

기하학적 패턴을 활용한 패션디자인 연구

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A Study on Fashion Design Using Geometric Pattern

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ABSTRACT

자연을 분석함으로써, 얻어진 기하학적 패턴은 이미 자연의 질서를 포함하고 있는 논리적이고 합리적인 기본형이기 때문에 간결하며 시각적으로 명쾌감을 준다. 이러한 기하학적 패턴은 복식 디자인에 있어서 20세기 이후 여러 디자이너의 작품을 통해 재구성되어 현대적 이미지를 나타내는 중요한 모티브가 되고 있으며, 다양한 기법과 재료로 형성화하여 도입되고 있다.

이에 본 연구는 복식의 문양, 실루엣, 디테일에 사용되고 있는 기하학적 패턴을 연구함으로써 기하학적 패턴의 새로운 조형가치를 고찰하였다. 먼저 기하학의 용어 정의를 하였고 기하학적 패턴의 유형과 표현 기법을 분석하고 정리하여 현대 패션에 나타난 기하학적 패턴의 조형미와 그것을 바탕으로 패션 이미지를 추론해 보았다.

현대 패션에 나타난 기하학 패턴을 분석해 보면 유형으로는

첫째, 기하학적 문양으로 복식디자인에 있어서 주로 평면적인 형태로 많이 나타나지만, 크기가 다르고 동일한 기하학적 패턴을 조합시킴으로서 평면적인 형태에 공간감을 부여하기도 하며, 같은 기하학적 패턴의 표면이라도 배치구조에 의해 직선 혹은 사선으로 지각되므로 전혀 다른 이미지를 주었다.

또한 현대 패션에 나타난 기하학적 패턴의 종류는 세로 스트라이프, 가로 스트라이프, 격자 문양, 원, 사선 스트라이프, 마름모, 사각형, 삼각형 등의 순서로 많이 나타났다.

둘째, 색채는 단색의 복식에 강한 대비가 이루어지는 색상으로 표현되어 역동감과 유연한 운동감을 나타냈다.

셋째, 기하학적 실루엣으로 단순한 라인의 형태를 나타내거나 입체적이고 부조적인 형태로 구성되어 전체적인 실루엣으로 사용되어 강한 조형감각을 보여주는데 원형을 이용한 실루엣이 가장 많았으며 사각형을 이용한 실루엣, 삼각형을 이용한 실루엣 순서로 나타났다.

넷째, 기하학적인 디테일로 복식의 어느 한 부분에 장식적으로 사용되거나 입체적 형태로 부출 되어 부

조적인 느낌을 주는데 소매에 가장 많이 나타났으며 앞여밈, 칼라, 밑단, 주머니 순서로 장식되었다.

다섯째, 현대 패션에 표현된 기하학적 패턴의 표현기법으로는 프린팅, 퀴팅, piece기법, 패치워크, 엮기, 플라쥬, 아플리케 순서로 많이 나타났다.

위의 분석을 토대로 기하학 패턴을 활용한 디자인에 내재된 조형의지는 다음과 같이 정리되었다.

첫째, 기하학적 패턴이 지닌 단순성과 경직성을 완화하기 위하여 여러 가지 패브릭을 조합시켜 입체적인 표면효과로 시각적인 착시효과를 극대화하였다.

둘째, 표현기법은 입체파적 표현주의의 특성의 하나로 복식에 사용되는 소재의 왜곡으로 설명할 수 있으며, 새롭고 실험적인 소재의 도입으로 인해 의의성과 부조화를 유발시키는 동시에 유희적인 일면도 지니는 일종의 그로테스크를 나타냈다.

이상에서 정립된 조형의지를 바탕으로 현대 패션에 나타난 기하학 패턴은 절제된 단순함과 명확성으로 단순미가 유추되었고 강한 색상대비로 인한 시각적 집중효과로 주목성을 가지며 재현이 가능하므로 반복성이 유추되었다. 그리고 표준영역이 없는 창의적 표현으로 풍부한 독창성을 보여주고 있다.

