



Visualising Gender Norms in Design: *Meet the Mega Hurricane Mixer and the Drill Dolphia*

Karin Ehrnberger^{1,*}, Minna Räsänen², and Sara Ilstedt¹

¹ School of Industrial Engineering and Management, Royal Institute of Technology, Stockholm, Sweden

² School of Communication, Media and IT, Södertörn University, Stockholm, Sweden

This article highlights how a gender perspective can be performed by design as critical practice. Two common household appliances – a drill and a hand blender – were used as a starting point. Inspired by Derrida's term *deconstruction*, the product language of the tools was analysed and then switched in two new prototypes: the hand blender *Mega Hurricane Mixer* and the drill *Dolphia*. The prototypes were shown at exhibitions and lectures. The comments by the audience show that a switching of product language entails that their relationship to the artefact itself also changes. Overall, the elements, which previously had been perceived as 'lacking transparency', were now visible. For example, the drill was identified as a "drill for women" and considered inadequate for drilling, and the mixer revealed needs and functions that the traditional mixer did not satisfy. This implies that design should not only be seen as 'final products' but as a part of a social process that takes place between the user, the artefact and the norms of society. By switching the product languages it was possible to highlight how gender values are connected to each design and each artefact. This means that the design of the artefacts around us is not fixed, but can be renegotiated and situated in time, place, and context.

Keywords – Design Practice, Gender System, Gendered Product Language, Social Context.

Relevance to Design Practice – This paper makes the case that a gender discussion must be incorporated into design practice to create design solutions that go beyond gender-dichotomous thinking, thus better providing for individual needs.

Citation: Ehrnberger, K., Räsänen, M., & Ilstedt, S. (2012). Visualising gender norms in design: Meet the mega hurricane mixer and the drill dolphia. *International Journal of Design*, 6(3), 85-98.

Introduction

Everywhere, we are constantly confronted with information that reflects society's perceptions of, and rules about, what is acceptable and what is not. The information can be obvious, informative, explanatory, or obtrusive such as in advertising, on signs, or in informative texts and warnings. It can also be subtler in the form of *codes*, which indicates a piece of information converted into a form or representation. These can be conveyed through, for example, the design of cities and buildings (and the accessibility to them), clothing, body language, as well as the design of products.

These codes both guide and govern our lives by creating both mental and physical boundaries to our actions. Our interpretation of the codes depends on our previous experiences and is drawn from a variety of factors, such as class (income, education, etc.), ethnicity (culture, history, religion, etc.), and sex (male/female, sexuality). It is also a question of location (geography), space (context), and time (modernity). We may say, therefore, that we are nurtured by our environment, as well as by each other. These things reflect values and express desires. Everyday environments and their forms and functions are the result of someone's conscious intention. It is therefore important that designers understand how the artefacts they create affect the formation and maintenance of these ideas, which include *gender*. The form can be considered to embody, reflect, and reproduce gender roles and power structures in our society. Inspired by the Offenbach

theory of product language (Gros, 1976), this article uses the term *product language* when referring to these codes in the design. Gros makes a distinction between the practical functions of a product on the one hand, and the formal and communicative aspects – the so-called product language functions – on the other. We will elaborate more on this later.

The field of gender studies has by now established a large volume of empirical research as well as a theoretical framework. There is literature on the subject that is developed in the fields of (for example) art, film, psychology, technology, and anthropology. However, the discussion of gender issues in design practice, or in design research, is still in its infancy. Existing design research notes the way things are, how they became so, and their effects (Attfield, 2000; Berg & Lie, 1995; Cockburn & Ormrod, 1993; Kirkham, 1996; Sparke, 1995) but there are few examples that try to identify the underlying structures (Jahnke, 2006). Compare this to the debate in architecture and technology where established conventions are questioned and

Received Sep. 26, 2011; **Accepted** Jul. 20, 2012; **Published** Dec. 31, 2012.

Copyright: © 2012 Ehrnberger, Räsänen, & Ilstedt. Copyright for this article is retained by the authors, with first publication rights granted to the *International Journal of Design*. All journal content, except where otherwise noted, is licensed under a *Creative Commons Attribution-NonCommercial-NoDerivs 2.5 License*. By virtue of their appearance in this open-access journal, articles are free to use, with proper attribution, in educational and other non-commercial settings.

***Corresponding Author:** karineh@kth.se

debated on a regular basis (e.g., Berner, 2003; Bonnevier, 2007; Faulkner, 2000; Rendell, Penner, & Borden, 2000; Sanders, 1996; Wajcman & Mackenzie, 1999).

Gender equality and equity in design is often highlighted, but it often results in producing designs that highlight the *differences* between men and women, although both the needs and characteristics vary more between individuals than between genders (Hyde, 2005). Examples of such design are Little Pink Tools (tools specially designed for women) and Dad Gear (child care products for dads). Furthermore, there are often practical considerations such as environment, functionality, and ergonomics to pay attention to, where the discussion and analysis of gendered product language is not highlighted. One exception is unisex products, which in some cases have been successful, like with the perfume *CK One* by Calvin Klein and Swatch unisex watches. The problem with a unisex design, as we see it, is that one often avoids using gendered colours, shapes, and attributes, so the result often becomes pale and/or without a strong identity. Unisex design, therefore, does not contribute significantly to blurring the boundaries of gendered product language.

There may be several reasons why gendered product language has not been problematized more. One reason could be that product language is considered self-evident, as naturally given, and therefore difficult to challenge – although clearly visible, it is also *invisible*. Another reason could be that the conditions for a gender critical perspective on design have not been very beneficial. Buckley (1986) noticed that women have been involved in design history in a variety of ways, but consistently ignored in, and excluded from, the literature of design. This means that their influence on design has been

systematically discouraged. The essay “Ornament and Crime” (Loos, 1997) where the modern architect Adolf Loos critiqued everything from teapots to shoes, famously found that the ornament of design being criminal, primitive, degenerated and most importantly, erotic and *feminine*, has had a great influence on design and design history of the 20th century. We cannot disregard this actuality.

The product language is the first thing that greets our senses, and it plays a significant role not only for how we understand the artefact, but also for how we perceive ourselves. Few attempts have been made in that direction, one example being the exhibition *Formgivning/Normgivning* (Jahnke, 2006), where the gender of the design became visible and was discussed from perspectives of colour and form, function, marketing, and identity. The exhibition attracted much attention both nationally and internationally, and focused on the gender perspective in design.

Design as a scientific area is expanding, which implies that the role of the designer will be questioned. Art critic and Ph.D. Linda Fagerström (2010), shows in her research project *Sex, Gender and Design* that a deeper gender perspective on design and the designer’s role is greatly needed. Her study also shows that designers themselves are calling for this. However, it seems to us that a critical gender perspective on the design process has not so far been widely incorporated in design research. We also lack a proposal for how designers can take advantage of such knowledge in practice.

The purpose of this article is to take a first step towards discussing and exploring a critical perspective in the design process. It discusses in what ways design artefacts and aesthetics can be seen as a (re)production of gender, in the light of the concepts of hierarchy and separation foundational to gender theory (Hirdman, 1990, 2003). This is a question about how we talk about, evaluate and design artefacts according to whether they are associated with a traditionally male or female domain (Berner, 2003; Cockburn & Ormrod, 1993; Wajcman & Mackenzie, 1999).

