دراسة مقارنة بين أقمشة تريكو اللحمة الملونة السنجل الجيرسيه (السادة والسنجل بيكيه) من حيث الخواص الجمالية والوظيفية المستخدمة كملابس خارجية للسيدات

A comparative study between colored weft knitted fabrics single jersey(plain properties used as Women's and single piqa) in terms of aesthetic, functional Outerwear

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Abstract:

The effect of derivatives of structure weft knitted single jersey between (plain and single piqa) was explored in this study. 20 samples were produced with colored stripe designs divided into (10 color stripe designs with plain structure, and 10 color stripe designs with Single piqa structure) They were knitted with identical machine settings. Fabric structure shows great impact on different properties of weft knitted fabric if processing parameters such as; yarn count, needle gauge, remain constant. This study investigates the effect of two weft knitted structures; plain jersey, single piqa on several functional properties such as:fabric weight , fabric thickness ,air Permeability, color fastness Dry& Wet ,.The test results revealed that the Superior Single Piquet in terms of weight and Thickness and superiority of Plain in terms of air permeability and color fastness Dry &Wet

.By comparing the aesthetic values of the plain and the single piqa, it is clear that the superiority of the single piqa superiority in the majority.

Key words: structure of single jersey؛ structure of Single pique؛ aesthetic properties؛ functional properties؛ Women's Outerwear.

1. INTRODUCTION :

High performance knitted production has evolved by altering fibers, yarns, and knitting parameters to create new fabric designs. This has led to multifunctional knitwear with exceptional features like softness, weight, thickness, air permeability. The fashion knitting industry is constantly evolving, where knitting accounts for a large percentage of fabric consumption. The structural parameters and functional properties of knitted fabrics depend on various factors. The **research problem** can be formulated through the following questions:

1- What is the best structural installation among the single jersey Derivatives (plain or

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single piqa) that achieves the functional and aesthetic properties of the Women's Outerwear fabrics?

2- What is the best striped design set and colour group that achieves aesthetic properties and suits the Egyptian taste as Women's Outerwear?

The **objectives of the research** emerge in:

1- Taking advantage of the capabilities of the machine in the production of single jersey derivatives using the parts of the machine to obtain different structural structures.
2- Reaching to determine the best Constructive combination among (the plain and single piqa) which achieves the best results for the functional and aesthetic properties as women's outerwear.
3- Reaching the best innovative designs and colour combinations that achieve aesthetic properties.

The **Research hypotheses**:

1- The different tracks of the machine are statistically significant on the functional and aesthetic properties of the fabrics produced.
2- The difference in the type of stitch used (knit or Tuck) is statistically significant on the aesthetic and functional properties of the fabrics produced.
3- The different design of the stripes and the different colour groups used is statistically significant on the aesthetic properties of the fabrics produce**.**

Search limits:

1- Circular weft knitting machine Gauge 12 Needle\inch.

2-Yarn 16\1 En raw cotton and 300\1 denier colored polyester.

3-structer of single jersey (plain) using one track and a knit stitch only.

4- structer of single jersey (single piqa) on two tracks using (knit and tuck stitch).

Research Methodology: Experimental Analytical.

2. Theoretical framework:

-The textile sector is one of the most important industrial sectors in the world. Fabrics are produced mainly by knitting technique and weaving technique. Knit fabric production is easier and quicker than woven technique. Knit garments is growing very rapidly due to less investment, requirement grow of backward linkage & high profit than woven garments. As it is known that yarn used for knit fabric needs no preparations like warping and sizing, yarn can directly feed on machine after receiving from spinning mills(1).

-The inter looping of a series of yarns forms the base of a knitted fabric where different types of loops or stitches, that is (knit, tuck and miss) determine the aesthetic and functional properties. Particularly many derivatives of weft knitted single jersey like Single pique, etc. have been developed by the

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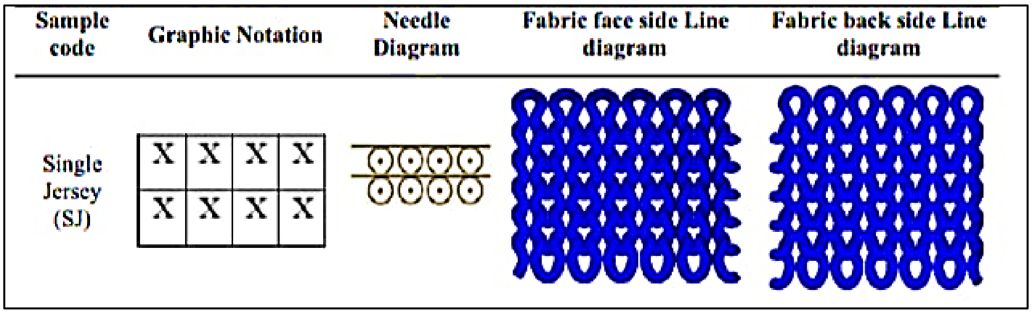
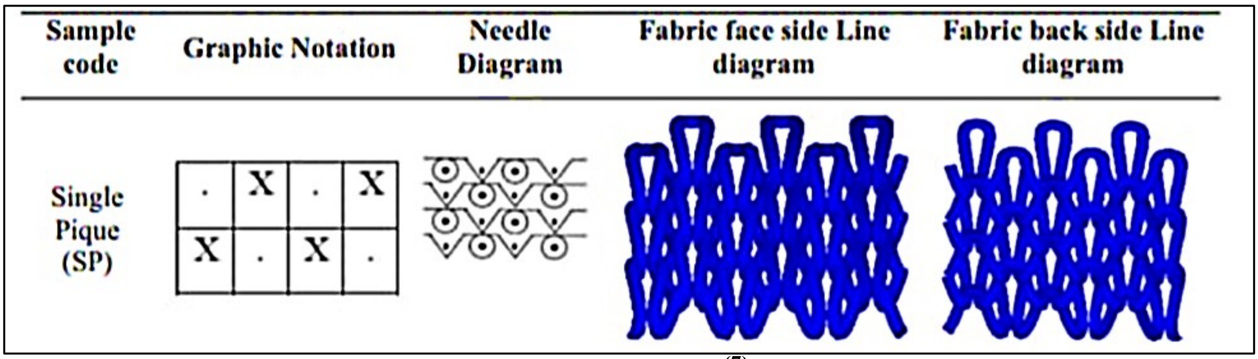
combinations of different stitches. These structures are widely used for casual-wear, for men and women etc. In worldwide Research and development continue for developing more derivatives of single jersey by altering the numbers or the position of stitch location within the structure and evaluating those for commercial production[2-3]..

- Single jersey (Plain) is the simplest and most economical weft knitted structure to produce and has the maximum covering power. It normally has a potential recovery of 40% in width after stretching .It is produced by the needles knitting as a single set, drawing the loops away from the technical back and towards the technical face side of the fabric[4].



Fig(1) Sigle jersey (plain)[7]

-single pique is a typical knitted structure with tuck stitches. Since tuck structures are more complicated than knit and float structures. [5]



Fig(2) Single piqe[7]

- The colored weft knitting base of the single jersey (plan single jersey and single piqe) in which colors are used according to the design to be implemented

And the specification set for implementation [6].

- Understanding the properties of the fabric and its relationship to end-use is crucial. Where the most important element in the function of clothing is the functional properties of performance and aesthetic and formal properties as general clothing and in our study this is called women's outerwear [7].

