

## Exploring Elasticity as a Medium for Emotional Expression in Silver Design

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### *Abstract*

*This research explored the elasticity of silver as a medium for expressing emotion in silver design, using Argentium® Sterling silver and laser welding. The research is situated in the context of traditional silversmithing design and practice (e.g. Clifford 1993, Glanville 2006, Hill and Margetts 2003), and has the aim of expanding its technical and creative possibilities (Niedderer 2009).*

*The research investigated the different possibilities of creating movement based on the flexibility of Argentium® silver to facilitate emotional expression in functional and non-functional forms of bowls. The project was conducted using creative exploration (Durling and Niedderer 2007). A soma-semiotic framework was established based on approaches of design and emotion (Kälviäinen 2005, Weerdesteijn et al 2005, Schusterman 2011), within which the results of the study were interpreted.*

*The outcome of the research is an enhanced understanding of the technical and conceptual issues of using elasticity and movement to create emotional expression in silver design, enabled by the combination of Argentium® silver and laser welding. In particular the study highlighted how complex emotions can be embodied in design objects, stressing the need for future research to develop a broader spectrum and vocabulary of complex emotional expression.*

***Keywords: craft, silver, design, elasticity, expression, emotion, movement, function, project-based research***

## Introduction: Elasticity in Silver Design

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This research explores the elasticity of silver as a medium for emotional expression in silver design, using Argentium® Sterling silver and laser welding. The research is situated in the context of traditional silversmithing design and practice (Clifford 1993, Glanville 2006, Hill and Margetts 2003, Schadt 1996, Weber-Stöber 1992) and has the aim of expanding its technical and creative possibilities (Niedderer 2009).

In the context of goldsmithing and silversmithing, silver is usually perceived as a soft metal. For example Sterling silver is softer than most standard gold alloys (e.g. 14 or 18ct standard yellow gold alloys) or similar platinum or white gold alloys (Wolters 1996: 44, 62). Silver becomes soft through heating and it becomes hard and flexible through being worked on cold. The traditional use of soldering requires heating the whole piece during the work process, which softens the silver. Any design using soldering processes therefore has to use sheet material of sufficient thickness to avoid easy indentation within use, commonly ranging between 0.8 – 2mm. This makes silverware expensive and puts a range of constraints on the designing and making of silverware.

This research explores the use of Argentium® Sterling silver with laser welding. Argentium® Sterling silver (AS) is a new silver alloy, which was developed to combat an oxidation process called ‘fire scale’, which occurs when Standard Sterling silver is heated during the fabrication process. Fire scale appears as bluish-grey stains in the surface of silver and is difficult to remove (Davis and Johns 2007). In addition to being firescale-free, AS has also been recognised for a number of other advantages. A previous project ‘Exploring the Creative Possibilities of Argentium® Sterling Silver’ demonstrated that Argentium® silver could be used successfully with laser welding (Niedderer, Harrison and Johns 2006; Stern-Leach 2007). The benefit of laser welding is in minimal heat application. This allows joining thin, work hardened silver parts without losing their flexibility, opening the design of silverware to the use of elasticity.

Elasticity and flexibility are here used as synonyms and refer to the springiness of silver. Elasticity, as the quality of being elastic, refers to a material substance “that spontaneously resumes [...] its normal bulk or shape after having been contracted, dilated, or distorted by external force.” (OED 2011a). This is not to be confused with the plasticity of silver, which is “the quality of being plastic; spec. the ability to be easily moulded or to undergo a permanent change in shape” and which is normally used in the form-giving of silver (OED 2011b).

Building on the insights of the previous project, the research presented in this paper explores how elasticity can be utilised to achieve emotional expression in tableware/silver design, focusing on the subject of the (fruit) bowl. Bowls are a common subject in silver design, and there are many examples (e.g. in Hund 1995, Goldschneider and Zapletalová 1998). Traditionally, silver bowls do not tend to be flexible but normally are rigid. More recently, some silversmiths have experimented with elasticity to achieve new forms of expression. For example, Ane Christensen has produced bowls from hard-spun domes. By sawing into them, she has expanded and changed the shape of the domes, inducing elasticity and making them 'quiver'. Christensen's bowls are aptly named "Nervous Bowls" to express their emotional appeal (Christensen 2011; Crafts Council 2005; Fig.4). They are a good example of how emotional expression can be achieved through elasticity. However, working from a single piece of metal is rather restrictive, leaving the maker without the ability of joining different parts.

This research explores how the combination of work-hardened silver and laser welding can provide new technical and creative opportunities through the ability of joining different parts, focusing on how flexibility can be integrated into the design of bowls to invoke emotion. The project explores functional and non-functional forms of bowls in relation to meaning creation in two steps: firstly, the technical opportunities and limits of material and object function of creating flexible constructions; secondly, the creative opportunities of material and object function in relation to visual and soma-semiotic expression of emotion (e.g. fear, nervousness, sensitivity, humor).

The project is based on the method of creative exploration developed by Durling and Niedderer (2007). Situated in the real life scenario of design practice, the research drew on both experiential knowledge and scientific data where appropriate, comparing them to enable and inform creative experimental exploration (van Manen 1990: 8, 74). A soma-semiotic framework was developed to interpret the results of the research, drawing on studies from design and emotional psychology (Kälviäinen 2005, Weerdesteijn et al 2005, Desmet & Hekkert 2007, Schusterman 2011).

