Industrial design strategies for eliciting surprise

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This paper reports on strategies industrial designers use when attempting to elicit surprise. Thirty senior representatives from influential design organisations were interviewed. A situational analysis of the responses suggests strategies that designers use as motivation for starting a design project. These include observations of social issues in the designers’ world and observations of their personal experience at behavioural, cognitive and emotional levels. We also found strategies that designers apply during the design process: using archetypes in unexpected contexts/objects, challenging assumptions of appearance, magical interactions, the smart doubling of things and unexpected scale. We suggest that a research through design approach may uncover further strategies that designers use implicitly and did not explicitly mention during the interviews.

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Picture yourself choosing a new mobile phone. You look at shelves full of models with similar technical specifications. Suddenly, a model grabs your attention and without conscious effort you find yourself holding it. There is something different about this model, something unexpected. It is irresistibly novel. Now picture yourself in the middle of the jungle. You hear a noise behind you. Your full attention is now occupied with assessing whether there is a threat nearby. Your heart and breathing rates shoot up. In both cases, your brain is experiencing a discrepancy between what it expects to experience and the actual stimulus or event. In other words, and at different levels, you are experiencing surprise. Your brain needs to assess whether the new and unexpected stimuli are potentially beneficial (pleasant surprise) or detrimental (unpleasant surprise) for you, so it pours attention resources towards the surprising stimuli. This is one of the most powerful effects of surprise and has important implications for design: it grabs our attention towards the surprising stimuli without our conscious effort. People experience surprise when they appraise a design as ‘novel’ or ‘unexpected’. While ‘novelty’ is one of the main factors that designers can bring to a product, little has been reported about what strategies designers use when they intend to surprise.

This paper considers surprise as an emotional response (Ekman, 1992, p. 170) towards incongruent (Ludden, 2008; Ludden, Schifferstein, & Hekkert, 2008),
unexpected (Plutchik, 1991; pp. 105–106), unfamiliar (Frijda, 1986, p. 18; Rodríguez Ramírez, 2011; pp. 6–7; Roseman, 1996, p. 245) or sudden (Frijda, 1986, p. 18) stimuli. Surprise can be identified behaviourally through wide eyes, short interruption of breathing, loss of muscle tone (Frijda, 1986, p. 18) and raised eyebrows (Corina, 1989, p. 230). Novel, unexpected and complex stimuli that elicit surprise can also elicit high levels of arousal, curiosity, exploratory behaviour, interest and fascination (Frijda, 1986, p. 345; Plutchik, 1991, p. 102). While some authors do not consider surprise an emotion and suggest it lacks hedonic value (see discussion in Ludden, 2008, p. 20; Ortony, Clore, & Collins, 1988), other authors classify it as an emotion with a high level of arousal that can be pleasant or unpleasant (Ekman, 1992). Surprise does not need to involve extreme uncertainty (Roseman, 1996, p. 244). If people appraise that an event was within their control, they can still experience surprise (Roseman, 1996, p. 244).

The unexpected characteristic of a stimulus means that it has novelty. From an evolutionary perspective, surprise is elicited by novel stimuli so that we can focus our attention on potentially dangerous or beneficial stimuli and thus surprise has also been described as a threat-detecting stimulus (Schutzwohl & Borgstedt, 2005), and a sense-making process (Pezzo, 2003), i.e. is that thing suddenly moving in the grass going to attack me?

Designed objects can be the stimuli that elicit surprise and some characteristics of a surprising experience can be valuable to study in design. For instance, surprise has the potential to elicit aesthetic experiences. Plutchik suggests that admiration is a combination of surprise, pleasure and a sense of approval (Plutchik, 1991, p. 102). The potential for eliciting surprise through incongruous characteristics of objects has also been suggested as an aesthetic experience (Hekkert, 2006, p. 168). Curiosity, interest, fascination, arousal and its impact on behaviour are characteristics that make surprise an important emotion to study in industrial design.