-Functional and Aesthetics properties:

Functional properties can be defined as the properties of the fabric weight, fabric thickness and others, as well as the response to the action of external forces applied to the fabric and resulting in deformation of what varies according to the formation of fabric composition such as pilling, Friction, Fabric Bursting resistance,air Permeability. This study uses aesthetic characteristics to predict

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textile performance, specifically women's satisfaction and acceptance of textile designs, with a focus on functional property tests.

The need for questionnaire to predict or assess subjective aspects of fabric aesthetics has increased in recent years for three main reasons:

1) The trend towards light-weight clothing has resulted the increased use of fabrics that are difficult to make-up and require new handling skills.

2) The trend towards shorter seasons and the use of rapid systems (such as just-in-time manufacturing), have meant that the delivery of fabrics that are difficult to make-up will disrupt production schedules. For this reason it is even more important that garment makers are able to predict fabric performance.

3) The increased use of automation garment manufacture removes the opportunity for skilled operators to correct for difficult or variable fabrics. [8]

-The instinct of God in women is the tendency to beauty and adornment, which is reflected in the choices of women, especially in clothes. Women's outerwear varies in terms of design, shape, material, occasion, wearing period, quality, prices, nature of clothing, whether they are workwear, occasions, and others[9].

Perhaps the most important characteristic of practical outerwear for women is that it is comfortable, practical, with a beautiful appearance that relaxes the soul and delights the eye and is characterized by keeping pace with change and development in fashions, colors and lines [10].

3. Material and Method:

3-1-Materials:

Knitting machine. Circular weft knitting machine equipped with different types of cams (knit and tuck cams) was used in the study. Four tracks, two of which were used in the study. The machine parameters are shown in Table 1.

Table 1. Machine parameters

N	Parameters	Details
1	Trucks	4
2	Number of feeders	36
3	Needle type	Latch
4	Machine gauge	12 N\Inch

Yarn: All structures were produced from a single type of

Yarn with parameters as shown in Table 2. The raw cotton

Yarns of count 16\1 NE, The colored polyester yarn of count 300/1 denier.

The Yarn parameters are shown in Table 2.

Table 2. Yarn parameters

N	Parameters		Details
1	Raw	Fiber type	Cotton
		count of yarn	16/1 Ne
2	coloerd	Fiber type	Polyester
		count of yarn	300/1 denier

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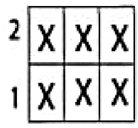
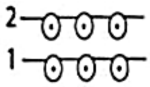
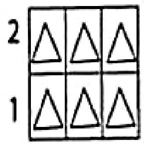
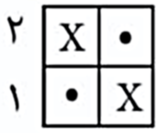
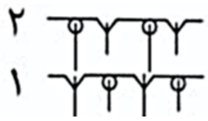
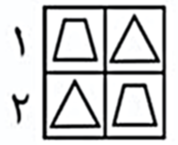
3-2Structure:

Sample knitted fabrics were produced as colored single jersey Derivatives fabric. The fabrics were produced by structure 1- plain .2- single piqa. The structure parameters are shown in Table 3.

Table 3. structure parameters

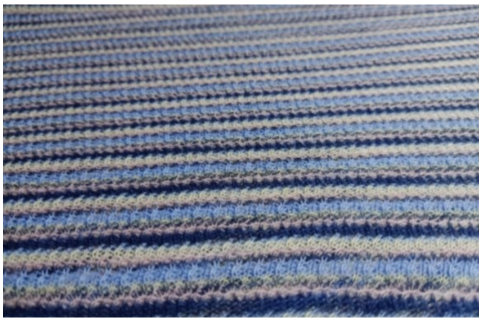
N	structure	Symbolic style	Diagrammatic style	Cam stylr	Track style
1	**Plain**				١ X
2	**Single Piqa**				٢ X ١ X

Twenty design colored samples Divided as follows:

1-Ten design colored plain jersey. 2-Ten design colored single piqa.

The design colored parameters are shown in Table 4

Table 4. Design colored parameters

N	Plain	N	Single piqa
1		11	
2		12	

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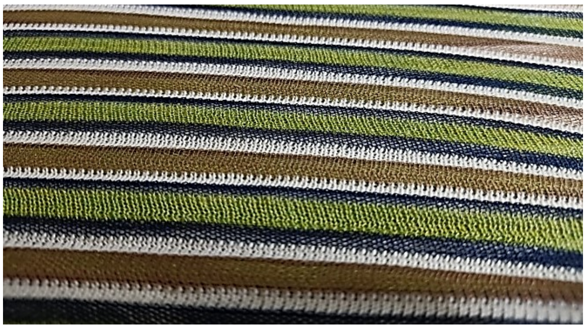
3		13	
4		14	
5		15	
6		16	
7		17	

8		18	
9		19	
10		20	

3-3-Functional properties:

While the following functional properties of the fabrics were measured in Accordance with the relevant standards:

1- Test Fabric Weight 2- fabric thickness

3-airPermeability 4- Color fastness

3-3-1 Test Fabric Weight:

This test was followed) ASTM D3776 / D3776M - 09a Standard Test Methods for Mass per Unit Area (Weight) of Fabric)

In this test, several 10 x 10 cm samples are made. The weight of each sample is then determined using a sensitive scale with four decimal places. The arithmetic average of the samples is then determined, and the result is multiplied by 100 to obtain the weight of the square meter. The results are as follows in table 4:

Table 4. Test readings for weight per square meter of fabric

Plain						Single piqa					
Sample No	**Readin (1)**	**Reading (2)**	**Reading (3)**	**Average**	**Result**	**Sample No**	**Reading (1)**	**Readin g (2)**	**Readin g (3)**	**Average**	**Result**
1	0.5632	0.5463	0.5419	0.5504	**110.09**	**11**	0.4183	0.3878	0.3781	0.39473	**78.94**
2	0.5103	0.5000	0.4664	0.4922	**98.44**	**12**	0.4261	0.4636	0.4346	0.4414	**88.28**
3	0.4958	0.5004	0.5077	0.5013	**100.26**	**13**	0.6799	0.6378	0.6264	0.6480	**129.60**
4	0.3763	0.3724	0.3675	0.3720	**74.413**	**14**	0.369	0.3883	0.3772	0.37816	**75.63**
5	0.5162	0.5267	0.5109	0.5179	**103.58**	**15**	0.6218	0.5828	0.5847	0.5964	**119.28**
6	0.5995	0.5387	0.571	0.5697	**113.94**	**16**	0.6939	0.7247	0.6964	0.705	**141.00**
7	0.3428	0.3242	0.3323	0.3331	**66.62**	**17**	0.5935	0.6392	0.6122	0.6149	**122.99**
8	0.31	0.3383	0.3341	0.3274	**65.49**	**18**	0.3605	0.3737	0.3791	0.3714	**74.28**
9	0.5932	0.5528	0.5318	0.5592	**111.85**	**19**	0.648	0.5924	0.6631	0.6345	**126.90**
10	0.4445	0.4433	0.487	0.4582	**91.653**	**20**	0.4868	0.4735	0.5037	0.488	**97.600**

3-3-2 Test Fabric thickness:

This test was followed ASTM D1777 - Standard Test Method for Thickness of Textile Material

The fabric is measured for thickness in multiple locations after it has been straightened and is not subjected to outside pressure or influence. The fabric is passed under the device's foot while bearing only the weight of the foot. The measurements yield the following results in table 5:

Table 5. Test readings for thickness per mm of fabric:

