

APPROPRIATENESS AND APPROPRIATION: EXAMINING MODERNIST COUTURE
CONNECTIONS TO EDWARDIAN LINGERIE AND BOUDOIR CLOTHING

by

Anna Kari Zykowski

(Bachelor of Applied Arts: Fashion, Ryerson University, 2001)

An MRP presented to Ryerson University
in partial fulfillment of the requirements for the degree of
Master of the Arts in the Program of Fashion.

Toronto, Ontario, Canada, 2013

©Anna Zykowski 2013

AUTHOR'S DECLARATION FOR ELECTRONIC SUBMISSION OF A MRP

I hereby declare that I am the sole author of this MRP. This is a true copy of the MRP, including any required final revisions. I authorize Ryerson University to lend this MRP to other institutions or individuals for the purpose of scholarly research. I further authorize Ryerson University to reproduce this MRP by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research. I understand that my MRP may be made electronically available to the public.

Abstract

This research explores material artifacts of Edwardian lingerie and Modernist couture through their cultural and material connections. Material culture theories of communication and production were used to examine garment artifacts from both Eras, while a conceptual framework provided a space to develop material outcomes and knowledge based upon research. Key findings from the research show that the cultural commodification of the female body, increased female agency and the fragmentation of social structures resulted in the development of specialized garments uniquely suited to the cultural requirements of the Modernist Era. Cultural producers continually adapted design practices and transformed dress signifiers of value in a cycle of appropriation and transformation. In addition, the appropriation of labour intensive Edwardian Era Lingerie techniques by Modernist couture houses supported the development of exclusive commodities whose design process was key to preventing devaluation through counterfeiting. Ultimately, a collection of garments resulted from a design exploration of these techniques, using action and practitioner research.

Acknowledgments

I would like to express my greatest gratitude to the people who have helped and supported me throughout my project. I am grateful to my teachers, Bernie Murray and Henry Navarro, for their support during the project, through ongoing advice and encouragement. I wish to thank my parents, Amy and Edmund Zygowski, for their undivided support and interest. They inspired me and encouraged me to go my own way. Last but not least, I want to thank Ian Pettigrew who motivated me and without whom I would be unable to complete this project.

Table of Contents

1. Title page	
2. Author's Declaration.....	ii
3. Abstract.....	iii
4. Acknowledgements.....	iv
5. Table of Contents.....	v
6. Introduction.....	1
7. Definitions.....	4
8. Literature Review.....	5
9. Creative Project.....	11
10. Methodology.....	12
11. Case Study 1.....	15
12. Case Study 2.....	20
13. Case Study 3.....	24
14. Creative Practice Outcome.....	28
15. Conclusion.....	34
16. References.....	36
17. Appendix a: Tables 1, 2 & 3.....	39
18. Appendix b: Process Work. Figures 1-34.....	51
19. Appendix c: Digital Collage Work. Figures 1-11.....	59
20. Appendix d: Images of Finished Artifacts. Figures 1-33.....	62

Introduction and Background

On Vionnet's design process, Bryant (1991) stated that "something stimulated her to re-think the way such simple dresses ought to fall over the body" (p. 1). This explanation for material innovation and creative production in Modernist fashion spurred this investigation into more fully understanding couture cultural production processes. In order to study how physical outcomes resulted in fashionable innovation, the present research began by looking at material artifacts through a scholar to practitioner perspective to discern patterns and similarities. Spurred by this question of innovation and origin, connections were explored which link Edwardian lingerie to Modernist garments, while material culture theory helped to articulate how cultural producers transformed existing garment techniques to communicate the social and cultural requirements of the Modernist Era.

Clothing at its most basic is "a material form made of cloth draped or wound around the body" (Loschek, 2009, p. 17). It occupies space and covers the body's surface and form through fit. These material forms are a result of processes that transform pliable materials into three dimensional shapes. The processes leave marks and create shaped elements, such as pleats, to sculpt soft fabric into forms that dress the body. This mark making on the covered body has evolved into a set of systems and methods of pattern design for developing styles of dress (Lee & Keoh, 1995). These methods are used by fashion designers so that clothing communicates as a cultural object in the form of aesthetic value (Baudrillard, 1993; Simmel, 1904), as knowledge and ideas (Campbell, 1997), as signs of status, propriety and identity (Veblen, 1992) and as vehicles of semiotic meaning (Bourdieu, 1993). As systems of signification, pattern-making methods are projected by the fashion designer onto cloth or pressed out of material from one place to another (Bernard, 2007; Loschek, 2009). Dress codes and clothing choices such as skirts

and pants have historically played a central role in constructing gender class and social standing; as a result, clothing design has become a method for reinforcing or challenging difference (Fields, 2007). The tension that results from changes or appropriation of conventional clothing through systems of design, such as creating a suit jacket without sleeves, challenges expectations and results in the communication of a new semiotic message (Loschek, 2009). Clothing as fashion thus is an “interface between creation and social communication, between form and medium” (Loschek, 2009, p. 18). This complex interplay is experienced when the designer develops garments through the material process of pattern design, as well as when customers, curators and stylists interpret and consume the garment as a cultural object.

Early twentieth century fashions are an example of clothing communicating as cultural objects to express social attitudes of the Era (Fields, 2007; Wilson, 1985). From 1901-1915, the Romantic ideal of the female corseted figure was dominant. Women’s clothing then served to display a social competence by correctly embodying a variety of cultural expectations through dress and appearance. As a result, an upper class socialite wore different dresses, coats and accessories for specific times or occasions during the day. Garments like the afternoon dress were worn according to specific functions or situations. Women used these specific garments to “fulfill a cultural requirement to define ever-shifting social identities” (Breward, 2003, p. 63). This display of social competence through the clothed body extended to both public and private spheres in a woman’s life and resulted in the emergence of a multiplicity of specialized clothing forms to support Edwardian social codes.

Modernist fashion, which emerged after 1916, represented cultural ideals and expectations, and opposed Edwardian values. In 1925, Bizet (as cited in Fields, 2007, p. 41) said of Modernist fashion, “every aspect of female dress has not only changed but become the mirror

opposite of what it had been in 1900.” This dramatic and sustained change to conventional clothing implies material evidence of larger social changes (Fields, 2007; Breward, 2003). Black (2012) connects this aesthetic break with Edwardian clothing conventions to accelerated change in Modernist society and industry through the events of WWI and WWII. Material artifacts developed by society and industry represent a record of the material conditions from this period. Designers such as Poiret, and the Callot Soeurs, drew upon these changes by dispensing with the rigid corset, both influencing and reacting to social and cultural changes through the development of new forms of fashion (Fields, 2007). Drawing upon these fashion scholars, this research seeks to understand the influence that social attitudes exerted upon the material processes of pattern design as the Edwardian Era gave way to Modernism, considering that traditional approaches to garment design may not have communicated the desired forms. The hypothesis of this study is that new or appropriated material processes for building garments and communicating social expectations may have emerged to reflect the new attitudes of Modernism.

Thus, this major research project will explore the following question: How did Modernist fashion designers modify and transform existing Edwardian traditions of pattern design to convey Modern social attitudes?

1. How did Edwardian social attitudes shape clothing forms and construction techniques?
2. How did Modernist social attitudes shape clothing forms and construction techniques?
3. What new types of fashion design processes during Modernism emerged in connection to prior techniques from the Edwardian Era?

Definitions

Social Attitudes - cultural ideas about appropriateness, modesty, morality, gender and value.

Pattern Design - a system of methods and techniques used to facilitate garment design, such as flat pattern making and draping. Fit, grain line alteration, ease and seam placement become opportunities to modify and augment existing forms into new ones.

Pattern Construction Methods - assembly methods that form material into shapes for the body. Assembly may occur through sewing, joining, through wrapping, tying, twisting, interlocking, spiraling or inserting fabric.

Edwardian Era - a style and ideology in the early twentieth century that romanticized nature and classical forms of beauty.

Modernist Era - a style and ideology of art, fashion and writing, popularized in the early twentieth century, which romanticized urbanity. More specifically, Modernism can be thought of as referring to the philosophy of modern art. A salient characteristic of Modernism is self-consciousness. This self-consciousness often led to experiments with form and artworks that draw attention to the processes and materials used and further advanced a tendency to abstraction.

Visual Language - a system of communication using visual elements and semiotic signs. Cherry (1968) argues human communicative activity includes the visual. Vestimentary garment schemata and concepts with which we can structure, perceive and recognize an item of clothing and communicate about it.

Sign- a discrete unit of meaning in semiotics. It is defined as something that stands for something to someone. It includes words, images and essentially all of the ways in which information can be communicated as a message.

Semiotics- is the study of signs and sign processes.

Design Research- an accessible systemic inquiry based on the practice of designing that uses analysis and synthesis to discover new knowledge

Literature Review

The examination of visual language, and the theories that accompany how language is communicated, is necessary to provide a deeper analysis of pattern design. Visual language is a system of communication using visual elements that represent concepts or convey meaning. Visual elements or structural units include form, shape, line, texture, motion, pattern and scale. Similar structural units are used in garment and textile terminology to express the structural building blocks of garments such as seam, stitch line, drape, form and fit. Ehrenfel's theory of gestalt from 1920 was a key theory in the study of visual language and was available for visual analysis during the Modernist Era. The Gestalt Theory examines how the perceiving eye seeks out simple and whole shapes by drawing together unifying elements or recognizing discordant visual elements. King and Wertheimer (2005) supported and built upon Ehrenfel's theory by noting that the mind expects to visibly connect elements in complex visual images and is always seeking to contextualize and discover meaning. Kandinsky (1947) showed that lines and marks can be expressive without any association with a representational image. These theorists and artists explored perception, expectation and form in visual language. Driscoll (2007) drew upon Foucault, Adorno and Wilson to contextualize a new proximity and alignment of avant-garde art with Modernist fashion, noting it was simply impossible to keep art neatly apart from fashion.

Another aspect to consider is the semiotics of visual language. Semiotics is the study of signs and symbols in verbal, written and visual languages. Barthes (1983), Baudrillard (1993),

and Saussure (as cited in Eco, 2007) explored how the mind judges and processes objects through the perception of signs. These signs and codes are then transformed into codes based upon cultural and social influences. Visual signs can have denotations and connotations of meaning in ways that are similar to words. Theories developed by Davis (1992), Lurie (1981) and Eco (1973) investigated this sign system or code within the context of fashion. Fashion sign codes are heavily context dependent (Davis, 1992) but rooted in constructs we expect to see, for example like pants or a jacket (Loschek, 2009). Subtle alterations in meaning occur when socially constructed forms, such as a trouser leg, are only slightly different. Humans perceive and build upon shape, stitching and context resulting in signs and symbols. Lurie (1981), Barthes (2007) and Loschek (2009) also connected semiotics to dress details and to the visual language of design elements within garment design.

In addition to visual language and semiotic studies, dress studies provides an understanding of visual language. Attitudes about the dressed body in turn shape attitudes about making and expressing ideas through pattern making. Entwistle's (2007) sociological theory of dress as a lived experience draws attention to wearing and using garments as an activity that is embedded within social relations in which "becoming a competent member involves acquiring knowledge of the cultural norms and expectations demanded of the body" (p. 275). Entwistle's research built upon Foucault's social theory of the body shaped by culture. This theory suggests that codes of dress require a competency of norms and expectations to maintain social status. This theory may extend to fashion designers and the maintenance of status through their competency in recognizing emerging norms and activities, such as sports and leisure, as designers apply those norms to pattern design. In this way, designers' statuses are tied to their ability to translate and identify value based dress codes for cultural consumption. Other theorists

such as Flugel (1930) and Mauss (1922) also attempted to address a philosophy of dress studies. Flugel's premise that fashion shares an evolutionary path like that of Darwin's biological evolution discussed ornamentation as a vestigial artifact of functional design. The concept of the evolutionary path in fashion may be applicable to identifying the origins of techniques used in Modernism. Modernist designers may have co-opted or transformed techniques from the Edwardian period, in a manner similar to Darwinian evolution. These theories on dress and the body attempt to describe how the material requirements of dress are appropriated in particular times or places outside its original purpose.