Surprise has often been used in design as an element for eliciting an experience of amazement (Desmet, 2003, p. 8), to create a sense of novelty (Desmet, 2002, p. 117), ‘to increase interest or prolong the attention value of a product’ (Hekkert, 2006, p. 168), to ‘engage the user’ (Grimaldi, 2006, p. 3), and to elicit curiosity and further exploration of the object (Ludden, 2008; pp. 17–18). Research has highlighted the value of surprise as an element that can help increase interest at the point of sale of a product (for instance Ludden et al., 2008, p. 28).

From the customers and users’ points of view, surprise can make objects grab attention at the purchase stage as well as making them interesting and fascinating to use. While surprise is characterised by a short-term duration and a rapid extinction, its effect can produce a longer-term experience of interest, amusement and fascination (Ludden, 2008, p. 120). This can result in the
owner experiencing pride of ownership towards a surprising and fascinating product and also towards the brand.

On the other hand, surprising interactions can have negative effects on the experience of a design. Rodríguez Ramírez (2011, pp. 184–227) describes how participants who reported high levels of surprise towards the task of using a number of designs of mousetraps, and found the situation undesirable to start with, also were much less willing to use the mousetraps in the future. Conversely, if a high level of surprise was accompanied by reports of other pleasant emotions and therefore making the situation positive, people were more willing to use the mousetraps when surprised. This suggests that surprise can increase the emotional response towards a situation, improving a positive situation or worsening a negative event.

Designers have often relied on their intuition and informed experience to produce objects that elicit surprise. However, little has been reported about how designers approach projects when they intend to surprise and what strategies they may follow. Sometimes the designers themselves are surprised during the design process and this serves as a strategy they can embrace to produce surprising designs. Schön emphasised that designers reflect-in-action (Schön, 1983; pp. 76–104). He describes how designers normally face complex situations and ‘designers’ moves tend, happily or unhappily, to produce consequences other than those intended’ (Schön, 1983, p. 79). These unexpected consequences may surprise the designer. Soo Meng (2009) reaffirms this idea and suggests that the design process is ‘inherently fluid, because it is not blinkered by the quest to achieve one design goal; rather it is open to new goals that one discovers by accident and unintentionally’ (2009, p. 64). It is through this fluid process that designers experience surprise towards their own experiments and developing designs; and it is often thanks to this process they can in turn surprise their customers. Despite critique about Simon’s portrayal of design as a linear process, Soo Meng (2009, pp. 62–63) clarifies how Simon also portrayed design as a fluid activity in which each step of implementation created a new situation, which in turn demanded a new design action. In this paper, we will present examples of designers reporting surprise during stages of the design process of their own creations, which in turn demanded new design actions and resulted in surprising designs. However, the focus of this paper is to report on strategies that designers use to surprise their customers, not themselves.

The main studies that report on industrial designers’ strategies to surprise (Ludden, 2008; Ludden et al., 2008) constructed their findings mainly through analysing designs from photographs in magazines and websites, and talking to a small number of designers. While this is a good start, our intention is to report on the strategies from the points of view of knowledgeable designers, who can tell us first-hand how they approached projects when they intended to surprise their customers. Ludden et al. refer to at least six strategies to elicit
surprise specifically through visual-tactile incongruity (2008). These include using a new material with unknown characteristics; a new material that looks like a familiar material; a new appearance for a known product or material; combination with transparent material; hidden material characteristics; and visual illusion. Ludden also reports other strategies to elicit surprise through visual-auditory and visual-olfactory incongruities (Ludden, 2008). In comparison, this paper offers other strategies that can be applied beyond visual-auditory and visual olfactory-incongruities. Our strategies also apply to the interaction with objects. The discussion section below will compare strategies from the literature with the ones developed in this study.

1 Methodology

1.1 Participants

There were 30 interviews with senior representatives from design organisations (table 1). The interviewees included senior designers, design managers or CEOs of design companies (VUW ethics approval #16059).

We intended to select interviewees who have had an impact on the design discipline. As we found no methodological studies that report on the impact of particular designers or design organisations on the discipline, the research initially made a comparison of available informal lists of ‘influential designers’. The sources included Businessweek magazine (Walters & Wong, 2004), Forbes Magazine (Meyers, 2005), designboom.com, core77.com, dsigner.com, Icon Magazine (Icon, 2005), and the book Designing the 21st Century (Fiell & Fiell, 2005). The list included 140 designers, design studios, and large corporations. They were contacted via email or telephone, 48 replied, and 23 interviews were arranged through this process. The other seven interviews were suggested by the initial interviewees as relevant people for the topic.