The purpose of this article is not to discuss the design process itself, but to highlight how a gender perspective can be visualised by a gender critical design practice. This is exemplified by a case in which the product language of an artefact associated with a traditionally male domain is substituted by the product language of an artefact associated with a traditionally female domain, and vice versa. In this way, the invisible meanings and values connected to each artefact, become visible.

Theoretical Starting Points

In this article, our theoretical starting point is inspired by the feminist critique of design. Throughout the history of design, the common view of women as belonging to the private sphere and the man belonging to the public sphere (Fraser, 1989) has been crucial to how artefacts are designed; design of artefacts depends on who is going to use them, the context of which they are a part, and the space in which this occurs (Kirkham, 1996). In the work process, one still uses a gendered product language, in which the

Karin Ehrnberger is a PhD candidate in Product Design at Royal Institute of Technology (KTH). She studied Industrial Design at University College of Arts, Crafts and Design in Stockholm and received her MFA 2006 with her thesis *Design and Gender*, on which the study in this paper is based. Her project has been reported on extensively in media and exhibitions. Her research explores different ways of integrating a gender perspective in the design process by questioning the sociocultural context in which design is defined. Karin has previously worked at Interactive Institute with energy consumption and human behavior and is currently involved in a research project with Centre for Health Technology in Halland, aiming at neglected needs within gynecology. Karin Ehrnberger is an appreciated lecturer and supervisor on design, theory and gender.

Minna Räsänen, PhD, is in Media Technology. Currently she is head of School of Communication, Media and IT at Södertörn University. Her research begins with an anthropological interest in understanding human beings in organisations and in society. It considers social practices, ways of acting with and through technology in order to convey ideas, knowledge, and values. The focus is not solely about the people’s interaction with the technology in situ but also how this interaction is made possible, and the conventions, structures, and norms that constitutes it.

Sara Ilstedt is professor in product and service design at Royal Technical University (KTH) in Stockholm. Sara has a background in industrial design and a PhD in human-computer interaction. Sara has worked with design research with issues such as health, wellbeing, energy consumption, and sustainability. She was in the team that developed the award winning relaxation game “Brainball” in 2001. Her team was also awarded “The coolest invention of the year” by *Time Magazine* for “Flower Lamp” in 2006 and the “Power aware cord” in 2010. She has a large publishing record in books, journals and conferences and was editor of the anthology “Under Ytan” about Swedish design research. She has been engaged in the development of design research in Sweden most recently as director of study for Designfakulteten, The National Swedish Research school in Design. Right now Sara Ilstedt has focused on sustainable design and started an arena for this called “Green Leap.”

female-feminine and *male-masculine* have polarising definitions clearly distinguishing between men's and women's needs. The man's superior position in society has also created a standard in which female product language is belittled and opposed (Buckley, 1986; Sparke, 1995). Feminists and design historians have taken the traditional design concept of *form follows function* as symbolic of male oppression of women. The machine (the man) takes priority over the body (the woman) (Ahl & Olsson, 2002; Attfield, 1989; Attfield & Kirkham, 1989). Design historian Penny Sparke (1995) describes in her book *As Long As It's Pink* how the design world, during modernism, began to develop a language and a philosophy based on the male culture – something she continues to believe to this day. This has created a two-tier system of values based on the systematic devaluation of femininity. 'Private' stands in contrast to (and is valued less than) 'public'; the same goes for ornamental to minimal, natural to cultural, traditional to modern, consumption to production, taste to design and so on with each concept being associated either to 'femininity' or 'masculinity' (Sparke, 1995, p. 222).

Functionalism and the principle *form follows function* were questioned in the 1960s, indicating a paradigm shift in design. However, as Krippendorff (2006) points out, the concept is still frequently used (p. 6). We do not argue for the feminist interpretation of *form follows function* per se, but use it as an analytical starting point.

Product Language

According to Gros (1976) "product language" represents the "sensual functions" of a product. These functions can be subdivided into formal aesthetic functions, i.e., those aspects that can be observed irrespective of the meaning of their content and semantic functions (Figure 1). The latter is then divided into two constituents: *indication function* and *symbolic function*. There are some inquiries made about the formal aesthetic functions being further explored in relation to the semantic functions (Zuo &

Jones, 2007). We agree with this and, further, that these functions are so intertwined with the overall product language that, when separated, there is a risk of losing important correlations between the formal aesthetics and the semantics. Therefore, in this article, the functions will not be analysed one-by-one since this will lead to an oversimplification of the product language. Formal aesthetic functions like *shape*, *colour*, *material*, and *décor* are analysed, as well as (and concurrently as) indicating functions like *graphics* and *buttons* and symbolic functions such as *metaphors*. In addition, we examine the role of verbal language in the gendering process of products regarding the division into product categories, name setting, and use of attributions. To quote Klaus Krippendorff (2006): "The fate of all artifacts is decided in language" (p. 148).

The Gender System

Seen from a gender perspective, the value system described by Sparke, reflects the gender structure on which our society is built. Gender researchers use the term *gender system* or *gender order* to explain this pattern. The gender system is described as a power structure (norm) that organises the relationship between the sexes on a symbolic, structural and individual level (Acker, 1990; Connel, 1987; Harding, 1987). Hirdman (2003) further suggests that the system is built according to basic principles of *separation* and *hierarchy*. The separation principle means that the behaviours and tasks are divided into 'male' and 'female' as opposites. The second principle is the hierarchy principle, which considers the male as the true standard of human values, and what he does and makes as being superior to that of a woman.

In addition to this, there is an on going discussion in the field of gender studies on the concept of intersectionality, which is how social categories such as ethnicity, religion, disability, and class are intertwined with gender qualities and how they interact. In this paper, we will nevertheless focus on the gender system according to Hirdman.

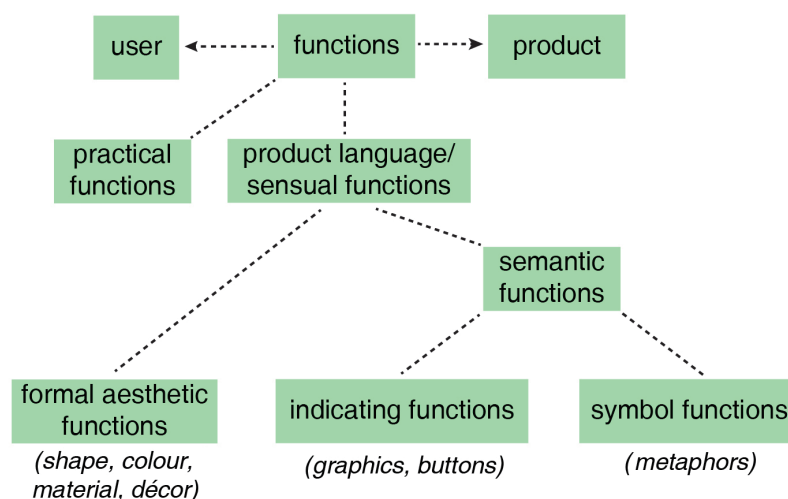


Figure 1. Conceptual model of the Offenbach theory of product language (Gros, 1976).