Crane and Bovone (2006) outline approaches to studying material artifacts through material culture theory. This is a key theory that supports a scholar-to-practitioner perspective, linking culture to the objects we make through an analysis of cultural, social and organizational influences. Entwistle (2007), Breward (2003) and Hall (1973) further connect the production of material artifacts to power, value and meaning. Hall (1973) contextualized the process of production as itself an artifact influencing the intended message, such as in the case of a particular effect of musical recording, or seams and stitches used in a certain way to make a garment. Entwistle (2007) argued cultural production innovation is an outcome of symbolic values manipulation in the form of dress signifiers carefully curated and arranged to resonate with consumers of culture. In a fashion context, Breward (2003) called physical seams and structures permanent physical evidence of the need by cultural producers to embody a cultural or fashion moment. For Barthes (1983), this arrangement of costumes becomes a syntax of clothing. Connotative signifiers communicate to make garments appropriate for certain situations, while material culture theory frames the study of material artifacts as the process of communication and production, commodification and consumption.

Fields (2007, p. 2) identified the division between male and female dress in the early twentieth century as fundamental to the way we dressed our bodies. She further specified dress code signifiers, such as underwear and outerwear, as important parts of the gendered fashion system where “intimate apparel is critical to making bodies feminine.” Fields’ scholarship on female dress, lingerie and changing ideals of femininity offer a crucial contextualization of changing social attitudes with direct references to material, ornamentation and construction. She stressed the need for close textual analysis of garments as material artifacts. This connection between social attitudes and material processes is supported when Black (2012) says: “The changing mores of society, as well as developments in fibers, can be read from the evolution of underwear, sportswear and especially bathing costumes” (p.81). Fields also drew upon Barthes’ concept of “appearance-as-disappearance,” a theory that addressed the tension resulting from gendered expectations of modesty and eroticism through bodily concealment and display. She asserted that the general practice of linking modesty to concealment and eroticism was challenged and destabilized in the early twentieth century, through the creation of new sites of display on the body.

Martin & Koda (1993) further connect properties of lingerie, such as soft construction techniques and ‘processes of lingerie,’ to Modernism through the couture work of the Boue Souers and the Callots. Citing designers Chanel and Vionnet, they briefly touch on early twentieth century material transition between underwear and external dress. Black (2007) and Debo (2012) also connect the rise of simplified female attire and working class chic as leisure wear, through Chanel’s and Schiaparelli’s use of fine jersey under-garments from the Edwardian Era. Modernist designer vocabularies emerge through object analysis of actual garments, through biographies, designer histories and design scholarship. Bryant’s (1991) examination of Vionnet’s

methodology, which involved draping on fabric on a small-scale wooden mannequin, clarifies how her garment's final design appeared so sculptural and three-dimensional. Vionnet's cuts used simple shapes to mimic nature which resulted in formations that expressively shaped and wrapped around the body. As a result, many of Vionnet's designs do not have traditional side seams or overarm seams on kimono sleeves. Bryant also illuminates Vionnet's innovative use of pin-tucking to obscure and support structural seaming. Bryant provided pictures and descriptive evidence of Vionnet's constructive outcomes that resulted in interrelated structures, seams and silhouettes that represented each other through repetition. For example, triangles were used as pattern piece shapes but were then echoed along a seam edge or as surface decoration. The structure and silhouette of clothes could then be further interrelated through visually harmonious combinations of shape, fit and design. Kirke (1998) also studied Vionnet and examined her theory that the body is an abstract volumetric element composed of geometrical shapes, and that dress parts should correspond to these forms. This approach was based upon Modernist visual art ideas about the body in movement, it inspired Vionnet to achieve a cohesive relationship between pattern making and elements of visual design. The shapes were derived from an anatomical study of the body itself, these shapes could cover a whole part of the body, or partial planes. Chanel similarly explored garment making through a close relationship to the art world. She explored concepts of taste, individuality and simplicity through the subversion of material hierarchies and shapes, while also experimenting with dress signifiers (Driscoll, 2007; Debo, 2011).

Pattern making methods for garment design are found in technical books. For example, Bray's (2003) book for drafting coats, pants and vests is divided into systems of design and

construction. She focused pattern drafting systems to address gendered and occupation based garment designs. In her book, styles and methods of pattern manipulation are presented on the body in particular contexts in support of recognizable style formats. These styles reflect notions of fashionable and appropriate dress, including the jacket, trouser and skirt. Bray's system divided the body into quarters and places seams along major contour changes on the body, such as: the side, the waist, the bust and the shoulder. Embedded within these traditional style systems are techniques for building garments in new contexts. However these technical books provide no information about connecting current systems of signification to the material processes of pattern design. An investigation into texts and processes that support the design of objects other than garments would contribute to this body of knowledge, as a multiplicity of design approaches contextualizes expression and meaning through pattern-making.

Aldrich (2007) presented a method for the appropriation of flat pattern making techniques that shifted the emphasis away from systems and styles in favor of creative draping and volumetric effects produced by the fabric. She encouraged distorting simple shapes through slash and spread techniques and the re-appropriation of systems of design for spatial explorations in fabric. She positioned the body as an abstract form, referring to arms and the torso as a cylinder with moving cylinders attached to it (Aldrich, 2007). Her method was borrowed or appropriated from geometric shapes in traditional folk costume clothing, as well as modern Western body fitting shapes, and is intended as an educational problem solving manual (Aldrich, 2007). Other sources of pattern designing that provide clear representations of visual ideas expressed through pattern making are found in Nakamichi's (2011) pattern work. She used basic pattern making elements, such as slashing and spreading, to express poetic ideas described as floating balloon or black hole (Nakamichi, 2011). Her application of origami and puzzle like structures replace

emphasis on style with a focus on sculpting puzzles with cloth. The designer Margiela also used pattern making to express ideas (Loschek, 2008). He experimented with traditional methods of jacket and shirt making and warped pattern elements, which re-contextualized the original structures. He appropriated forms that resembled occupational clothing and used the methods to express ideas about social constructs. The difference between these designers lies in the material manipulation of dress signifiers, forms and social constructs through pattern design. Vionnet shifted emphasis to the body and the physical properties of the fabric, whereas Margiela investigated the semiotic norms and expectations of vestimentary constructs. Nakamichi's focus on pattern making methods as a puzzle structure provides another example of the pattern designer building and shaping through visual language.

Creative Project

The creative component of this study conceptually investigates the idea of the 'chimera.' The chimera is described as a mythical animal with parts taken from various animals or, more generally, as an imaginary monster comprised of incongruous parts. In terms of fashion design process, this re-arranging of forms, the opposition or incongruency between the parts expressed in the chimera, conceptually demonstrates the change that occurs in pattern design during the shift from Edwardian to Modernism. The garments will develop from using self study methods, such as sketchbook documentation and experimental design, to express how the chimera embodies the relationships between social attitudes and pattern design.

Methodology

Practice based research is qualitative research, in that it produces findings not arrived at by statistical procedures or other means of quantification (Strauss and Corbin, 1998). Johnson (2007) proposed that practice can provide a foundation of knowing when conducted as a form of inquiry in conjunction with reflection, critique and creativity. He valued the understanding and knowing that develops during the practice of design through reflection upon action. Gray and Malins (2004) further contextualized the necessity of using a variety of established and experimental methods to collect data within practice based research. Forms of data could be incomplete artifacts, sketches and experiments. The outcome of practice research is the artifact, which is evidence of knowledge made during practice (Bye, 2010). A problem-based design framework for design scholarship is a systemic inquiry based on the practice of designing. This begins with a clearly defined aesthetic or design problem using analysis and synthesis to discover new knowledge (Bye, 2010). Bugg (2006) outlines a qualitative practice based conceptual framework with which to develop new understanding in fashion design, while building concept and context based garments through case study, visual analysis and design through knowing. This framework is particularly suited to the research subject because it bridges the gap between scholar and practitioner perspectives. The resulting material outcomes are a response to the research. This outcome is documented via practice based progress and findings with photography. This creative project uses and modifies Bugg's conceptual model by replacing Bugg's interviews with case studies. In addition, Bugg develops her own garments, which she calls case studies. Bugg investigated her hypothesis by exploring meaning through form and content. This creative project will also explore meaning through form and content, but the garments developed will not be called case studies, they will be called artifacts.

Hypothesis

Modernist couture designers appropriated and reinterpreted Edwardian inner wear material processes as a cultural production response to changing social attitudes. This hypothesis explores a causal relationship between social change and the pattern design innovation of Modernist designers. Traditional pattern design methods may not have conveyed the correct expressive characteristics, leading Modernist designers to modify techniques from unexpected sources.

Relationships are established by:

Investigating how Edwardian social attitudes shape clothing forms and construction techniques through a qualitative case study and visual analysis. Comparison tables cite specific examples of social change and garments. Based upon the knowing of practice based research, relationships will be developed through a visual component such as self-study documentation in a sketchbook.

A qualitative case study will be employed to identify how Modernist social attitudes shape garment design and result of cultural change. This is followed by comparison tables which collate data through visual analysis.

Hypothesis is explored by:

Visual analysis of material artifacts from each Era is carried out through case study research. Exploration of the change that occurred between Edwardianism and Modernism is accomplished through development of garments, while a photographic record of the process and of the garments gives concrete form to exploration of the hypothesis. This explores how material artifacts embody relationships between social attitudes and garment design.

Research Component

A qualitative case study exploring how Edwardian social attitudes shape clothing forms and construction techniques. A comparison table will be used to support this component.

A qualitative case study exploring how Modernist social attitudes shape clothing forms and construction techniques. A comparison table will be used to support this component.

A qualitative analysis using mixed methods will examine new types of fashion design processes that emerged during Modernism and in connection to prior techniques in the Edwardian Era. These mixed methods are visual and comparative analysis.

Practice Based Component

The allegory of the chimera conceptually embodies my research by demonstrating the relationship social attitudes have to pattern design. To develop the chimera as an artifact of practice the researcher will use mixed methods such as self-study and action research. Within the research component, six main overarching themes will be identified and tables will be developed.

Self-study documentation in a sketchbook will organize these themes and collect images and technical process information under those headings.

Within each theme different techniques will be explored through collage and sketching. Technical processes, such as unusual ornamentation and seam constructions, will be physically built through action research and recorded within the sketchbook.

Based on reflection during practice, three dimensional components will be draped using researched pattern processes. These components will be documented using photography for visual analysis. Analysis and reflection will be established by cross-referencing back with the research component, in order to show that relationships between social attitudes and pattern design are clearly represented.

Component ideas that represent the hypothesis will be translated into fully finished garment artifacts. Patterns developed during the process will be documented and represented as part of the process of ‘knowing.’

Six garments will be constructed as artifacts of the research. The resulting garments will be photographed to document how the garments interact with the body.

Anticipated Outcomes

This research may result in an analysis of how aspects of garment production function as a reflection of cultural attitudes in society. In general, the project aims to link scholarly fashion research to practitioner outcomes. Research documents that Edwardian and Modernist garment design within a material culture theories framework—combined with a creative project that implements these findings—will explore techniques and modes of couture fashion production to convey semiotic meaning. The final work may make a compelling case for the connection between class, gender and social attitudes, as well as showing the cultural production of material artifacts within garment design hierarchies. The presentation of the garments and the research project may provide practitioners with a greater understanding of how to apply, appropriate and combine material production techniques from different Eras, in the context of producing cultural meaning.

Case Study 1

Garments are material evidence of fashionable change and development (Breward, 2003, p. 65), and they are a visual outcome of the need by cultural producers to embody a cultural or

fashion moment. Physical seams and structures from garments, such as Edwardian underwear garments, represent physical evidence and can be studied as material artifacts of social change and material innovation. Fifteen Edwardian undergarments, such as negligees, slips and teagowns (Appendix a, Table 1 and 3), are discussed, and exemplify the production of cultural meaning between 1901-1915.