1.2 Interviews

The interviews were semi-structured (Hesse-Biber & Leavy, 2010; pp. 102–108), in-depth (Hesse-Biber & Leavy, 2010; pp. 93–101; Rubin & Rubin, 2005; pp. 12–14) and lasted between 40 and 60 min. The interviews included a protocol with a set of starting questions, which included:

1. Describe how you normally approach a project.
2. Do you expect specific responses from people to (any of) your designs?
3. If ‘surprise’ is mentioned, go to 6. If ‘surprise’ is not mentioned, go to 4.
4. Have you produced designs that you think surprise people? If yes, please describe and go to 6; if not, go to 5.
5. If you do not intend to surprise people through your designs, are there any reasons for it?
6. How did you approach the projects in which you intended to surprise?
Some extra questions depending on how the interview develops:

7. Did you intend to surprise people from the beginning of the project or was it something that developed along the way?
8. At what stage did you find the ‘surprising element’?
9. Have you used a similar approach to surprise in other projects?
10. How do you know if people are actually surprised?

1.3 Data analysis
The analysis of the interviews followed a Grounded Theory approach with a postmodern turn, namely situational analysis (Clarke, 2003, 2005). Grounded Theory is a positivist qualitative research methodology that seeks to construct theory from analysing data and finding concepts that explain the gathered data (Crotty, 2003, p. 78). Situational analysis is an approach that uses some elements of Grounded Theory from a constructionist and postmodern perspective.
Firstly, the interviews were transcribed using a selective transcription approach (Gilbert, 2001, p. 135; Poland, 2003, p. 281). As per Clarke (2005, p. 84) and Strauss and Corbin (1998; pp. 101–161), the transcriptions were printed and used for coding and memoing (Figures 1–2). For instance, Figure 1 illustrates one of the interviews and coding that constructed the strategy ‘2.2.4 Using archetypes in unexpected contexts/objects’. Figure 2 illustrates the coding that was the starting point for the strategy ‘2.2.3 Magical interactions’.

There were several stages of interviews following theoretical sampling and opposite sampling approaches. The codes and memos were used as raw data.
to build situational maps. In particular, the analysis focused on creating ‘positional maps’, which help develop ‘strategies for plotting positions articulated and not articulated in discourses’ (Clarke, 2005, p. 86). Figure 3 shows an example of an early positional map, in which the codes from the transcriptions were mapped by joining common themes that eventually became categories and strategies if there was sufficient evidence of their use by designers. Clarke (2003, p. 570) suggests that a map is ‘good enough’, or validated, when it has reached saturation. Saturation means that the explanations offered in the paper include all the relevant knowledge that can be constructed from the data gathered and such explanations have been analysed many times and are not changing substantially any more (see for example Strauss & Corbin, 1998, p. 570). Saturation in this paper was reached by having worked on the map of strategies many times over a few years, adding and deleting strategies, combining strategies with other common strategies, breaking strategies down into sub-categories, and reaching a point at which the researchers believed that all the strategies that matter — and that can be derived from the research — had been addressed.

2 Results: strategies to elicit surprise
The results from the situational analysis of the interviews suggest 11 strategies that designers explicitly use when intending to surprise. They are divided into two main sections: strategies used as a motivation for designing and strategies used during the act of designing.

Design strategies to surprise

Figure 2 Sample of coding of selective transcription of interviews
Figure 3 Example of a positional map developed from the coded interviews. The codes from the interview transcripts are connected looking for common themes and categories.
2.1 Finding the potential to elicit surprise as a motivation for designing

Designers use these strategies in general to find inspiration in a project and are not exclusive to designing surprising products. However, designers often mentioned them as the crucial step for finding surprising interactions. The strategies found in this category refer to the observations designers have of their world that inspire design projects. These observations have the common denominator of having such a strong impression on the designers that they are motivated to start and carry out design projects.