Plain											Single piqa										
Sample No	**Reading**									**Average**	**Sample No**	**Reading**									**Average**
1	**0.18**	**0.25**	**0.22**	**0.27**	**0.20**	**0.27**	**0.28**	**0.25**	**0.28**	**0.244**	**11**	**0.18**	**0.23**	**0.16**	**0.18**	**0.23**	**0.24**	**0.27**	**0.25**	**0.23**	**0.218**
2	**0.28**	**0.29**	**0.14**	**015**	**0.12**	**0.14**	**0.12**	**0.16**	**0.15**	**0.172**	**12**	**0.19**	**0.28**	**0.18**	**0.25**	**0.26**	**0.27**	**0.21**	**0.23**	**0.27**	**0.237**
3	**0.18**	**0.21**	**0.21**	**0.20**	**0.24**	**0.26**	**0.19**	**0.18**	**0.21**	**0.208**	**13**	**0.49**	**0.49**	**0.50**	**0.52**	**0.49**	**0.54**	**0.48**	**0.48**	**0.48**	**0.493**
4	**0.02**	**0.10**	**0.06**	**0.02**	**0.02**	**0.04**	**0.07**	**0.04**	**0.05**	**0.045**	**14**	**0.21**	**0.20**	**0.24**	**0.17**	**0.27**	**0.20**	**0.20**	**0.20**	**0.20**	**0.21**

5	**0.13**	**0.22**	**0.20**	**0.18**	**0.18**	**0.15**	**0.12**	**0.20**	**0.10**	**0.164**	**15**	**0.49**	**0.42**	**0.41**	**0.40**	**0.47**	**0.45**	**0.43**	**0.45**	**0.45**	**0.491**
6	**0.33**	**0.25**	**0.25**	**0.18**	**0.23**	**0.21**	**0.22**	**0.22**	**0.22**	**0.248**	**16**	**0.48**	**0.50**	**0.42**	**0.94**	**0.41**	**0.50**	**0.52**	**0.42**	**0.43**	**0.463**
7	**0.02**	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.02**	**0.01**	**0.014**	**17**	**0.47**	**0.44**	**0.44**	**0.43**	**0.42**	**0.94**	**0.40**	**0.41**	**0.41**	**0.434**
8	**0.02**	**0.01**	**0.01**	**0.02**	**0.01**	**0.02**	**0.02**	**0.03**	**0.01**	**0.016**	**18**	**0.12**	**0.14**	**0.10**	**0.18**	**0.11**	**0.09**	**0.13**	**0.13**	**0.13**	**0.125**
9	**0.21**	**0.21**	**0.22**	**0.19**	**0.22**	**0.22**	**0.20**	**0.23**	**0.21**	**0.212**	**19**	**0.50**	**0.57**	**0.51**	**0.53**	**0.57**	**0.46**	**0.53**	**0.52**	**0.52**	**0.523**
10	**0.18**	**0.14**	**0.15**	**0.17**	**0.16**	**0.14**	**0.15**	**0.14**	**0.12**	**0.15**	**20**	**0.37**	**0.36**	**0.35**	**0.33**	**0.29**	**0.34**	**0.34**	**0.34**	**0.32**	**0.327**

3-3-3 Test Fabric Air permeability:

This test was followed (ASTM D 737) Standard test method for air permeability of textile, this test method covers the measurement of the air permeability of textile fabrics .This test method applies to most fabrics. The values stated in SI units are to be regarded as the standard. The values stated in CM3/CM2/SEC units may be approximate .This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use. The following outcomes arise from the measurements in table6:

Table 6. Test readings for air permeability

Plain					**Single piqa**				
Sample No	**Reading**			**Average**	**Sample No**	**Reading**			**Average**
1	586	459	540	**528**	**11**	688	623	534	**611.6**
2	611	603	594	**602**	**12**	495	583	498	**525.3**
3	620	570	562	**584**	**13**	356	349	450	**385**
4	671	636	601	**636**	**14**	713	651	622	**662**
5	425	506	484	**472**	**15**	481	458	542	**493.6**
6	411	388	370	**389**	**16**	380	402	383	**388.3**
7	729	738	711	**726**	**17**	432	392	407	**410.3**
8	659	660	691	**670**	**18**	650	622	649	**640**
9	400	393	422	**405**	**19**	367	440	349	**385**
10	530	615	569	**571.3**	**20**	452	538	482	**490.6**

3-3-4 Test Fabric Colorfastness:

This test was followed (AATCC 116 Colorfastness to Crocking: Rotary Vertical Crock Meter) Standard. This test method is used to determine the amount of color transferred from the surface of colored textile materials to other surfaces by rubbing. It is applicable to textiles made from all fibers in the form of yarn or fabric, whether dyed, printed or otherwise colored and especially where the singling out of colored areas smaller than possible. Test procedures employing test squares either dry or wet with water or other liquids are within the scope of this method. The findings of the measurements are as follows in table 7:

Table 7. Test readings for colorfastness in Dry &Wet:

Plain			Single piqa		
Sample No	Dry	Wet	Sample No	Dry	Wet
1	4\5	4	11	4	3\4
2	4\5	3\4	12	4\5	3\4
3	4\5	4	13	4\5	4
4	4	3	14	4	3\4
5	4\5	3	15	4\5	4
6	3\4	2	16	3\4	4
7	4	2	17	4\5	3\4
8	4\5	3	18	4\5	3\4
9	4\5	3\4	19	4\5	4
10	4	3\4	20	4	4

3-4-Aesthetic properties:

The following aesthetic properties of fabrics were measured According to the following relevant criteria through a questionnaire submitted to specialists:

1-The extent to which color compatibility and adaptation are achieved according to the design.

2- The extent to which balance is achieved by design.

3-The extent to which proportionality is achieved by design.

4-The extent to which innovation is achieved by design.

5-The suitability of the design to the Public Opinion as women's outerwear.

6-The appropriateness of the structural structure used to highlight the aesthetics of the design.

4-RESULTS AND DISCUSSION:

Based on the above presentation of the tests, we will provide an analysis and discussion of the results of those tests as follows:

<u>RESULTS of Functional properties</u>

4-1-(A) Result of Weight Test (Plain):

Based on the analysis of the results of weight tests for plain samples shown in Fig No. 3 . Minimum weight: 65.49 g\m^2 ,Some samples, such as 4, 7, and 8, show significantly lower weights, but the sample with the lowest weight is sample 8.Maximum weight: 113.94 g\m^2 which was achieved with sample No. 6,The

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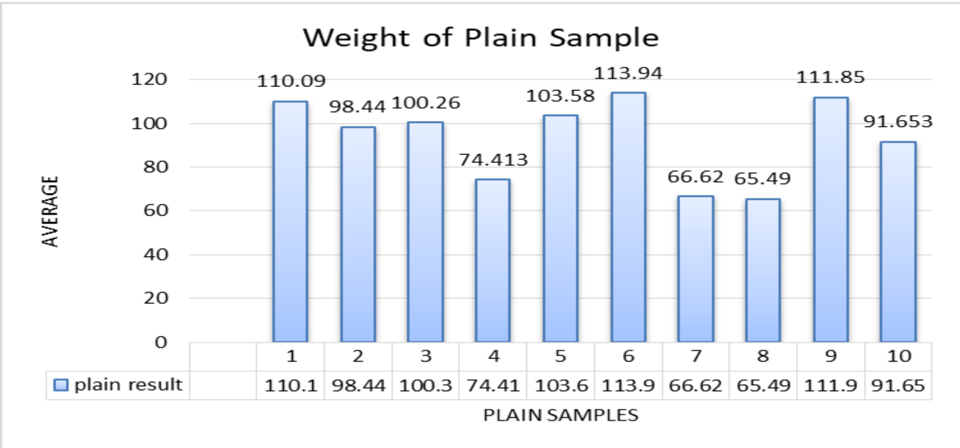
difference in sample weights is due to several factors: Differences in yarn thickness and density: Although the yarns used are specified as 1/16 raw cotton and 1/300 colored polyester, there are slight variations in the thickness and density of the yarns. These differences lead to differences in the weight of the fabric, as the designs differ from each other in terms of the width of the covering and color. The raw color is made of cotton material, while the colors are made of polyester.