Edwardian companies such as the Callot Soeurs, the Boue Souers, and Doucet had production divisions within their fashion houses which specialized in lingerie, daywear and eveningwear formats (Champsuurs, 2012). Daywear disciplined the body with tailored forms and corsetry so that the body's form was shaped to be acceptable (Loschek, 2009). Traditional dressmaking employed side seams and darts to control and shape, this was well suited to displaying the corseted body. However, clothing forms for public and private spaces were very different in both form and function. Many respectable women saw their sartorial role as a direct expression of her husband or father's social standing and, as such, Edwardian female sexuality was expressed via modesty and maternity (Barthes as cited in Fields, 2007; Craik, 1994). In private spaces her sexuality was also governed by those expectations, resulting in Edwardian underclothes and nightdresses which mediated social requirements by obscuring the uncorsetted body in simple voluminous and overdecorated shapes (Craik, 1994; Martin and Koda, 1993). Undergarments were seen as secret garments, revealed only in private bedrooms or hidden under daywear (Steele, 2009). Edwardian lingerie forms visually and structurally evolved to be different from Edwardian daywear. Distinct material and technical vernacular emerged as a cultural response to answering the requirements of 'being acceptable' in this private space. Thus, the complex rules of sexual conduct in private spaces had a material outcome, that of negligees,

peignoirs and decorated bed jackets, “which were short hand for moral qualities” (Craik, 1994. p. 28). Appendix a, Tables 1 and 3 show the majority of these garments were covered in handwork and their general shapes were based upon very simple rectangles, tube and cone shapes. In contrast (Appendix a, Table 1) daywear forms were more fitted and less excessively decorated.

Key observations of Edwardian material artifacts are:

Dress signifiers associated with femininity were prominent. These signifiers were ruffles, lace insets, tucks, gathers, fagoting and applique, typically in combination with each other.

A multitude of lingerie and undergarment shapes dressed the body.

Bias was used in conjunction with decorative detailing to create garment movement.

Soft volumes obscured, rather than constricted, the naked body.

The movement of garment details was intended to draw attention to parts or all of the body.

The display of lace as a form of conspicuous consumption led to fabric simply supporting the lace and decorative details. Large panels or planes of decorated fabric, uninterrupted by seam lines, emerged as a showcase for lace and handwork.

An aesthetic of Romanticism remained prominent until around 1915.

This lingerie materially and symbolically represented male ideas of how women should display their uncorsetted bodies. Frilly, frivolous petticoats and intimate apparel forms developed, hidden from public scrutiny, in a “hermetic and rich” environment (Martin and Koda, 1993). Tables 1 and 3 (Fig. 4, 11 & 12) show that all of the garments for the bedroom, such as nightgowns and peignoirs, are the loosest, most decorated and the most sheer. Lingerie covered the naked body with dress signifiers that connoted femininity, sexuality and modesty, making it appropriate for a particular social space. These connoting signifiers were expressed materially through large bands of lace, handwork, godets and decorated gussets (Appendix a, Table 3, Fig.

1-6). Heavy ornamentation can be found on negligees, large planes of fabric were decorated with feminine details, which were then placed on the bias. When we look at the negligees in Figures 3, 4 and 5, simply shaped garments are modified by softly gathering fabric lengths and tiered cone shapes full of godets or ruffles (Martin and Koda, 1993). In addition, the garments on table 2 are materially distinguished as feminine by coded surface ornamentation via expensive lace, white on white translucent layering, and highly embellished edges (Davis, 1992; Eco, 2007). These coded surfaces “attracted attention as the body moved” functioning to draw attention to certain areas and openings on the garment while identifying the obscured body as female (Cunnington & Cunnington, 1951, p. 58; Davis, 2007). Barthes theorized that the ‘hidden or hinted at,’ in the context of Edwardian lingerie, might have been seen as more erotic than actual nudity, since a woman’s sexual modesty was the Edwardian ideal. The resulting effect is an Edwardian female figure shrouded in mystery and modesty, through the use of translucent and opaque lace and volumes of fabric making the body appropriate.

Long petticoats and daytime slips were also decorated, these comparatively plain but form fitting undergarments were embellished at the hems and edges so that when worn under daytime garments these borders were seen and revealed as the body moved. The continued importance of voluminous daytime skirts resulted in a proliferation of ruffles, gathers and fullness of all kinds in petticoats and skirt hems. Bodice fitting slips also answered the need to display a trim corsetted waist, incorporating bias panels, gores and gussets. This decorated daytime underwear constituted a sexually charged form of clothing, suggesting a blurring of boundaries between private and public spheres. This clothing pushed at the contested political and social borders of appropriate and respectable conduct for women in Edwardian society. While men exerted influence via the Male Gaze and Patriarchy, an emerging Modern Woman

also exerted her influence (Craik, 1994). The Modern Woman “saw contemporary dress and its reform as a vehicle for furthering debate on sexual and social emancipation” (Breward, 2003, p. 54). These topics of debate were linked to rapidly changing ideas about female agency, female participation in active sports, as well as comfort (Craik, 1994). The resulting underwear shapes, which obfuscated the female body, and the ornamented material structures, which revealed it, were material responses to satisfying the governing cultural tastes of displaying the female body in private spaces.

The proliferation of increasingly elaborate undergarments and boudoir clothing was also the result of an expanded definition of acceptable public and private spaces available to women for entertaining, sport and leisure. The Edwardian focus on entertaining uncorsetted, in a more casual or informal environment within the home, presented a new space that required appropriately dressed bodies. This blurring of private and public spaces resulted in apparel emulating undergarments by 1900, leading to new interpretations of the teagown (Martin and Koda, 1993). The fashion for women to receive guests in their private rooms in ‘dishabillee,’ or without corset, was not exclusively an Edwardian one. Precursors exist in the late Victorian period via the Rational, Aesthetic and Reform Movements, as well as through more avant-garde uncorsetted garments from the Weiner Werkstatte. However unlike previous movements, the taste makers of the Modernist Era, not the avant-garde, popularized and made appropriate an uncorsetted tea gown shape by fusing shapes and surfaces found on undergarments with shapes more like day-wear. Appendix a, Table 3, Fig. 7 and Fig. 8 are examples of the Edwardian tea gown, which mediate between conspicuously displaying the wealth of a woman’s husband via dress signifiers and material luxury and a more casual uncorsetted shape (Roach and Eicher, 2007). The teagowns share a similar level of material and ornamental luxury to nightgowns and

peignoirs (Table 3, Fig. 6 & 7). These garments feature highly ornamented all-over lace panels, insets and sheer luxury fabrics. As material expressions of female agency and femininity, these simple shapes and abstracted volumes became a theme that was picked up and appropriated by later generations. In summary, the chart analysis shows Edwardian Lingerie structures for tight fitting camisoles and slips, voluminous generating forms for petticoats, body obscuring shapes for the boudoir and dress signifier covered teagowns.

Case Study 2

This case study examines fashion's alignment with the aesthetics of Modernism, from 1916 and onwards, specifically addressing how cultural producers of fashion responded to emerging consumer tastes and values. Fifteen couture garments (Appendix a, Table 3, Fig. 15-30) from French couture houses, such as that of Chanel, Paquin and Lucille, Vionnet, Lanvin, Poiret and others are discussed. These cultural producers are responsible for innovation and material production in this Era. The emergence of Modernist aesthetics was the outcome of many technological, industrial, scientific, artistic and sociological shifts, which ultimately led to a fragmentation of social and class structures (Back, 2007). Changing values—and consequently Modernist consumer needs—were symbolically in opposition to all that was romantic, decorative and class appropriate in the Edwardian Era. Modernist era artists such as Loos and Le Corbusier eschewed ornamentation, favoring a Fordian, functional aesthetic which positioned ornament as feminine and irrational (Negrin, 2003). Key contemporary art movements such as Fauvism, and Dadaism influenced and informed Modernist fashion (Entwistle, 2007). These conceptually based movements expressed ideas through visual art and material objects about modern, urban living, while rejecting pre-war fashion.

As a result of these dramatic social and cultural influences, the aesthetic valuation placed upon dress signifiers and forms were turned upside-down (Driscoll, 2010; Back 2007 & Lehmann, 2000). Modernist cultural producers navigated these changes by borrowing and appropriating design details and material processes from other Eras. The Edwardian emphasis on materiality and wealth gave way to Jazz Era escapism in conjunction with more practical dress solutions. Once Poiret famously dispensed with the corsetted female body, a new uncorsetted ideal emerged that conformed to the new standards of beauty. This new female body and its clothed form evolved towards an increased aesthetic alignment with the new functional and anti-decorative values of Modernism (Appendix a, Table 2). However, this change in social and aesthetic influences did not happen in an orderly linear transition, instead a multiplicity of shapes, materials and symbolic values were produced and consumed. Designers such as Chanel, Poiret, Lucille, Lanvin, Vionnet and others responded to this new aesthetic economy by materially representing the contradictions of modern life (Evans, 2008). Tables 2 and 3 explore this change and show the variety of shapes which all use similar signifiers such as lace, bias and exaggerated garment shapes. Thus, customers communicated their needs and designers assessed and responded to customer demand in terms of material and symbolic value (Crane and Bovone, 2006). When Koda (as cited in Driscoll, 2010, p. 140) said Chanel had an ability to “perceive and insist upon something more fundamental than the ornament of conventional appearance,” he was describing Chanel’s ability to respond to and assess these new customer values via the production of fashion commodities (Entwistle, 2008). This confluence of communication and commodity, production and creativity, resulted in fashion innovation and helps to contextualize how, despite this alignment with Modernist aesthetics, techniques and forms borrowed from Edwardian lingerie made their way into the new vernacular.

Key observations of Modernist material artifacts are:

New sites of decoration are developed in the seams and on the edges, at areas of fit, and clustered on areas of large panels.

Shape is expressed through volumes that abstract the body, such as soft modified tube shapes that are modified by gussets and bias.

Dress signifiers such as femininity, modernity, and luxury expressed through lace, tucks or surface embellishments.

Structures are achieved through inseting luxury bands and that alter the fabric's behaviour and grain experimentation, such as through bias.

Light holding properties through sheer and opaque fabric creates tension between the garment silhouette and the bodies' outline.

New spaces emerge in addition to private and public spaces, resulting in new types of garments.

As a result of the fragmentation of social and class structures, the deliberate raiding of feminine dress signifiers and lace from lingerie forms, used in conjunction with other Modernist signifiers, marked these new garment forms as highly charged. Their creation was a response to a less binary view of private and public spaces, a view mediated by social ideas about casual wear, sportswear, loungewear and playwear. When Lelong (Vogue, 1925) said his kinetic design was about designing gowns in motion, he was articulating how he composed his garments based upon the Modernist Aesthetic. His kinetic design method conceptually connected people, and their attitudes via ornament, to a particular time and space. He used visual composition techniques to unify individual gussets, dress signifiers and shapes, in order to

convey meaning. As part of a whole, garments elements communicated meaning only in relation to each other and to the bodies they adorned (Negrin, 2003). Consequently, individual details were adapted to visually suit the new aesthetic.

Lucile, Poiret and Paquin were some of the first designers to use photography, cinema and performance formats to exploit and focus upon the “spectacle of the flesh” (Evans, 2008, p. 245). Table 3 (Fig. 17 & 20) shows sheer panelling, lace, flounces and other techniques borrowed from lingerie in order to flaunt and draw attention to the female body. Drawing male and female patrons to early fashions shows, these cultural producers responded economically by creating social events and clothing designed to draw and secure patrons. “As the fashion show became theatricalized by Lucile and Poiret, the gaze that was solicited shifted from an exclusively female form of consumption to a male gaze that rested as much on the mannequin as on her dress” (Evans, 2008, p. 244). In this respect, dress signifiers had a similar function to ornamentation found in Edwardian lingerie: that of creating movement, signifying femininity and drawing the eye to the body. The continued use of ornamentation was a response to cultural producers recognizing the cultural value and tension inherent in a more eroticized, objectified female body. “Lucile’s coup was to commodify sensuality through her gowns and their presentation,” this innovation propelled Lucile to New York and Paris (Evans, 2008, p. 242). Lucile’s designs (Fig. 17 & 20), which used combinations of sheer and opaque fabric, were covered in feminine dress signifiers. The sheer lingerie garments of Edwardian times displayed a body that was at once dressed and undressed. These material signifiers, still marked with the charged connotations of lingerie, were carried over to Modernist garments (Steele as cited in Martin and Koda, 1993). These very connotative qualities may have positioned those signifiers

ideally for transformation, enlargement and appropriation. Jazz Era dance crazes adopted by new Flapper Girl were another area of change, generating more casual social spaces for which garments were required. Flounces and bias cuts in sheer flowing fabric emerged to reflect the Era's focus on technology and urban life (Tables 3, Fig. 22 & 28). In addition, sheer or sparkling luxury material such as gold lame, glossy satins, woven-in beading and lace yardage in combination with feminine dress signifiers became important. This combination of garment details were particularly suited to conveying movement in Jazz.