The gender system's principles can be traced and characterised in design (Rommès, 2006). There is a clear illustration of the separation principle in how products are targeted at children. With the help of the product language, gendered toys and clothes appear from an early age. The products are also sorted as being “for girls” and “for boys” in the stores. The message is hard to misinterpret: girls should wear princess dresses, play with dolls, and toy housework products, while boys should wear dark clothes with prints of skulls or dinosaurs, and should play with war toys and construction kits (Figure 2). The division creates expectations for boys to be tough, smart, and logical, and for girls to be beautiful, quiet, and caring (Kirkham, 1996; Lepkowska, 2008; Rommès, Bos, & Josine, 2011).

The same expectations follow us much later into life. Using the aesthetic dichotomy, properties, and explanations are coded into masculine and feminine. Products targeted at women are characterised by soft, clean, organic shapes, and bright colours (preferably pink), and there is often some sort of decoration such as hearts, diamonds, or flowers (Figure 3). Products targeted at men, however, are characterised by complex, angular shapes, and dark colours. Preferably, the products also express some kind of machine aesthetic and enhancement of performance, or have an expression hinting at danger or challenge (Figure 4). The differences are seldom as obvious as for the Braun's shavers (Figures 3 & 4). Still, these are equally (or even more) important to observe. It is very often a relative matter; an object for women can have ‘masculine’ attributes and be conceived as an object for men as long as there is no alternative for men represented. However, it is worth noticing that it seems quite hard to find the opposite, an object for men with ‘feminine’ attributes which

can be conceived as an object for women as long as there is no alternative for women represented. In some cases, the difference between a masculine design and a feminine design can be a question about colour, function, or size alone; still, there is a difference.



Figure 3. Products targeted at women.



Figure 4. Products targeted at men. Product photos are printed with permissions by Braun, all other rights reserved.



Figure 2. The artwork *Maia and Her Pink Things* from *The Pink Project*, 2006 (left) and *Kihun and His Blue Things* from *The Blue Project*, 2007 (right) by JeongMee Yoon, illustrates the separation principle in design in a striking way. Product photos are printed with permissions by JeongMee Yoon, all other rights reserved.

Hirdman (2003) argues that the principle of separation is followed by the principle of hierarchy, which would indicate that male products also are valued higher than female products. This principle is based on the acceptance of man as the *norm* and women as the *exception*. The same thinking can be traced to the fact that female products often diverge from the ‘regular’ product selection (that is targeted at ‘people’) and is explicitly targeted as being ‘for her’ (Figure 5).

In product categories related to traditional female domains (like home care products, child care products, hygiene products, and make-up), one can see that women are the main target group. However, it is important to keep in mind that these domains belongs to the private sphere and has a low status in society (Carli, 2001). In spite of the fact that women (or mothers) are the main target group, they do not seem to become the norm (people). Therefore, products within these product categories that are targeted towards men become something else without being an exception to the norm. For example, cosmetics targeted at men are called ‘grooming products’ (not ‘cosmetics for him’); Philips’ iron targeted at men is called a “power-tool” (instead of *home appliance*, which probably is more associated with use by women); child care products targeted at men become Dad Gear (not child care products for men), and so on. Until recently, TENA incontinence protection was simply called TENA Lady (for women) while their incontinence protection for men was called TENA Protection Guard. However, this made them hard to find in the stores and TENA had to add ‘for men’ on the packages. This could imply that products associated with women’s domains (which are less valued in society) and femininity must become something different to maintain their status, thus being accepted by men. According to Hirdman’s (2003) gender system, this could be interpreted as an example of the principle of hierarchy in design thinking.

There are many examples where a masculine product language is used to communicate superiority. These products are described with superior adjectives such as *professional*, *exclusive*, or *intelligent*. More simple and cheaper versions of the same product category tend to adopt a more ‘feminine’, often bordering on childish expression (Figures 6 & 7). Even traditionally culturally feminine products seem to follow this logic (Figure 8). This supports Hirdman’s theory of the principle of hierarchy in product language.

The product language is also strengthened by an often emotionally-charged name, based on the value system’s principles. The separation principle is especially clear in products within the hygiene industry, where products targeted at women have names that refer to softness, intimacy, emotions, and childishness. Examples of such product names are the perfume *Sexual Sugar* from Michel Germain, the epilator *Silk-épil Soft* from Braun, and the watch *Baby J* from Casio. The men’s collections stand in contrast, with names that can be associated with characteristics such as precision, strength, challenge, and intellect. Examples of which are the shaver *Smart Touch* from Philips, the fragrance *Adventure* from Davidoff, and the energy drink *Monster*. Intellect, strength, and adventurousness are characteristics that are prized in Western society, while intimacy, emotions, and naivety are less so (Kessler & McKenna, 2006).



Figure 5. Futuro knee protection, sport selection to the left and selection ‘for her’ to the right.



Figure 6. Braun electric toothbrushes. From left to right: from simple and cheap technology (“feminine” product language) to advanced ‘professional’ and more expensive technology (“masculine” product language). Product photos are printed with permissions by Braun, all other rights reserved.



Figure 7. Bosch coffee makers. From left to right: the more performance, the more straight forms and darker colours. Product photos are printed with permissions by Bosch, all other rights reserved.



Figure 8. Babyliss hairdryers. From left to right: 1600 W, 2000 W, and 2200 W. Product photos are printed with permissions by Babyliss, all other rights reserved.

Even in non-gender-specific product categories, one can find examples where the image of what is feminine and masculine is reproduced by choice of name. DUKA home store in Sweden used to call china with floral decoration such names as *Lovisa* and *Anna*, while china with a single stripe was called names like *Gustav* and *Carl*. The furniture company IKEA chooses to put girls' names such as *Felicia* and *Alvine* on the soft, intimate, and decorative products like fabrics, rugs, curtains, and upholstery, while more functional products such as bookcases and chairs, receive a boy's name like *Billy* and *Sebastian*. Here, the hierarchical principle may not be as clear as the examples above, but it can nonetheless be discerned. Floral decoration could be described as a symbol for *romance* (a feminine characteristic), while a stripe could be described as a symbol for *rationality* (a masculine characteristic), where rationality is regarded as superior to romance (at least in Western society) (Kessler & McKenna, 2006; Prokhovnik, 1999). Regarding IKEA's choice of names, the products with female names are all textiles, which is a traditionally feminine thing. The products with male names, on the other hand, are mainly made from wood and steel, which are traditionally masculine materials. Textiles as material and textile work are strongly associated with the private sphere, while wood/woodwork and steel/steelwork are associated with the public sphere, where the public sphere is considered superior to the private (Martin & Sparke, 2003). It is not hard to imagine that IKEA's choice of names is based on the traditional idea of the division of labour in the household.

There are of course, exceptions. Alessi, Karim Rashid, FRONT, and Marc Newson are just a few examples of original design that challenge normative thinking. Still, they are all also examples of high-end design aimed towards an educated elitewhich a majority of people can't afford and, thus, constitute a minor part of the global market.

Gendered Product Language through Functional and Decorative Hierarchy

In order to discuss the hierarchical value system of design processes, it is important to question more deeply the perception of characteristics and explanations that are defined as masculine or feminine. If masculine design language is used to raise the status of a product, it is pertinent to ask exactly what it is in the product language that is expected to convey this to us, and what this means. We must also ask ourselves what this means for the perception of feminine product language, and what consequences this may have in a wider context.

