Food, Disability and Design

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Abstract

This paper aims to inform the reader of the design-related challenges faced with feeding oneself with a disability. This seemingly normal task is something that is taken for granted; from a small age, we are taught to hold and use forks and knives correctly, etiquette on serving and presenting food and on maintaining a convivial and friendly atmosphere. Unfortunately, due to the effects of aging or acquired disabilities, the dignity of this simple task can be compromised. Literature suggests that mealtimes for people with a disability can cause emotional stress due to the reduction of independence, self-consciousness of their appearance, and fatigue (Backman et al., 2008) (Coleman et al., 1993 and 2006). These factors may lead to social isolation and a reduction in the pleasure of partaking in a meal in a social context. While products exist that fill the physical need for gripping and balancing, the design of these implements leave little to be desired. An investigation into the design of exemplary adaptive products, such as the ‘Smoking Glass’ by Joe Colombo and the vegetable peeler from OXO have promoted inclusion, ease of use for sufferers of arthritis and have opened up a new market segment of inclusive kitchen technologies that bring the sufferer back into the kitchen. The discipline of industrial (product) design is explored, and its pertinence to the research and development of new adaptive aids is demonstrated. Strategies for the future are proposed utilising emerging industrial design techniques and food design trends, such as molecular gastronomy are hypothesised as future areas of research and development for inclusive food design.

This paper forms part of a doctoral research project from Swinburne University of Technology, Melbourne, Australia. It will discuss the sensitivities of a person with a disability when confronted with designed products used during a mealtime, and will suggest potential strategies to help alleviate the emotional stressors.

Keywords: Industrial Design, Disability, Cutlery, Food, Product.
Introduction

In Veblen’s book from 1899, ‘The Theory of The Leisure Class’, we are introduced to the social and emotional importance of fine cutlery, crockery and tableware. Veblen suggests that:

“We all feel, sincerely and without misgiving, that we are the more lifted up in spirit for having, even in the privacy of our own household, eaten our daily meal by the help of hand-wrought silver utensils, from hand-painted china (often of dubious artistic value) laid on high-priced table linen. Any retrogression from the standard of living which we are accustomed to regard as worthy in this respect is felt to be a grievous violation of our human dignity (Veblen, 1965).”

Certainly, in a modern western society, we can demonstrate our tastes and define our identities by the objects we surround ourselves with. Studies have been undertaken where the appearance of a product, such as that of an automotive brand, can infer that the user is more attractive and educated (Effendi et al., 2009). However, in the realm of disability, product design, specifically related to disability is lacking. The current range of products on the market lack the flair, or ‘x’ factor evident in able-bodied design. It is suggested that poorly designed assistive tools will not be used (Coleman et al., 2006), and when this is compounded with the fatigue caused by a disability such as arthritis, food preparation can become emotionally and physically stressful (Repping-Wuts et al., 2008).

It is fair to say that industrial design should not be underestimated in the development of assistive cutlery to fit the needs of all users. Industrial designers have the ability and skills to understand the user behind product development. In the case of adaptive cutlery this user-centred approach to design should clearly identify the current problems with existing products and improve upon them. The discipline of industrial design can be defined as the conception and planning of products for multiple reproductions. It is a creative and inventive process that balances all users needs and desires within technical and social constraints (Fiell and Fiell, 2000). The primary distinguishing characteristic of industrial design compared to engineering is its concern for aesthetics and the system (environment) in which the user interacts with an artefact. Industrial design works coherently alongside engineering to develop optimum solutions to specific problems, however industrial design stands alone as a credible discipline through the ability to better understand user needs and design to satisfy these. This research is evidence of this by highlighting the importance of social-inclusive design used to minimise the stigma attached to adaptive cutlery for the aging or disabled.

