibrator that is not a vibrator. So from my point of view I'd like to see something like that that's marketed in a different way that hasn't got quite so much stigma.

The key findings from these focus groups with experts were as follows:

- The majority of therapists preferred the non-electronic massagers
- They were particularly concerned about the claims the product manufacturers make regarding the products reducing stress and relieving muscular pain
- Users do not read instructions
- Product complexity should be reduced so that the product is easy 'to read' to avoid misuse

Effective product development

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The following represents the key issues that developers (designers and manufacturers) need to consider and respond to in order to develop the next generation of massagers.

- Reduce and/or eliminate stigma
- Product semantics need to be more considered
- Avoid false claims
- Explore the relaxation route rather than the sports injury route
- Involve users within the product development process (prior to concept generation through to concept refinement)

Conclusion

What does the future hold for this product type? Health, beauty and relaxation as activities are increasing in popularity in the United Kingdom. As technology develops, the authors are confident that lighter products will be possible that can stimulate a manual massage in the not too distant future.

- Massagers need to be lighter in weight
- Integrate visually within the home environment
- Respond to supra-functional needs (emotional, aspirational and cultural etc)
- Stimulate the effects of manual massage techniques
- Focus on relaxation

This study has evaluated the hand-held massagers currently available on the market from two perspectives, that of users and that of experts. It has initiated an exploration of possible new design solutions, as intended by the original research aims. It emerged that the best form of massage is still achieved by human hands and although it might have been speculated that therapists would welcome electrical and manual devices to assist them in their treatment, this was not found to be the case.

It is of some concern that the manufacturers' claims for these products are misleading at best and potentially damaging to the general public, especially to those with sports injuries, at whom the larger massagers are targeted. This might be one of the reasons why the focus group participants were unwilling to recommend the massagers since it would compromise their professional integrity to do so (Health Professions Council 2002).

Although the outcome of this study may be somewhat disappointing from the product development team's point of view, it nevertheless highlights the importance of consulting with users in the early stages of a new design development in order, in this case, to prevent a perpetuation of the "unused massager syndrome".

The company was advised to explore the use of massagers for relaxation rather than for the alleviating sports injuries. Though the manufacturer had identified problems with the use of existing products they had not grasped the extent to which the product failed to satisfy fundamental needs. Based on the results of this study, the authors conclude that current products are inadequate sometimes potentially harmful to users. Rather than mirror improvements in details of product design, a radical revision of design approach needs to occur, supported by research with users and expert therapists.

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