Case Study 3

This case study uses comparative analysis, drawing upon Table 3, to more specifically connect the material production and techniques from both the Edwardian and Modernist Eras. Stewart (2005) argues, "Couturiers distinguished their designs by emphasizing their creativity and by using exclusive fabrics, rich trim, careful fitting and fine hand sewing" (p. 106). In turn, value was created through the development and innovation of original creative fashion. Methods of making in couture houses from the Edwardian and Modernist Eras were organizationally very similar, with specific spaces designated for garment divisions such as lingerie, fur, evening wear and daywear, further divided by various levels of design, production, assembly and finishing (Champsaur, 2012). From a scholar to practitioner perspective, understanding this connection pulls away some of the semantic, vague and romantic language used to describe couture fashion design. In some cases, work experience attained during the Edwardian Era in the couture industry was a training ground for young Modernist designers. Vionnet was one such designer that worked as a premiere for the Callot Souers, interpreting drawings through drape, haptic

material development and cognitive critical thinking to resolve construction techniques (Bryant, 1991). As premiere for the Callot Souers and Doucet, she would have interpreted Edwardian Era garment forms, taking with her production knowledge like unique cutting, transferring and draping practices when she set up her own house, 'Vionnet et Cie,' in 1912. Cultural innovators from both Eras developed garment models as a material commodity carrying high cultural value and meaning. The development of high cultural value effected production practices whenever complicated detail work, tricky cutting or detail transferring added additional steps to garment making. Table 3 shows that the majority of garments from both Eras were richly decorated, using fine or sheer fabrics. In fact, there are so many similarities in terms of techniques throughout the charts that it is only in fabric properties and garment purpose where we see significant difference. Lingerie shapes and techniques of ornamentation were adopted, but only in conjunction with more luxurious fabric that connoted Modernist aesthetics. In addition, the Romantic bias hems and pintucks from Edwardian Lingerie were transformed, enlarged and appropriated, so that the overall effect was much more graphic and minimal.

Key observations of six main characteristics present in both Eras are:

Sheer volumes display and conceal the uncorsetted female body.

Bias, off grain or gussets are used to fit simple shapes to the body. Bias in conjunction with simple shapes, modified by tucks and gussets, leads to graceful shapes.

Large planes of fabric with handwork are wrapped or interlocked on the body. This drive to drape uncut fabric units results in unusual off grain seam solutions.

Basing garment design upon the display of bands, such as lace, knits, and luxury trims.

Garment pattern pieces become merely supporting elements that are positioned radially, stacked in a spiral, and tiered in ways that support display of banding or luxury fabric.

Decoration via dress signifiers focuses the eye to the body, with fabric movement and visual interest.

New sites of display emerge to draw attention to the body, along seams and joins, as well as through the use of opaque and sheer materials.

Many designers became known for intricate bias cuts and labour intensive methods in support of an image based upon limited edition, handcrafted goods (Champsaur, 1925). Bias cuts, which were also used in Edwardian lingerie, relied upon exploiting the warp, weft and off grain effects of material drape. Drape further depended upon the materials' weight and structure, whose characteristics on the bias included the ability to bend around curves. When balanced and supported, bias could be stable, behaving like knit jersey. Bias handkerchief hems, bias flounces and godets found on Edwardian Lingerie hems were enlarged, multiplied and abstracted, making them the central feature of Modernist garments. The ability of bias to mold and wrap sculpturally around the body were fully exploited in the hands of Modernist designers.

Bias effects and other form of ornamentation may also have been a production response to garment counterfeiting espionage. As a practitioner making in a competitive production world, the tension that existed between communication, production and commodity emerged via counterfeiting. "Designers employed intricate fitting, cutting and sewing as a solution" (Stewart, 2005, p. 2). Designs by Paquin, Poiret, Vionnet, Chanel, Patou, and Lanvin all suffered from increased fashion espionage involving stolen toiles, illegal copying at alteration houses and patent infringement (Champsaur, 2012). The pressure for "a couture house to be innovative and to create a new offering" resulted in production practices that made designs too difficult to copy (Kirke, 1998, p.16). To prevent staff piracy, couture houses organized spaces so that

“garment pieces in the course of construction were carried between ateliers by the privileged few” (Evans, 2008, p. 254). Detailed ornamentation from Edwardian lingerie applied to sheer and luxury materials would have required significant skill and accuracy in assembly for acceptable results. In this context, couture designers were exploiting their own knowledge of garment production efficiency—in the form of pattern innovation—to preserve couture as a cultural commodity. Although Modernist Era fashion gradually evolved towards a more austere, minimal aesthetic using simpler shapes and planes of unadorned fabric, sites of ornamentation remained that borrowed from Edwardian Lingerie. Seam joins became sites to display fagoting, ornamentation transformed simple shape to effect fit, and the use of gussets to modify simple shapes into complex ones was still popular. The resulting outcome of these modified seam joins was increased suppleness of seam, increased movement and improved fit (Kirke, 1998).

Unique cultural, consumer and production conditions resulted in ideal conditions for the use and appropriation of Edwardian Lingerie dress signifiers in Modernist garments. When haute couture designers developed constructive solutions as a production response to counterfeiting and mass production, they appropriated and abstracted existing Edwardian shapes and techniques. These techniques were appropriated to convey new visual ideas that corresponded with new cultural ideas about dressing and displaying the female body. Dress signifiers from lingerie were adopted, in part, as a response to changes in female agency and attitudes about the objectification of women’s bodies. Shape and volume changes—away from a corseted female form—materially fulfilled cultural requirements to define cultural attitudes and change.

Creative Practice Outcome

For initial inspiration, a trip to the Ryerson Fashion Archives was undertaken to closely view Edwardian and Modernist construction methods. Photos were taken of material artifacts and their garment characteristics (Appendix b, Fig. 1-5). The experience of being exposed to period artifacts oriented the direction of the work; as a result, interior construction details of the artifacts were recorded. Some initial observations were: many garments contained clustered handwork such as tucks and fagoting resulting in shaping and many garment shapes appeared to be derived from non traditional pattern shapes. Designer research was undertaken to orient the research in terms of the design development practiced by early twentieth century couture designers.

Photos were drawn upon later to develop digital collage imagery (Appendix c, Fig. 1-11). This digital imagery combined original drawings inspired by themes from Modernism with original photos of lace, handwork and beading from Edwardian garments. Digital imagery was developed as surface decoration and printed on silk crepe de chine through the mashup of visual imagery. The purpose of the digital fabric prints was to explore the idea of fixed dress signifiers. Printing images into the fabric that embody a combination of both Eras creates a project specific set of dress signifiers interacting with garment shapes, handwork and material properties.

Based upon the six themes observed in the case studies, the researcher began self study documentation in a sketchbook by isolating specific techniques (Appendix b, Fig. 6). Then, action research and reflective knowledge building was used to sew fabric samples of clustered handwork (Appendix b, Fig. 7-10). These test samples on silk crepe de chine explored machine and hand sewn tucks positioned on the straight of grain in different compositions, varying the tuck length, concentration of tucks and proximity in relation to each other. For accuracy, simple

tuck grids were drawn out on paper, then traced onto the fabric. This process helped to identify successful handwork effects such as tucks and gathers, and enabled the researcher to assess how fabric modified by handwork was transformed visually and materially, and was altered by changing the way the fabric handles or drapes.

The researcher made the following observations: that the tucks drew fabric in, reducing fullness, that small tucks modified the fabric shape in small amounts and larger tucks resulted in more pronounced changes. In addition, tucks could be positioned in an arrow shape to generate slight concave and convex shapes in the fabric, and when tucks were positioned evenly over the entire sample, the resulting fabric was springy and the entire samples handling properties were transformed. Appendix b, Fig. 7-8 show examples of these experiments hanging on the bias and on grain. Both grain positions, and the effects resulting from on or off grain hang, suggest direction for further sampling using larger fabric pieces. Many of these effects result in unique fabric structures and shapes that are hard to replicate unless sample swatches are produced. This may be one of the ways Modernist designers developed hard to replicate effects, producing cultural value and deterring counterfeiting. Based upon these experiments, the researcher developed shape ideas while referring back to the shapes in Edwardian and Modernist garments: the dynamic soft tube shape created through shapes like cones, barrels and tubes, and modified by gussets and handwork (Appendix b, Fig. 11-12).

At this point the researcher referred more closely to the six main themes to direct the outcome of each garment and a number of draping experiments resulted (Appendix b, Fig. 14-34). At the same time, the outcome was governed by the chimera, which resulted in a mash up of all themes, rather a literal linear documentation of techniques. In this context the chimera represents the change from Edwardian to Modernist and techniques were selected

according to their ability to represent that change.

The six themes are listed here for clarity:

Abstracted sheer volumes display and concealed the uncorsetted female body in response to the social requirements of making the body appropriate.

Simple tube shapes are modified by bias or gussets.

Uninterrupted ornamented panels are wrapped or interlocked on the body resulting in unusual off grain seam solutions.

Conspicuous display through banding, such as lace, knits, and luxury trims, results in garment pattern pieces becoming merely supporting elements.

Pattern pieces are positioned radially, are stacked in a spiral, and are tiered in ways that support the display of banding.

Decoration through dress signifiers focuses the eye to the body with fabric movement and visual interest.

New sites of display emerge along seams and joins, as well as through the use of opaque and sheer materials.

These garments and the recorded processes are artifacts of the themes shared by Edwardian lingerie and Modernist garments. For garment one, (Appendix d, Fig. 1-7) the idea of the Chimera was explored by juxtaposing graphic decoration and luxurious romantic lace. Bands of bias were sewn on top of the lace creating tension between graphic and romantic visual signifiers. Fagoting was then used to join seams drawing the eye to the graphic lace mashup and to the body. The garment form was developed on the dress form starting with a simple tube. Bias side panels were added for shape, a gusset under the arm and on grain front and back panels. A series of decorative and functional tucks created convex shapes around the shoulder area. For

garment two, (Appendix 4, Fig. 8-12) the idea of the chimera was explored by building a tiered cone around bands of luxury lace or special fabric. Shaping was achieved by sewing tucks along fabric bands to achieve volume. While the skirt forms a cone shape the bodice was made using a simple barrel shape positioned on its side. Built using sheer fabric, the bodices layered seams are opaque and create graphic lines that corresponds both to the idea of abstracted volumes and graphic display of the body. For garment three, (Appendix d, Fig. 13-17) the idea of the chimera was applied by juxtaposing themes of movement and display by creating uninterrupted ornamental panels joined to lace banding. The garment was formed using five panels of pin-tucked chiffon; its handkerchief hem contributes to the spiraling structure through the bodice. Applied lace is placed to suggest tension between more linear Modernist ornamentation and more romantic Edwardian ornamentation.

For garment four, (Appendix d, Fig. 18-23) the idea of the chimera began with clustered ornamentation to shape and modify fit. Long hand sewn pin-tucks create shape at the waist and small allover pin-tucks create a stretchy flexible bias fabric around the shoulder. Diamond shaped gussets at the underarm modify the simple tube shapes of the torso and sleeve for better fit. For garment five, (Appendix d, Fig. 24-27) the idea of the chimera was used by combining the soft bias tube with clustered ornamentation, creating better fit. Sheer cut out shoulder panels and a wrap around band play with themes of graphic display and conspicuous display via banding. For garment six, (Appendix d, Fig. 28-33) combining uninterrupted ornamented panels with movement by trying to shape the panels around the body using tucks, created the idea of the chimera. The tucks and the panel itself start at the bodice and wrap around the hips. Convex fullness is created with the tucks. In addition, the sheer panels in front and back play upon the display and concealment of the female body. These garments, the photo documented action

research and patterns represent part of the process of 'knowing,' offering insight into material limitations and unique outcomes.