또한 내재된 패션 이미지를 분석해 보면 정확함과 차가움의 의미를 지닌 이지적 이미지와 우주의 질서를 반영하는 상징적 이미지, 복잡한 자연으로부터 간결한 형태로의 경향성이 이루어낸 인공적 이미지를 느낄 수 있었으며, 미래적 이미지와 전통적 이미지의 상반된 개념의 이미지를 같이 내포하고 있음을 추론할 수 있었다.

이와 같이 현대 패션에 표현된 기하학적 패턴은 복식을 조형예술 분야로 확실히 인식시키고 발전시키는 데 중요한 촉매제 역할을 담당하고 있으며 또한 많은 디자이너들에게 창조적 욕구를 불러일으키고 영감을 주는데 중요한 모티브를 제공하고 있다.

Key words: Geometrical pattern(기하학적 패턴), modern fashion(현대 패션), ornaments(장식).

I. Preface

1. The purpose of this research

Geometric patterns are composed of points, lines, circles, triangles, and quadrangle, etc. and they are one of the oldest decorations that were invented by mankind. The geometric patterns were originated from the superstitious way of thinking of people in primitive society and the signals were the symbols of their belief that they had in the mind.

Geometric patterns acquired from the analysis of Nature consist of logical, rational and basic shapes. The patterns inherently include natural order in them, and are therefore concise and visually clear. Because of these characteristics, one can alter and combine these patterns to create the way to express a variety of his own ideas and desire¹⁾.

The detailed purpose of this study is as follows:

First, In order to research on the characteristics of geometric patterns, I study on the characteristics of geometric patterns appeared in Art history as the fundamental forms of structure.

Second, I examine the types of geometric patterns appeared in modern fashion as silhouette, pattern,

and detailed decoration.

Third, I conduct surveys on the various expression methods that were attempted to express the geometric patterns.

Fourth, Based on the above research, I try to infer the plasticity and fashion image of geometric patterns.

The purpose of this research is to study on the geometric forms used in patterns, silhouettes and details of dress, and to explore the possibility of expanding the scope of expressions in fashion by making inference on the plasticity and fashion images of geometric patterns through the research on the various expression methods that were attempted to mitigate the limitation from the simplicity and decorative restraints of geometric patterns.

2. The content and scope of this research

The literatures used in this research consists mainly of books on fashion design, both domestic and international. Also art books, research thesis, newspapers, and magazines were used.

In order to analyze the plasticity of geometric patterns that were appeared in modern fashion with positive research method, I have used the literature of Collection(1990-1999), Fashion News(1997, 1998)-Specialty fashion Magazine of Japan, Collezioni Donna(No.37,49,57,58) of Italy, Vogue(1992-1993) of America, Bazaar(1996-1999)-Italian Edition, and SFAA(1997-1999) of Korea together with photographic data in the literature.

The analysis of geometric patterns was done mainly focusing on the group of designers in overseas fashion industry, who were introduced by the "Collection" and were known to have shown a lot of geometric patterns in their practical designs: 46 designers from Milano Collection, 68 designers from Paris Collection and 15 designers from New York Collection. The data for statistical analysis were compiled mainly from Collection(1990-1999) and approximately 1,520 pictures out of 28,000 cuts that used geometric patterns were taken.

This research begins with definitions of specific terms related to geometric patterns, followed by the analysis of typical characteristics of geometric shapes as well as various techniques used to express them. The research ends with an inference on the image of geometric patterns in modern fashion.

3. Definition of terminology

Geometry is defined as "a branch of mathematics²⁾ that deals with the measurement, properties, and relationships of points, lines, angles, surfaces, and solids"³⁾.

However, in this research, we are not so much concerned with geometry in mathematical sense as we are with geometric shapes, which are simplified and purely two-dimensional forms such as circles, triangles, and squares.

In English, a "pattern", when it is used as a noun, refers to "an example, shape, model, or design". And when it is used as a verb, "pattern" means "to furnish with a design and to create according to a model". A Korean dictionary defines pattern as a field of researching the properties of shape, size,

and position. Considering all the above definitions, one can say that geographic pattern means researching the properties of geometric forms.

In this research, I have used the definition of 'geometric pattern' as the meaning of 'researching concise, condensed, and simplified two-dimensional shapes such as circles, triangles, and squares'.