In order to facilitate a critique of the hierarchical value system of design, we need to examine things in the specific context that gives them the content and meaning (Attfield, 1995; Haraway, 1988). In this article we have chosen to focus on the context of household technology. Research claims that it is in the home where gender roles are created, maintained, and reproduced (Pinto, 2006; Prhat, 2004). It is therefore all the more important to focus on products that are only used in the household. The household's technical artefacts play a central role in this, as they

are a part of a system that is directly linked to gendered places and activities. Engineering and technology is often associated with machines and performance. Being 'technically competent' is considered to be a male characteristic (Berner, 2003; Faulkner, 2000; Wajcman & Mackenzie, 1999). Traditionally male tasks, such as tinkering with the car, fixing the stereo, connecting the computer, and carpentry around the house are consequently perceived as 'technical' in the proper sense of the word. However, to make a dress using the sewing machine, knitting a sweater on a knitting machine, or baking bread with the aid of household appliances (which are traditionally female endeavours), are not considered as 'technical' tasks (Berner, 2003, p. 34). This view is fundamentally not about the technological artefact in itself, but about a way to view and evaluate the action carried out in relation to the artefact. However, this view influences to a great extent the decisions taken in the choice of design. Previous studies show revealing examples of how gender-related intentions are designed into technical artefacts, depending on whether the intended user is a woman or a man. 'Male' technology is already defined at the conceptual stage as modern, challenging, and complex, while 'female' technology is defined as simple and uninteresting (Berg & Lie, 1995; Cockburn & Ormrod, 1993; Schroeder, 2010). By using a gendered product language, this contributes to the maintenance of a hierarchical system in which 'male' technology is valued higher than 'female' technology.

We will now, starting with the feminist interpretation of the principle *form follows function*, analyse how design contributes to this perception. Since the word *function* in design seems synonymous with masculinity, and femininity with the word *form*, and also that function is valued higher than form, it is interesting to look at the values that we attach to these words, and how this creates aesthetic codes for what is considered to be male and female engineering.

The hierarchy of function visualised through product language

According to Merriam-Webster.com (2012), the definition of *function* is: "the kind of action or activity proper to a person, thing, or institution; the purpose for which something is designed or exists; role." One can thus say that the function, when talking about products, is the (designed) purpose of it. So, different products in the same product category ought to be equally functional, albeit in different ways.

In product design, different features are used to communicate what function a product offers. Below there are photographs of two irons (Figure 9). The one on the left features high power, fast heat, and a scratch-resistant soleplate. The product description on the package is summarised thus: "more power, more steam, more performance." The iron to the right has features such as a 'drop-stop system', a soft handle, an extra large water fill point, an extra long cord, and an easy-to-read water-level indicator; it is summarised in the product description on the package: "great results, minimal effort."

According to the principle of separation, the product language of these irons tells us that *performance* is associated with male characteristics, while *helpfulness* is associated with female characteristics. The iron to the left is, in fact, occasionally described and/or marketed as an “iron for men”, and the device is consequently presented as a “power tool” instead of a garment-care appliance (e.g., Moffat, 2010). It even comes in a solid case and costs more.

According to the principle of hierarchy (where masculine product language is believed to override the feminine), *performance* is accorded a higher value than *features*, which are more helpful in nature. This is something that can be perceived in how it is marketed, using superior adjectives like *powerful*, *strong*, and *robust* (Kessler & McKenna, 2006). Yet, the helpful features that are essential for some people (even men) barely warrant a mention. Seeing it this way, it becomes clear how the product language contributes not only to how functions become gendered, but how we arrange them in a hierarchical order.

The hierarchy of decor visualised through product language

The product language seems to be determined by the function, with products that express *performance* being superior. When we talk about the *decor*, we usually mean an addition to the already finished, purely functional, product. In this way, all forms unrelated to any function should be classified as pure decoration. Through this understanding, it appears to us that *function* is wrongly perceived as a contrast to *decoration*. The perception being that a pure product without decor is more ‘functional’ than a product *with* decor. What we tend to forget is that the decoration is not only flowers and leaves (Figure 10, left), it is also the stripes, the extra screw, the imitation chrome and the additional fan hole (Figure 10, right). We do not as clearly perceive this as decoration because these embellishments accentuate the performance aspect of the product. Decor is thus subject to the same hierarchy principle as function. A flower can thus be seen as detrimental to the credibility of a ‘functional product’ even though it is no more or less decorative than the “go-faster stripe.” We also tend to forget that the decoration may have an intrinsic value – a function to create emotions and experiences beyond the question of performance, such as desire, joy, or humour.

This gender system, and the principles of functional and decorative hierarchy, thus constitute the basis for the analytical framework of the gendered product language of technology that is applied to the work described in this article.

Research Approach

The research approach is inspired by *Research through Design* (RtD) (Frayling, 1993). RtD generates knowledge by designing innovative artefacts, models, prototypes, products, concepts, etc., and evaluates them by conducting various experiments (tests, perception experiments, etc.). It approaches the world of (research) objects primarily from the perspective of ‘designability’ (and changeability), and thus arrives at new ideas.



Figure 9. Philips irons. The one on the left is described in terms of performance, and the one on the right in terms of utility. Product photos are printed with permissions by Philips, all other rights reserved.



Figure 10. A screwdriver from Rusta (left) and a screwdriver from Black & Decker (right). Product photos are printed with permissions by Rusta and Black & Decker, all other rights reserved.

The concept of the design process follows Derrida’s (1978) deconstructivism, which aims to make the invisible *visible*. Derrida focuses on text and argues that language can be likened to a ‘filter’ through which we see ‘reality’. We cannot perceive reality directly, but can only understand it through the words we have to describe it. Everything we read, see, think, feel, and so on is a kind of ‘text’ that we interpret. The term *text* is thus used in a broad sense and refers not only to written texts, but also to the product language of the things that surround us. Deconstruction can be described as a kind of liberating interpretation of ‘texts’, which tries to uncover hidden meanings and give them new life and meaning through reinterpretation and placing them in new contexts. One way to do this is to put things in opposite relation to each other, because our relationship with them then changes and offers new perspectives (Derrida, 1978). Moreover, the design process is influenced by the design method “(Re)designing the characters of artefacts” (Krippendorff, 2006, p. 232), which suggests a way for designers and stakeholders to liberate themselves from the linguistic construction of product language. The method implies that by putting characters in opposite relation to each other, it becomes clear how we value them, thus enabling us to re-evaluate them.

In this study, we place two common household appliances – a drill and a hand blender – in opposed relation to each other by switching their product language. A drill may be considered, we suggest, as a traditionally masculine hand tool, and a blender

as a traditionally feminine hand tool. The obvious differences in the designs could instantly be explained in terms of the products' identity as 'kitchen equipment' or 'hand tools', without any reflection on whether they are gendered. In Sweden, a lot has happened in the household technology market in recent years, and it has become fashionable to be a DIY person and a backyard chef. Although traditional gender roles still dominate (Prhat, 2004), mostly men (but also a few women) have recently started to move across gender domain boundaries. In line with this phenomenon, there has been an increasing introduction of more electrical appliances to the hand tool and cookware markets. It is worth noting, however, that the masculine product language of hand tools has hardly changed, while many kitchen products have moved towards a more masculine expression (which may be interpreted as an expression of performance).