In the following, the paper describes the theoretical framework, the research and its evaluation. The conclusion summarises the outcomes of the study, its benefits and limits, and opportunities for further research.

## Context: Silver Design 'in a Fruit Bowl'

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This section explores the context of contemporary silver design, in particular the design of silver bowls in relation to the use of elasticity for expressing emotion. The aim is to provide an interpretative framework for emotional expression in silver design. The context brings together three aspects: a review of the bowl in the context of contemporary silversmithing, the idea of emotion and its embodiment and expression through movement in objects, and the discussion of relevant theories for the expression and interpretation of emotion within the design context.

### The significance of the bowl in silver design

The bowl is a common subject in the practice of silver design, and there are many examples throughout history and in contemporary practice which demonstrate the significance of this modest object. Over time, bowls have served the most mundane needs as well as humanity's most sacred rituals, including for example bowls for eating and serving food as well as bowls for libation and ritual washings.

Although the theme of the bowl (Schale) is prominent in practice, in theoretical and philosophical discussions more often the vessel (Gefäß) has found attention. One key philosophical reference to both the vessel and the bowl is by Elias Canetti (1973: 254) who reflects on the emergence of artefacts, based on the hands, as a functional object and as a signifier of the development of the human mind:

*The hand which scoops up water is the first vessel [Gefäß]. The fingers of both hands intertwined are the first basket [...] It is not enough that this or that shape should exist in the surrounding world. Before early man could create it himself, his hands and fingers had to enact it. Empty fruit husks in the shape of cups [Schale], like coconut shells, may have existed for a long time, but were thrown away heedlessly. It was the fingers forming a hollow to scoop up water which made the cup [Schale] real (p. 254)<sup>1</sup>*

Canetti's description invokes the humble nature and simplicity of the vessel/bowl, which is manifest in its shape - at minimum the bowl is a concave form with a usually round or oval opening, the most classic shape being the segment of a sphere – but also its immense significance. It is perhaps this juxtaposition of simplicity and significance that has provided artists and craftspeople with the desire to approach the theme of the bowl over and over again. The simplicity of its function puts little restriction on artistic expression and allows it to flourish in the design of the bowl. Bowls have been fashioned in silver in many forms and for many purposes. As tableware, there are for example serving bowls, dessert bowls, fruit bowls,

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<sup>1</sup> Note that 'Schale' (German for bowl) is erroneously translated with 'cup'.

flower bowls, rose bowls, bowls serving as decorative centre pieces for the table and small-scale sculptural bowls which express aesthetic or conceptual values.

The analysis and interpretation of silver design has traditionally been the domain of historical and critical or curatorial study. Within this domain, the subject of the silver bowl has rarely been discussed on its own. Mostly, silver bowls are discussed as part of the general context of silverware or tableware. Historical overviews e.g. by Schadt (1996), Glanville (1997, 2006) and Müller (2001) provide a useful overview of techniques, provenance, stylistic parallels and influences of silver design. Where the discussion focuses on bowls, the focus tends to be on individual antique or historical examples (e.g. Hendrix 1999; Karageorghis 1999; Quast and Tamla 2010; Neumann 1999).

Compilations of contemporary silverware tend to come in form of exhibition catalogues. Some of the best examples are by Weber-Stöber (1992: *Silbergestaltung*), Valcke et al. (1993: *A Sparkling Party*), Hund (1995: *Der Silberstreif*), Goldschneider and Zapletalová (1998: *Metalmorphosis*), Coatts (1999: *A Feast of Silver*), and Mendini (2003: *Tea and Coffee Towers*). These offer variously introductions to modern and post-modern silver design, its historical or curatorial context, the understanding and use of contemporary silver, and to the life of practitioners, the development of their style and the education system.

Within these compilations, one can find many different interpretations of the bowl, although the overall characterisation through accompanying essays could be described as formal aestheticism and an occupation with the bowl form *per se*. Good examples are David Huycke's award-winning design from 1995 (Weber-Stöber 1995: 45), which explores and celebrates the purity of the bowl form in its gentle variations. In contrast, Bennett (Goldschneider and Zapletalová 1998: 58), Gogna and Niedderer (Weber Stöber 2001: 54, 86) play with the meaning of the bowl, exploring the relationship of function, form and content while maintaining the basic functionality of the bowl. For example, Bennett's Rose Bowl "Spaghetti Junction", which was presented to Birmingham City Council, reputedly is a humorous commentary on Birmingham's infrastructure (Fig. 1). In an attempt to further question the concept of the bowl, Lee, Tomasi and Schütter (Weber Stöber 2001: 80, 110) as well as Clarke (Goldschneider and Zapletalová 1998: 63) deconstruct the bowl in the aim to rethink the use and perception of the bowl. David Clarke's fruit receptacles offer perhaps one of the most far-reaching interpretations of this theme (Fig. 2).



Figure 1: Gerald Benny. (1972). "Spagetthi Junction", Rose Bowl. © BMAG



Figure 2: David Clarke. (1997) "Epergne", Fruit Receptacle. © Bishopsland Trust

More recently, some silversmiths have experimented with the bowl form in a different way. They have begun to explore the bowl form with the aim to express emotions or interrelationships using aspects of movement. For example, in her piece "Movement No.1", Theresa Nguyen (Gesellschaft für Goldschmiedekunst 2010: 114) approaches the idea of movement symbolically, the shape of the object representing the idea of the wave. Ya-Kyung Shin (Gesellschaft für Goldschmiedekunst 2010: 27) takes a similar approach with "Reunion", a bowl made of used spoons, which symbolise human interaction.