II. Analysis of geometric patterns appearing in modern fashion

1. Types of geometric patterns

Geometric patterns often appear in fashion design in flat and two-dimensional forms. In a monochrome garment with a simple silhouette, geometric patterns in strongly contrasting colors presents dynamic image as well as supple mobility.

Geometric patterns used in fashion are divided into free-flowing forms such as circles and arcs, and regulated forms as squares, triangles, and straight lines. In general, regulated forms are more easily perceived than flowing forms.

The most common types of geometric patterns in modern fashion are: vertical stripes, horizontal stripes, grids, circles, diagonal stripes, rhombuses, squares, and triangles, in the order of preference.

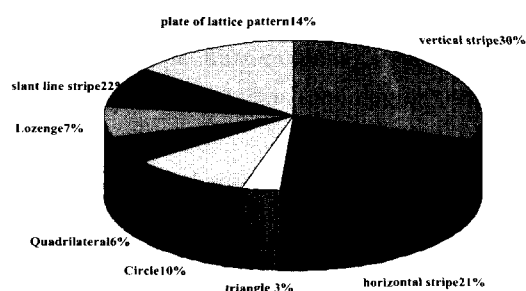
By combining many different sizes of the same geometric shape, a three-dimensional effect can be produced on a two-dimensional surface.. Different arrangements of identical geometric patterns can lead to the perception of either straight or diagonal lines, and elicit entirely different feelings<figure 1>.⁴⁾



<figure 1> Rublna, 1996
S.F.A.A

<Diagram 1>Analyze the geometrical pattern which appeared in modern fashion

head	quantity	%
plate of lattice pattern	36	14%
slant line stripe	22	8%
lozenge	15	7%
quadrangle	13	6%
circle	25	10%
triangle	8	3%
horizontal stripe	51	21%
vertical stripe	73	30%
	243	100%



-collection(1990-1999)-

2. Geometric silhouettes

In the silhouettes of garments, geometric forms appear as simple lines or three-dimensional shapes.

They can be in a single part of a garment, or the entire silhouette itself. In any case the forms convey strong sense of structure.

Silhouettes used in recent fashion trends employ closed geometric forms such as squares, triangles, circles, etc. Closed forms create fixed silhouettes and the clear and closed outlines of which draw visual attention to the garment itself instead its surroundings⁵⁾.

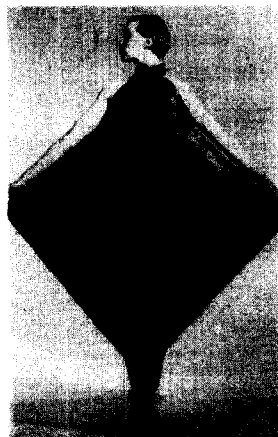
Color is the most powerful design element in determining the image of a silhouette. Dark colors produce a weak shade effect, highlighting the silhouette while making three-dimensional surfaces look flat. Bright colors produce a strong shade effect, creating a silhouette that makes flat surfaces look three-dimensional.

1) Flat image of geometric silhouettes

At present, silhouettes comprised of circles are more common than silhouettes composed of squares or triangles. Circle silhouettes appear feminine and comfortable because they produce a cheerful image. Depending on a viewpoint, silhouettes using circles can also produce a modern, high-tech image. With a series of geometric curves expressing rational rhythm, circles are very geometric and complete, but at the same time circle possess the desire for change that is inherent in most things. These unique characteristics create the feelings of natural and active mobility .

The quadrangle⁶⁾ silhouette is the second most common type of silhouette. Square silhouettes have the image of composure and weight, partly due to the horizontal and vertical lines of the square, which elicit the feelings of clarity as well as warm stability. Feelings about scope and limit are strong in square silhouettes, while the crossing of vertical and horizontal lines elicits tension as well<figure 2>.

Triangle silhouettes, the third common type, give aggressive and directional feeling. Garments with inverted triangle silhouettes evoke vigor and instability, and with regular triangle silhouettes we can express both vigor and stability<figure 3>.