Tension variations during production: During the knitting process, variations in tension can occur. If the tension is not constant, it results in variations in the density and weight of the fabric. Moisture content: The moisture content of the fiber affects the weight of the samples. Cotton, being a natural fiber, has the ability to absorb moisture from the environment, which may increase weight while polyester is a material that has no moisture content. Polyester dye absorption:

Polyester dye absorption may vary slightly between samples, resulting in variations in weight. The amount of dye absorbed can contribute to the overall weight of the fabric.



Fig(3) Rusalt of Weight Test(Plain)

4-1-(B) Result of Weight Test(Single Piqa):

While the analysis of the results of the weight test for the samples of the single Piqa as in Figure 4, where the weight of the square meter of the samples ranges from **141 g\m²** to **74.28 g\m²**, where the sample No. 16 was the highest weight while the sample No. 18 was the least weight .The difference in sample weights is due to several factors: Differences in yarn thickness and density. Although the yarns used are specified as 1/16 raw cotton and 1/300 colored polyester, there are slight variations in the thickness and density of the yarns. These differences lead to differences in the weight of the fabric, as the designs differ from each other in terms of the width of the covering and color. The raw color is made of cotton material, while the colors are made of polyester.

Tension variations during production: During the knitting process, variations in tension can occur. If the tension is not constant, it results in variations in the density and weight of the fabric. Moisture content: The moisture content of the fiber

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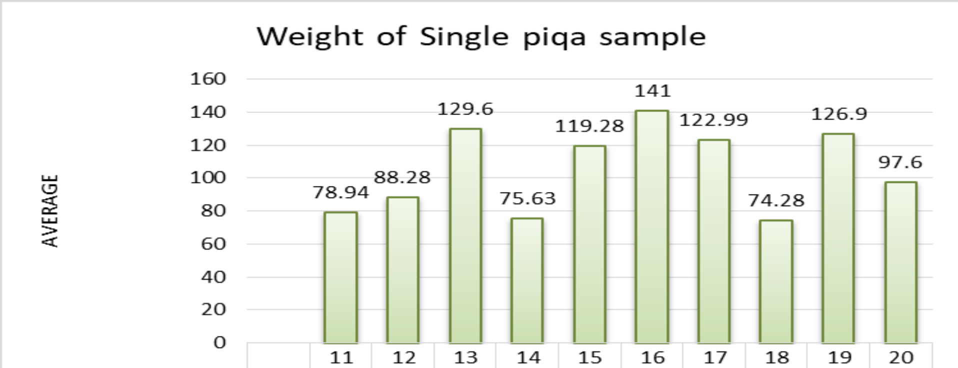

	11	12	13	14	15	16	17	18	19	20
Single piqa result	78.94	88.28	129.6	75.63	119.3	141	123	74.28	126.9	97.6

Fig(4) Rusalt of Weight Test(Single Piqa)

-Thus, we find that the weight of the samples of the single pique is heavier than the samples of plain. Structural Complexity: Single piqa structures are more complex due to the inclusion of tuck stitches, which can lead to increased yarn usage per unit area compared to the simpler plain jersey. This additional yarn increases the overall fabric weight. Yarn Density: The inter looping and layering effect caused by tuck stitches in single piqa can lead to a denser fabric, contributing to higher weight.

4-2-(A) Result of thickness Test (Plain):

Based on the analysis of the thickness test results of the plain specimens as in Figure 5, the thickness per mm of the specimens ranged from 0.248 mm to 0.014 mm, where the specimen no. (6) Achieved the largest thickness, while sample No. (7) Achieved the lowest thickness. The difference in thickness between samples is due to: Difference in yarn quality Although all samples are made using 16/1 raw cotton yarn and 300/1 polyester yarn, there can be slight differences in the quality of the yarn itself, including These include: Yarn Thickness and Uniformity: Differences in yarn thickness or uneven yarns can lead to differences in fabric thickness. Differences in the distribution of cotton and polyester threads within the fabric can affect the overall fabric thickness. The knitting process: It can cause differences in the thickness of the fabric due to: Tension in knitting: Different pressures during knitting can cause differences in the density and thickness of the fabric. Below are the average thickness results for each normal sample: Sample 4, 7, and 8 (low thickness) Samples. This is because : Higher knitting tension: If these samples are knitted with a higher tension, they will be tighter and therefore thinner. Yarn

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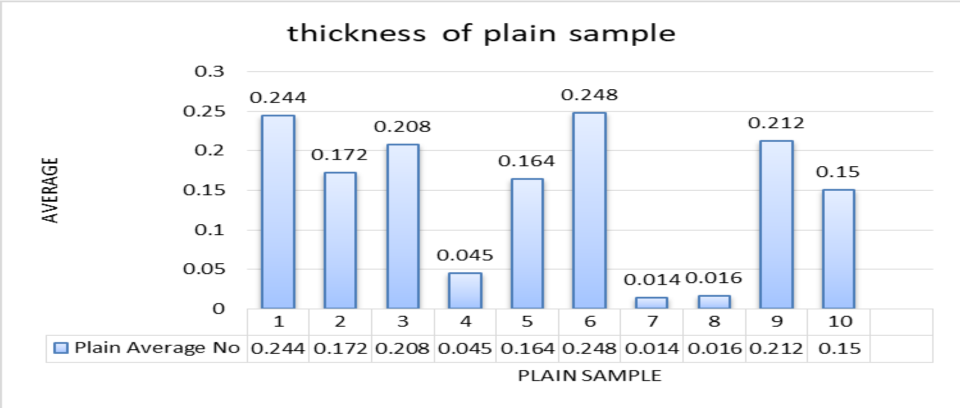
Disadvantages: These samples may contain yarns with fewer fibers or lower density, resulting in a thinner fabric. Samples 1, 6 and 9 (high thickness) show higher thickness values. This may be because: Lower knitting tension results in a larger, thicker fabric. Yarn quality: These samples may contain yarns with higher fiber content or better uniformity, which contributes to greater thickness.



Fig(5) Rusalt of Thickness Test(Plain)

4-2-(B) result of thickness Test (Single Piqa):

While the analysis of the results of the Thickness test for the samples of the single Piqa as in Figure 6, Thickness per mm of the samples ranged from0.523mm to 0.125 mm، where it was that the sample no. (19) Has achieved the largest thickness while the sample No. (18) Has achieved the lowest thickness. Factors affecting thickness fluctuation: Yarn quality, Yarn thickness and consistency: Differences in yarn thickness or consistency can lead to differences in fabric thickness. Fiber content and distribution: Differences in the yarn blend of 16/1 raw cotton and 300/1 polyester can affect the thickness of the fabric. Knitting process: Tension in knitting: Variations in knitting tension can cause differences in fabric density and thickness. Samples 13, 15, 16, 17 and 19 (higher thickness) - Knitting Tension: Reduced knitting tension can result in a larger, thicker fabric. Yarn quality: These samples may contain yarns with higher fiber content or better uniformity, which contributes to increased thickness. Samples 11, 12, 14 and 18 (less thickness)

Knitting Tension: Higher knitting tension can result in a tighter and thinner fabric.