For our study, we analysed the design language in the light of the aesthetic codes of 'masculine' and 'feminine' technologies, and applied these to the design process in the creation of new prototypes. The prototypes we made were created by the first author in the context of her thesis at the University College of Arts, Crafts and Design in Stockholm, in 2006. The project received attention, which resulted in invitations to exhibitions and lectures around the world, including: *The Shanghai Biennale* at Shanghai Art Museum, Shanghai 2006; *North Style* in Glaspavillon in Berlin in 2007; and *Abnormal* in the Swedish Museum of Architecture in Stockholm in 2007. Besides these exhibitions, they have been shown at dozens of other exhibitions in Nordic countries. The lectures have, amongst other places, taken place at the *Abnormal* exhibition at the Swedish Museum of Architecture in Stockholm (2007); Nordes Conference in Stockholm (2007); and at universities and colleges (e.g., Mälardalen University 2007; University of Stockholm 2010; Royal Institute of Technology 2011; Uppsala University 2011). Approximately 100,000 people have seen the prototypes at the exhibitions, and approximately 500 people have been engaged in the lectures. The participants comprised different sexes and ages and, given the different situations, we may assume that the audience also represented different occupations and interests. At these exhibitions it was possible for the audience to look at the prototypes, but not to hold them. Such occasions also opened up an opportunity for debate. Some of the reactions, comments, and statements were recorded sporadically afterwards, but they have not been systematically documented. The work gained publicity in the media, including reviews and editorials (e.g., Abrahamsson, 2007; Ekdal, 2007; Raattamaa, 2007; Zetterström, 2007). Finally, the study has been mentioned in several books, anthologies, research reports, and in student literature (e.g., Fagerström, 2010; Ilstedt-Hjelm, 2007). In this article we use the statements from the exhibitions and lectures and texts from the editorials and books to provide context and nuance to the analysis and discussion.

The need for an analysis of product language and gender issues in design developed as the project received increasing levels of interest at exhibitions, lectures, and in the media. What is reported below should be viewed as a first step towards a more profound gender research in design. However, the reader should keep in mind that a more systematic collection of people's statements is required for a more detailed analysis.

Making Visible the Invisible by Switching Product Language

In this study, we placed two appliances – a drill and a hand blender – in opposed relation to each other by switching their product languages, and this section begins with an analysis of these items. Product language analysis is a first step in a deconstruction (cf. Derrida); it is an interpretation, which tries to highlight the 'hidden' meanings and give them new life and meaning by reinterpreting them and placing them in a new context where the expression is exchanged. This section then goes on to present and analyse the new design proposals.

Starting Point – A Drill and a Hand Blender

For this study we chose two products: A drill and a hand blender. The following analysis of the product language takes as its starting point existing examples of these products against the background of the beliefs about 'male' and 'female' technology (Berner, 2003; Faulkner, 2000; Wajcman & Mackenzie, 1999). There are a variety of drills and hand blenders in the market. A drill/screwdriver from Bosch (Figure 11, left) and a hand blender from Braun (Figure 11, right) were selected because, even if they are unique in a sense, their product languages represent typical examples of these product categories.



Figure 11. Drill/screwdriver from Bosch (left) and hand blender from Braun (right). Product photos are printed with permissions by Bosch and Braun, all other rights reserved.

The drill's product language is based on expressing *performance*. The external housing is accentuated by the shape, racing stripes, and raised panels, as well as by the many ventilation holes, which reveal that there is a risk of overheating. The various material imitations that come together in the overall form give a complex and exclusive impression. This impression is reinforced through the drill offering many mechanical features, which are operated by means of switches and knobs marked with numerical codes for precision. The dark colours and metal parts give the drill a heavy, sturdy feel and make us believe that the machine is meant for heavy tasks that require solid tools. The grip is rough suggesting that it requires manual effort to operate it. The red trigger is similar to that of a weapon

and indicates that special skill is required to use it. In addition, the overall appearance of the machine resembles a weapon – an artefact associated with fear and danger.

The blender, on the other hand, has a single, unified, organic form. The technology is hidden by the external form of the product, and the rotary blade is beautifully framed in a “skirt.” The buttons (one *on* and one *off* button) are integrated into the shape, and one gets the feeling that the force should be more like that of a ‘hug’. The hand blender suggests, in contrast to the drill, that it was designed for lighter duties that do not require as much effort. The colours are bright white and pastel, which gives a light and airy feel. The graphics in the picture depict fruits and vegetables, which conveys the various applications in a clear and concise manner. The power can be controlled using a button marked only with the symbols + and -, which enables precision.

The hand blender’s product language may be interpreted as gendered in a traditionally female way, while the drill’s product language is traditionally male. The gendering hence follows a hierarchy of techniques for determining what is ‘dominant’ and what is ‘ancillary’. This is particularly noticeable in the categorical names *power tools* and *kitchen aids*. Our notions about these artefacts seems to be reproduced in their design.

Design Proposal

These concepts, as with the existing product languages, were then used in the creation of two new prototypes: the hand blender *Mega Hurricane Mixer* and the drill *Dolphia*. The product languages of the design proposals were set in opposing relation to each other. The hand blender was designed based on the drill’s product language and vice versa.

The Mega Hurricane mixer

In the design proposal, the hand blender (Figure 12) has a larger size than the technology inside requires, giving a feeling that this is a robust product with a strong engine. The designs are inspired by an eagle – a formidable animal that symbolises precision and speed. External colour differences and different surface materials give it a complex and exclusive appearance. The message here is that this is a product that can withstand shock and rough handling, which is why it is composed of durable materials, has a matte finish and dark colours. The handgrip gives the idea of being ergonomic and heavy, and it has a surface that appears to increase grip sensation. The switch is designed like a trigger; it is orange and stands out visibly to illustrate that this is a ‘product of power’. It is designed in such a way that the grip is similar to the grip of a gun – an artefact that is targeted and dangerous. The hand blender has, at the top, a display that shows the power setting in luminous figures. This allows the user to easily monitor power and have more control. Finally, a rotary blade is fastened in a ‘chuck’, which is adorned with ostentatious digital characters. The idea is that the rotary blade can be changed for different purposes so as to enable greater flexibility and creativity.



Figure 12. The mixer “Mega Hurricane.”

The Dolphia Drill

The drill’s product language is inspired by a dolphin’s anatomy (Figure 13), hence the name Dolphia Drill. The dolphin is a gentle animal that is often seen as having human-like characteristics. The drill is white and light blue, with a glossy surface to urge caution and care in handling. The body shape is unitary and reveals nothing of the motor inside. The vents are decoratively placed some distance away from the engine to minimise the expression of the device’s performance. For this reason, even the power switch is integrated into the pan, and it is concealed by a decorative rubber panel. The feeling conveyed during use should be that of ‘hugging out’ the power and should require minimal strength. The chuck is easy to hold, and there is no need for a key when changing the drill bit. Clear symbols help the user determine which settings should be used for different purposes. The drill is limited to three drill bits of different sizes.



Figure 13. The drill “Dolphia.”

Response to the Mega Hurricane and the Dolphia

At the exhibitions, the drill and hand blender were set out next to each other on podiums. Behind the podiums, posters were hung showing pictures of the drill drilling a hole in the wall and the hand blender by a bowl of tomato sauce. Nobody was permitted to touch the models. Here we recount some of the comments made by people during the exhibitions and lectures (names given above).

