

UMA RELAÇÃO ENTRE TÊXTEIS TRIDIMENSIONAIS E DESIGN DE JOALHERIA

A relationship between three-dimensional textiles and jewellery design

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Resumo: O desenvolvimento de joias está inserido atualmente no campo do design e esse novo posicionamento faz com que seja possível englobar no seu desenvolvimento muito mais que criatividade artística, pode ser associado, por exemplo, a novos materiais e tecnologias. Os têxteis 3D, devidos as suas características físicas e de produção possuem alto potencial para serem inseridos no desenvolvimento de joias.

Palavras chave: Design de joalheria; Têxteis tridimensionais; Inovação.

Abstract: The development of jewellery is currently part of design field and this new positioning makes possible to include in its development much more than artistic creativity, relating, for example, with new materials and technologies. Due to their physical and production characteristics, 3D textiles have high potential to be inserted in to jewellery development.

Keywords: Jewellery Design; Three-dimensional textiles, Innovation.

Introduction

Fashion can put together, into one creation, technology and aesthetics with a highly visible effect. By experimenting different shapes, materials, colours and references the creation is supported through research and study process. Often free of market requirement, fashion design can change rules, break standards, establish closeness to artistic and scientific fields in the search for the new.

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As stated by Cappellieri (2014), jewellery conjugate arts, crafts, fashion and design. To Guilgen & Kistmann (2013) what features the jewel is its adornment function and its symbolic value. The economic value is by exclusivity and innovation. The use of new materials and technologies contributes to the competitiveness of this market and is a key factor in contemporary jewellery, creating new trends.

The jewellery design currently has an unlimited field of activity, in either materials or techniques, as much as related to the market. Combining techniques from other areas is one way to expand this field and although textiles are an area already explored in jewellery, there is still much potential for research and development.

The textile jewellery has already incorporated knitting structures to design, using new materials or new technologies. To develop new products with knitting is necessary art, technology and fashion interaction, according to Black (2005), with the evolution of new technologies as an essential asset for industrial knitting to renovate and refresh. Contemporary jewellery is currently characterized by the production process as creation. The contemporary jewellery also experiment and combine art and technology to express new concepts, perceptions and feelings.

Use the potential of new technologies is a key factor as an exercise to create the 'new' in the contemporary jewellery. This paper aims to present the alliance between textile technology, jewellery and design considering the possibilities of experimental research to design new forms, techniques and technology to emphasize the 3D knitted effects and its potential as structure and material on the development of a textile jewellery collection.

Design jewellery

The strong relationship of jewellery with ornamentation, whose function is aesthetic and symbolic, induced jewellery to be ignored as a product design for a long period. Designers used to give a bad connotation to handmade production processes such as the majority techniques that jewellery production have, which create a barrier for them to approach jewellery development (CAMPOS, 2012).

As the contemporary jewellery started to represent a way of communication, blurring the boundaries between crafts, contemporary art, fashion, and product design it became the result of mixing these fields (GOMES, 2009). The contemporary jewellery is not a static category, but a term that represents a multitude of different objects and ways of thinking these objects.

According to Campos (2010; 2012), the classic definition of jewellery as 'ornaments made of precious materials' seems to address only part of the jewellery production. To Stralio (2009) the jewel is a body adornment, an object full of visual expression, authenticity, wearability and durability since it is made with accuracy and technical quality. Since the last century, the concept of jewellery has expanded, with new forms of ornaments, purposes and materials. The jewel, today, is a product of his time and an expression of social and individual dynamics, developed by those who create, possess and use.

Although design has as principle fulfil a function, its functionality is not only practical. If in arts the production is due to a self-realization, self-expression or to create for a small elite, design aims to improve, enhance or create new products for the whole community. Since arts is used to produce one single piece and design until recently have a mass production, to reproduce pieces is considered as part of the design process. These differences between art and design made jewellery much closer of arts and crafts, and design only recently approached jewellery as a product (COUTINHO, 2011; CAPPELLIERI, 2014; CAPPELLIERI *et al.*, 2014).

According Cappellieri (2014) art and design are undoubtedly distinct categories, although approaching its boundaries. The designer thinks to make people feel something; the artist feels to make people think. Design creates products considering technical aspects, materials, prototype, manufacturing and mass production, integrated with economic aspects.

Besides covering different areas of knowledge in production processes, to Llaberia (2009) the design methodology to create a jewel involves the same parameters for creating products such as a mobile phone, a pen, a watch or a car, considering each technical particularity. The design of a jewel can either be produced with the traditional techniques as a single piece as well as for mass

production, as much as can use unconventional materials and adopt new technologies that come from other areas.