Design is the force that differentiates otherwise identical products. A Riedel crystal wine glass performs the exact same task as one from IKEA, however one is more desired; it looks better, it feels better and according to certain manufacturer’s claims, it makes the liquid taste better (Riedel, 2011). In fact, many manufacturers of glassware specific to the types of drink to be imbibed; Riedel – the aforementioned Austrian manufacturer – makes glasses that are designed to amplify the enjoyment of different varieties of wine. A glass for Bordeaux, for instance has a much different shape to that of a Riesling glass. These options provided, whether they actually enhance the flavours is entirely subjective, however as consumers, we enjoy the distinction of such pieces. However, for the able bodied person, one does not even need to go to great expense for the same pleasure. Glasses, flatware and plates that can be considered ‘designer’ can be purchased at IKEA, Target and other such retailers. Phillipe Starck’s line of products for Target in the late 1990’s illustrated that high-design can be ‘democratic’, however the consideration this has been given to the other-abled market appears to be lacking. This preludes the purpose of this study in highlighting the issues surrounding food design products for the disabled, and demonstrating the contribution that designers can make to this field.
Cutlery and the disabled

Literature suggests that the first documented usage of cutlery was in Italy in the 11th century (Glanville and Young, 2002). Glanville (2002) implies that this first appearance was stigmatising; the wife of a wealthy Venetian Doge used golden implements to consume her food, much to the disgust of her fellow diners who considered it an affront; was she too precious to consume food with her fingers – an implement given by God? In the 14th century, Wolfman and Gold (1994) suggest that cutlery became far more prevalent and within three-hundred years, cutlery became the height of status in a way that would have displeased the aforementioned Venetian diners; to have your fingers touch the food was considered highly uncouth (Wolfman and Gold, 1994). Diplomats and heads of state travelled with their own sets of cutlery and collections of tableware and flatware grew to become conspicuous symbols of status and excess in the Victorian era (Veblen, 1965).

From this, it is of interest that there is an International Standard for cutlery – ISO 4481. This standard demonstrates the level of sophistication undertaken to develop implements for the consumption of various kinds of food; listing twenty-one spoons, thirteen forks, fifteen knives and fourteen miscellaneous items of flatware. In contrast to this excess, the Italian Futurist movement rejected the use of cutlery altogether (Marinetti, 1930), recalling the earlier disgust from the Venetians, suggesting that the usage of cutlery reduced the sensuousness of food and deprived the diner of ‘pre-labial pleasure’ and yet again suggesting that the hand was the ultimate utensil. A retrospective catalogue of utensils by Mostre Giorgetti, entitled ‘Cutlery’ indicates this on the front cover and poetically describes the tactility and the lineage of flatware extending from the human hand (Corrani Editore, 1997).

Unfortunately, as poetic and beautiful as the human hand may be, people who lack the mobility, strength or have tremors, such as those with Parkinson’s disease or a form of arthritis require specialised utensils. These utensils may take such forms in which they certainly assist the user to partake in their food, and much like our Victorian-Era ancestors, allow the user to ensure that their fingers do not touch the food, however their appearance potentially deprives them of the emotional connection between their food and their utensil.

Studies have suggested that within the senior’s generation, the preparation of food can be seen as a gift (Sidenvall et al., 2000) and that the act assists in the confidence levels and self-worth of the person. Companies such as OXO, famous for their ‘Good Grips’ range have assisted in this area by developing easy to use, non stigmatising utensils in which to prepare the food. However, this has not extended to cutlery or tableware. Literature suggest that if the product’s aesthetics belie its role as an assistive device, the uptake of the advice will be limited (Backman et al., 2008). Certainly in regards to the consumption of food, the appearance of adaptive cutlery may be confronting when compared to an elegant piece of silverware, or an inexpensive piece from IKEA. The pieces generally have bulky handles to assist the user’s grip and may require specialised work areas, such as an angled spoon or a knife that rocks from side to side. When we contrast these with the conspicuous consumption of the past — and that even airlines such as Qantas tout the fact that Marc Newson has designed the in-flight crockery and cutlery (Emille, 2008) — we can see how the appearance of the utensils may cause emotional discomfort.

Design as a method of differentiation

As Tovey (1997) notes industrial design as a discipline is a recent creation of the 20th century. It has roots in the philosophy and practice of the Crafts movement and the Bauhaus in Europe, and in the USA through the invention of styling as a way of increasing product sales. It is called ‘industrial’
because of its concern with products manufactured by industrial processes, and has tended to have an emphasis on vocational effectiveness and practice (Tovey 1997). Industrial design in the 21st century has changed. It is no longer just about invention, styling or increasing product sales – it has changed through necessity more than desire. Industrial design has broadened its scope and must understand the way in which people interact with design in order to create products that fulfill the needs of all persons concerned. These areas were obviously considered during the 20th century but are of utmost importance now due to a more competitive marketplace, more demanding consumers, and a better awareness of key drivers such as sustainability. Designers now must investigate the impact of design on emotion and the user experience. This advances the understanding of how emotion and affect have implications for the science of design (Norman, 2002). It is essential that products designed for use follow good human-centred design methodologies and by using design psychology as a principle for analysis suitable design solutions for all types of people will be possible.