In "Sensible Trinkgefäße/Sensitive Cups", Katja Höltermann follows a different path, using movement to heighten the experience of the everyday action of drinking by making the disappearance of the liquid visible

through the changing position of the cups (Weber Stöber 2001: 64; Fig. 3). Also utilising movement, but here in form of the vibration intrinsic to the material/objects form, Ane Christensen has produced bowls from hard-spun domes. By sawing into them, she has expanded and changed the shape of the domes, inducing elasticity and making them quiver. Christensen's bowls are aptly named "Nervous Bowls" to express their emotional appeal (Christensen 2011; Crafts Council 2005; Fig. 4).



Figure 3: Katja Höltermann. (1999) "Sensible Trinkgefäße/Sensitive Cups". Silver, hollow mounted. © Katja Höltermann. (Since 2001, production also in stainless steel by Fa. Carl Mertens)



Figure 4: Ane Christensen. (2001) "Nervous Bowl". Photograph: Anders Kjaersgaard/Dominic Sweeney © Ane Christensen

These four examples demonstrate different ways of utilizing movement to express their ideas: the first two examples use the symbolism of visual images, the last two examples use our reading of and empathy with certain movements to express the emotions they carry. In the following, this paper examines more closely the idea of emotion in design, how we read emotion through embodied experience, and how emotions can be expressed through movement within design objects.

## Expressing Emotion in Design

The idea of emotion in design has come to prominence in 1999, when the Design and Emotion Society was formed, and with publications such as *Emotional Design: Why We Love (or Hate) Everyday Things* (Norman 2004). Emotion, however, has been of concern before then. For example, Alessi has strongly used a semiotic approach under the lead of Laura Pollinoro to create emotion through visual storytelling (Ciccolo 1996, Pollinoro 2011, Kälviäinen 2005: 88). One of Alessi's most iconic objects from this period was the "Anna" corkscrew (Alessi 2011a), and some time later the 'Girotondo' series (Alessi 2011b), which used facial and body expressions to convey happiness in line with semiotic interpretations of anthropomorph shapes (Kälviäinen 2005: 87). At the same time in the early 1990's, the introduction of emotional expression also entered the silversmithing arena with the colourful and sometimes quirky aluminium vessels by Robert Foster (O'Callaghan 1992), or Allan Sharff's vessels in silver (2011).

The extended engagement with design and emotion since 1999 has moved beyond the semiotic approach, complementing it with the psychological understanding of emotion and its embodiment, e.g. through non-verbal communication and movement (e.g. Ekman and Keltner 1997). The touch screen technology and gestural manipulations in smart phones, such as the iPhone, are but one prominent example of this application. According to Spillers (2003), emotions here are generally used as a success element whereby design can evoke feelings of pleasure/success (desired) or annoyance/failure (to be avoided).

Further reaching approaches are evident in the work of Lee and Nam (2006), who look at the emotional response of products within interaction (Lee, Park and Nam 2007), and of Weerdesteijn, Desmet and Gielen (2005) who have explored "the possibility of using expressive movement for creating products that elicit predefined emotional responses" (p.28). Using the case study "Learning to Talk with Your Body", they designed six objects, "each expressing a distinct emotion: anger, fear, sadness, joy, pleasant surprise or attraction" (ibid.) with the aim



*to develop an educational product that can be used to teach children, aged between four and six, how to emotionally express themselves with their bodies. The objects were designed to express the given emotions in their static appearances and (interactive) dynamic movements. (Weerdesteijn et al 2005: 28)*

Weerdesteijn et al's approach is of particular interest here because it helps to understand how silver objects, e.g. by Höltermann and Christensen, are able to create emotional expression and engagement using movement on several levels. Key here is that emotion is generally defined as "brief, rapid responses involving physiological, experiential, and behavioural activity that helps humans respond to survival-related problems and opportunities" (Keltner and Ekman 2000: 163).

The interrelationship of emotion and bodily action provides an "efficient means for interpreting a person's emotion [...] by imitating that person's emotional experience" (Weerdesteijn et al 2005: 29). Imitating a person's bodily experience, such as body posture, gesture or movement, or facial expression, creates an empathic experience. Such empathic experiences have been shown to have a neurological basis (Shusterman 2011: 155), which allows for the interpretation of that embodied experience by a fellow human. It is this aspect of empathic experience which allows humans to interpret objects in a similar way (Kälviäinen 2005: 87), and which is utilized in design to embody emotion.

If used/understood in this way as (bodily) movement, we can see how emotion can be embodied in an object, or in the action involving an object, its use, thus linking human action/behaviour and an object's function, which can also be understood as a 'plan for action' (Kälviäinen 2005: 84; Weerdesteijn et al 2005; Niedderer 2007: 9,10).

## **An Interpretive Framework for Emotion**

Summarising the above discussion, we can distinguish three different ways of dealing with experience in design. Firstly, emotion appears in the literature as reaction of the user e.g. as an indicator of success/failure or as appraisal response indicating attraction/repulsion to an object (Spillers 2003, Desmet and Hekkert 2007: 64).