When the prototypes were shown in exhibitions, it became obvious that an exchange of product language meant that the human relationship with the artefact itself had changed. The general comments from the audience suggest that elements, which previously had been perceived as 'lacking transparency', had been made visible. The exception to this was in Shanghai (China), where there did not appear to be a significant reaction to the shape change. This could be explained by cultural differences between East and West, which probably affects the interpretation of the aesthetic expression. It also shows how constructed and situated (Haraway, 1988) one (sex) norm is, and therefore also how changeable.

It seemed to be difficult for people to identify the Dolphia drill as a drill at all. The drill was often mistaken at first glance to be a hair dryer, even though the drill bit was always visible and stood against a picture of a newly-drilled hole. The times when it was correctly identified as a drill often gave rise to laughter, and it was described as, *inter alia*, "comical" and "ridiculous." When this perception was challenged, it became difficult to justify. One man answered: "yes, but one of those clearly cannot be used to drill", without being able to develop the point further. The drill was also recognised by both men and women as a "women's drill." As this continued, it was obvious that the product language reminded people about 'female products' and kitchen appliances. The drill was described as "inviting" and "interesting." The comments were mainly aimed at the new possibilities opening up for the drill. A man was surprised that the feminine product language attracted him to the drill, but said that he would never think about such things otherwise. When probed what it was about the product language that appealed to him, his answer was "the totality", and he continued "it is good looking and handsome." Someone thought the drill looked "nice" and explained this by saying that it looked "simple" and "user-friendly." An elderly woman exclaimed at one point that "with one of those drills even I could see myself drilling." It was the drill's "simplicity" and "flexibility" that appealed most, and she said that normally "just the thought of taking out the drill [which was stored in the toolbox] was tiresome."

The Mega Hurricane Mixer hand blender seemed to generally impress with its new look, and both men and women described it in terms such as "tough" and "cool." Many questions were raised about its functions and people also felt compelled to touch it, despite written appeals not to do so. On some occasions, it was described in negative terms, with such adjectives such as

"dangerous" and "clumsy" – again by both men and women. These beliefs seemed to be based on subjective perceptions of the activity of cooking. One woman claimed that cooking was a "soft" activity with soft materials, citing as an example the preparation of soups and sauces. Therefore, she said, a hand blender's traditional design language was better. This argument ran contrary to others (made by women), who said that they used a blender to crush ice for a drink, nuts into pesto, and frozen berries for smoothies – something, they agreed, that could not be defined as 'soft' activities. The masculine design language that they thought felt "substantial and durable" attracted these women. They also demanded sharper blades, as they felt that they quickly became worn.

The Analysis of Statements

Let us now analyse the drill's and hand blender's gendered product language by focusing on the statements from the respondents. To sort the statements concerning the prototypes we have been inspired by the KJ-method, which is a tool for organizing a large amount of language data (Kawakita, 1986). By sorting the data into related groups, the correlation between them appears, providing a basis for analysis. In this study, the statements can be sorted into categories of interpretation based on the degree of acceptance regarding the artefacts' product identity. The first category is based upon statements that indicate a low degree of acceptance, while the fourth category is based upon statements that indicate a high acceptance. The analysis of both products is presented in this way.

In the Dolphia drill's interpretation process, four categories of interpretation can be identified. These together may be seen as a hierarchical system, based on the degree of acceptance regarding the artefact's identity as a drill. The first category for the Dolphia drill is when the artefact's identity as a drill is eliminated entirely in favour of an identity as a hairdryer. It is certainly true that the form language bears a close resemblance to some hairdryers on the market, but the drill bit and the image with the drilled hole was, in this case, entirely disregarded. This can be explained by the activity of *drilling* being seen as a traditionally male activity, and therefore incompatible with a feminine product language.

In the second category, the drill's identity is accepted, but it is regarded as ironic. The drill is accepted here as an *object* but not as a *subject*. Its competence is questioned, which suggests that the female product language is inconsistent with ideas about performance and durability.

In the third category, the drill's identity is accepted on one condition: that the intended user is a woman. It is similar to the form language of kitchen appliances that identifies them as 'feminine products'. This in turn, confirms *cooking* as a feminine activity. The Mega Hurricane Mixer hand blender was never defined as a product for men, despite its masculine product language. The female product language is

associated with a supportive and soft nature. This could be based on the belief that, when a woman uses a drill, not as much performance is required, and consequently the female product language is appropriate.

In the fourth category, the drill's identity is fully accepted, and the new design may even be described as an improvement to the traditional drill design. Features that are considered obvious to give identity to the traditional drill may, as a result of the new design, come to be questioned from a wider perspective, which takes into account aspects such as the handling and storage of the drill. Conversely, it enables the appreciation of characteristics that are not traditionally those of a drill, like beauty, simplicity, and fluidity.

In the case of the hand blender, only the fourth category of interpretation could be identified. People accepted its product identity immediately, without questioning its credibility as a blender. Indeed, it was perceived as so credible that people wanted to try it. For those who saw cooking as a "soft" activity, the masculine product language appeared to be threatening and awkward (because the mixer's steel was taken from another traditional hand blender, it can be concluded that those opinions were solely induced by the product language). Those who thought the opposite believed that the masculine product language did the blender justice, and they did not want to define cooking as a "soft" activity. Interestingly, this group also called for a sharper blade because they thought it would wear out too quickly, suggesting that the traditional blender is not designed with this kind of activity in mind.

As no one had the opportunity to either take away or use the prototype, it can be concluded that these assessments were based solely on the associations, values, and product languages that design provokes. The analysis indicates that these, in turn, were founded on how the activity performed with each artefact was seen, rather than on the artefact itself.

It is clear that the statements about the form language of the drill were much more diverse and elaborate than those of the mixer. The drills identity seemed to disappear and become questioned when receiving an aesthetic associated with "female" technology, whereas the blender mainly gained from the new (masculine) form language. This supports the view that the male (aesthetic) is the norm and therefore more readily includes other product categories, whereas the feminine (aesthetic) is the exception and only appropriate for "women" products.

The analysis of the statements also shows that the traditional product language of the drill and hand blender is gendered (the logic of separation). It reflects an idea of the division between the sexes, and the tools and activities associated with it. It may therefore be concluded that the normative product language contributes to the delineation of both men's and women's identities and needs, both on a mental and practical level. Examples of this include the man who came, of his own accord, to appreciate the feminine product language of the drill; the woman who was willing to use the drill if it looked like Dolfhia; and the women who had experienced the limitations of a hand blender's dulled blades.