According to Cross (2001) design knowledge has various relations with designed artefacts. Some of it is knowledge inherent in the artefacts of the artificial world (e.g., in their forms and configurations – knowledge that is used in copying from, reusing or varying aspects of existing artefacts), gained through using and reflecting upon the use of those artefacts. Some of it is knowledge inherent in the processes of manufacturing the artefacts gained through making and reflecting upon the making of those artefacts. And some of each of these forms of knowledge also can be gained through instruction in them (Cross, 2001).

Although some question the value of practice and projects in design research (Durling, 2002), making in the design research process has significance for knowledge creation in creative arts and industries (Mäkelä, 2007). In doctoral design, the artefact or project, reflection and practice may play a role as the material resolution of practical ‘applied’ problems with more general theoretical or methodological consequences (Pedgley, 2007). The issues of knowledge and making in design research have particular relevance to industrial design.

For design research in particular, a certain legitimacy is offered to design fields through their collaboration in such projects. In this still early state of the design research argument the importance of reflecting on the socially responsible activities and processes of design work can influence change within the current areas that are lacking within this discipline (Melles et. al., 2010). One such downfall is the lack of design concentration given to products for an aging population or people with an acquired disability. Unlike the more established science and engineering disciplines, design must spend time contextualising the ability to influence change within applied design research process. This historical moment and the socially responsible context offer ideal conditions for developing the legitimacy of design research as an agent for change. The legitimacy of industrial design as an academic and research intense field cannot be developed alone through theoretical position papers in the literature. Rather, industrial design, like other design disciplines with hitherto vocational focus must prove its value in contexts such as offered by this study where it must hold its own and learn from more established fields.

A study by Gemser et. al. (2000) shows that an increasing number of manufacturers implement industrial design in their product development process in order to gain a competitive edge in the marketplace. Research on the effectiveness of this is limited (Potter et. al., 1991) (Bloch, 1995) (Hertenstein et. al., 2005), however there is a growing belief that by prioritising the important contribution industrial design can make to a products development, the rewards can be seen as vital to a company’s competitive position. Nonetheless, in order to stand out from the crowd, more innovative and appropriate designs are necessary. Indeed, a more innovative design strategy is likely to have a higher payoff in terms of company performance (Gemser et. al., 2000).

A study by Hertenstein, Platt and Veryzer (2005) shows that companies that invest in good industrial design were stronger on all measures except growth rate. This provides strong evidence that good
industrial design is related to corporate financial performance and stock market performance even after considering expenditures on industrial design (Hertenstein et. al., 2005).

Determining what ‘good’ design is can be a subjective issue, however it is important to provide basic principles to validate the claims within this study. Dieter Rams who served as head designer at the influential German company Braun for over 30 years was a good advocate of how you can determine what good design is. Back in the early 1980s, Rams was becoming increasingly concerned by the state of the world around him. Aware that he was a significant contributor to that world, he asked himself an important question: Is my design good design? As good design cannot be measured in a finite way he set about expressing the 10 most important principles for what he considered was good design. Rams’ view on good design is as follows:

Good design:

- Is innovative
- Makes a product useful
- Is aesthetic
- Makes a product understandable
- Is unobtrusive
- Is honest
- Is long-lasting
- Is thorough down to the last detail
- Is environmentally friendly
- Is as little design as possible (Retrieved from Vitsoe, 2012)

These 10 guidelines for good design are of greater importance when designing socially inclusive products to ensure the dignity of simple everyday tasks can be reached, while still remaining within the realm of current product development methods. There are many definitions of ‘good design’, however in order to contrast the above list from Rams, a business model has been evidenced to appreciate that good design — like all design — will come at a cost. By doing this we can come to a pragmatic compromise with the aim of addressing most of the aspects stated when designing from both perspectives. Hertenstein, et.al. (2005) give clarity from a business point of view and states:

Good design can be determined by the following factors:

- Quality/excellence of design evidenced in the firm’s products, services, collateral, etc. (e.g., an opinion of the firm’s design of products and materials).
- Quality of the firm’s design program (e.g., number of design awards, peer recognition).
- Importance of the firm’s design program (e.g., large investment in design, stature of design group).