Design work with different proportions and create for architecture, interiors, furniture, lighting and objects, but few designers use to consider jewellery as well. To Cappellieri (2014), the usual lack of a social function and mass production process, which are some design values, could justify reduced interest in working with exclusivity and distinction, values more established for jewellery. However, this line of thinking ignores that function is not restricted to its usability, and the ability to evoke ideas is also part of design proposal. Therefore, by associating style and personal taste, fashion and symbolic meanings to the development of personal items, such as apparel and accessories restricted it to its own fields, parallel to design (CAMPOS, 2012).

As design start to approach fashion began to incorporate some values and meanings, also approaching jewels. The design started considering the choice and diversity of expressions that contemporary jewellery allowed, questioned the traditional jewellery values and expanded the possibilities of jewellery as an object, resulting in different arrangements and multiple forms (CAMPOS, 2012).

Jewellery design is the activity of performing creative solutions, with development and conceptual components, as any product design is developed. To adopt a new product development methodology to jewellery, design seeks to express concepts and values that meet consumers needs and desires, and should also fit a particular time, culture and social context (LLABERIA, 2009; STRALIOTTO, 2009).

Thus, a jewellery collection is designed beyond a solution for a rational production, which considers only the economic principles or use. In a jewellery project, there is the concern on developing a message or narrative, with shapes and colours to approach consumers through emotions. Regarding conceptual aspects, Campos (2007) consider that design guidelines and concepts are elements that distinguish each piece. Each item in a collection, such as ring, earring, bracelet or necklace, not only has its own importance as a single piece and should communicate the concept of the collection, but also must establish a link with the other pieces.

Analysing the current context of jewellery, Gomes (2009) realized that there is a margin between the inventiveness of the artist and the designer functionality, with creations as outcomes of the new cultural, sociological, psychological and aesthetic frameworks. Oliveira (2012) shows that there have been countless individual online projects of product designers who are increasingly taking jewellery over control as a design product.

Investment in new materials and new technologies has opened the door to designers interventions, as these new projects do not require specific knowledge of working with materials commonly associated with jewellery like gold, which require technical knowledge (OLIVEIRA, 2012).

In a time when the boundaries between the areas are extinguishing, cultural influences are multiplying, with the influence of art, fashion, pop culture and street culture strengthening and inspiring new creations. The jewellery, as an individual object, interact with the user and among the crowds, between public and private, because it's able to communicate, connect and cause social interactions. This is a period of opportunity for the contemporary jewellery to expand, creating its own language to illustrate scenarios as diverse as art, design and fashion, public and private (SKINNER, 2013).

In this new scenario, the jewellery design seeks to combine both the traditional techniques of making jewellery and the new technologies. Here it is considered more important the use of a jewel as an object and its meaning for the consumer, than the jewellery as art and object of galleries and exhibitions. Currently the jewel is designed as any other utensils, machines, equipment, tools, furniture etc., since it is also a product developed with design, thought and designed for use by the consumer.

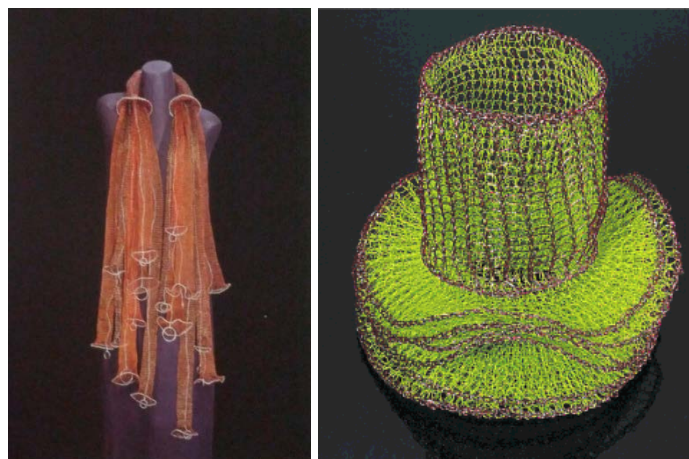
Textile jewellery

The link between jewellery and textiles is certainly not something new. In different times and places, fabric and accessories with hand-stitched metal were found. There are historical examples of items combining metal and textile techniques at different times, countries and continents, from ancient Greece and

medieval Europe to tribal decorations in Africa, as well as Mexico and China. What is surprising is how little these items have in common, apparently occurring at random, with isolated techniques. Most of the items appear to have been produced mainly for ceremonial occasions, richly adorned (MEILACH, 2003; KEAY, 2012).