Knowledge Outcomes from the Creative Process

Developing small swatches, followed by larger panels and then draping those panels, leads to a better material outcome and a better understanding of how ornamentation alters the fit and hand of fabric. This process can take a lot of time, with multiple levels of matching, transferring and hand stitching. This approach and its economy, success or suitability in the context of production development, must be mediated by cultural producers. Digitally printing fabric with transfer or marked lines embedded into the surface is one solution the researcher has come to; in effect, this reduces the production steps of accurately transferring multiple marks to bias pattern pieces, and accurately matching mirrored patterns. This idea came from reflection upon practice, as a result of spending so much time manually tracing pin-tucks with wax paper and a tracing wheel. Another problem that arose was the destruction of the pattern from repeated perforation paper detail marks on the paper pattern. A solution here may be digitally scanning in the pattern and superimposing relevant data onto the digital print. The process of transferring detailing could be exploited digitally by appropriating and marking the fabric in a pleasing manner for the purpose of color blocking, pin-tuck details or engineered decoration. The resulting fabric would have cut lines, details and notches for fabric matching embedded into the cloth, along with any surface design. This process could mediate the cost and time investment in handwork and assembly. However the process of digital printing does include the risk of misprinted surfaces, resulting in mismatched print or mismatched grain. This misprinting was experienced by the researcher and needs further study. This solution is an example of how

pattern innovation resulted from a material problem. Digitally printed detailing applies couture production methods to ready-to wear production, making these methods more accessible.

This process also resulted in a better understanding of bias. The characteristics of understanding grain through balanced bias, adjacent planes, and off grain draping resulted in the type of action research discoveries that Modernist designers would have made. Ornamentation, which altered hand of the fabric, also effected the fit: the result was a stretchy, jersey like fabric. This altered bias fabric could be molded around shoulders, bust and waist, exploiting the quality of the fabric. Seams sewn on the bias tend to bow outwards, so sewing a straight of grain seam onto a bias edge functions to stabilize a seam. Large planes of ornamented fabric handle and drape better on the bias, whereas fabric draped on the straight of grain resulted in a flat washboard effect (Tables b, Fig. 30). Another place where action research contributed to knowledge was in the application of fastenings to bias garments. Inserting zippers into bias seams created massive buckling and was a structural problem. Stabilizing the zipper opening became necessary, or alternatively, inserting a zipper into an on-grain opening worked. This structural issue may be why ties, buttons and crisscross banding were prevalent in bias garments.

Finally, the process of photo documentation through a photo shoot of the final garments united the material properties of the garment as a cultural commodity with the female body. Selectively sheer and opaque cutouts dressed the female body, materially indexing it and making it appropriate for particular cultural spaces. With their deliberate cut outs and short hems, these garments intentionally blur the format of garments for private and public spaces and represent an outcome of change through material appropriation.

Conclusion

This research explores the cycle of appropriation, expectation and transformation that occurs when cultural producers adapt design practices to create material artifacts of value. Unique social hierarchies and events during the Edwardian and Modern Eras resulted in specialized clothing forms. Specialization in the form of cultural value can be analyzed through an artifact's ability to communicate, be commodified in various ways, the manner in which they were produced and how creativity was employed to develop innovative qualities. Using this model of investigation was a useful tool for understanding how characteristics shared by Edwardian lingerie and Modernist clothing were similar, both materially and connotatively. The effect of combining the techniques in the final garment pieces does demonstrate how specialized techniques and material forms of Edwardianism were present in the vernacular of Modernist design. Many techniques were similar such as handwork, the use of simple shapes, fine silks and the graphic use of opaque and sheer fabrics. The particular material qualities of Edwardian lingerie and its connotations applied to Modernist day and evening wear and signified ideas about the bodies, social spaces and taste. Changing attitudes towards female agency, the growing objectification of women's bodies and the ability of designers to perceive and act on this subtle shift in perspective, resulted in the deliberate material and production appropriation of Edwardian lingerie signifiers. These appropriated Edwardian techniques were also well suited to developing exclusive, hard to counterfeit designs that eschewed traditional pattern design approaches. The process of sampling fabric, altering ornamentation, enlarging, reflecting upon those samples and finally, unifying design elements through draping the entire design on the mannequin, is a time consuming process that is hard to emulate using flat pattern design. The length of the process contextualizes how well suited it is to deterring counterfeiting.

The final outcome of the garments that used the allegory of the chimera allowed the researcher to directly explore correlations between social change and pattern design. One outcome of this research hopes that designers will consider how combinations of historical details laden with semiotic meaning, material and form communicate as a whole. When applied appropriately, these combined elements communicate the social requirements of consumers in the form of cultural value.

Further Research

Further study related to this research could include exploring ideas about power and female authority, and how these concepts were interpreted by tailoring production methods. Balenciaga, James and Dior were designers that experimented with tailoring and may have appropriated dress signifiers from multiple sources to express these ideas. Additionally, the knitting, crochet and lace industries' alignment with Modernism represents a unique area of material investigation and study.

References

- Aldrich, W. (2007). *Fabric, Form and Flat Pattern Cutting*. Oxford: Blackwell Publishing.
- Arnold, R. (2008). Movement and Modernity: New York Sportswear, Dance and Exercise in the 1930's and 1940's. *Fashion Theory*, 12, (3), 341-358.
- Arzalluz, M. (2009). *Cristobal Balenciaga: The Making of A Master*. New York: Harry N. Abrams.
- Back, K. (2007). Modernism and Fashion: A Social Psychological Interpretation. In M. Bernard, (Ed.), *Fashion Theory: A Reader* (398-407). New York: Routledge.
- Barthes, R. (2007). Fashion Photography. In M. Bernard (Ed.), *Fashion Theory: A Reader*. (517-519). New York: Routledge.
- Baudrillard, J. (1993). The Enchanting Spectacle. In M. Gane (Ed.), *Symbolic Exchange and Death*. New York: Sage Publications. 87-99.
- Bray, N. (2003). *More Dress Pattern Designing*. London: Wiley-Blackwell.
- Black, S. (2012). *Knitting Fashion, Industry Craft*. London: V and A Publishing.
- Bourdieu, P. (1993). *Soziologische Fragen*. Frankfurt: Main.
- Beward, C. (2003). *Fashion*. Oxford: Oxford University Press.
- Bryant, N. (1991). The Interrelationship Between Decorative and Structural Design in Madeleine Vionnet's Work. *Costume*, 25, 73-88.
- Bryant, N. (2003). Facets of Madeleine Vionnet's Cut: The Manipulation of Grain, Slashing and Insets. *Clothing and Textiles Research Journal*, 11(2), 28-37.
- Bugg, J. (2009). Fashion at the Interface: Designer-Wearer Viewer. *Fashion Practice*, 1(1), 9-32.
- Bye, E. (2010). A Direction For Clothing and Textile Design Research. *Clothing and Textiles Research Journal*, 28 (3), 205-217.
- Campbell, C. (1997). When the Meaning is Not the Message. In M. Nava, A. Blake, I. MacRury, & B. Richards (Eds.), *Buy This Book: Studies in Advertising and Consumption*. UK: Taylor and Francis Books. 340-351.
- Champsaur, F. (2012). Madeleine Vionnet and Galeries Lafayette: The Unlikely Marriage of a Parisian Couture House and French Department Store, 1922-40. *Business History*, 54 (1), 48-66.

- Cherry, C. (1968). *On Human Communication*. Cambridge: MIT.
- Craik, J. (1994). *The Face of Fashion: Cultural Studies in Fashion*. New York: Routledge.
- Crane, D. & Bovone, L. (2006). Approaches to Material Culture: The Sociology of Fashion and Clothing. *Poetics*, 34, 319-333.
- Cunnington, C. & Cunnington, P. (1951). *The History of Underclothes*. London: Dover Publications.
- Davis, F. (1992). *Fashion, Culture and Identity*. Chicago: University of Chicago Press.
- Debo, K. (Ed.). (2011). *Unravel: Knitwear in Fashion*. Sweden: Lannoo Publishers.
- Driscoll, C. (2010). Chanel: The Order of Things. *Fashion Theory*. 14 (2), 135-158.
- Eco, U. (1973). Social Life As A Sign System. In D. Robey (Ed.), *Structuralism: An Introduction Wolfson College Lectures 1972*. Oxford: Oxford University Press. 57-72.
- Entwistle, J. (2007). Addressing the Body. In M. Bernard (Ed.), *Fashion Theory: A Reader*. New York: Routledge. 143-147.
- Evans, C. (2008). Jean Patou's American Mannequins: Early Fashion Shows and Modernism. *Modernism/ Modernity*, 15 (2), 243-263.
- Evans, C. (2003). *Fashion at the Edge*. New Haven: Yale University Press.
- Fields, J. (2007). *An Intimate Affair: Women, Lingerie, and Sexuality*. London: University of California Press.
- Flugel, J. (1930). *The Psychology of Clothes*. London: Institute of Psycho-Analysis and Hogarth Press.
- Hall, S. (1973). *Encoding/ Decoding in the Television Discourse*. England: Centre for Cultural Studies, University of Birmingham. 128-138.
- Hansen, K. (2004). The World in Dress: Anthropological Perspectives on Clothing, Fashion and Culture. *Annual Review of Anthropology*, 33, 369-392.
- Heisey, F. & Brown, P & Johnson, R. (1988). Three-dimensional Pattern Drafting: A Theoretical Framework. *Clothing and Textiles Research Journal*, 6 (1), 731-737.
- Kandinsky, W. (1947). *Point and Line To Plane*. N.Y.: Courier Dover Publications.
- Kirke, B. (1998). *Madeleine Vionnet*. New York: Chronicles Books.

- King, D. B & Wertheimer, M. (2005) *Max Wertheimer and Gestalt Theory*. New Jersey: Transaction King Publishers.
- Lehmann, U. (2000). *Tigersprung: Fashion in Modernity*. New York: MIT Press.
- Lelong, L. (1925, July). Kinetic Design. *Vogue*. 66, 7.
- Negrin, L. (2003). Ornament and the Feminine. *Feminist Theory*, 7(2), 219-235.
- Simmel, G. (1904). Fashion. *The American Journal of Sociology*, 62 (6), 541-558.
- Steele, V. & Mears, P. (2009). *Isabel Toledo: Fashion From the Inside Out*. New Haven: Yale University Press.
- Stewart, M. L. (2005). Copying and Copyrighting Haute Couture: Democratizing Fashion 1990-1930s. *French Historical Studies*, 28, (1), 103-130.
- Martin, R. & Koda, H. (1993). *Infra-Apparel*. New York: Metropolitan Museum of Art.
- Mauss, M. (1922). *The Gift: Forms and Functions of Exchange in Archaic Societies*. London: Routledge.
- Trocchio, P. Di. (2011). Fashion Purist: The World According to Madeleine Vionnet. *Fashion Theory*. 15 (4), 517-524.
- Veblen, T. (1992). *The Theory of the Leisure Class*. New York: Transaction Publishers.
- Wilson, E. (1985). *Adorned in Dreams*. California: Virago Press Limited.

Appendix a




Table 1




Edwardian Social Attitudes	<----->	Edwardian Clothing Forms
patriarchal attitudes structure, control and govern women's issues	the patriarchally Edwardian structured society effected how women and their bodies were valued, and how they were expected to present and display themselves	corsets and a controlled female body
female sexuality	women were expected to express their sexuality through modesty, maternity	clothing forms emerged to support these restrictive forms of sexual expression
rigid class and consumption oriented society	class and social setting specific clothing	women had afternoon, evening, boudoir, tea and sport clothing, which were visually distinct from each other women were expected to change many times a day to dress appropriately for each activity
Aesthetic alignment with Romanticism, nature, beauty and order	clothing forms and decoration supported a Romantic ideal	clothes were decorated with symmetrical forms drawn from historical dressmaking




Table 2




Modernist Social Attitudes	<----->	Modernist Clothing Forms
Fragmentation of class and social structures in relation	fashion in favor of the 'individual' and 'taste'	new types of garment shapes, material and presentation are valued
Increased female agency with less patriarchal control over female bodies, in conjunction with the increased objectification of the female body	the female body is displayed and viewed in new ways	visual tension results and occurs between the silhouette of the garment and the body
Aesthetic alignment with avant-garde art, with scientific advances in psychology, as well as a rejection of historicism	less natural, more graphic visual marks, as well as an alignment with symbolic and representational use of visual marks	garment forms and silhouettes depart from historical forms through abstraction
the corsetted body is dropped in favor of disciplining the body through athleticism and fitness	new clothing forms emerge to dress the new accepted body shape	women's bodies are dressed in a soft dynamic tube
fragmentation of public and private spaces occurs esp. in combination with photography, film and dance	dress signifiers are "turned on their head" esp. with respect to material hierarchies and garment signifiers meant for private spaces and for use in evening wear .	forms and techniques from inner wear are mixed together with outerwear and daywear
technology advances in transportation, production and urbanization result in mixed cultural reactions in the form of contradiction: the city is at once romanticized as in primitivism	technology advances in film, photography and transportation result in new formats of socialization, display and entertainment	new modernist clothing forms are created for these social spaces