<figure 2> quadrilateral.
silhouettes Fashion Design
Conception Training II



<figure 3> Pirre Cardin,
1986

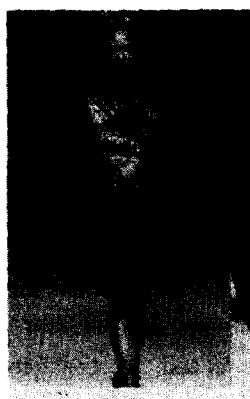
2) Three-dimensional image of geometric silhouettes

The three dimensional images of circle are a sphere, cylinder, or cone. A sphere maintains absolute symmetry at all times, and is therefore the most perfect shape visually⁷⁾. Spheres also give the feeling of constantly moving (figure4).

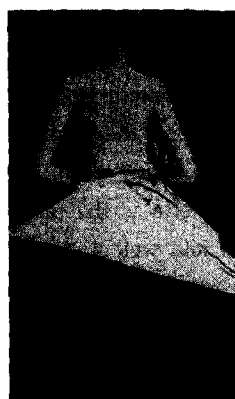
Cylindrical silhouettes are practical type and give the feeling of still motion linders are viewed analytical rather than rational.

Spherical silhouettes can exquisitely link the geometric shape of the garment to the structure of the physical body, evoking the mysterious feelings of universe.

The cylinder, a type of pyramid, is the most stable shape from an engineering point of view. Cylindrical silhouettes express the feelings of sharp and rational rhythm while evoking blazing emotions as well(figure 5).

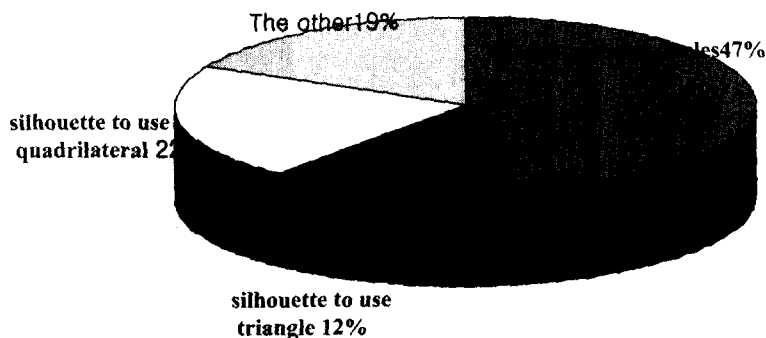


<figure 4> Paco Rabanne
Fashion Design Conception
Training II



<figure 5> Alexander
Mequeen, 1996, S/S,
Collections

<Diagram 2>Analyze the geometrical silhouettes which appeared in modern fashion



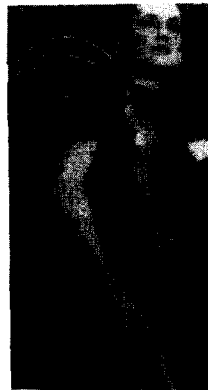
3. Geometric ornaments

Ornaments can be used in a part of garment decoratively, or be exposed in three dimensional shape creating a structural effect. They can also be used effectively across the entire garment. When used in dress, geometric ornaments are really eye catching and pleasing to the eyes⁸⁾.

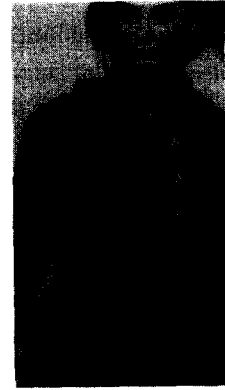
In modern fashion, the shapes that are most frequently used for ornaments are circles, squares, and triangles, in the order of frequency. Circular ornaments are cute and pleasant, and have a feminine image. Depending on a viewpoint, they can also carry a high-tech image. Circular ornaments are usually used for sleeves (figure 6), and sometimes for hemlines and necklines.

Square ornaments are solid and stable, and have a masculine image. An orderly arrangement of square ornaments on dress elicits stability, however, the slightest tilt can break the entire balance and evoke unstable feelings. Square ornaments also have a composed image that is authoritative and heavy, conveying a sense of stability. They are mostly used for hemlines, and at times for front adjustments and pockets⁹⁾(figure 7).

Triangles can also represent diagonals, which are straight- yet-free, off-centered, dynamic lines that portray clean precision. When used in dress they portray the exactly same image. Regular triangles, whose peaks face up, elicit feelings of stability and depth, while inverted triangles evoke feelings of instability and strong dynamics. As the most simple and geometric polygon, the triangle evokes feelings ranging from stability to dynamics, and with its directional quality, triangles leave intense impression¹⁰⁾.