To Meilach (2003) the use of textile techniques in contemporary jewellery owes much of its popularity to M. Arline Fisch, an innovative jewellery designer and lecturer of international reputation (Figure 1) . In the 60's she began to explore the possibilities of knitting, crocheting, weaving and braiding with silver and gold threads to create flexible elements in their jewellery and body ornaments. In the 80's she used knitting machines and colourful copper wires to produce lightweight tubular structures to body adornments. Her book *Textile techniques in metal*, of 1975, has influenced several generations of designers and artists ever since, and inspired more than a few works on textile, exploring threads and yarn (SEARLE, 2008). In the late 70s, early 80s, many artists start looking for materials like fabrics and fibres, to create lighter forms than using metal or plastic (LLABERIA, 2009).

Figure 1- Necklace Copper Cascade, by Arline Fisch
and bracelet Green + Purple, by Arline Fisch.



Source: SCHICK, 2006 and SEARLE, 2008

Textiles offer a huge variety of techniques that can be adopted for jewellery (Figure 2), with fibres, yarns or ribbons of almost all metals, and techniques such as knitting, weaving, felting, embroidery and sewing (KEAY, 2012; HAYWOOD,

2013). Knitting and weaving fabrics progressively become used when textile designers, such as Mie Iwatsubo and Lyndsey Walters, realized how they could manipulate these materials for accessories and jewellery (BLACK, 2005). The huge range of possibilities that textiles provide have become a popular choice among jewellery designers and have been widely accepted by consumers. Now textile materials are part of present and future jewellery.

Figure 2 - Ring Centaurea Cyanus, by Nora Fok and necklace Whim-Whams, by Reina Mia Brill



Source: CHURCH, 2011 and SCHICK, 2006

Jewellery relations with innovation, technology and materials

The barriers between traditional materials and techniques and contemporary innovations has been broken and the result is a much more fluid and interdisciplinary way to create and use much less conventional materials for jewellery. In this paper the concept of jewellery design considers that the contemporary jewellery support their value beyond the hierarchical value of materials and rely on the context and language used to express its concept.

The jewellery of the twentieth century is characterized mainly by the growth of luxury jewellery and the rise of jewellery design or jewellery of art, where the use of alternative or unconventional materials was a breakthrough (YOUNG, 2012). For Cappellieri et al. (2014) the jewel has been one of the objects that less evolved in terms of materials and production techniques, but its meaning and form have changed radically, which transformed its aesthetic values and its

importance. To Skinner (2013) though, the key role in creating and defining the values of contemporary jewellery is more attached to the use of materials than its concept.

The boundaries between jewellery, art, fashion and design were challenged with the adoption of new materials, and new forms and functions were explored. The use of new materials, such as polymers, paper, non-precious metals, and ceramics, combined with traditional materials is a current practice in the development of modern jewellery and these multidimensional potential of materials results in completely new solutions (YOUNG, 2012; CAPPELLIERI *et al.*, 2014). According Cardoso (2010) the material is one of the biggest challenges for designers and have the knowhow to take advantage of textures, shapes, finishes and modulations can enhance and complement the value of a jewel.

Innovation in jewellery design is not only marked by advances in technology and choice of materials, but also for creative experimentation (STRALIOTTO, 2009; GUILGEN e KISTMANN, 2013). It is often necessary to adapt the new materials to the existing techniques or even adopt techniques from other areas to get new results. The ability to combine techniques and materials and understand the old and new technologies can provide ideas that influence the contemporary jewellery, generating new trends, and stimulate a continued development (BLACK, 2005; GUILGEN e KISTMANN, 2013; CAPPELLIERI, 2014).

It is essential that jewellery designers know well current and traditional technologies and materials that are in use, as much as traditional and innovations in other areas that may transform the production of products, evolving, expanding and changing the way contemporary jewellery is appreciated and interpreted and inspiring new perspectives (OLIVEIRA, 2012; SKINNER, 2013).

The 3D printing is an example of technology adopted from other areas which introduced a new language in jewellery, since with greater precision and quality in details which enable create innovative new shapes and aesthetic (BENZ E MAGALHÃES, 2010). However, the three-dimensionality can come from other fields, with its own materials and technologies, such as knit with 3D effect, with shapes and meanings that can transform the jewellery design.

Three-dimensional textiles in jewellery

The use of new materials in the jewellery not only include this product as part of the design development field, but also brings the possibility of working concepts not yet explored. Considering three-dimensional (3D) textiles as a new material for jewellery, it is necessary to understand its development as well as some classifications and uses.