- Yarn defects: These samples may contain yarns with fewer fibers or lower density, resulting in a thinner fabric. Sample 20 (moderate thickness).This sample shows moderate thickness, indicating a balance between different factors affecting thickness. It may represent an average result under standard conditions. Variation in thickness results for individual Piqa samples can be attributed to a combination of factors related to yarn quality, knitting process, finishing techniques, and measurement methods. Especially :Higher Thickness: Samples 13, 15, 16, 17, and 19 are likely affected

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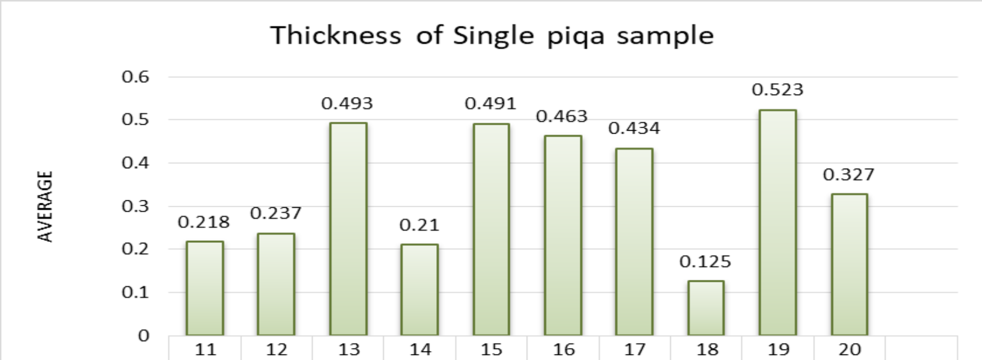
by lower knitting tension, higher yarn quality, or less aggressive finishing processes .Less Thickness: Samples 11, 12, 14 and 18 may be due to higher knitting tension, yarn defects or measurement inconsistency .Average thickness: The sample represents 20 average cases referring to standard conditions.



	11	12	13	14	15	16	17	18	19	20
Single piqa	0.218	0.237	0.493	0.21	0.491	0.463	0.434	0.125	0.523	0.327

Fig(6) Rusalt of Thickness Test(Single Piqa)

-Thus, we find that the samples of the single pique is thicker than the samples of plain. From the above we find that we have the following average thickness for each type of sample: Average thickness of plain knitting: 0.147 mm. Average thickness of one piqa: 0.352 mm. Single piqa specimens are approximately 2.39 times thicker than plain. Come back to: Knitting structure effect, the complex and dense structure of Single Piqa inherently consumes more yarns and forms tighter seams compared to the simpler plain. This results in a thicker texture. Yarn consumption and density. Using more yarns and higher stitch density in single piqa fabrics contributes significantly to increasing thickness. More yarns in a denser arrangement naturally increases the thickness of the fabric. Tension and loop formation: Specific tension settings and loop configurations in Single Piqa knits are designed to create a tighter, thicker fabric. This controlled tension allows the loops to be larger and denser.

4-3-(A) result of Air permeability Test (Plain):

According to an analysis of the plain sample air permeability test results shown in Figure 7, the samples' air permeability rates (CM^3\$CM^2$ \SEC) ranged from **726 to 389**, with sample No.(7) achieving the highest rate and sample No. (6) Achieving the lowest. Variation in air permeability results for plain samples can be attributed to several factors. Factors affecting air permeability: Fabric density and intensity: Higher density, lower permeability: Sample No. 6, with the lowest air permeability (389 CM^3\$CM^2$ \SEC). It had the highest weight and greatest thickness, which reduces the spaces between the yarns through which air can pass. Lower density, higher permeability: Sample No. 7, with the highest air permeability (726 CM^3\$CM^2$ \SEC), was one of the lowest in weight and the thinnest, allowing more air to pass through the larger internal yarns. The size of the spaces .Yarn properties: The fineness of the yarn and twist: The

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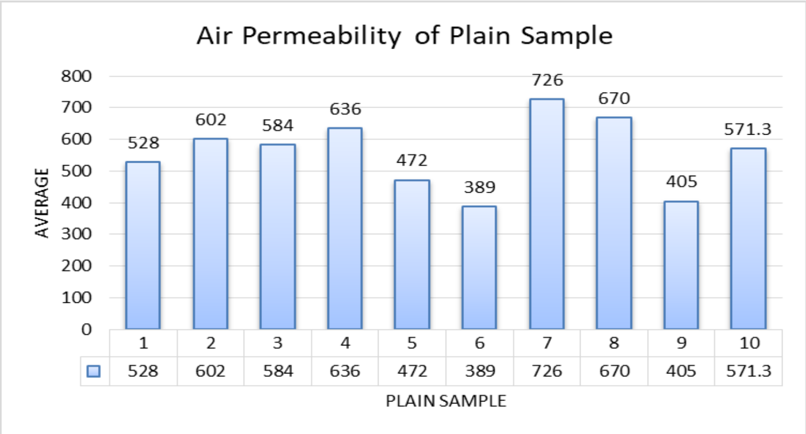
fineness of the yarns used in the fabric affects the air permeability. Fine yarns with higher twist levels can create a tighter fabric structure, reducing air permeability (polyester). Conversely, coarse yarns with low levels of twist can increase permeability by creating larger spaces between the yarns (cotton). Knitting Tension: Tighter knitting tension results in a tighter fabric structure with smaller pores, which reduces air permeability. This could explain the low permeability in samples such as No. 6. Loose knit tension: increases the porosity of the fabric, resulting in increased air permeability. This case for samples such as No. 7. Accordingly, this is the case: Sample No. 7 (highest permeability, 726 CM^3\$CM^2$ \SEC): It is lighter and thicker, and has a more flexible cohesive structure with larger spaces between the yarns. With more yarns than raw cotton, which is rougher than polyester, which contributes to increased porosity. Sample No. 6 (lowest permeability, 389 CM^3\$CM^2$ \SEC): As it is heavier and thicker, its structure is more tightly knit with smaller spaces between the yarns. Which leads to reduced porosity. Medium samples (for example, No. 3 at 584 CM^3\$CM^2$ \SEC): It represents a balance of factors, with moderate fabric density, yarn properties, and knitting tension.



Fig(7) Rusalt of Air Permeability Test(Plain)

4-3-(B) Result of Air permeability Test (Single Piqa):

The air permeability rates (CM^3\CM^2 \SEC) of the samples ranged from **662 to 385**, with sample No. 14 obtaining the highest rate and samples No. 13–19 reaching the lowest, according to an examination of the Single Piqa sample air permeability test findings displayed in Figure 8. Factors affecting air permeability

Fabric density and tightness: Higher Density, Lower Permeability: Samples with lower air permeability, such as Sample No. 13 (385 CM^3\$CM^2$ \SEC), are likely to have a higher fabric density or a tighter knit structure, which reduces the spaces between the yarns, impeding the flow of The air .Lower density, higher permeability: Samples with higher air permeability, such as sample 14 (662 CM^3\$CM^2$ \SEC), may have a lower fabric density or a looser knit structure, allowing more air to pass through the larger spaces between yarns. Yarn properties:

Yarn Fineness and Twist: The characteristics of the yarn used, including

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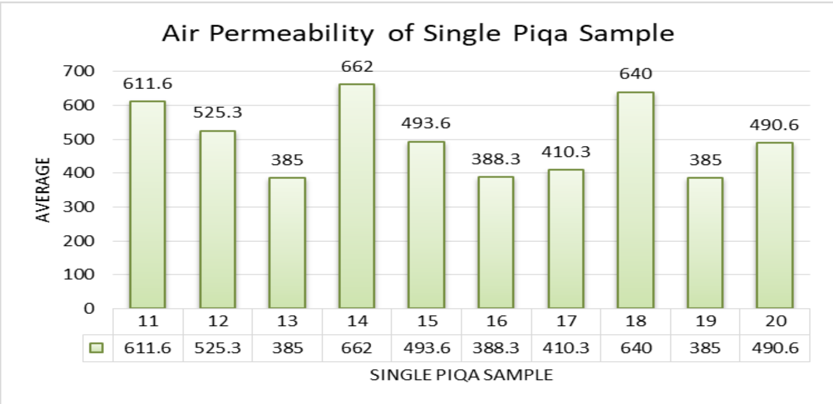
the level of fineness and twist, greatly affect air permeability. Fine yarns with higher levels of twist tend to create a more compact structure, which reduces permeability (polyester). Conversely, coarse yarns with low levels of twist can increase permeability by creating larger spaces between the yarns (cotton).