Table 3



Garment	Purpose of Garment	Garment Shape	Decoration Placement on Garment	Types of Symbolic Dress Signifiers	Garment Structure	Material Properties
Fig. 1  Nightgown, 1905.	private nightgown	soft tube shape	all over decorative pintucking and cutouts, lace at hem and sleeve edges	conspicuous consumption, femininity, romanticism, and display of the body veiled by handwork	panels placed on the bias, tiered banding, tucks to create volume	white cotton and lace, sheer and opaque fabrics, creating graphic effects through positive and negative space
Fig. 2  Peignoir, 1905.	private peignoir	soft tube shape, obscuring the body with volume	all over decorative pintucking, ruffles at hem and sleeve edge	conspicuous consumption, femininity, romanticism, and modesty	panels placed on the bias, tiered banding, ruffles to create volume, use of on and off grain drape	white cotton and lace, sheer and opaque areas
Fig. 3  Peignoir, 1901.	private peignoir	soft tube shape, obscuring the body with volume	all over decorative pin-tucking and cutouts, lace at hem and sleeve edges	conspicuous consumption, femininity, romanticism, and modesty	tiered banding, ruffles to create volume	white cotton and lace, sheer and opaque areas




Garment	Purpose of Garment	Garment Shape	Decoration Placement on Garment	Types of Symbolic Dress Signifiers	Garment Structure	Material Properties
Fig. 4  Peignoir, 1905.	private nightgown	soft tube shape, obscuring the body with volume	all over decorative lace insets and cutouts, ruffles at hem and sleeve edges	conspicuous consumption, femininity, romanticism, and display of the body veiled by handwork	tiered banding, ruffles to create volume	white cotton and lace, sheer and opaque areas
Fig. 5  Nightgown, 1905.	private nightgown	soft tube shape, obscuring the body with volume	all over decorative lace insets and cutouts, ruffles at hem and sleeve edges	conspicuous consumption, femininity, romanticism, and modesty	tiered banding, ruffles to create volume	sheer and opaque fabrics, creating graphic effects through positive and negative space
Fig. 6  Peignoir, 1906.	private peignoir	soft tube shape, obscuring the body with volume	all over decorative lace insets and cutouts, ruffles at hem and sleeve edges	conspicuous consumption, femininity, romanticism, and modesty	tiered banding, ruffles to create volume	white cotton and lace, sheer and opaque areas




Garment	Purpose of Garment	Garment Shape	Decoration Placement on Garment	Types of Symbolic Dress Signifiers	Garment Structure	Material Properties
<p>Fig. 7</p>  <p>Teagown, 1906.</p>	semi-private teagown	soft tube shape, obscuring the body with volume	all over decoration clustered on panels, ruffles at hem and sleeve edges	conspicuous consumption, femininity, romanticism, and modesty	tiered banding, ruffles to create volume, tucks and fagotting at seam joins	sheer and opaque fabrics, creating graphic effects through positive and negative space
<p>Fig. 8</p>  <p>Doucet, teagown, 1907.</p>	semi-private teagown	loose hourglass shape	all over lace	conspicuous consumption, femininity, romanticism, and modesty	an amalgamation of daywear and under-wear forms, the use of on and off grain drape creates loose folds at areas of uncorsetted body	sheer and opaque fabrics, creating graphic effects through positive and negative space
<p>Fig. 9</p>  <p>Slip, 1908.</p>	private slip	form fitting, tiered hourglass shape	all over decorative lace insets and cutouts, ruffles at hem and sleeve edges	conspicuous consumption, femininity, romanticism, and modesty	bias banding for fit, ruffles to create volume, tucks and fagotting at seam joins	white cotton and lace, sheer and opaque areas



Garment	Purpose of Garment	Garment Shape	Decoration Placement on Garment	Types of Symbolic Dress Signifiers	Garment Structure	Material Properties
<p>Fig. 10</p>  <p>Nightgown, 1902.</p>	private nightgown	soft cone shape, obscuring the body with volume	all over decorative lace insets and cutouts, ruffles at hem and sleeve edges	conspicuous consumption, femininity, romanticism, and modesty	tiered banding, gathers to create volume, fabric panels support the display of lace, use of on and off grain drape	white cotton and lace, sheer and opaque fabrics, creating graphic effects through positive and negative space
<p>Fig. 11</p>  <p>Peignoir, 1908.</p>	private peignoir	soft tube shape, obscuring the body with volume	all over decorative lace insets and cutouts, ruffles at hem and sleeve edges	conspicuous consumption, femininity, romanticism, and display of handwork	tiered banding, ruffles to create volume, tucks and fagotting at seam joins	white cotton and lace, sheer and opaque areas
<p>Fig. 12</p>  <p>Nightgown, 1909.</p>	private nightgown	soft tube shape	all over decorative lace and additional decoration at hem and sleeve edges	conspicuous consumption, femininity, romanticism, and display of the body veiled by handwork	bias banding, ruffles to create volume, tucks and fagotting at seam joins	white cotton and lace, sheer and opaque fabrics, creating graphic effects through positive and negative space




Garment	Purpose of Garment	Garment Shape	Decoration Placement on Garment	Types of Symbolic Dress Signifiers	Garment Structure	Material Properties
<p>Fig. 13</p>  <p>Slip, 1908.</p>	private slip	soft tube shape, modified by tucks that create form fitting areas	all over decorative pintucking and cutouts, lace at hem edges	conspicuous consumption, femininity, romanticism, and display of the body veiled by handwork	bias banding, tucks and fagotting at seam joins for fit, use of on and off grain drape	white cotton and lace, sheer and opaque areas
<p>Fig. 14</p>  <p>Camisole and drawers, 1903.</p>	private under garment	soft tube shape, obscuring the body with volume	plain areas in conjunction with edges decorated by lace insets and cutouts, ruffles at hem and sleeve edges	conspicuous consumption, femininity, romanticism, and modesty	bias banding, ruffles to create volume, tucks and fagotting at seam joins	thin white cotton and lace, sheer and opaque areas
<p>Fig. 15</p>  <p>Corset cover, 1915.</p>	private under garment	form fitting	all over decorative lace insets and cutouts	conspicuous consumption, femininity, romanticism, and modesty	bias banding, tucks and fagotting at seam joins	thin white cotton and lace, sheer and opaque areas



Garment	Purpose of Garment	Garment Shape	Decoration Placement on Garment	Types of Symbolic Dress Signifiers	Garment Structure	Material Properties
<p>Fig. 16</p>  <p>Paquin, 1912.</p>	public evening wear	soft tube shape with tiered gathered banding	decorative large panels, tiered ruffles at hem	conspicuous consumption, femininity, romanticism and modesty	tiered banding, ruffles to create volume	sheer and opaque fabrics, creating graphic effects through positive and negative space
<p>Fig. 17</p>  <p>Lucile, 1918.</p>	public evening wear	soft tube shape	clustered decoration on large panels and along hems	conspicuous consumption, graphic use of feminine dress signifiers and display of the body veiled by handwork	tiered banding, gathers to create volume	sheer and opaque fabrics, creating graphic effects through positive and negative space, luxurious fabrics

Garment	Purpose of Garment	Garment Shape	Decoration Placement on Garment	Types of Symbolic Dress Signifiers	Garment Structure	Material Properties
<p>Fig. 18</p>  <p>Callot Souers, 1915.</p>	public evening wear	soft tube shape	plain areas in conjunction with decorative lace insets and cutouts, ruffles at hem and sleeve edges	conspicuous consumption, femininity, modernism, and modesty	heavily decorated lace in conjunction with plain fabric, tiered banding, gathers to create volume	sheer and opaque fabrics, creating graphic effects through positive and negative space, luxurious fabrics
<p>Fig. 19</p>  <p>Vionnet, 1921.</p>	public evening wear	barrel and cone shapes	plain areas in conjunction with decoration along seams and edges	conspicuous consumption, femininity, modernism, and modesty	handkerchief bias hem, gussets, use of on and off grain drape	sheer and translucent fabrics, luxurious silk in a strong color
<p>Fig. 20</p>  <p>Lucile, 1923.</p>	public evening wear	soft tube shape, obscuring the body with volume	all over decorative lace insets and cutouts, ruffles at hem and sleeve edges	conspicuous consumption, femininity, modernism, and the display of the body veiled by handwork	tiered bias banding, gathers to create volume, use of on and off grain drape	sheer and opaque fabrics, creating graphic effects through positive and negative space

Garment	Purpose of Garment	Garment Shape	Decoration Placement on Garment	Types of Symbolic Dress Signifiers	Garment Structure	Material Properties
<p>Fig. 21</p>  <p>Lanvin, 1925.</p>	public evening wear	soft tube shape with tiered gathered banding	plain areas in conjunction with decorative lace insets and cutouts, gathers at hem and sleeve edges	conspicuous consumption, femininity, modernism and the display of the body veiled by handwork	tiered banding, gathers to create volume	sheer and opaque fabrics, creating graphic effects through positive and negative space
<p>Fig. 22</p>  <p>Callot Souers, 1925.</p>	public evening wear	soft tube shape with tiered gathered banding	decorative lace ruffles at hem and sleeve edges	conspicuous consumption, femininity, modernism and the display of the body veiled by handwork	tiered banding, bias handkerchief hems, use of on and off grain drape	sheer and opaque fabrics, creating graphic effects through positive and negative space, luxurious fabrics
<p>Fig. 23</p>  <p>Paquin, 1923.</p>	public day wear	soft tube shape	all over decorative lace insets and cutouts	conspicuous consumption, femininity, romanticism and the display of the body veiled by handwork	panels of lace supported by panels of pin-tucked plain fabric	sheer and opaque fabrics, creating graphic effects through positive and negative space

Garment	Purpose of Garment	Garment Shape	Decoration Placement on Garment	Types of Symbolic Dress Signifiers	Garment Structure	Material Properties
<p>Fig. 24</p>  <p>Chanel, 1923.</p>	public evening wear	soft tube shape, obscuring the body with volume and banding	all over decorative lace insets and cutouts, ruffles at hem	conspicuous consumption, femininity, modernism and the display of the body veiled by handwork	tiered banding, gathers to create volume	sheer and opaque fabrics, creating graphic effects through positive and negative space
<p>Fig. 25</p>  <p>Callot Souers, 1925.</p>	public evening wear	soft tube shape with tiered bias banding	all over decoration and slight ruffle at hem	conspicuous consumption, femininity, modernism and the display of the body veiled by handwork	tiered bias banding, use of on and off grain drape	sheer and opaque fabrics, creating graphic effects through positive and negative space, luxurious fabrics

Garment	Purpose of Garment	Garment Shape	Decoration Placement on Garment	Types of Symbolic Dress Signifiers	Garment Structure	Material Properties
<p>Fig. 26</p>  <p>Vionnet, 1920.</p>	public evening wear	soft tube shape, obscuring the body with volume	all over unified ruffles using seams and edges as a feature	conspicuous consumption, femininity, modernism and the display of the body veiled by handwork	tiered banding, use of on and off grain drape, an abstraction of garment techniques	sheer and opaque fabrics, creating graphic effects through positive and negative space, luxurious fabrics
<p>Fig. 27</p>  <p>Callot Souers, 1925.</p>	public evening wear	soft tube shape, obscuring and revealing the body with volume and banding	all over lace, ruffles at hem	conspicuous consumption, femininity, modernism and the display of the body veiled by handwork	tiered bias banding, use of on and off grain drape, gathers to create volume, gusset to create shape	sheer and opaque fabrics, creating graphic effects through positive and negative space
<p>Fig. 28</p>  <p>Lanvin, 1926.</p>	public evening wear	soft tube shape, obscuring the body with volume	all over decorative embroidery, ruffles at hem	conspicuous consumption, femininity, modernism, and the display of the body veiled by handwork	bias handkerchief hem, use of on and off grain drape	embroidered panel, creating graphic effects through positive and negative space, use of luxurious fabrics