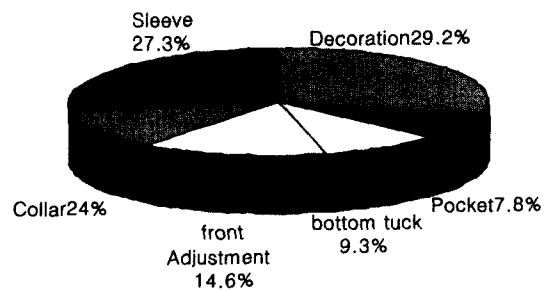
<figure 6> Pierre Cardin Fashion Design Conception Training II



<figure 7> Junko Shimada 90-91A/W Collection

<Diagram 3> Analyze the geometrical decoration which appeared in modern fashion

Item	quantity	%
decoration	60	29.2
pocket	16	7.8
bottom tuck	19	9.3
front adjustment	30	14.6
collar	24	11.8
sleeve	56	27.3
	205	100



collection(1990-1999)

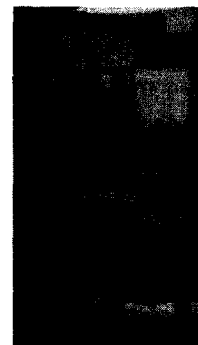
2. Expressive techniques of geometric patterns

1) Patchwork

Patchwork¹¹⁾ refers to the attachment of geometric pieces of cloth (mostly square and triangular) to compose a design. There are two types of patchwork—mosaic and appliqué. Mosaic patchwork contains influences from abstractism, functionalism, and Bauhaus. It involves the attaching one patch of a specific shape after another in successive and adjacent fashion¹²⁾. Appliqué patchwork involves the taking patches of different shapes and attaching them in a more random, scattered manner. The appeal of the geometric motif found in patchwork is that it has very strong ornamental effect and it is visually very pleasant<figure 8>.

Entertaining pictures can be added to each patch: however, the pictures must be simple and easily recognizable to draw attention.

Patches can also be arranged in such a way that they are perceived as vertical or horizontal stripes to convey active feeling. Taking squares of contrasting size and color, and placing one on top of the other, patches can provide a sense of space to a flat surface by creating a raised texture.



<figure 8> Knit Patchwork Fashion Design Conception Training II

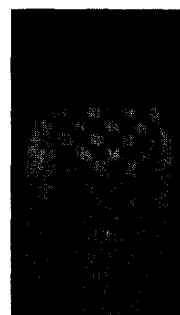
2) Weave

Weaves that consist of vertical and horizontal strips crossing at ninety-degree angles have the properties of squares, and thus create the feeling of the simplicity and clarity of geometric shapes. Different methods of weaving can produce different visual effects. The following is an organization and summary of the different methods, which have been appearing in specialty fashion magazines since 1990.

The first method utilizes the color-contrast effect often found in geometric patterns. Black and white strips of tape were sewn close to create a design consisting of straight and simple lines, eliciting feelings of integrity, clarity, and resolution<figure 9>.

The second method involves using the same fabric for both the vertical and horizontal strips, and it also involves sewing the strips close to give the impression of an actual weave.

The third method uses thin tape sewn in wide intervals to maximize the space within the cross-sections. By revealing the background surface, this method creates a translucent effect while conveying an image of delicacy<figure 10>.



<figure 9> Fashion Design Conception Training I



<figure 10> Sophie Sitbon Fashion Design Conception Training I

3) Quilt

Geometric quilts in modern fashion are being created with the development of new experimental materials. Quilts create playful, surprising, and amusing feeling. By adding bulk to flat surfaces, they create a three-dimensional effect to dress.

Quilts consisting of geometric patches of different color are considered a paradoxical form of expression, because they combine the patches that look incompatible at first glance. They are unusual and exaggerated, and also they maximize the effects of optical illusion<figure11.

4) Appliqué

Appliqué¹³⁾ is a more liberal and less restrained method of composition that partitions the human body as if it were a canvas. In other words, for the sake of easier composition, complex forms are simplified into geometric components<figure 12>.