Implications for Design

This gives us reason to more deeply discuss the meanings of certain statements and examine them from a broader perspective. That fact that the drill can be perceived as inaccessible gives a broader interpretive variability, if we assume that not only features, but also places, are gendered (Massey, 1994; Prhat, 2004). This could, of course, be about the weight of the drill, but it may also indicate that the drill is stored in a room that is off-limits in an everyday sense. To examine this, it is relevant to discuss the nature of a person's relationship to the place of storage; this becomes particularly relevant in the case of possible changes in everyday practices and behaviours – if the drill was designed so that it became a natural part of everyday life, would more (in this case, *mostly*) women change their behaviour? As we can see in, for example, Little Pink Tools, it seems as if these aspects have been central in the design process. The tools are delivered in a purse-like bag to attract women. In the same way, the Philips iron for men is delivered in a solid case to attract men. This design solution creates a dilemma: it can of course contribute to a change in behaviour, but there is also a risk that the strong gender codes in the design exclude those who do not fit into the norm. As Maria Abrahamsson (2007), editorial writer for one of Sweden's biggest newspapers, Svenska Dagbladet expresses: "Some women may identify themselves with kitchen tools, I certainly don't" (our translation from the original in Swedish). Therefore, we believe that it is important to search for solutions beyond gender-dichotomous thinking.

It is also interesting to note the unforeseeable consequences of a product. Instead of looking at artefacts as static *things*, it might be fruitful to see them as tools that can be used in different ways and for different needs. That one may, for example, call for sharper blades for hand blenders (because they wear out too quickly), shows that there exists a need which runs contrary to popular notions about the activity of mixing. The hand blender's role seems to be judged by the resistance posed by the ingredients to be blended, while the drill is not considered in the same way. The design of the drill is well connected to its performance – aesthetically designed but also functionally in terms of the requirement to drill into the hardest concrete wall. Why are hand blenders not designed to be able to better handle ice and nuts? The results of this study suggest that there are customer needs that the existing product does not satisfy. Should not, then, the activity be re-evaluated? One can also examine more closely the foundation on which these beliefs are based. The activity of mixing seems to be assessed according to the ingredients' degree of softness. The blender is therefore understood as a performing product, in contrast to the resistance it meets with tougher ingredients. The drill, however, is not classified as 'softer' or 'harder', depending on the task of drilling into plaster or concrete. This can be explained by a fixed idea of the drill as performing in itself, which is also reflected in the masculine aesthetics. One could interpret the perceptions of the blender as "clumsy" and "dangerous." Is it because one associates the experiences we have of the traditional drill, or is

there a perception in contrast to the activity of mixing, valued as a ‘soft’ activity? Even the drill was described as “nice” because it looked “user friendly.” This could be interpreted as the perceived ‘dangerous’ complexity of the traditional drill. It is important to broaden the interpretation of expression and to test these statements over and over again to get an idea of what lies behind them.

Further, our beliefs about the scope of use should be reconsidered, because when one examines how people use the artefacts, this does not always correspond with what the artefact is supposed to do. It is important to be aware of this because we, by design, can change attitudes towards not only the product but also the activity, and thus create behavioural change (if desirable). Swedish architect and writer, Lars Mikael Raattamaa (2007), compares the changing of product language in our study to cross-dressing, which is the wearing of clothing and other accessories commonly associated with another gender. People that cross-dress, often feel liberated by expressing emotions that they cannot freely express in clothes designed for their gender. Using the idea of cross-dressing in the design process, the form could be looked at as ‘clothing’ and the function of the artefact as the expected act. Thus, we suggest that the concept *form follows function* could be changed to *function follows form* (the expected act follows the clothing). What happens when an artefact borrows another artefact’s ‘costume’? In drag shows, cross-dressing is used in a parodic way to lead spectators to reflect on body. Feminist polemicist and philosopher, Judith Butler, offers parody as a way to destabilise and make apparent the invisible assumptions about gender identity and the inhabitability of such “ontological locales” as gender. By redeploying those practices of identity and exposing the *always failed* attempts to ‘become’ one’s gender, Butler (1993) believes that a more fluid interpretation of gender can emerge. This study corroborates this thinking (the drill was even described as “ridiculous”), and we believe that the slightly humorous design made it easier for people to move away from their preconceptions and reflect upon their feelings and reactions provoked by the artefacts. Therefore, we would also like to encourage designers to use a sense of humour in their work.

We believe that this thinking is an example of one interesting way to move away from our normative reasoning when developing new design, not only when it comes to gender but also in terms of class, age, and ethnicity. Social classifications are set up as dichotomies, but more importantly; they represent an established social order – a hierarchy where certain groups are established as being superior to other groups. Straight is superior to gay, white to ethnic, rich to poor, and young to old (Jenkins, 2008). Design represents and reproduces these social classifications every day.

Concluding Remarks

The design objective here was not to design new handheld machines, or to make a ‘manly’ blender or a ‘feminine’ drill. The purpose of the swapping of product language was to make

the invisible visible, and to show how values are connected to each product language and each artefact. This research discusses and attempts to show that the interaction between humans and artefacts can be seen as a mutually transforming process. Design consists not only of a final product, but includes a social process that takes place between the user, the artefact, and society. This means that the form of the artefacts around us is not determined once and for all, but can be renegotiated according to time, place, and context. To follow Donna Haraway (1988), even the design process is situated in time, place, and context. We as designers must become more aware of our responsibility and our power to make a change. It is therefore important to question and reassess the design process. Here, the notion of gender plays a significant role and was used as first step towards discussing and exploring a critical perspective of the design process. However, further research and intersectional perspectives (e.g., class, ethnicity) are needed in order to provide complementary and differing sets of interpretations. By placing the product in a larger context and questioning how the product will affect the users’ relationship to others, we believe that designers can come up with alternative designs and solutions that better fulfil individual needs.

Acknowledgement

We would like to thank the audiences at the various exhibitions and lectures for participating in the research. The project was coordinated and carried out by the first author as a Masters project at University College of Arts, Crafts and Design in Stockholm.

We gratefully acknowledge the financial support for writing this paper (School of Industrial Engineering and Management, Royal Institute of Technology). We thank PhD-candidate Looove Broms (School of Industrial Engineering and Management, Royal Institute of Technology), Teo Enlund (School of Communication, Media and IT, Royal Institute of Technology), professor Ylva Gislén (Konstnärliga forskarskolan / National research school in the field of arts), PhD-candidates Kristina Lindström, Åsa Ståhl, Zeenath Hasan (K3, Malmö University), and Cristine Sundbom for their valuable comments on earlier drafts of this paper. Important feedback given by the anonymous reviewers has been much appreciated.

The use of images of Braun, Bosch, Babyliiss, Philips, Rusta, and Black & Decker products in this article is by permission, all other rights reserved. The use of these images and permission does not constitute approval or otherwise by these companies as to the contents of this article or any conclusions as may be set forth therein. Braun, Bosch, Babyliiss, Philips, Rusta, and Black & Decker granted permission for using their products’ images in this article. All other uses require permission.