Secondly, Kälviäinen (2005) emphasizes the semiotic reading and differentiation of emotion in craft and design artefacts. Her interpretation pertains both to emotional expression (Roseman, Wiest and Swartz 1994: 216) as can be found in facial expressions (e.g. in the 'Anna' corkscrew) as well as to "denotative, functional [behavioural] and connotative abstract and symbolic meanings" (Kälviäinen 2005: 87). Kälviäinen thus combines the two aspects of experience of meaning and emotional experience which are distinguished separately in Desmet and Hekkert's framework (2007).

Thirdly, Weerdesteijn et al (2005) emphasise on the embodiment of emotion in objects through the embodiment of physical movement, utilising the functional-behavioural aspect of emotion (Roseman, Wiest and Swartz 1994: 216).

Using insights from these different ways of reading, we should be able to ascertain further insight into the design of the two objects introduced above: The “Sensible Trinkgefäße” by Höltermann and the “Nervous bowl” by Christensen. We can now see that they embody emotion in two different ways, drawing on the functional-behavioural aspect of emotion and emotional expression respectively.

In relation to Höltermann’s work, we can elicit a second level of meaning which goes beyond the maker’s own interpretation (heighten the experience of the every-day action of drinking): the cups tilt more the emptier they get. This is comparable to the expression of sadness in Weerdesteijn’s table of emotions and the object that was developed accordingly (Weerdesteijn et al 2005: 32, 33; Fig. 5). Whether this is sadness about having finished the drink, about not having been able to stay abstinent or about a friend leaving at the end of the drink, we do not know. This kind of information is dependent on the individual user and the context of use. However, the notion of the movement is (arguably) universal due to the embodied soma-aesthetic experience (Wallbott 1998).



Figure 5: Jeske Weerdesteijn (2005). “Figure 2a: Sadness is indifferent to manipulation”. (Weerdesteijn et al 2005: 30).

In turn, Christensen’s “Nervous Bowl” predominantly uses emotional expression (although the quivering can also be seen as movement, and thus to encompass both aspects of emotion, i.e. expression and behavioural). While nervousness is not one emotion commonly encountered in the literature, it can be seen as a subset of fear or excitement or a combination of both.

This example highlights that the fine discrimination of different and complex emotional expressions is still a challenge (Roseman, Wiest and Swartz 1994, Wallbott 1998), since quivering can be read in several different ways: as nervousness, fear, or joyous excitement, or even as the simple acknowledgement of another person in a room. In such cases, the

interpretation is dependent on very fine aspects of discrimination taking into account the nature and intensity of the movement, and the combination with other signs that provide the context.

These examples demonstrate how, together, these theories of somatic experience and semiotic interpretation allow for a closer reading and understanding of emotion in design, applied to silver design. One could therefore speak here of a soma-semiotic framework, although this is not used in the medical sense of psychotherapy, instead referring to the semiotic interpretation of signs of emotion through experience of bodily movement/actions or expressions.

## **Exploring Emotion through Elastic Movement**

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Based on the theoretical framework developed in the previous section, the practical part of the research investigated how emotional expression and functional-behavioural aspects of emotion can be used to embody emotion within silver design. This investigation was based on an exploration of the technical and creative opportunities of elasticity in silver design enabled by the combination of Argentium® silver and laser welding. The aim was to expand current conceptions of silver design through the inclusion of movement leading to the expression of emotion. The project focused on the bowl form and explored functional and non-functional forms of the bowl as a common form in silver design which invites creative freedom due to its simplicity.

The project progressed in two stages:

Firstly, technical opportunities and limits of material and object function were explored, including joining techniques and their impact on different ways of constructing elastic movement;

Secondly, based on the insights from the first stage, three different ways of constructing movement were utilised to develop three designs exploring the soma-semiotic emotional expression of these movements.

## **Methodology**

The practical enquiry was based on the method of creative exploration, which Durling and Niedderer (2007: 14) define as the “working through of a research problem through designing”, including “ideation, drawing, prototyping, etc.” They distinguish two modes of creative exploration, analytical and synthetic, where “the creative aspect of designing has been brought to bear” ... “within a predetermined research framework” (pp.14-16). In other words, analytical investigation seeks to gain a deeper understanding of a particular concept or phenomenon through systematic

design inquiry within a pre-determined conceptual framework (p.14) while designing as a synthetic process uses real world intervention and observation to capture complex phenomena/situations (p.15). Durling and Niedderer (2007) further explain the aim and rationale of creative exploration:

*Using designing in this way is useful where it is necessary to gain insight into the complexity of a situation, phenomenon or process, where scientific reduction is unable to provide a sufficiently rich or coherent picture of the subject being investigated. (p. 14)*

*This way of using designing within research is therefore not illustration or demonstration, nor is it necessarily about testing any concept or theory, but essentially it utilises designing to reveal new avenues and opportunities for development, and to gain new insights and understanding (p.16).*

In the case of the present research, analytical investigation was used to explore the embodiment of emotion in an object through movement within the soma-semiotic framework. Developing the practice within the soma-semiotic framework has enabled the interpretation of the results within these parameters from the maker's point of view, in this case the soma-semiotic reading of movement as image/sign as indicators for emotional behaviour based on the universality of certain movements.

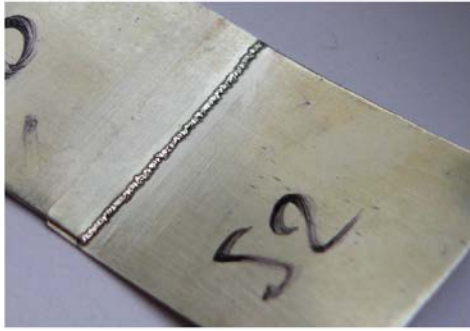
Synthetic inquiry was used for the first (technical) part of the investigation. The research was situated in the real life scenario of design studio practice, drawing on experiential knowledge as well as scientific data as appropriate. Both sets of data were compared continuously and have informed any design decisions made to enable insightful experimental development (van Manen 1990: 8, 74).