Appliqué is originally meant to be used for mending and decoration , and it can be made more conspicuous by using a thread of contrasting color.

5) Piece work

There are methods of composition based on the rhythm of repeating geometric units. The most representing example is piecing.

Rather than simply filling in a given fabric for a decorative effect, piecing involves the assembly of different pieces of the same shape. Depending on the number, size, direction, repetition, and spacing of the pieces assembled, either three-dimensional effects or flat or relief image can be created on the fabric. Piecing has systematic beauty that is found in repetition and duplication. The use of a single shape in piecing looks simple, but the repetitious arrangement and assembly of those pieces can create visually special effects. Shapes to be used for piecing should be selected based on the how they look when they are put together rather than how they look individually¹⁴⁾<figure 13, 14>.

5) Collage

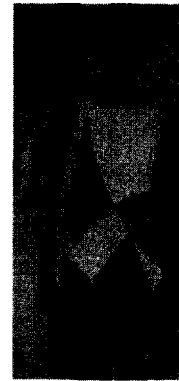
The word "collage" is derived from the French verb Coller, which means "to attach with glue". The original definition was specialized and now refers to attaching print material, cloth, iron pieces, wood pieces, sand, leaves, etc¹⁵⁾.

Collages appearing in modern clothing consist mainly of irregular shapes. Due to the development of various techniques utilizing collage along with the development of new fabric, modern dress has progressed into a form of plastic art.

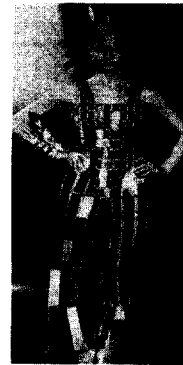
As mentioned above, the expressive techniques of geometric patterns most frequently found in modern fashion are printing, quilting, piecing, patchwork, weaving, collage, and appliqué, in the order of



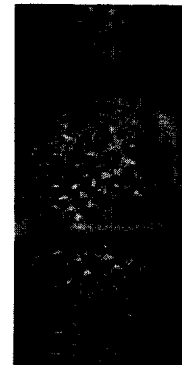
<figure 11> J. C. de Castelbajac Fashion Design Conception Training I



<figure 12> Laura Biagiotti 1997 S/S Collection



<figure 13> Paco Rabanne 1997S/S Fashion News



<figure 14> Paco Rabanne 1997S/S Fashion News

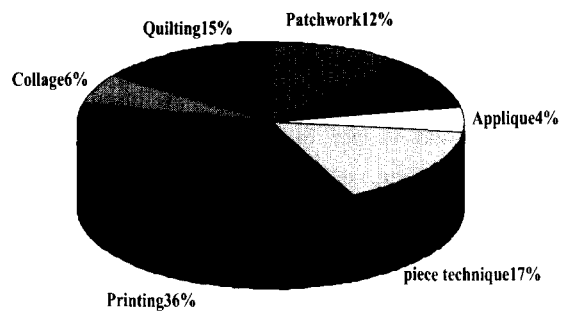
frequency. An analysis of actual samples leads to the following summary.

First of all, in order to soften the simplicity and rigidity of geometric patterns, contrasting textures were used to maximize tactile and visual effects.

Secondly, the expressive techniques mentioned before are the characteristic of three-dimensional expressionism, and can be described as the methods of distorting fabric. The introduction of new and unique fabric allows an even greater variety of expressions. Accordingly, these techniques elicit the feelings of surprise and plasticity as well as grotesque amusement.

<Diagram 4> Expression method of geometric pattern which appeared in modern fashion

Item	quantity	%
quilting	30	15%
collage	13	6%
printing	68	36%
piece technique	38	17%
applique	10	4%
weaving collage	20	10%
patchwork	24	12%
	203	100%



collection(1990-1999)

III. The aesthetic characteristics of geometric patterns in fashion design

1. Simplicity

The simplicity and purity of geometric patterns that are expressed directly through geometric shapes or by blending them into three-dimensional dress through silhouettes, patterns, and ornaments, are creating new forms of beauty in plastic art. In the simplicity of geometric patterns, there is moderate and reasoning beauty as well as urban and modern beauty. Modernism is expressed through the simplification of the human body into a series of simple geometric shapes. This mode is composed of straight, basic lines, free of decorative elaboration. By trying to express the beauty of fashion through functionality and structure only, the feelings of integrity, clarity, directness, and resolution are created.