Knitting tension: When knitting tension is high, the resulting fabric is tighter, with smaller pores, which reduces air permeability. Like samples with low air permeability such as sample No. 13. Lower knitting tension: results in a fabric with larger pores, which increases air permeability. As we seen in samples such as sample 14.Thus we find that Sample No. 14 (highest permeability, 662 CM^3\$CM^2$ \SEC): It is likely to have a more flexible knit structure with larger spaces between the yarns. Sample No. 13 (lowest permeability, 385 CM^3\$CM^2$ \SEC):

It is likely to have a tighter knit structure with smaller spaces between the yarns.

Medium samples (for example, No. 15 at 493.6 CM^3\CM^2 \SEC): It represents a balance of factors, with moderate fabric density, yarn properties, and knitting tension. They may have a more uniform manufacturing, resulting in average air permeability results.



Fig(٨) Rusalt of Air Permeability Test(Single Piqa)

- Thus, we find that the air permeability of plain samples is higher than that of single piqa samples. Air permeability is affected by several factors including fabric construction, yarn type, knitting techniques, weight and thickness. The results indicate that normal specimens have higher air permeability compared to single piqa. Plain Range: 389 to 726 CM3\CM2 \SEC, Average: ~558.1 CM3\CM2 \SEC. whereas single piqa samples range: 385 to 662 CM3\CM2 \SEC, average: ~491.87 CM3\CM2 \SEC .Fabric Structure: plain samples usually has a simpler structure with a flat, uniform surface where one type of loop is used (knit). This uniformity can create channels for air to pass through more easily. Single piqa has a more complex structure with a textured surface where two types of loops are used (knit & tuck). Which may create more turbulence as air passes through, reducing the overall permeability of the yarn properties and fabric density. Both fabrics are manufactured using the same yarns (1/16

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raw cotton and 1/300 polyester), but the arrangement of these yarns and their interaction within different knit structures affects. Great on air permeability .The relatively simpler and more open structure of plain knitting can facilitate better airflow. The simpler structure allows for larger spaces between the strands and thus higher permeability. Single piqa is a more complex and dense structure that can reduce the size of the spaces between the strands, resulting in lower air permeability. Plain are also lighter and thinner, which allows airflow, while single piqa are characterized by a higher weight and greater thickness, which hinders airflow to some extent compared to plain.

4-4-(A) Result of Colorfastness Dry& Wet Test (Plain):

According to the analysis of the dry and wet color fastness test results of the plain sample shown in Figure 9, the color fastness ratings of the samples ranged from 4 to 4\5, and samples no. (1-2-3-5-8-9) were achieved. The highest rate and sample No. (6) Achieved the lowest rate in dry, while wet color fastness rates ranged from 2 to 4, samples no. (1-3) achieving the highest rate and sample no. (6-7) achieving the lowest rate in wet.

Dry color fastness:

-4/5: Very good color fastness with minimal noticeable color shifting or smudging.

- 4: Good color fastness with slight discoloration or spotting.

- 3/4: Moderate color fastness with some noticeable discoloration or spots. - Samples 1, 2, 3, 5, 8 and 9 show very good dry color fastness with a rating of 4/5. Samples 4, 7 and 10 show good dry color fastness with a rating of 4.Sample 6 shows moderate dry color fastness with a rating of 3/4.

Wet color fastness:

- 4: Good color fastness with slight discoloration or spotting.

- 3/4: Moderate color fastness with some noticeable discoloration or spots.

- 3: Noticeable change or spotting in color.

- 2: Noticeable change or pigmentation in color.

Sample 1 shows good wet color fastness with a rating of 4.Samples 2, 3, 9 and 10 show moderate wet color fastness with a rating of 3/4.Samples 4, 5 and 8 show remarkable wet color fastness with a rating of 3.Samples 6 and 7 show a wet color fastness rating of 2.

This is due to a number of factors:

Fiber composition: Plain samples are manufactured using 16/1 raw cotton and 1/300 polyester. Cotton fibers generally have good color fastness when dyed properly, but can show greater contrast in humid conditions due to their natural absorbency. Polyester fibers usually hold color well, but their performance can vary depending on the type of dye and the dyeing process.

Dyeing process: Proper dyeing processes and conditions, such as maintaining the right temperature, pH and duration, ensure better dye penetration into the fibers, resulting in higher color fastness rates. Good dry color fastness results indicate that the dyeing process was quite effective.

Humid conditions can cause more dye to leach out of the fibers, especially if the dye is not completely set on the fibers.

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This could explain the lower wet color fastness rates of some samples.

Fabric Structure:

- Plain knitted fabrics have a simple and uniform structure, which facilitates dye absorption and reduces the possibility of uneven color distribution. However, the absorption of cotton can result in greater dye leaching in humid conditions.

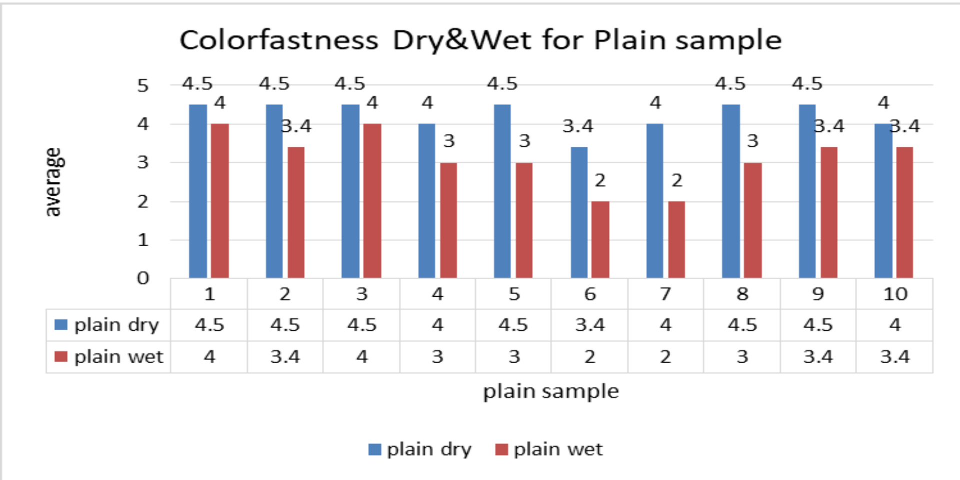
Post-dyeing treatments:

- Treatments such as washing, heat setting and finishing processes can affect color fastness. Proper post-dyeing treatments help fix the dye more firmly within the fibres, resulting in better resistance to discoloration and stains.