## **Technical Development**

The technical investigation was twofold: Through experimentation, first different ways of joining silver sheet using laser welding were explored, including flanges, ridges, welding sheets flat together or flat over edge in order to make the seams durable (Colour Plate 1; Niedderer 2009: 169).

Second, the impact of the different ways of joining was assessed on different ways of constructing elastic movement within the bowl form, using a combination of drawing, modelmaking and conceptual reasoning. This resulted in the identification of three possible ways of constructing movement intrinsic to the bowl form:

- strip of silver sheet fixed on one side (most flexible)
- looped silver strip (medium flexible)
- joining of two silver strips of different lengths (least flexible)



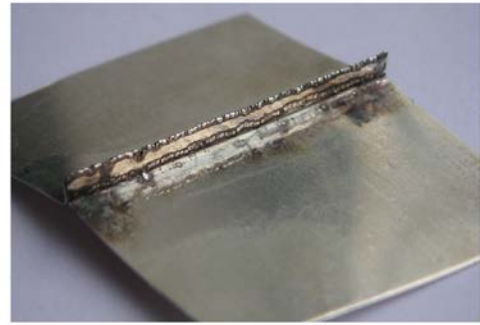
Example 1: welding two sheets over edge



Example 2a: Welding two sheets flat (straight)



Example 2b: Welding two sheets flat (zigzag)



Example 3: two sheets with ridge, welding 1 edge/1 flat

Colour Plate 1: Niedderer, K. (2008). Examples of laser welding with Argentium® silver. © Kristina Niedderer.

All solutions identified were based on the recognition that, in order to achieve elasticity, the deconstruction of the bowl form was required, following examples by Clarke and Christensen discussed above. At this point, due to the time and resource limitations of the project, other potential solutions such as the helix shape, which had been used previously (Niedderer, Harrison, and Johns 2006), were not further explored because they were not considered to be particularly appropriate to the bowl form. With further time and resource, of course, these may also be considered and further solutions may be identified.

## Creative Exploration

Following the technical investigation, which was synthetic in nature, the creative exploration changed to a combination of synthetic and analytic mode. The technical experimentation produced an understanding of the need to design differently to accustomed ways, because of the differences in the technical construction. An approach of moving from simple to complex was followed in exploring flexibility in relation to emotion to allow for this need.

In contrast to Wendlesteijn et al (2005), rather than trying to predict an emotion and finding an appropriate way of expressing it, this exploration used an open-ended approach, trying to understand what movements can be produced using identified technical solutions, and what emotions they are likely to express. In this way, within the theoretical framework, space is

given to allow for the creative leap as a characteristic strength of designing to generate novel solutions that may not otherwise be predicted.

The first design utilised slim strips of silver sheet, fixed on one side, to create a bowl, leading to a star-shaped, layered construction, which provided the basis for two small bowls 'Anemone' (Fig. 6). Each of the bowls is made up of ca. 80 strips of Argentium® (0.1mm thick), in form of an 8 (10) pointed star of 10 (8) layers. After joining the strips through laser welding, the flowery forms became 'alive', fragile looking yet strong and flexible, reacting to any disturbance in the room with a slight vibration.



Figure 6: Niedderer, K. (2009). *Anemone*. Photo © Niedderer

The Anemone bowls had no explicit practical function but were rather sculptural in character, allowing maximum freedom of experimentation. The insight gathered about the use of elasticity were transferred into the subsequent design of two fruit bowls. The two fruit bowls used the same principle of construction (star-shaped layering) as the first to introduce the idea of movement into functional silver design, but now used looped silver strips and joined silver strips of different lengths for fruit bowls one and two respectively.

'Fruit Bowl 1' used 16 looped silver strips arranged in a 2-layered star shape to create a flattish ball shape, which transforms into a doughnut shape when laden with fruit, visualising the weight of the fruit (Figure 7). This construction is very springy and can be made to bounce as if in 'elated joy', displaying the corresponding movement qualities described by Walcott (1998: 893) for elated joy, i.e. high movement activity and dynamics.