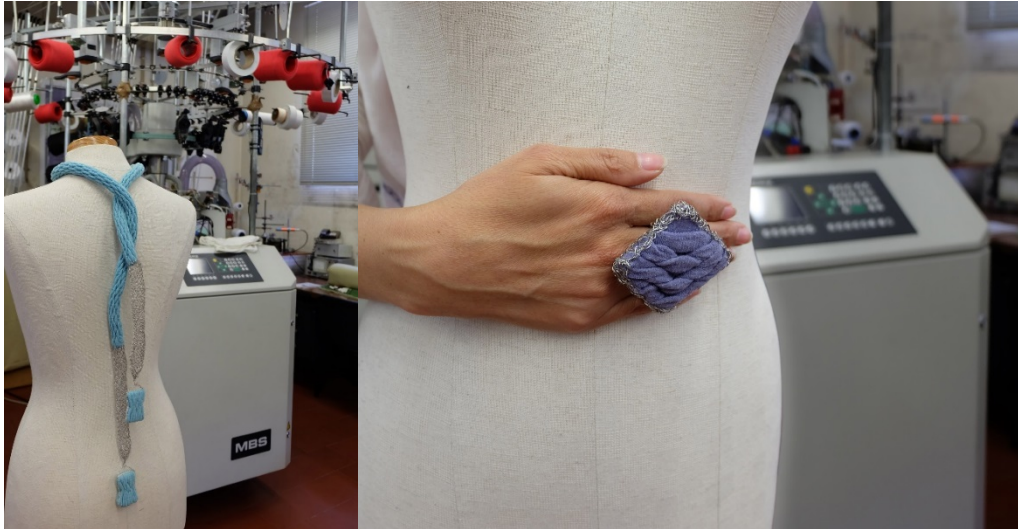
Even though 3D textiles and structures have a recent history, there are some different definitions already. The 3D textiles can be produced with many ways, such as woven, knitted, braided, nonwoven and new structures and technologies are being developed. Ionesi et. al. (2010) define 3D textiles as "a continuous ensemble, with fully integrated fiber, characterized by multiaxial spatial orientation". For Hearle (CHEN e HEARLE, 2016) 3D fabrics can have "an overall 3D shape or a more complex internal 3D structure or both". The 3D forms can be single-layer with an overall shape, multilayer hollow or with an overall shape and solid with multiple layers (CHEN, 2015). This paper considers all these definitions, but will consider any fabric with a third-dimensional shape, surface or effect as 3D fabric.

The interest and applications on 3D textiles are increasing and have potential to cover a wide range of products, but so far it is still applied mostly for technical textiles, such as aerospace, automobile and military, sport and leisure, medial, protection, geotextiles and construction (CHEN, 2015). Fashion design have been exploring 3D textiles on the production of garments knitted with one piece, known as fully-fashion. But its potential goes beyond technical textiles or fully-fashion.

The possibility to create new shapes with a complex structure seems very appealing and 3D effects produced in a single piece through knitting machines show the potential of this material. Maciel (2014) developed 3D knitting effects to be used on a textile jewellery collection reworking techniques from a flat-bed knit machine to a seamless knit machine (Figure 3). The development of three-dimensional (3D) effects by weft knitting was stimulated by the opportunity to

manufacture it with techniques and materials used in conventional knitting to produce a textile contemporary jewellery collection (MACIEL, 2014; MACIEL *et al.*, 2014). But other technologies and structures can also be explored to develop jewellery with 3D textiles, like weaving, braiding and nonwoven.

Figure 3 - Necklace and ring from the Knitting with 3D effects jewellery collection



Source: Maciel, 2014.

Conclusions

Considering the definitions presented on contemporary jewellery and its functions, it is clear the use of the term jewellery design. Considering jewellery as a design product is easier to understand its concepts and need to explore new materials and technologies in the development of this type of product.

Despite 3D textiles being associated with technical textiles, to include jewellery as an application show many other possibilities of development and applications. By associating new ways of working 3D textiles in jewellery collection, it shows that is possible to develop collections with innovative concepts and values on both fields, textile and jewellery. The potential of three-dimensional textiles has an ongoing range of techniques and functions yet to be explored on jewellery.

The three-dimensional textile design is a field with vast potential to be explored. Countless possibilities are right at sight and it is vital to include and

stimulate more designers to keep researching and therefore improving the vast universe of textile and, more specifically, three-dimensional textile surfaces. The challenge of 3D textiles to keep developing to its full potential might rely on being explored for new applications and uses.

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References

BENZ, I. E.; MAGALHÃES, C. F. D. Interação entre design de joias e novas tecnologias. P&D Design, 2010.