References

1. Abrahamsson, M. (2007, February 8). Skruvade perspektiv ger inte jämställdhet [Turned around perspectives does not contribute to equality]. *Svenska Dagbladet*. Retrived from http://www.svd.se/opinion/ledarsidan/skruvade-perspektiv-ger-inte-jamstallldhet_199205.svd

2. Acker, J. (1990). Hierarchies, jobs, bodies: A theory of gendered organizations. *Gender and Society*, 4(2), 139-158
3. Atgender. (2009). *Atgender - The European association for gender research, education and documentation*. Retrieved June 15, 2011, from <http://www.atgender.eu/>
4. Attfield, J. (2000). *Wild things: The material culture of everyday life*. Oxford, UK: Berg Publishers.
5. Attfield, J. (1989). Form/female follows function/male: Feminists critiques of design. In J. A. Walker (Ed.), *Design History and the History of Design* (pp. 199-225). London: Pluto.
6. Attfield, J., & Kirkham, P. (1989). *A view from the interior: Women and design*. London, UK: Women's Press.
7. Buckley, C. (1986). Made in patriarchy: Toward a feminist analysis of women and design. *Design Issues*, 3(2), 3-14.
8. Butler, J. (1993). *Bodies that matter: On the discursive limits of sex*. New York, NY: Routledge.
9. Beauvoir, S. (2006). *Det andra könet (The second sex)*. Stockholm, Sweden: Nordstedt Pocket.
10. Berg, A. -J., & Lie, M. (1995). Feminism and constructivism: Do artefacts have gender? *Science, Technology, & Human Values*, 20(3), 332-351.
11. Berner, B. (2003). *Vem tillhör tekniken? Kunskap och makt i teknikens värld [Who does the technology belong to? Knowledge and power in the world of technology]*. Lund, Sweden: Arkiv Förlag/A-Z Förlag.
12. Bonnevier, K. (2007). *Behind straight curtains: Towards a queer feminist theory of architecture*. Stockholm, Sweden: Axl Books.
13. Carli, L. (2001). Gender and social influence. *Journal of Social Issues*, 57(4), 725-741.
14. Cockburn, C., & Ormrod, S. (1993). *Gender and technology in the making*. London, UK: Sage.
15. Connel, R. (1987). *Gender and power: Society, the person, and sexual politics*. Chicago, IL: Stanford University Press.
16. Derrida, J. (1978). *Writing and difference*. London, UK: Routledge and Kegan Paul.
17. Dd32r443Ekdal, N. (2007, February 25). Fablernas värld [The world of fables]. *Dagens Nyheter*. Retrieved from <http://www.dn.se/ledare/signerat/fablernas-varld>
18. Faulkner, W. (2000). Dualisms, hierarchies and gender in engineering. *Social Studies of Science*, 30(5), 759-92.
19. Fagerström, L. (2010). *Kön, genus och design [Sex, gender and design]*. Stockholm: Vulkan. Fraser, N. (1989). *Unruly practices: Power, discourse and gender in contemporary social theory*. Minneapolis, MN: University of Minnesota Press.
20. Frayling, C. (1993). *Research in art and design*. London, UK: Royal college of art.
21. Gros, J. (1976). Sinn-liche funktionen im design [Sensory functions in design]. *Form Zeitschrift für Gestaltung*, 75(3), 12-14.
22. Haraway, D. (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist Studies*, 14(3), 575-599.
23. Harding, S. (1987). *Feminism and methodology: Social science issues*. Bloomington, IN: Indiana University Press.
24. Hirdman, Y. (2003). *Genus - om det stablas föränderliga former [Gender - The mutable forms of the stable]*. Sweden, Stockholm: Liber.
25. Ilstedt, S. (2007). *Under ytan: en antologi om designforskning [Under the surface: An anthology over design research]*. Stockholm, Sweden: Raster Förlag.
26. Jahnke, M. (2006). *Formgivning/Normgivning [Formgiving/Normgiving]*. Gothenburg, Sweden: Gothenburg University Press.
27. Jenkins, R. (2008). *Social identity*. New York, NY: Routledge.
28. Kawakita, J. (1986). *Kj hou*. Tokyo, Japan: Chuokoronsha.
29. Kessler, S. J., & McKenna, W. (2006). Toward a theory of gender. In S. Stryker & S. Whittle (Eds.), *The transgender studies reader* (pp. 165-182). New York, NY: Routledge.
30. Kirkham, P. (1996). *The gendered object*. Manchester, UK: Manchester University Press.
31. Krippendorff, K. (2006). *The semantic turn - A new foundation for design*. New York, NY: Taylor & Francis.
32. Lepkowska, D. (2008, December 16). Playing fair? *The Guardian*. Retrieved from <http://www.guardian.co.uk/education/2008/dec/16/play>
33. Loos, A. (1997). *Ornament and Crime: Selected essays*. Reprint. Riverside, California: Ariadne Press
34. Martin, B., & Sparke, P. (2003). *Woman's places: Architecture and design 1860-1960*. London, UK: Routledge.
35. Massey, D. B. (1994). *Space, place, and gender*. Oxford, UK: John Wiley & Sons.
36. McCall, L. (2005). The complexity of intersectionality. *Journal of Women, Culture and Society*, 30(3), 1771-1800.
37. Merriam-Webster.com (2012). *Dictionary and Thesaurus - Merriam Webster Online* Retrieved October 14, 2012, from <http://www.merriam-webster.com/dictionary/function>
38. Moffat, C. (2010). *Sleek and rugged: It's an iron for men*. Retrieved August 10, 2011, from <http://www.connectedaustralia.com/News/BreakingNews/tabid/119/ArticleId/3621/Sleek-and-rugged-its-an-iron-for-men.aspx>
39. Pinto, K. (2006). *Honey I'm home: Racial and gender differences in household labor among married couples in the U.S.*. Montreal, Canada: American Sociological Association.
40. Prhat, A. -M. (2004). *Mannen i garaget och kvinnan i köket [Man in the garage and woman in the kitchen]*. Stockholm, Sweden: Tjänstemännens Centralorganisation.
41. Raattamaa, L. M. (2007, February 2). Form som formar [Forms that forms]. *Aftonbladet*. Retrieved from <http://mobil.aftonbladet.se/kultur/konst/article11048136.ab?partner=www>

42. Rendell, J., Penner, B., & Borden, I. (2000). *Gender space architecture: An interdisciplinary introduction*. London, UK: Routledge.
43. Rommes, E. (2006). Gender sensitive design practices. In E. Trauth (Ed.), *Encyclopedia of gender and information technology* (pp. 675-681). Hershey, PA: Idea Group.
44. Rommes, E., Bos, M., & Josine, G. O. (2011). Designing gendered toys. *International Journal of Gender, Science and Technology*, 3(1), 185-204.
45. Sanders, J. (1996). *Architectures of masculinity*. New York, NY: Princeton Architectural Press.
46. Schroeder, K. (2010). *Gender dimensions of product design*. Paris, France: UN Women, UNESCO.
47. Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist*, 60(6), 581-592.
48. Sparke, P. (1995). *As long as it's pink: The sexual politics of taste*. London, UK: Pandora Press.
49. Statistiska Centralbyrån. (2005). *Tid för vardagsliv* [Time for an everyday life]. Stockholm, Sweden: Statistiska Centralbyrån.
50. UN. (2008). *Gender equality architecture reform (GEAR) campaign*. Retrieved June 15, 2011, from <http://www.gearcampaign.org/>
51. Wajcman, J., & Mackenzie, D. (1999). *The social shaping of technology*. Buckingham, UK: Open University Press.
52. Zetterström, J. (2007, January 5). Schabloner styr designarbetet [Clichés dominate the design work]. *Sydsvenska Dagbladet*. Retrieved from <http://www.sydsvenskan.se/kultur-och-nojen/schabloner-styr-designarbetet/>
53. Zuo, H., & Jones, M. (2007). An exploration into aesthetics association of product form. In *Proceedings of the 3rd International Workshop on Design and Semantics of Form & Movement* (pp. 12-18). Eindhoven, The Netherlands: Philips Design.