Since 1990, the trend of fashion has not been governed by just one type, but developed with multiple images.

The first type, retro-fashion, is a reinterpretation of the 1960s style- clean-cut designs, expressed through the use of geometric graphic patterns. This style involved applying a minimum expressive techniques to dress.

The second type, artistic dress, contains avant-garde elements and surpasses the limits of conventional arts. Artistic dress is now accepted as a form of plastic art, along with painting, sculpture,

and crafts. Depending on the nature of the individual designer, the direction of the creative process as well as the image expressed can be very diverse¹⁶⁾. In artistic dress, three-dimensional silhouettes are often formed through the alignment and compilation of simple geometric shapes, which can also be used as individual motifs.

As geometric patterns employ the most basic shapes such as circles, triangles, and squares, it gives the highest satisfaction to modernists who regard simplicity as the greatest beauty.

2. Attention

Because of their simplicity and clarity, geometric patterns create strong visual effects and have a mechanical beauty expressed through dynamic speed and activity. They draw attention especially when they are used in creative fabric of the machine age, or when they are seen in multi-media images in basic colors. They appear as separate entities from space through clear-cut, closed definition, and sometimes seem to expand three-dimensionally when they are put on a human body as a dress.

Ornaments with geometric patterns are strongly noticeable and are visually pleasing. Ornaments can be used decoratively in a single part of a garment, or three-dimensionally for a geometric structural effect.

3. Repetition

Geometric patterns are easily reproducible. As they are not originated from intentional or accidental elements, they can be objectified and reproduced exactly. In today's world where geometric patterns are extensively used in all visual environments such as computers, graphics etc., this type of reproducibility is invaluable and has become the ideal matrix of pure, modern and abstract plasticity.

Opt-art, based on the repetitive element of geographic patterns, has its roots in visual and tactile principles, and it refers to an inclination to show abstract, geometric and mechanical forms and patterns. Through the various arrangements of diagonals, squares, and dots, geometric patterns are varied, and depending on the repetition, it allows one to see a form, color, or design that was not apparent at first glance. This type of opt-art has influenced many designers, and become an important material for textile designs and silhouettes. Opt-art is now being focused and created a trend.

4. Originality

Geometric shapes are the forms stripped of all abstract, extraneous excesses, and restored to their most basic geometric elements. Works composed of these shapes possess unique meanings that require no explanation. Accordingly, geometric shapes are being used throughout the fields of art and culture.

Just as the different transformations of lines and shapes were widely used in fabric patterns and personal ornaments in the past, it has the dress itself being applied today as an element of design, and thus it has been included in the domain of plastic art. In current fashion, the originality of geometric

shapes is being widely expressed through silhouettes. Since the early 1990s, geometric dress has become progressively more valuable as a new, abstract plastic art.

Now, a cultural diversity is being recognized that has no standard model or bounds in the expression of dress, breaking stereotypes and re-quoting past motifs in the present. Completely different fabrics are being mixed and matched, and even unsuitable material such as glass and wood are being used as fabric. Modern, daring creativity is establishing as the new sense of beauty through three-dimensional geometry, which has become a style of its own, giving us new insights on fashion¹⁷⁾.

IV. Fashion images of geometric patterns in fashion design

1. Intellectual image

Compared to the drifting shapes that often appear in paintings, geometric shapes are very well organized and arranged systematically, and thereby leave a clear and intellectual impression¹⁸⁾. At the same time they may appear as abstract forms composed of non-reproducible elements, in which case they are seen very accurate, clean, and intellectual.

In geometric abstraction, the emphasis on geometric elements expresses an absolute dimension that transcends mathematical order and individuality, a dimension sought by the mind's desire for intuition and perfection¹⁹⁾.

In the past, geometric forms were created subconsciously through the emotional impulses shared by society, whereas today, forms are consciously inspired from intellect and appreciated as subjective expressions of individuals²⁰⁾.

2. Symbolic image

As geometric patterns are the forms stripped of all excesses and restored to their most basic geometric elements, they convey the feelings of simplicity and clarity. Even without an objective explanation, their significance is implicit in their brevity.