Although most companies recognise the importance of industrial design as necessary for being competitive, they often struggle to assess its contribution to the organisation. This is complex as industrial design is only one of several product development functions that contribute to new product success. Therefore, it is fair to suggest that what is being designed should best meet the needs of the user. In this study it is evident that what currently exists in food design products for the elderly and people suffering from an acquired disability is inadequate. Current literature (Coleman et al., 2006) shows that major areas within what is classified as good design have not been prioritised in existing products, leading to a failure in products for people with disabilities. Because of this, these people who have trouble performing everyday tasks, such as using cutlery, feel socially isolated and embarrassed by their condition. This is not the fault of the person, however the fault of the inadequate design.

More specifically, industrial design should concentrate its focus on improving customer ease of product use while improving on aesthetic capabilities and ensuring differentiation from competitive
products. In the case of adaptive cutlery for people with a disability, the differentiation will be a product that satisfied the users needs while not making the user feel socially awkward when using it. Current products fail to do this. These activities together with other influencing aspects such as a successful marketing campaign and quality engineering and manufacturing, will enhance a customers perceived product value, which in turn strengthens demand and justifies a determined selling price, thus increasing sales revenue for the company involved while still satisfying the consumer.

How industrial design can help

The Italian designer, Joe Colombo, was a strong proponent of designing products to enhance the pleasure of food. Stories of Colombo serving squid-ink risotto on obsidian black plates to amplify the intensely dark and lip-staining nature of the meal to unsuspecting guests are lore (Gardoni, 2002). However, it is the “Smoke Glass” that is the most pertinent to those with a disability. This elegant glass was designed so he could hold his aperitif and cigarette in one hand, leaving the other hand free to graze or to greet people. The way in which this is done is through grasping the glass with the thumb via its specially designed stem. Colombo’s glass is of course, fragile and expensive, however a facsimile of this has been created, named the Manoy Beaker. This piece of drinkware shares an almost identical form, yet is made from a much more resilient plastic. However, the elegance and drama of the original Smoke Glass is lost, perhaps due to the reason that this piece has now become a far more ‘serious’ item that is used for rehabilitation and feeding, as opposed to eating convivially. When considering the importance that Veblen placed in his 1899 work, ‘The Theory of the Leisure Class’, on having attractive and desirable items of cutlery and crockery – even when eating in solitude – the aesthetic considerations of the aforementioned products should satisfy the emotional need of wanting beautiful things that still can assist the end user. As Coleman (2006) suggests, ‘bad design disables’, and that by rectifying the design and the product’s aesthetics, a more elegant solution may be found.

One example of a product that is both assistive and attractive is the iconic OXO vegetable peeler. This peeler was created to satisfy the need of the inventor’s wife; to have a potato peeler that did not cause her discomfort and to be attractive (Design Council, 2009). An American product design consultancy – Smart Design – was tasked with developing the product. The design process was detailed in the 2009 film Objectified (Hustwit, 2009), where a multitude of mock-ups were designed and tested for grip levels, comfort and most importantly, the aesthetics. The number of awards this product has attained is numerous, as is the amount of households that own such a peeler. Due to this, OXO have released subsequent products, fulfilling an entire segment of the market where attractive and notably, assistive utensils can be purchased inexpensively and promote social inclusion through the act of preparing a meal.