2.1.1 Observations beyond my personal experience

‘Observations beyond my personal experience’ refers to observations that designers have of how other people use objects, what they do in their daily activities and what they need. Observations of family and friends seemed to be more meaningful for the designers than observations of strangers. For instance, an experienced furniture designer (interviewee #8) mentions how she designed a range of furniture based on observations she had of her friends (Figure 4). One of the projects developed from the observation that some of her friends often visit Paris, where apartments are small, and the friends they stay with often lack appropriate furniture for sleeping guests. In this case, she designed furniture for her friend Jim who often visits her in Paris. Figure 4 is a structure of everyday furniture that could become a small private space and bed in a small apartment. It attempts to elicit surprise by normally being a piece of furniture for storage, and becoming bedroom furniture when Jim visits.

A senior designer mentions the example of designing an alarm clock for Barbie based on the observations he had of his nine year old daughter. He mentions:

I have a daughter, inevitably I start to see through her eyes and what she might want and understand. Kids’ products or toys are challenging, trying to get into their mindsets does not come as naturally. You want to keep the energy alive. You want to be as passionate about you doing [sic] a Barbie

Figure 4 Quand Jim monte à Paris. Image courtesy of Matali Crasset
box as you are when doing a Nike watch (interviewee #20, personal communication, October 6, 2008).

He talks about seeing the world through his daughter’s eyes in order to keep a high level of interest in the project as well as to better understand the potential users. In order to achieve this, he turns to people close to him, as interviewee #8 turned to her friends.

2.1.2 Observations of my direct experience

Designers also described finding relevance in their worlds through ‘personal experience’. In this case, it is not an observation of something happening to someone else. It is something that happens directly to them.

2.1.2.1 Behavioural level: how I use objects

At the behavioural level, designers mention that how they use objects themselves is sometimes the deciding factor as to how to approach the design project. This category refers specifically to how they interact physically with objects.

An example of ‘how I use objects’ is the lamp On/Off by a senior designer from Milan (Figure 5). The lamp is turned on or off by shifting its weight from one side to the other. The lamp attempts to surprise people by not having a standard switch. The design of the lamp originated as a response to accidentally knocking over the bedside lamp when falling asleep and trying to turn it off. The same kind of gesture can in this design turn the lamp on or off, without knocking it over.

2.1.2.2 Cognitive level: how I understand objects

‘How I understand objects’ can also be expressed as how designers personally interpret objects. This is the area in which designers verbalise a theoretical description of their design activities and approaches. Some designers emphasise this category in their work by developing their own theories about the interaction between people and objects. Their theories are highly workable, which means that most of the designers mentioning their own theories would use them as starting
points in their process. For instance, a senior designer from Milan suggests that people have filters of memory with which…

…they recognise objects thanks to the construction of an icon. To unleash emotions, the icons need to be taken away, at least removed. Changing the priority of the perception of objects does this… Then the user can perceive the new emotions and be surprised thanks to the instability created by the new product (interviewee #24, personal communication, 3 October, 2007).

The main characteristic of this approach is that it explicitly intends to surprise by addressing the expectations of people. Such expectations relate to the icons of objects that people construct. This icon is taken away and another one is put in its place, thus destabilising the perception of the user. The designer used this concept of destabilisation with the design of a stool that is reminiscent of the shape of a bucket, the ‘Moving stool’ (Figure 6).

2.1.2.3 Emotional level: how I emotionally experience the world. A senior designer from San Francisco offers a description of ‘how I emotionally experience the world’. He mentions that…

…designers are pretty emotional people. There is a lot of passion in the work that we do that hopefully comes through the work that we do… Research can be very instinctual to us as designers being part of the culture, whether it’s sports, consumer electronics, housing, gaming… Just because we live and breathe as much as we can every day, we have our point of view as consumers and designers (interviewee #3, personal communication, October 6, 2008).

Another designer expresses similar ideas by saying that ‘our concepts reflect how we feel and what we think is cool’ (interviewee #28, personal communication, October 7, 2006).
A senior lighting designer mentions that in 1975, he saw a fisherman hauling in a net full of fish, and the drops of water falling from the net looked like tears. There was a strong light from the morning sun reflected on the drops. He kept this observation for 35 years and designed the *Lacrime del pescatore* (Fisherman’s tears) installation (Figure 7). The design consists of a series of layered nylon nets with 350 crystals representing tears illuminated by a halogen light-bulb. The designer admits that the installation was very close to his own emotions, and his intention was to express those emotions. He even mentions that the design ‘was a bit on the edge, it may be seen as kitsch, but I am comfortable with it because the final result, including the movement and composition, express what I felt 35 years ago’ (interviewee #18, personal communication, September 21, 2009).