In the simplicity and symbolism of geometric patterns, the shapes that were harmoniously formed according to principles of balance and proportion are endless possibilities. Their three-dimensional expression, symbolizing universal order, is grafting past styles to the present while creating new styles of their own. Geometric patterns are not merely designs, but reflect people's inner thoughts and feelings. Geometric patterns express the complexity of the present time in simple and abstract forms, and we can say that geometric patterns are the representing symbol of modern beauty.

3. Artificial image

In dress, straight forms often look detailed and artificial, while curved forms appear soft, flowing, and natural.

In a modern fashion, geometric and artificial images often exaggerate and distort the human figure by three-dimensionally expanding the space between the garment and the physical body (picture 103,104). The most artificial images are expressed through new and unique fabric, such as metal, aluminum, and plastic, satirizing the emotional void left from today's environmental pollution, industrialization, and loss of hope.

4. Futuristic image

Modern society is being forged through future oriented imagination, with state-of-the-art technology from industry²¹⁾, commerce, and science. The interest in futurology is increasing, and futuristic experimental forms of dress are appearing more often. Avant-garde futurism is being widely expressed in fashion through new fabrics such as vinyl, paper, glass, metal, and plastic. Not only is it presenting a new form of beauty in clothing, but is also promoting the image of futurism that began with the merger of scientific civilization and artistic dress.

In the new fashion industry grown out of technological development, geometric patterns are being diversely applied through new fabrics, such as the ones aforementioned. Two types of futuristic silhouettes- simple geometric silhouettes, and exaggerated silhouettes, have appeared together. Design elements of the past are being balanced with the elements of the present, artificially exaggerating and shrinking the human body.

Three-dimensional effects such as geometric silhouettes, bold geometrical graphics, and protective polish not only present a new beauty in artistic dress, but also open up the possibilities of futurism.

V. conclusion

Geometric pattern adapted from the nature is logical, rational, and basic pattern. The geometric pattern became the important motifs to many designers since the beginning of the 20th century for fashion design. The various techniques and materials using the geometric pattern were adopted in fashion design.

This study tried to analyze the geometric pattern which appeared in fashion.

Geometric pattern is expressed in the following type:

1) It appears much in plane form mainly in the design of dress and its ornaments as geometrical pattern, but it gives the space sense to plane form by mixing geometrical patterns of different and same sizes together.

And, even in case of the surface of same geometric pattern, as it is perceived linearly and slantly by its structural arrangement, it created quite different image. Besides, if we examine the frequency of geometrical pattern usage which appeared in modern fashion, it appeared in the order of vertical stripe, horizontal stripe, plate of lattice pattern, slant line stripe, lozenge, quadrangle, and triangle etc.

2) It showed dynamic as well as flexible sense of mobility by the contrasting colors of monochrome dress and its ornaments.

3) It shows the strong plastic sense with the use of whole silhouette by showing the form of simple line or 3-dimensional and relief-characteristic form with geometrical silhouette.

Silhouette using circles appeared the most, and the silhouettes using quadrangle and triangle followed.

4) It gives the feeling of relief characteristic by the partial decoration of the dress and its ornaments or in 3-dimensional form as geometric decoration. It appeared in sleeve the most, and front adjustment, color, bottom tuck, and pocket followed.

5) As for the expression method of geometrical pattern in modern fashion, it appeared in the order of printing, quilting, piece work, patchwork, weaving collage, and applique.

The result of analysis in this research is summarized as follows :

1) In order to relieve the simplicity and rigidity that geometrical pattern has, this researcher maximized tactile textile and visual illusion effect by trying various texture contrast.

2) Above expression method which appeared in modern clothing may be explained as the distortion of material to be used in dress and its ornaments as one of 3-dimensional expressionism features. And, it causes unexpectedness and disharmony by the introduction of new and experimental material and it shows a kind of grotesque to have one side of play at the same time. As a result of this research, geometrical pattern which appeared in modern fashion has plastic beauty such as simplicity, noticing nature, repeating nature, and originality etc. And, in order to analyze fashion image, this researcher tried to include the meaning of contrary concept of intellectual image, futuristic image and traditional image.

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