The process of the aforementioned product development is far from unique; this is what industrial (product) designers around the world do on a daily basis. Advancements in technologies and materials however, have led to methods that will influence the next generation of utensils and cutlery for the disabled. The advancement of rapid-manufacture (rapid-prototyping) technology now allows a designer to generate physical 3D concepts that can instantly be assessed by the users. The additive, freeform nature of rapid manufacture, coupled with improvements in materials, processing speed, accuracy and surface finish, opens up an array of options that before were impossible. The technology makes it feasible to manufacture series production parts economically in quantities of one to several thousand pieces, depending on part size and other factors. Without the constraints imposed by tooling, designers are given the freedom to create new designs that before were difficult or impractical to manufacture (Hopkinson et. al., 2006). For low-volume production runs such as what would be expected for adaptive cutlery, this technology should be exploited to address the needs of all consumers. Most new designs are not put into production due to the high costs of tooling. When
tooling is removed from the equation, it becomes feasible to introduce new products in low quantities to evaluate the market demand and success of the product.

Apart from the benefits of low production runs, rapid manufacture can also be used during the concept development phase to evaluate a concept. This process enables a more efficient transition from 2D concept sketching to 3D concept proposals used to effectively evaluate the design intent. When designing a product that a human physically interacts with — holding, gripping, cutting etc. — it is imperative that prototypes are made. Concept sketching, CAD development and concept visuals are important to initial the design process, however if a physical prototype is not produced the design outcome will fail to address the specific needs of the user. For products designed to meet the needs of elderly or people suffering form a disability this is essential. In the case of adaptive cutlery, it is vitally important to address the needs of the user and then ensure the aesthetics of the product are successfully resolved to create a functional product while at the same time being desirable. This is a major area that is lacking within current products. Rapid manufacturing is a tool that makes this process more feasible, but the designer must still work closely with the eventual user(s) to create an outcome that will rectify the stigma associated with products designed for disabilities.

A strategy for the future

An inclusive future in food design must take into account the rapidly aging population. Population ageing is occurring on a global scale, with faster ageing projected for the coming decades than has occurred in the past. Between 1950 and 2000 the median age of the world’s population rose just three years (from 23.6 to 26.4 years). In contrast, from 2000 to 2050 the median age is projected to increase by 10 years, to reach 36.8 years. Globally, the population aged 60 years and over is projected to nearly triple by 2050, while the population aged 80 years and over is projected to experience a more than fivefold increase (ABS, 2004). This statistical data reinforces the need for industrial designers to create appropriate products that address the needs of elderly that may acquire a disability of some kind. Fine and gross motor skills within this demographic can be enhanced, improved upon or potentially fixed altogether with intuitive design solutions that address these societal problems. While products for this market need not appear to be agricultural or pedestrian however, there are certain constraints that need to be considered. The chance of a glass falling and breaking, due to a lack of strength in the hand or arm is increased. Designers can use this as an opportunity, as opposed to a hindrance. The usage of safety glass for drinkware for bars and nightclubs, was introduced as a method of controlling ‘glassing attacks’ (Daily Mail Reporter, 2010). Using the same type of glass for someone with reduced grip strength could instil confidence in knowing that should the glass fall, their chance of injury by glass fragments is reduced. Alternatively, advances in manufacturing have given rise to a multitude of new materials and processes; polycarbonates and other plastics are reaching a certain level of sophistication where a copy of a cut crystal glass could be created affordably and most importantly, shatterproof. From a design point of view, the abundance of knowledge gained by an industrial designer needs to be utilised to integrate user needs into a particular design, which inturn will consider such principles as ergonomics, graphic user interfaces, materials, and semantics.

Materials and processes can give rise to new typologies. The first popular bicycle had enormous main wheels, with a smaller-diameter trailing wheel, giving rise to their nickname ‘Penny Farthing’ (in reference to the English coinage). Bicycles now have evolved into sleek machines that bear little resemblance to this machine. A Segway, for instance may potentially be classed as an evolution of the bicycle as it performs the task of personal human mobility using two wheels and a handlebar, yet its design and method of operation differs greatly. Perhaps food design may see a similar revolution?
Certainly, from a historic perspective, utensils for the consumption of food have evolved to suit the needs of the user and the prevailing trends of the time. A review of the international cutlery standard, ISO 4481 would see a listing of different utensils, many with their lineage from the noble courts of England. Terrapin forks, for instance, were used to consume the flesh of turtles. As the consumption of turtle meat has significantly declined due to conservational and ethical concerns, such forks are no longer used, or are re-appropriated as ice-cream forks. The ‘spork’ is one such evolution of the terrapin fork, where a combination of a spoon and fork is used to eat desserts. It is of note that this utensil has been used in an assistive context as it affords the user a greater sense of confidence as the scooped shape assists in securing food, such as peas.