-Differences in post-dyeing treatments can result in differences in wet color fastness. Inconsistent application of these treatments may result in lower ratings in some samples.

-Slight differences in dry color fastness ratings may be the result of slight inconsistencies in the dyeing process or differences in yarn quality.

- The most significant differences in wet color fastness ratings are likely due to cotton's natural tendency to absorb more water, which can result in dye leaching. In addition, the type of dye used and its affinity for fibers under wet conditions can contribute to these differences.



	1	2	3	4	5	6	7	8	9	10
plain dry	4.5	4.5	4.5	4	4.5	3.4	4	4.5	4.5	4
plain wet	4	3.4	4	3	3	2	2	3	3.4	3.4

Fig(9) Rusalt of Colorfastness Test(Plain)

4-4-(B) Result of Colorfastness Dry &Wet Test (Single Piqa):

According to an analysis of the Single Piqa sample Colorfastness Dry &Wet test results shown in Figure 10, the samples' Colorfastness Dry rates ranged from **4 to 4\5,** samples No.(12-13-15-16-18-19) achieving the highest rate and sample No. (16) Achieving the lowest in Dry, while Colorfastness Wet rates ranged from **3\4 to 4** samples no. (19-20) achieving the highest rate and sample no. (11-12-13-14-15-16-17-18) achieving the lowest in Wet.

According to the analysis of the dry and wet color fastness test results of the individual Piqa sample shown in Figure 10, the dry color fastness rates of the samples ranged from 4 to 4\5, with samples No. (12-13-15-16-18-19) achieving the highest rate and sample No. (16) Achieved the lowest rate in dry, while wet color fastness rates ranged from 3/4 to 4. Samples No. (19-20) achieved the highest rate and sample No.

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(11-12-13- 14-15-16-17-18) achieving the lowest level in wetlands

Dry color fastness:

- 4/5: Very good color fastness with minimal noticeable color shifting or smudging. - 4: Good color fastness with slight discoloration or spotting.

- 3/4: Moderate color fastness with some noticeable discoloration or spots.

Samples 12, 13, 15, 17, 18, and 19 show very good dry color fastness with a rating of 4/5.

Samples 11, 14 and 20 show good dry color fastness with a rating of 4.

Sample 16 shows moderate dry color fastness with a rating of 3/4.

Wet color fastness:

- 4: Good color fastness with slight discoloration or spotting.

- 3/4: Moderate color fastness with some noticeable discoloration or spots.

Dry color fastness:

Samples 13, 15, 16, 19 and 20 show good wet color fastness with a rating of 4.

Samples 11, 12, 14, 17 and 18 show a medium wet color fastness of 3/4.

Is due to:

Fiber composition:

Single piqa swatches are manufactured using 16/1 raw cotton and 1/300 polyester. Cotton fibers generally have good color fastness when dyed properly, but can show greater contrast in humid conditions due to their natural absorbency. Polyester fibers usually hold color well, but their performance can vary depending on the type of dye and the dyeing process.

Dyeing process: Proper dyeing processes and conditions, such as maintaining the right temperature, pH and duration, ensure better dye penetration into the fibers, resulting in higher color fastness rates. Good dry color fastness results indicate that the dyeing process was quite effective.

- Humid conditions can cause more dye to leach out of the fibers, especially if the dye is not completely set on the fibers. This could explain the lower wet color fastness rates of some samples.

Fabric Structure: single piqa fabrics, known for their complex and denser structure compared to regular fabrics, can affect dye absorption and retention. The structure can help retain dye better during dry conditions, but it may also trap more water in wet conditions, which can lead to dye leaching.

Post-dyeing treatments: Treatments such as washing, heat setting and finishing processes can affect color fastness. Proper post-dyeing treatments help fix the dye more firmly within the fibers, resulting in better resistance to discoloration and stains.Differences in post-dyeing treatments can result in differences in wet color fastness. Inconsistent application of these treatments may result in lower ratings in some samples.

Environmental and mechanical factors: Mechanical factors during testing, such as the amount of force applied and the duration of rubbing, can affect the results. Environmental conditions such as humidity and temperature during testing can also affect color fastness results.

Slight differences in dry color fastness ratings may be the result of slight inconsistencies in the dyeing process or differences in yarn quality. The most significant differences in wet color fastness ratings are likely due to cotton's

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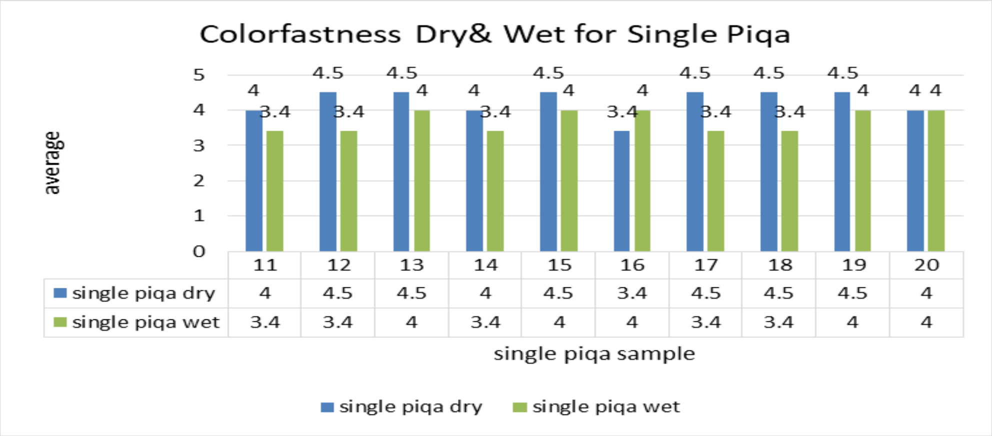
natural tendency to absorb more water, which can result in dye leaching. In addition, the type of dye used and its affinity for fibers under wet conditions can contribute to these differences.



	11	12	13	14	15	16	17	18	19	20
single piqa dry	4	4.5	4.5	4	4.5	3.4	4.5	4.5	4.5	4
single piqa wet	3.4	3.4	4	3.4	4	4	3.4	3.4	4	4

Fig(10) Rusalt of Colorfastness Test(Single Piqa)

- Thus, we find that the dry and wet color stability of the single-spot samples is higher than that of the plain samples.

Dry color fastness:

-Both plain and single piqa specimens show good to very good dry color fastness, with ratings mostly ranging from 4/5 to 3/4.

Wet color fastness:

- plain samples show greater variation in wet color fastness, with ratings ranging from 4 to 2.

-Single piqa specimens tend to be more stable in wet color, generally in the range of 4 to 3/4. And the reasons for that are due to:

Fiber composition

- Both sample sets use 1/16 of raw cotton and 1/300 of polyester colors, so the differences are not due to fiber composition but to other factors such as fabric structure and processing.

Fabric structure

Plain fabrics: It usually has a simpler and less dense structure. Easily penetrates the dye but may not retain dye as well under pressure, especially in humid conditions. It exposes a larger surface area, which may result in more color loss during rubbing.

Single Piqa Fabrics: A denser and more complex structure. Better at trapping the dye within the fabric matrix. Less surface area exposed, resulting in better dye retention during humid conditions.

Dyeing and fixing process: Correct fixation of the dye is crucial to color fastness. Differences in dyeing conditions, such as temperature, pH, and duration, can lead to differences in how well the dye adheres to the fibers .Due to their structure, single piqa fabrics may undergo more consistent dyeing and fixing, resulting in better performance in wet color fastness tests.

Mechanical factors during testing:

Plain samples:

High variation in structure may lead to inconsistency in test results .More susceptible to surface abrasion and dye loss in humid conditions due to less dense fabric.