### 2.1.3 Issues in my world

‘Issues in my world’ involves mainly current social issues that are important for the designers. Interviewee #8 mentions that she often develops ideas from reading newspaper articles (personal communication, July 22, 2006). Interviewee #18 says that for him the incandescent lightbulb is ‘the most wonderful object made by human beings’ (personal communication, September 21, 2009). The law introduced in Europe in 2009, which banned frosted incandescent light-bulbs, irritated the designer. His team designed the Euro Condom (Figure 8) in response. The design involves a silicon cover that diffuses light just as the frosted incandescent bulbs do. The design intends to make a statement about an important issue in the world according to the designer.

### 2.1.4 Surprising experiments

In this category the designers set up experiments, but they do not know what may come out of them. The results of the experiments are then modified in order to make them final functional products. This category relates to what Schön (1983) and Soo Meng (2009) refer to as reflecting-in-action. For instance, in the ‘Design by Animals’ project, the designers put different animals to the task of affecting their material environment. In one experiment,
the designers placed a boa constrictor on a rod of clay. The boa rolled itself over the rod and started to compress it, creating unique forms. The designers then used the form to design clothes hangers (Figure 9). They also mapped the movement of a fly around a lightbulb in order to design a lamp (Figure 10).

The lamp Titania by a senior designer changes colour when the user changes a filter (Figure 11). The designer mentions that the initial intention in designing Titania was to explore the form of a plane’s wing (interviewee #19, personal communication, September 15, 2006). They discovered the property of changing the light’s colour by experimenting with different materials to decide which colours of plastic the lamp should be offered in. They found that including only one coloured sheet of plastic was enough to change the colour of the whole lamp, which was an unexpected finding. This was surprising to the designers, who assumed that their customers could be surprised by the same effect too.

2.2 Strategies used during the designing stage of a project: applying my informed experience

As opposed to ‘strategies at the observation stage of a design project’, this category does not focus on observations by the designers; it represents the synthesis of their research into a designed object. It occurs during the design process, as opposed to being a motivation for starting a project.

2.2.1 The smart doubling of things

A senior designer from San Francisco asserts that ‘it is the smart doubling of things’ that I think people discover, are surprised by, and enjoy’ (personal communication, November 10, 2008). For instance, his design studio was involved in the branding and product design for the Y water bottle, which had to appeal to children. The design includes playfulness by using...
a biodegradable rubber band that serves to join bottles together (Figure 12). The design studio claims that the use after consumption is only possible because the object produces an emotional connection with children.

2.2.2 Challenging assumptions of appearance

This strategy refers to projects in which designers change what could be seen in the industry as an assumption of how a specific object should look. For instance, computers were expected to be boxy and beige for a long time, until Apple introduced the iMac in the 1990s. It seems that the more established an assumption of appearance, the more surprising a challenging design can be.

A senior designer mentions the Jawbone Bluetooth headset (Figure 13) as an example of a project attempting to challenge assumptions of appearance. He
states that previous Bluetooth headsets looked like ‘blobs’ as they were designed with the premise that ‘if we are going to design something for your face, let’s make it organic, so that it’ll blend in’ (interviewee #20, personal communication, November 10, 2008). The designer adds: ‘I don’t put a chicken wing on my face, that’s organic. We said: things people wear on their face are jewellery. They have to have details and materials selection… that was [sic] complementary to the way that I look’.

2.2.3 Magical interactions
There were at least two studios that explicitly claimed to attempt to elicit surprise through magic. One of them aims to surprise people by developing products that are ‘alive, animated, transformers, performers; that assume diverse identities; that are magic with non-banal technologies’ (interviewee #4, personal communication, July 12, 2004). A senior designer referred to a project based on paranormal phenomena. He designed lamps that turn on through ‘the black magic of electromagnetism’ (interviewee #4, personal communication, September 26, 2006); a table that seemed to fly by imitating wood with Styrofoam; and a mirror that made images disappear by using liquid crystal.