Specifically, designers have the ability to tailor the utensil to the user. For instance, sufferers of poor grip could have their hands imaged using a 3D scanner and then imported into one of the various engineering software packages. Balance points can also be defined at this stage, where the designer may choose to add more material at certain points to achieve a pleasing weight distribution. This could also be applied to sufferers of Parkinson’s disease or other maladies where tremors are prevalent; the weighting of the utensils can be modified to suit the severity of the problem. Through this method, a truly tailored fit, much as the same as a shoemaker’s wooden lasts can be achieved. This also gives rise to decorative potential – as the grip can be prototyped within a computer, various adornments and sculptural elements can be included to the satisfaction of the user. For instance, the sufferer may require a utensil with the bowl of a spoon at a right angle and the grip to be physically attached via a strap; using the above techniques and utilising the designer’s abilities, the form of a fork or spoon could be altered to be that of a serpent. This may cause the piece to be more visible, however, its appearance may take upon a more decorative and sculptural appearance, implying a sense of pride and status to the owner that bypasses the outward appearance of the disability.

Further to this, the molecular gastronomy trend has seen the introduction of various utensils, flavours and techniques that would not normally appear in a home or commercial kitchen. Techniques where flavours are impregnated into jellies, turned into an aerosol or distilled are certainly appropriate for the future of food design in a setting for the disabled. Heston Blumenthal’s style of haute cuisine for example, could be re-appropriated for use in a medical setting; this has demonstrated on the television show ‘Heston’s Mission Impossible’ where the enjoyment of the patients — namely children — in a hospital was paramount to increasing their food intake and increasing their self esteem (Blumenthal, 2011). Certainly, we could look to this as an example of the power of design thinking in the area; that a modification in the utensils and in the ‘design and manufacture’ of the cuisine that would be partaken may positively assist the emotional concerns of people living with a disability.

Patients who require food to be puréed may, for instance, have it converted to a gel or foam, adding a level of texture and enjoyment to experience. Soups could be solidified into thin wafers that would dissolve in the mouth, alleviating spills. The opportunities presented using this method are vast and broad and would be suitable for further investigation.

**Conclusion**

Design thinking need not be expensive or use exotic materials or ingredients; it does however require thorough research into the needs of the end user and latitude of thought. As demonstrated in this research, the inclusion of design thinking in the process of both the creation of the utensils for preparing and consuming the food, and in the actual creation of the food, can amplify the social experience and promote inclusion for those with a disability.

Collaborative work within interdisciplinary environments should always come together when designing products. A single designer and a single user working together are unlikely to create an optimal outcome for all. This paper has highlighted the current problems associates with industrial design
outcomes for the elderly and users with an acquired disability and proves that there are processes that can be adhered to for the creation of socially inclusive products. All components of a product development team must work together to create the very best possible outcome to meet the needs of a user. For adaptive cutlery, the users (persons with the disability) must be consulted to generate a list of user needs to initial a concept, and then be involved once again to evaluate the concept. It is imperative for the user to direct and influence the project direction as the designer themselves could not possibly understand what is required – unless of course the designer also suffers from the same disability. Industry partners such as hospitals, rehabilitation therapists etc. should be involved to provide a theoretical base for best practice in this field, while manufacturers, engineers and/or scientists could provide new or emerging technologies that perhaps the user suffering the disability isn’t familiar with. Ultimately it is up to the industrial designer to ensure this collaboration occurs. A designer needs a theoretic platform to ensure that the final designed outcome is an advancement of what currently exists, but this process must involve many parties to successfully address the project intent.

The result of this study aims to create new power for industrial design by showing that this discipline is not just about ‘making things look good.’ It is much more complex and all designed outcomes should consider social responsibility to ensure that everyone — no matter their dexterity — can enjoy a socially inclusive life. By doing this it shows that alternative ways of creating consumer products are possible. All actions that expand on current practice are important in improving the knowledge base of designers in this field who should now have the ability to put social responsible knowledge into action. Any product that can improve the quality of life for someone is a worthwhile investment and something that all industrial designers should aspire to develop.

References