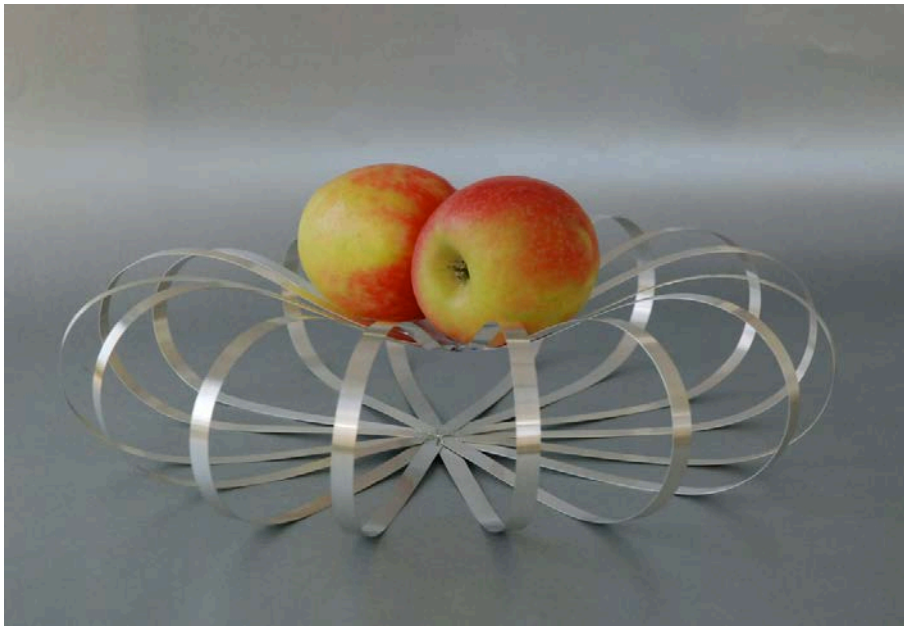


Figure 7: Niedderer, K. (2009). Fruit Bowl 1. Photo © Niedderer

Thus far the design's expression was predicted, what was not predicted was that once the 'bowl' was laden with fruit, it sheared also sideways. With the fruit in the middle, the long silver strips on the outside and the rolling movement (combined up-down as well as sideways movements), together, these components made the bowl not just 'joyous' but also comical, raising associations to a 'drunken spider' (body high up in the middle on long legs 'wobbling about').



Figure 7: Niedderer, K. (2009). Fruit Bowl 2. Photo © Niedderer (ø ca. 45cm)

'Fruit bowl 2' was made of 2 x 20 silver strips of different lengths arranged in a double layered-star shape to create the outline of a double-walled bowl (Fig. 8). Like Fruit Bowl 1, when laden with fruit, the shape of Fruit Bowl 2 deforms. However, due to the less flexible construction, there is little movement akin to emotional expression but rather movement that can be described as functional-behavioural: the more the bowl is laden with

fruit, the more it closes its fingers, seemingly protecting its contents (Fig. 9). Protection is here seen as a derivative of fear (of something being taken away) indicated through closed movements/body posture (Walcott 1998: 983; Weerdesteijn et al 2005: 32).



Figure 8: Niedderer, K. (2009). Fruit Bowl 2 (detail with fruit). Photo © Niedderer

## Discussion and Conclusion

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This study has considered the idea of expressing emotion through movement in the context of silver design, introducing the idea of design and emotion which has been established over the last decade in product design. The review of the expression of emotion in design has been used to establish a soma-semiotic framework as a means of interpreting the results of the creative exploration undertaken as part of this research. The creative enquiry was conducted in two parts:

Firstly, the synthetic part explored the different possibilities of creating movement based on the flexibility of working with Argentium® silver and laser welding. Technically, this was a relatively straightforward small-scale study, which gave insight into different ways of joining thin flexible silver strips as well as of designing flexible constructs that can be used for the creation of bowl forms within a silversmithing tradition.

In the second, analytical part, exploring the different possibilities of creating movement with regard to expressing emotion proved more complex. While being able to predict the movement and emotional expression of the bowls *per se* using the soma-semiotic framework, the final prototypes revealed complexities both in terms of the flexibility of the constructions and emotional expression that went beyond any predictions.

In technical terms, model making allowed only for limited prediction of the flexibility behaviour of the constructions, especially under load. While the



main movements (up-down) were predictable, the sideways movements were not. In order to advance this aspect in future, potentially CAD driven models e.g. through solidworks, might offer help in providing better predictive powers, although gaining access to professional software required to manage the complexity of the constructions may prove difficult within a normal silversmithing context.

In relation to these technical aspects, integrating emotion could be predicted on a basic level. However, the fine differentiation and discrimination of emotional responses produced in the bowls exceeded prediction. For example, it was possible to distinguish three very different kinds of 'quivering' within three of the bowls discussed in this paper: Christensen's bowl was found to have a kind of 'nervous' quiver, which may be associated with anxiety or fearful anticipation and which Weerdesteijn et al. (2005: 32) characterise with fumbling, passivity, little strength and tenseness. The 'Anemone' bowls, reacting to any disturbance in the room with a slight upward vibration or quiet quiver, communicate a low excitement (like the general acknowledgement of persons in the room) and a somewhat contented happiness, which is characterised by low movement dynamics and an upward movement for joy (Wallbott 1998: 893). Fruit Bowl 1, as discussed above, combines 'elated joy' (through its bounce) with the potentially scary image of a spider, creating a comical image through the juxtaposition of the different signs, which incidentally is comparable to the boggart turning ice-skating spider for Ron in Harry Potter and the Prisoner of Azkaban (Rowling 2000: chapter 7).

These findings mirror some of the difficulties and contradictions experienced in psychological studies of emotion which describe and measure the recognition of emotional expression and behavioural movements as indicators of emotion (e.g. Roseman et al 1994, Wallbott 1998, Weerdesteijn et al. 2005). At the same time, they demonstrate how complex emotions can be embodied in design objects to develop a broader spectrum and vocabulary of complex emotional expression.