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Figure 13 Jawbone Bluetooth headset. Images courtesy of Fuseproject.

Figure 14 Levitating lamp. Image courtesy of Front Design.
glass that can be turned on and off. Another design studio developed a range of products in collaboration with magicians. The designs are created with what would seem ‘impossible characteristics that defy the laws of nature’ (Front, 2010). The results include a lamp that levitates (Figure 14); a chest of drawers that separates and floats away (Figure 15); and another chest of drawers with fronts that disappear, revealing empty cavities within (Figure 16).

There are other examples of designs that involve some kind of magic interaction that intends to elicit surprise and where the designer does not necessarily describe them literally as magic. For instance, the Leaf lamp (Figure 17) features a touch-sensitive area on which it is necessary to run one’s finger along the surface of the base to dim the light up or down. There is no visible moving switch. The features were innovative when the lamp was released, and intended to offer a sense of surprise. In many examples, it is the use of a new technology that brings about the sense of magic. Wensveen suggests that ‘electronic products instil moments of magic and surprise as they seem to surpass the laws of nature and physical causation’ (2005, p. 157).

2.2.4 Using archetypes in unexpected contexts/objects

Under this category, designers used an archetype of an object and translated it into a different context or object. Figure 5 reflects the use of an archetype—a bucket—used in a different context: as a stool.

Designers have often used this strategy in the design of lamps. For instance, the workstation desk ‘Angel’ includes doors that when closed make it look like a giant lamp (Figure 18).

A group of designers from Paris often uses archetypes in different contexts (Fenoglio & Lecourt, 2012). For instance, they used the form of a wine glass to design the vase Verre (‘glass’, Figure 19). They also used the shape of a key as an element to turn switches on and off (Figure 20).
2.2.5 Unexpected scale
Designers referred to the use of scale for surprising people. For instance, the workstation/lamp Angel uses the form of an archetypal bedside table lamp on a much bigger scale (Figure 18). The design of a chaise longue (long chair)
plays with words to offer exactly that: a long chair (Figure 21). The design plays with the scale of the length of the chair.

3 Discussion

The results separate the strategies into observations that designers make before they start a design project and strategies that are used during the design project. The strategies based on observations are similar to the strategies suggested by companies like IDEO (see for instance Brown, 2009; Kelley & Littman, 2005; Myerson, 2001). In particular, the IDEO Method Cards (IDEO, 2003) and the Human Centered Design Toolkit (IDEO, 2011) offer a range of strategies for making design-relevant observations of people’s behaviour. However, IDEO’s main goal is to make ‘design useful, useable and delightful to people’ (IDEO, 2003, p. 2). The strategies suggested in this paper are intended only to surprise and can be used in conjunction with other approaches to make designs useful and usable.

Some of the strategies suggested in this paper can be compared to other studies (in particular Ludden, 2008; Ludden et al., 2008). Figure 22 offers a schematic comparison between the strategies offered in this paper and those of Ludden et al. (2008).

Two of the visual-tactual strategies offered by Ludden et al. (2008) resemble strategies from this research. The first one is ‘a new appearance for a known product or material’ (Ludden et al., 2008, p. 34). It is similar to the strategy
‘breaking expectations through challenging assumptions of appearance’ from this research. We specifically refer to it as ‘challenging assumptions’ as this implies that an assumption has been formed about what the appearance of an object should be like. This is important, as it may seem that the more established the assumption of an appearance is, the more surprising a challenging appearance would be. A senior designer reinforces this idea when he says ‘we found that people thought that all Bluetooth headsets needed to look organic... so
we challenged that notion’ (interviewee #20, personal communication, November 10, 2008). Ludden refers to this characteristic by mentioning that the strategy refers to a ‘familiar’ or ‘well-known’ product (Ludden et al., 2008, p. 34).