BLACK, S. **Knitwear in fashion**. New York: Thames & Hudson, Inc., 2005. ISBN 0500284016.

CAMPOS, A. P. D. A joalheria contemporânea e as fronteiras da arte e do design. V Encuentro Latinoamericano de Diseño 2010, 2010, Buenos Aires. Facultad de Diseño y Comunicación.

_____. Pensando a joalheria contemporânea com Deleuze e Guattari. **Revista Trama Interdisciplinar**, v. 2, n. 2, 2012. ISSN 2177-5672.

CAMPOS, M. A. D. M. S. **A pesquisa de tendencias: uma orientação estratégica no design de joias**. 2007. Pontifícia Universidade Católica do Rio de Janeiro - PUC-RIO, Rio de Janeiro.

CAPPELLIERI, A. **DIGITAL ARTISANS: THE FUTURE OF DESIGN AND CREATION**. RYSMAN, L.: Art Jewelry Forum 2014.

CAPPELLIERI, A.; DEL CURTO, B.; TENUTA, L. **Intorno al futuro. Nuovi materiali e nuove tecnologie per il gioiello - Around the future. New materials and new technologies for jewellery**. Venezia: Marsilio Editori, 2014. ISBN 9788831718622.

CARDOSO, A. C. D. **A jóia como complemento da moda.** 2010. (Mestrado em Design de Moda). Faculdade de Arquitetura, Universidade Técnica de Lisboa, Lisboa.

CHEN, X.; HEARLE, J. **3D Textiles: Modelling, computerized manufacture and applications.** 3D fabrics & their applications. Roubaix, France: ENSAIT: 21-30 p. 2016.

CHEN, X. E. **Advances in 3D Textiles.** Elsevier Science, 2015.

CHURCH, R. **Rings,** London, V&A Publishing, 2011.

COUTINHO, S. C. **Joalheria no Corpo Urbano.** 2011. (Mestrado em Design de Ourivessaria). Escola das Artes, Universidade Católica Portuguesa, Porto.

GOMES, A. F. R. **O design do adorno contemporâneo: da tradição à inovação.** 2009. (Mestrado em Design). Departamento de Comunicação e Arte, Universidade de Aveiro, Aveiro.

GUILGEN, C. D. A.; KISTMANN, V. B. Materiais e processos não-tradicionais utilizados no design de joias contemporâneo. Anais: Colóquio de Moda - 9º, 2013.

HAYWOOD, J. **Mixed Media Jewellery: Methods and Techniques.** 1º. London: Bloomsbury, 2013. ISBN 9780713688672.

KEAY, S. **Jewellery using textile techniques.** London: Bloomsbury, 2012. ISBN 9781408101070.

LLABERIA, E. M. **Design de joias: desafios contemporâneos.** 2009. (Mestrado em Design). Design, Universidade Anhembi Morumbi, São Paulo.

MACIEL, L. **Joias em malha com efeitos 3D: estendendo os limites da tecnologia.** 2014. 113 (Mestrado em Design e Marketing). Departamento de Engenharia Textil, Universidade do Minho, Guimaraes, Portugal.

MACIEL, L.; CATARINO, A. P. A. W.; ROCHA, A. M. **Knitted jewelry: extending the limits of technology.** Transition: Re-thinking Textiles and Surfaces. Huddersfield, UK: University of Huddersfield 2014.

MEILACH, D. Z. **Art Jewelry Today.** Schiffer Pub., 2003. ISBN 0764317660.

OLIVEIRA, L. A. G. D. **Joalheria, corpo e design**. 2012. (Mestrado em Design Industrial). Faculdade de Engenharia, Escola Superior de Artes e Design - ESAD Universidade do Porto, Porto.

SEARLE, K. **Knitting Art: 150 Innovative Works from 18 Contemporary Artists**. Voyageur Press, 2008. ISBN 1616731273.

SCHICK, M. **500 Necklaces: Contemporary Interpretations of a Timeless Form**, New York, Lark Crafts, 2006.

SKINNER, D. E. B. **Contemporary jewelry in perspective**. New York: Lark Crafts, 2013. ISBN 9781454702771.

STRALIOTTO, L. M. **Ciclos: Estudo de casos de ecodesign de jóias**. 2009. (Mestrado em Design). Faculdade de Arquitetura, Universidade Federal do Rio Grande do Sul, Porto Alegre.

YOUNG, A. **The workbench guide to jewelry techniques**. London: Thames & Hudson, 2012. ISBN 978-0-500-51514-3. Disponível em: < www.thamesandhudson.com >.