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## References

- Alessi (2011a). *Project: AM01 - Anna G. corkscrew*. Retrieved 30 Dec, 2011, from URL: <http://www.alessi.co.uk/ashop-uk/home-design/bar-and-wines-90149/anna-g-corkscrew-580/>
- Alessi (2011b). *AKK78 - Mini Girotondo, round tray*. Retrieved 30 Dec, 2011, from URL: <http://www.alessi.co.uk/ashop-uk/design-products/trays-90142/round-tray-mini-girotondo-5037.html>
- Cannetti, E. (1973). *Crowds and Power*. (Translated from the German by Carol Stewart). Penguin Books.
- Ciccolo, E. (1996). *L'oggetto dell'equilibrio. Centro Studi Alessi 1990 – 1996*. Crusinallo, Italy: Alessi.
- Clifford, H. (ed.) (1993). *20th Century Silver*. Crafts Council.
- Coatts, M. (1999). *A Feast of Silver*. London: CAA. Retrieved 30 Dec, 2011, from URL: <http://www.caa.org.uk/exhibitions/archive/2000/a-feast-of-silver.html>
- Christensen, A. (2011) *Kinetic Pieces*. Retrieved 30 Dec, 2011, from URL: <http://www.anechristensen.com/silverware/pages/kinetic.html>
- Crafts Council. (2005). *Jerwood Applied Arts Prize 2005: Metal*. London: Crafts Council.
- Davis, S. and P. Johns. (2007). *The Properties and Applications of Argentium® Sterling Silver*. 31st IPMI Conference. Retrieved 7 Dec, 2007, from URL: [http://www.argentiumsilver.info/uploads/Files/papers/31st\\_ipmi\\_sdavis\\_pjohns.pdf](http://www.argentiumsilver.info/uploads/Files/papers/31st_ipmi_sdavis_pjohns.pdf)
- Desmet, P. M. A., and Hekkert, P. (2007). Framework of product experience. *International Journal of Design*, 1(1), 57-66.
- Durling, D. and K. Niedderer. (2007) The Benefits and Limits of Investigative Designing. *IASDR International Conference 2007*. Hong Kong: Hong Kong Polytechnic University. Retrieved 30 Dec, 2011, from URL: <http://www.sd.polyu.edu.hk/iasdr/proceeding/papers/The%20Benefits%20and%20Limits%20of%20Investigative%20Designing%20%20%20.pdf>
- Ekman, P. and D. Keltner. (1997). Universal facial expressions of emotion: An old controversy and new findings. In U. ~~Stegreiter & P. Attnau (Eds.),~~ *Nonverbal communication in social interaction*. ~~Hilse, D. & J. Erlbaum~~
- Gesellschaft für Goldschmiedekunst. (2010). *Silver Triennial International*. Stuttgart: Arnoldsche and Hanau: Deutsches Goldschmiedehaus Hanau.
- Glanville, P. (1997) *Silver*. V & A Publications.
- Glanville, P. (2006). *Silver in England*. Oxon, UK: Routledge.
- Goldschneider, I. and Zapletalová, A. (1998). *Metalmorphosis*. Museum of Decorative Arts Prague and British Council.
- Hendrix, E. (1999) A Cypriot Silver Bowl Reconsidered: 2. The Technique and Physical History of the Bowl. *Metropolitan Museum Journal*, Vol. 34, pp. 21-31. Retrieved 30 Dec, 2011, from URL: <http://www.jstor.org/pss/1513043>
- Hill, R. and M. Margetts. (2003). *Michael Rowe*. Birmingham: Birmingham Museums and Art Gallery in association with Lund Humphries.
- Hund, B. (1995). *Silberstreif: eine Kunstausstellung*. Esslingen, DE: Neckarwerke.
- Kälviäinen, M. (2005). Action, movement and bodily relationships in products. In L. Feijs, S. Kyffin and B. Young (eds.) *Design and Semantics of Form and Movement*. Northumbria University, UK, Technical University Eindhoven and Phillips Design Eindhoven, NL, pp. 84-89. Retrieved 30 Dec, 2011, from URL: <http://www.northumbria.ac.uk/static/5007/despdf/designres/2005proceedings.pdf>
- Karageorghis, V. (1999) A Cypriot Silver Bowl Reconsidered: 1. The Iconography of the Decoration. *Metropolitan Museum Journal*, Vol. 34, pp. 13-20. Retrieved 30 Dec, 2011, from URL: <http://www.jstor.org/stable/1513042>
- Keltner, D., & Ekman, P. (2000). Emotion: An overview. In A. Kazdin (Ed.), *Encyclopedia of psychology*. London: Oxford University Press, pp. 162-167.
- Lee, J-H. and T-J. Nam. (2006). Augmenting Emotional Interaction Through Physical Movement. *ACM Symposium on User Interface Software and Technology (UIST), 2006 Adjunct Proceedings: Posters*,