Garment	Purpose of Garment	Garment Shape	Decoration Placement on Garment	Types of Symbolic Dress Signifiers	Garment Structure	Material Properties
<p>Fig. 29</p>  <p>Vionnet, 1937.</p>	public evening wear	form fitting tiered hourglass shape	all over decorative lace insets and cutouts	conspicuous consumption, femininity, modernism and the display of the body veiled by handwork	tiered banding and gussets for shaping	sheer and opaque fabrics, creating graphic effects through positive and negative space
<p>Fig. 30</p>  <p>Chanel, 1925.</p>	public evening wear	soft tube shape, obscuring the body with volume and tiered detail	all over decorative ruffles that spill over hem and sleeve edges	conspicuous consumption, femininity, modernism and the display of the body veiled by handwork	bias paneling, use of on and off grain drape	sheer and opaque fabrics, creating graphic effects through positive and negative space, use of luxurious fabrics

Appendix b



Fig. 1



Fig. 2



1920's

carpet

Fig. 3



Fig. 4



Fig. 5

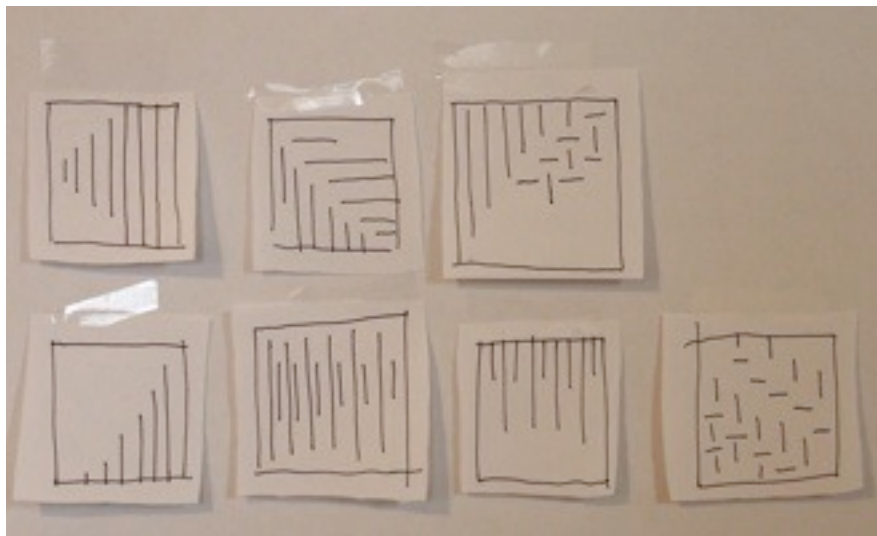


Fig. 6



Fig. 7



Fig. 8



Fig. 9



Fig. 10

Lace veiling and silk bending with floats that imitate fagotting...