The second strategy that resembles the findings from this research is ‘visual illusion’ (Ludden et al., 2008, p. 36). The strategy connects to ‘use of magical interactions’ from this research, which also relates to and involves ‘visual illusions’, but expands such a notion by allowing more than just appearance and allowing for interactions. An example of this can be seen in the use of technology and touch in the Leaf lamp (Figure 16), which uses tactile sensors to turn on and off, dim the light, and change colour, all without moving or visible switches. The ‘use of magical interactions’ is also related to Ludden et al.’s strategy of ‘new material with unknown characteristics’, as the unknown characteristic of the material could be seen as magical.

The strategy ‘using archetypes in unexpected contexts/objects’ in this research is related to the ‘new material that looks like familiar material’ from Ludden et al., as the ‘familiar material’ can be seen as an archetype that is applied in a new context. However, the strategy ‘using archetypes in unexpected contexts/objects’ opens the opportunity to design using any kind of archetype and not
only a material, whether it is a form, a meaning, a texture, a mechanism, a technology or a movement.

There are strategies that Ludden et al. mention that this research did not find. For instance, ‘combination with transparent material’ or ‘hidden material characteristics’ were not mentioned by the interviewees. Conversely, Ludden et al. do not mention any of the strategies based on the observations of the designers or ‘the smart doubling of things’ or ‘unexpected scale’.

The strategy ‘use of an archetype in a different context’ can sometimes allow only a very literal interpretation: once the new connection is understood, there may be very little more about the object that is interesting. Ludden has suggested that surprise can be experienced several times towards the same design, but its intensity decreases drastically (Ludden, 2008, p. 125). Other authors point out that surprise may be a single experience. For instance, Desmet (2002, p. 117) indicates that surprise is ‘often a ‘first-time’ only emotion’. Fox-Derwin suggests that some projects are ‘one-liners’, which means that they hold an interesting feature, but once that feature is experienced there is not much more to the design (2011, pp. 26–29). As an example of this, Fox-Derwin refers to the ‘crushed’ ceramic cups by Rob Brandt that imitate what a crushed plastic disposable cup would look like.

4 Conclusion
This paper offers specific strategies that are directly applicable to design projects. The strategies are specific enough to be workable, but general enough not
to dictate recipes that limit creativity. The main audience to which the suggested strategies are aimed is industrial design students and junior designers, as the strategies can be used as starting points for designing when intending to evoke surprise. Nevertheless, the strategies can also be used by more experienced designers when they need a different approach to what they normally do. This is emphasised by the fact that none of the experienced designers interviewed mentioned more than a few strategies, which suggests that they could find the rest of the strategies useful as a fresh approach to their process.

It was mentioned in the introduction of this paper that surprise has the characteristics of drawing people’s interest towards stimuli and that it relates to familiarity. Designers either moved away from the familiar to elicit surprise, or used familiar elements in a different context to elicit surprise. However, further discussion about familiarity is necessary. For instance, how do we establish what is, and for whom something is, familiar? How far away can designs step from familiarity and still elicit a pleasant surprise? Using unexpected contexts seemed to be a common strategy for designers. Nevertheless, an unexpected context could be anything that is not the expected context. How do we know that an unexpected context may work in a favourable way for eliciting surprise? Such questions go beyond the answers from interviewees. The balance between eliciting pleasant surprise and moving away from familiarity could be further investigated.

The goal of this paper is to report on explicit strategies that designers use to elicit surprise, so the strategies are based solely on the responses from the interviews. Such an approach gives depth to the analysis and assures that the intentions of the designers are accounted for, which is a main goal of this research. However, it should be pointed out that there are other categories that could be found through analysis of existing designs without directly talking to the designers, which is what other authors have attempted before. For instance, Ludden et al. (2008) talked to a few designers, but their research does not concentrate on reporting on the original intention of the designers as stated by the designers. The main body of their work was based on analysing designs from pages in books, fairs, the internet and shops (Ludden et al., 2008; pp. 28–29).

Further research could investigate implicit strategies. The research could follow a participatory research approach, with researchers working as designers within design studios, attempting to uncover strategies that designers do use but were not able to verbalise through the interviews. The participatory research could take the form of embedded ethnographic researcher if it was carried out by a trained ethnographer. It could also take the shape of a reflective design practitioner if the designer is properly trained in the art of describing the insights of their practice. Ideally, the research would include
both approaches in order to achieve the most in-depth analysis of how designers can elicit surprise.

References