- ACM, pp.95-96. Retrieved 30 Dec, 2011, from URL:  
<http://www.acm.org/uist/archive/adjunct/2006/pdf/posters/p95-lee.pdf>
- Lee, J-H, J-Y. Park, T-J. Nam. (2007). Emotional interaction through physical movement. In J. Jacko (ed.) *Human-Computer Interaction, Part III*, HCII 2007, LNCS 4552, Berlin: Springer, pp. 401-410.
- Mendini, A. (ed.). (2003). *Tea and Coffee Towers*. Electa.
- Müller, H. (2001). *European Silver: Thyssen-Bornemisza Collection*. Translated by P.S. Falla and A. Somers Cocks. Philip Wilson Publishers.
- Neumann, G. (1999) A Cypriot Silver Bowl Reconsidered: 3. The Inscription. *Metropolitan Museum Journal*, Vol. 34, pp. 33-35. Retrieved 30 Dec, 2011, from URL: <http://www.jstor.org/pss/1513044>
- Niederderer, K., Harrison, C. & Johns, P. (2006). Exploring the Creative Possibilities of Argentium® Sterling Silver. In K. Friedman, T. Love and E. Corte-Real (eds.), *WonderGround*. Lisbon, Portugal: IADE. Retrieved 31 Aug, 2011, from URL:  
[http://www.iade.pt/drs2006/wonderground/proceedings/fullpapers/DRS2006\\_0203.pdf](http://www.iade.pt/drs2006/wonderground/proceedings/fullpapers/DRS2006_0203.pdf)
- Niederderer, K. (2007). Designing Mindful Interaction: The Category of the Performative Object. *Design Issues*, 23 (1), Winter 2007.
- Niederderer, K. (2009). Sustainability of Craft as a Discipline? *Making Futures*, Vol 1, pp. 165-174. ISSN 2042-1664. Retrieved 31 Aug, 2011, from URL:  
<http://makingfutures.plymouthart.ac.uk/journalvol1/papers/kristina-niederderer.pdf>
- Norman, D. A. (2004). *Emotional Design: Why We Love (or Hate) Everyday Things*. Basic Books.
- OED (2011a, 6 November), *elastic* (3.a.). Oxford English Dictionary Online, Retrieved 6 Nov, 2011, from URL:  
<http://www.oed.com/>
- OED (2011b, 6 November), *plasticity* (1.) Oxford English Dictionary Online, Retrieved 6 Nov, 2011, from URL:  
<http://www.oed.com/>
- O'Callaghan, J. (1992). *Drei Silberschmiede – Drei Länder: The Eloquent Vessel (Robert Foster)*. Köln: Museum für Angewandte Kunst.
- Quast, D and Ü. Tamla. (2010). Two Fifth Century AD Byzantine Silver Bowls from Estonia. *Estonian Journal of Archaeology*, vol.14 (2), pp. 99-122. Retrieved 30 Dec, 2011, from URL:  
[http://kirj.ee/public/Archaeology/2010/issue\\_2/arch-2010-14-2-99-122.pdf](http://kirj.ee/public/Archaeology/2010/issue_2/arch-2010-14-2-99-122.pdf)
- Pollinoro, L. (15.4.2011), *Laura Polinoro, I.E. Creative Affinities*. LPWK Design Studios. Retrieved 30 Dec, 2011, from URL: [http://www.facebook.com/note.php?note\\_id=200511066655534](http://www.facebook.com/note.php?note_id=200511066655534)
- Rabinovitch, S and H. Clifford. (2000). *Contemporary Silver: Commissioning, Designing, Collecting*. Merrell Publishers.
- Roseman, I.J., C. Wiest, and T.S. Swartz. (1994). Phenomenology, Behaviors, and Goals Differentiate Discrete Emotions. *Journal of Personality and Social Psychology*, Vol. 67 (2), pp.206-221.
- Rowling, J.K. (2000). *Harry Potter and the Prisoner of Azkaban*. London: Bloomsbury Publishing.
- Schadt, H. (1996). *Goldschmiedekunst. 5000 Jahre Schmuck und Gerät*. Arnoldsche.
- Sharff, A.. (2011). *Korpus > Birds*. Retrieved 30 Dec, 2011, from URL:  
<http://www.scharff.dk/Korpus/Birds/tabid/431/language/en-US/Default.aspx>
- Shusterman, R. (2011). Somatic Style. *The Journal of Aesthetics and Art Criticism*, Vol. 96 (2), pp.147-159.
- Spillers, F. (2003). Emotion as a Cognitive Artifact and the Design Implications for Products That are Perceived As Pleasurable. *Cognition*, Vol. 7, Pages: 1-14. Retrieved 30 Dec, 2011, from URL:  
<http://www.experiencedynamics.com>
- Stern-Leach. (2007). Laser Weldable Joints. Retrieved 5 Dec, 2007, from URL:  
[http://www.argentiumsilver.info/uploads/Files/reports/laser\\_weldable\\_joints.pdf](http://www.argentiumsilver.info/uploads/Files/reports/laser_weldable_joints.pdf)
- Valcke, J., C. Weber-Stöber, V. Schwarzinger, J. de Laet and L. Janssen. (1993). *A sparkling Party*. Brussels: VIZO
- van Manen, M. (1990). *Researching Lived Experience*. State University of New York Press.

- Wallbott, H.G. (1998). Bodily expression of emotion. *European Journal of Social Psychology*, Vol. 28, pp. 879-896.
- Weber-Stöber, C. (ed). (1992). *Silbergestaltung: Zeitgenössische Formen und Tendenzen*. München, Germany: Klinkhardt & Biermann.
- Weber-Stöber, C. (ed). (1995). 11th Silver Triennial 1995. Hanau, Germany: Gesellschaft für Goldschmiedekunst & Kulturamt Hanau.
- Weber-Stöber, C. (ed). (2001). 13th Silver Triennial 2001. Hanau, Germany: Gesellschaft für Goldschmiedekunst & Kulturamt Hanau.
- Weerdesteijn, J.M.W., P.M.A. Desmet and M.A. Gielen. (2005). Moving Design: To Design Emotion Through Movement. *The Design Journal*, Vol. 8 (1), pp. 28-40.
- Wolters, J. (1996). *Der Gold-und Silberschmied. 1. Werkstoffe und Materialien*. Rühle-Diebener Verlag.