Fig. 11

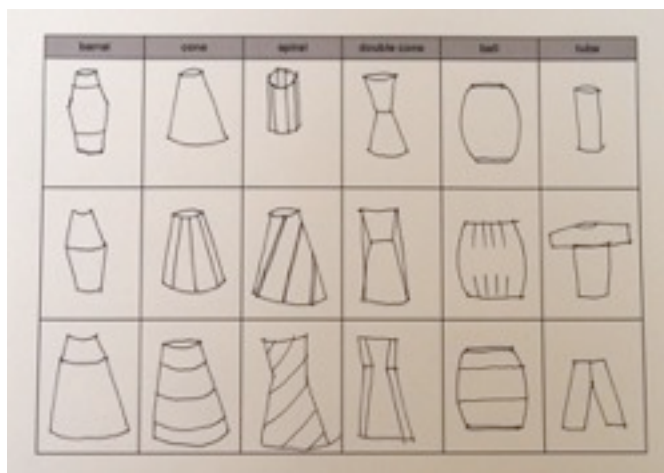


Fig. 12

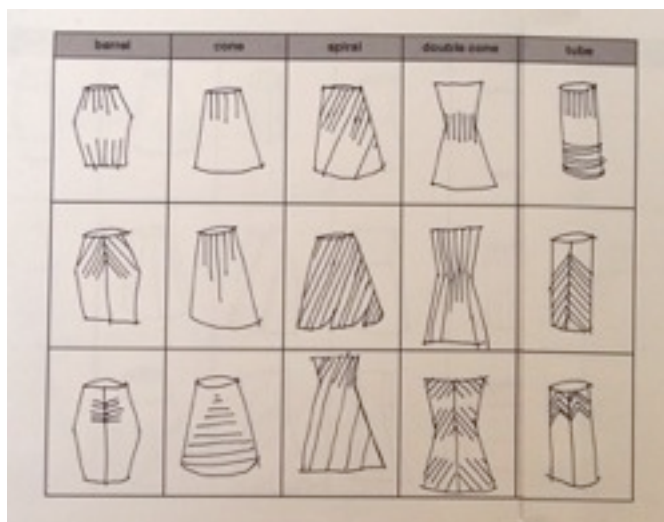


Fig. 13

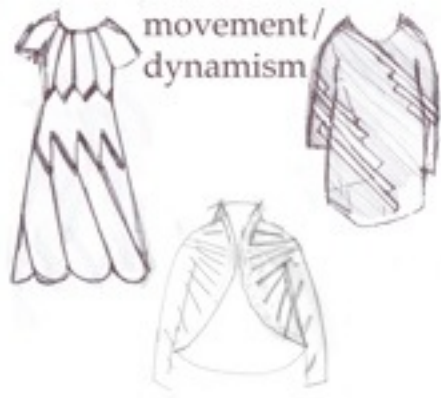


Fig. 14



Fig. 15



Fig. 16



Fig. 17

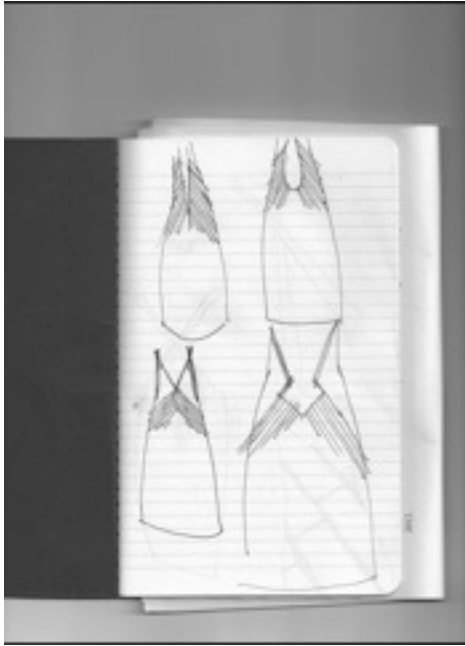


Fig. 18



Fig. 19



Fig. 20

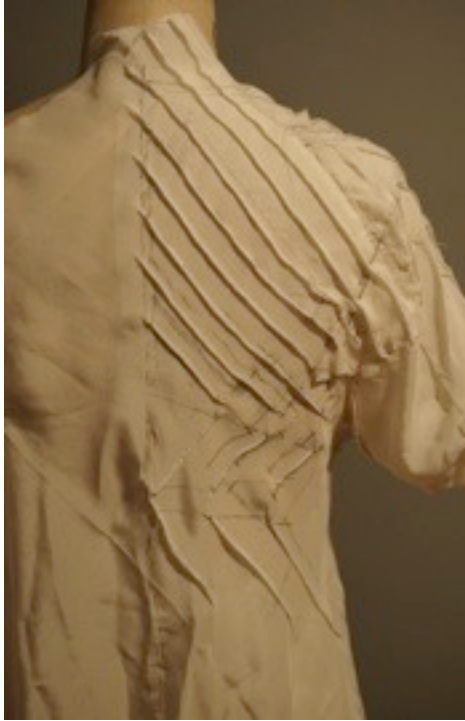


Fig. 21

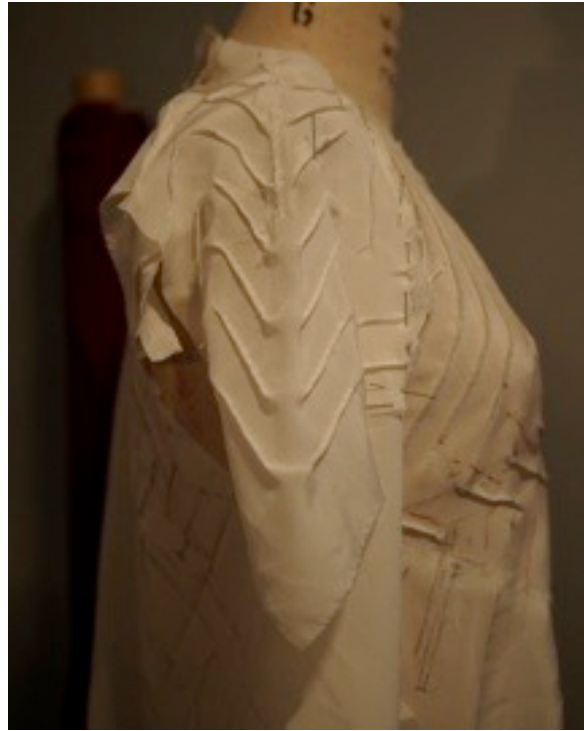


Fig. 22



Fig. 23

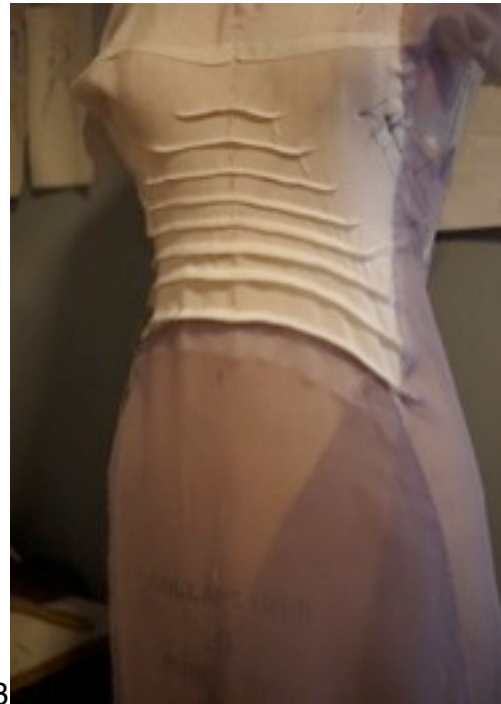


Fig. 24



Fig. 25



Fig. 26



Fig. 27



Fig. 28



Fig. 29



Fig. 30

Appendix c



Fig. 1

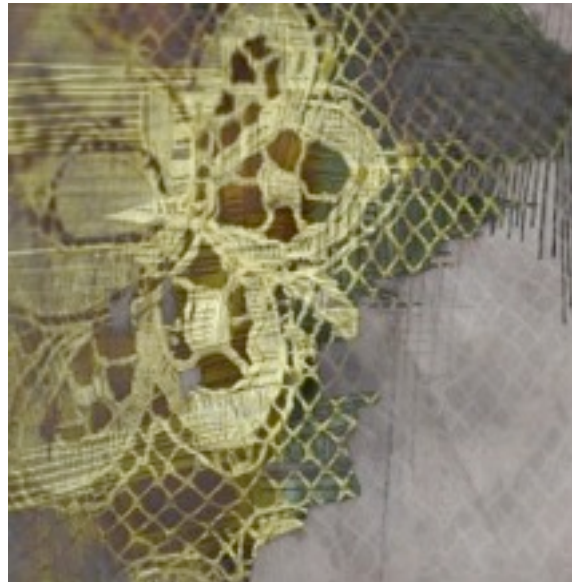


Fig. 2



Fig. 3



Fig. 4

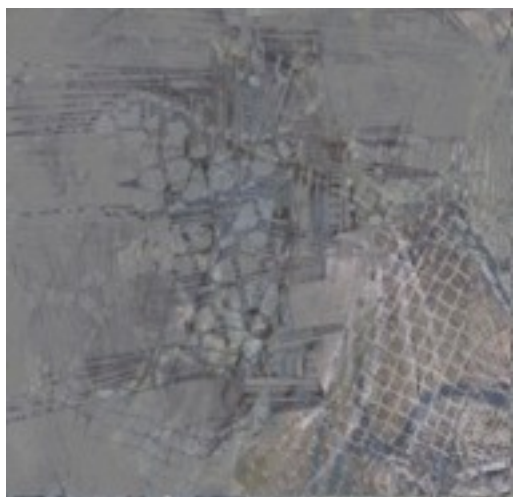


Fig. 5

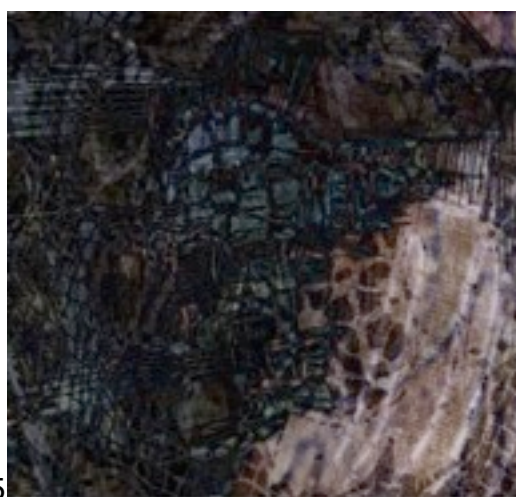


Fig. 6

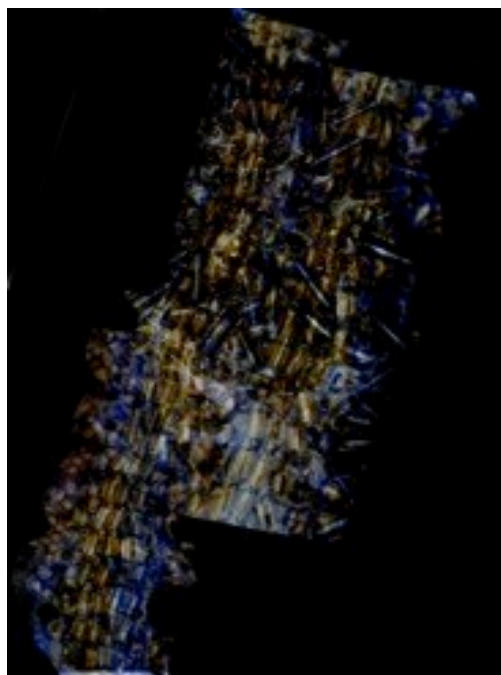


Fig. 7



Fig. 8



Fig. 9



Fig. 10



Fig. 11

Appendix d



Fig. 1



Fig. 2

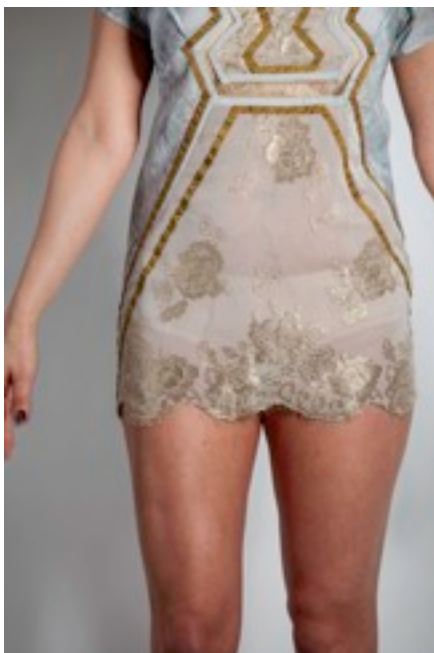


Fig. 3

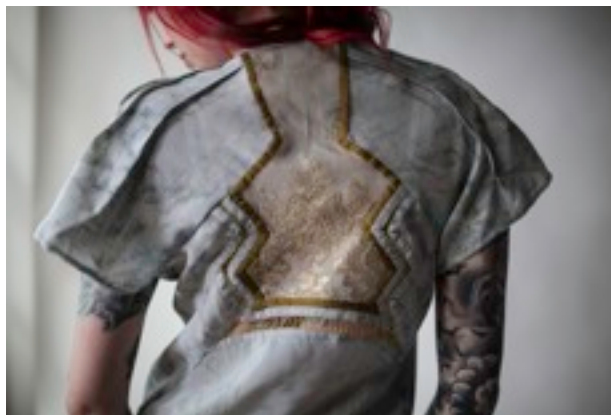


Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8



Fig. 9



Fig. 10

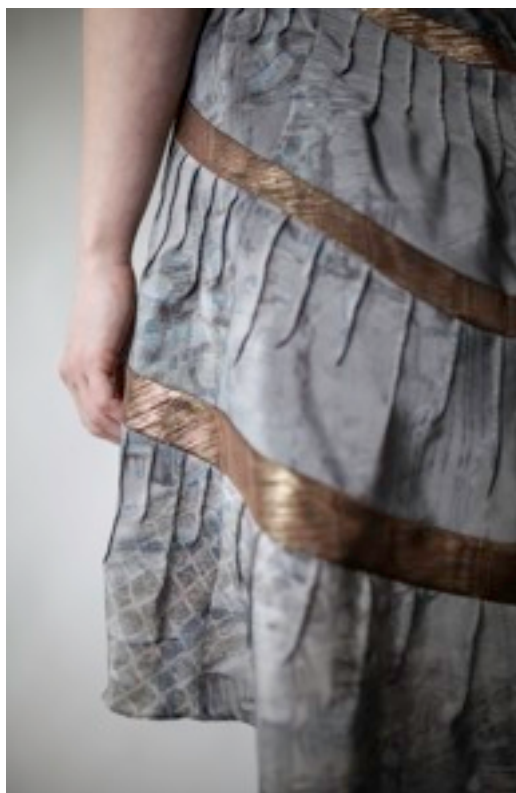


Fig. 11



Fig. 12



Fig. 13



Fig. 14



Fig. 15



Fig. 16



Fig. 17

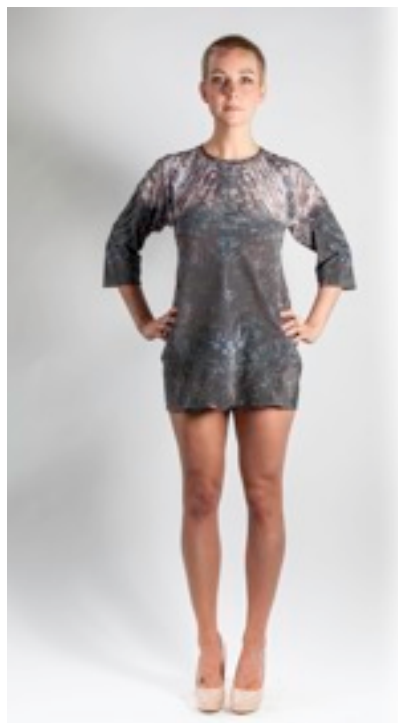


fig. 18



Fig. 19



Fig. 20



Fig. 21



Fig. 22

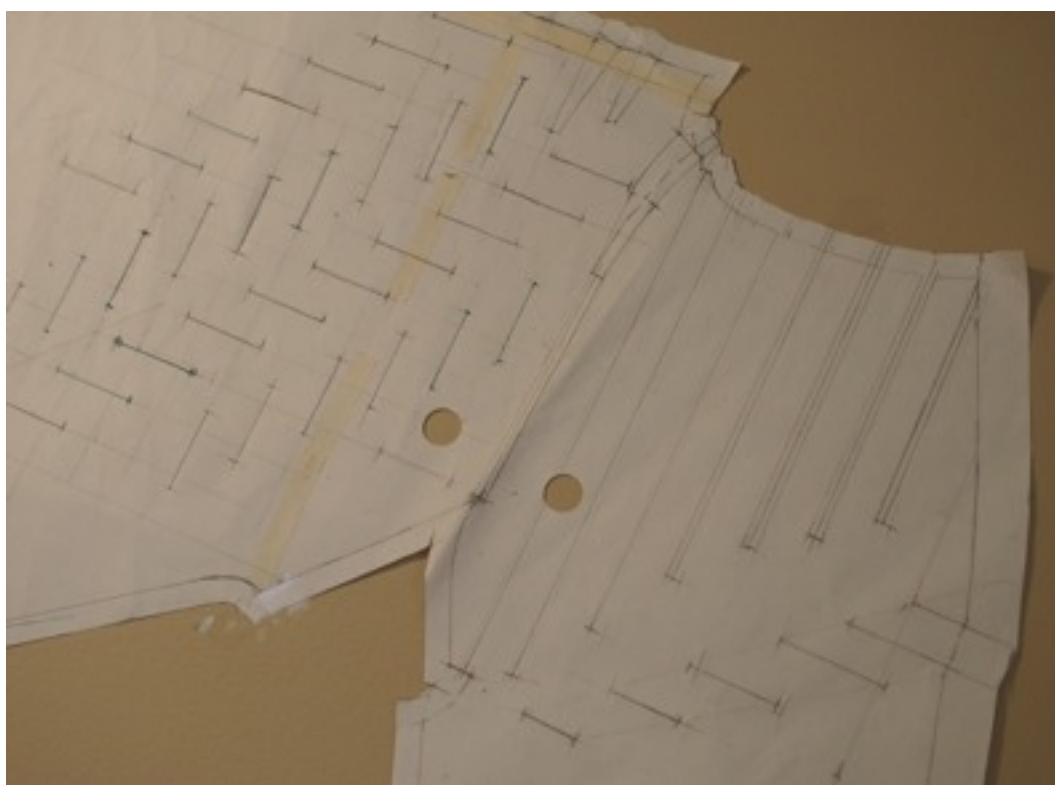


Fig. 23



Fig. 24



Fig. 25



Fig. 26

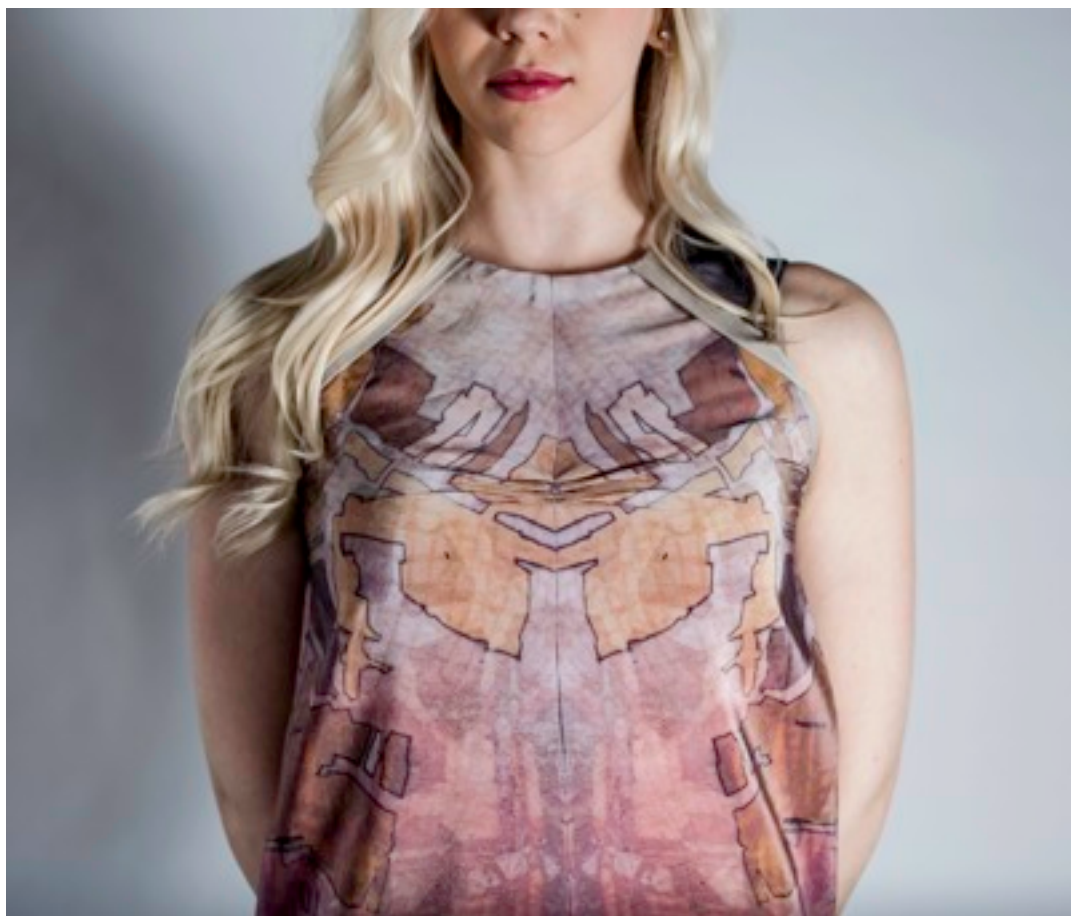


Fig. 27



Fig. 28



Fig. 29



Fig. 30



Fig. 31



Fig. 32



Fig. 33