Single piqa samples: More consistent structure, leading to more consistent results. Less susceptible to surface

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abrasion and dye loss due to the density of the fabric.

Post-dyeing treatments: Post-dyeing treatments such as washing, heat preparation and finishing processes can significantly affect color fastness. Inconsistent application of these treatments can lead to variations in color fastness results, especially in plain fabrics.

Thus, the differences in color fastness results between the plain and single piqa samples can be attributed to the structural differences between the two types of fabric. Plain fabrics, with their simpler, less dense structure, tend to show more contrast and generally lower color fastness in wet conditions. In contrast, the denser, more complex structure of Single Piqa fabrics helps them retain color better in dry and wet conditions. Additionally, uniformity in the structure of Single Piqa fabrics results in more consistent results across samples. Proper dyeing and post-dyeing treatments are crucial to achieving good color fastness, and any inconsistencies in these processes are likely to affect plain fabrics due to their structural properties.

RESULTS of Aesthetic properties:

By analyzing the results of the questionnaire, it was found that:

The following **Figure 11** method shows the result of analyzing respondents' opinions on the extent to which color compatibility and adaptation according to the design are achieved in the plain structure, which shows that the second **design** has achieved the **highest** result, While the seventh **design** achieved the **least** result

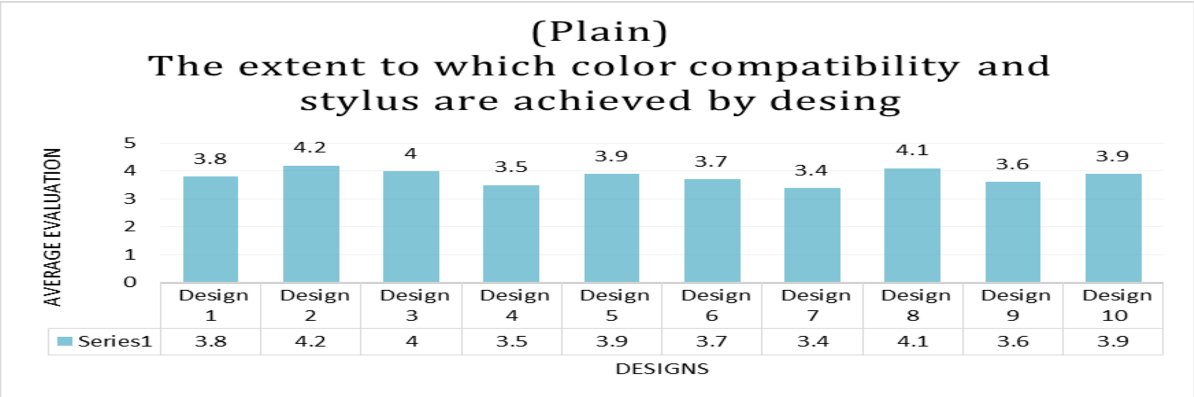

Fig11. The extent to which color compatibility and adaptation are achieved according to the design.

The following **Figure 12** method shows the result of analyzing respondents' opinions on. The extent to which color compatibility and adaptation are achieved according to the design in the single piqa structure, which shows that the **eleventh design &twelveth design** have achieved the **highest** result, While the **sixteenth design** achieved the **least** result

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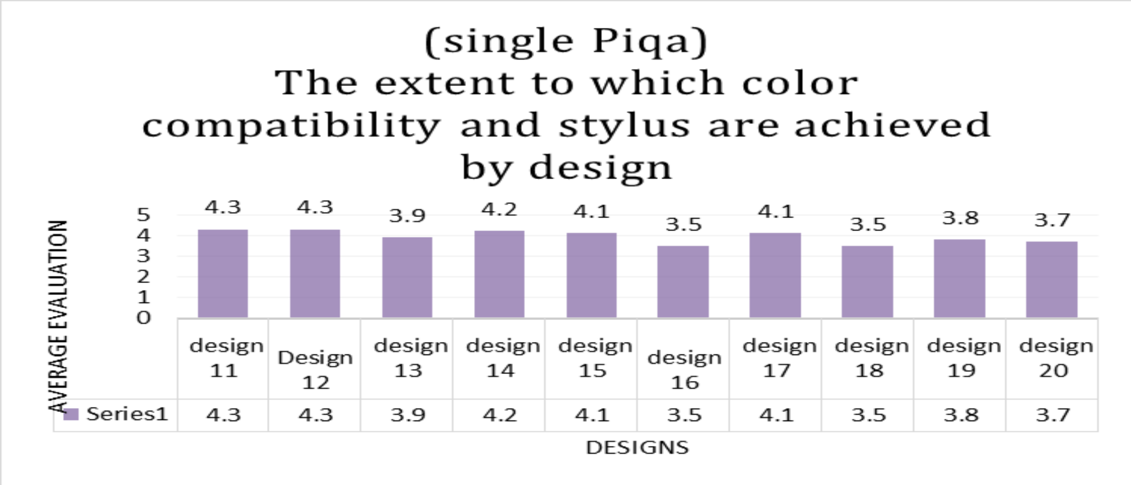

Fig12. The extent to which color compatibility and adaptation are achieved according to the design

The following **Figure 13** method shows the result of analyzing respondents' opinions on the extent to which balance is achieved by design are achieved in the plain structure, which shows that the second **design& eighth design** have achieved the **highest** result, while the seventh **design** achieved the **least** result

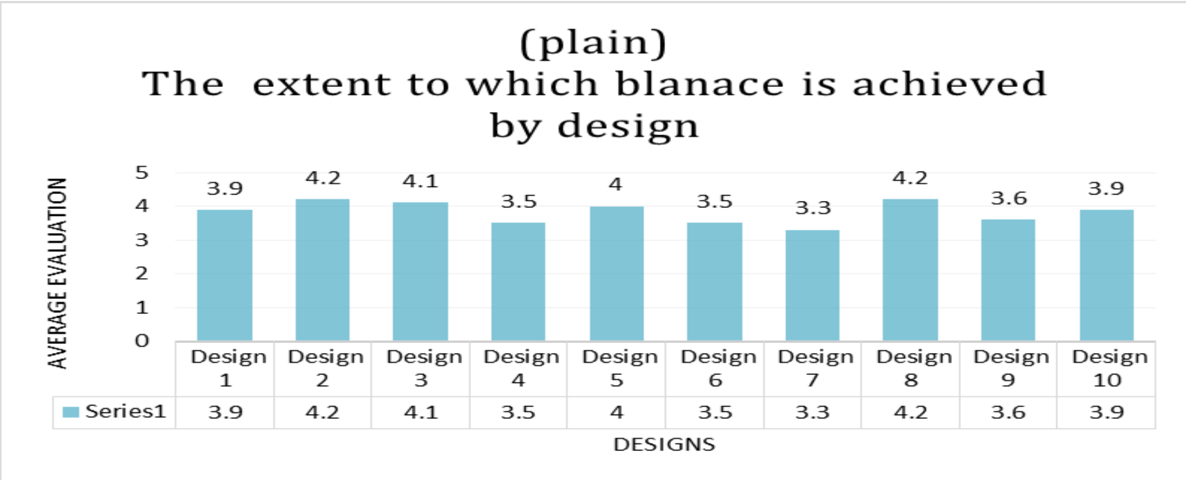

Fig13. The extent to which balance is achieved by design

The following **Figure 14** method shows the result of analyzing respondents' opinions on. The extent to which balance is achieved by design, in the single piqa structure, which shows that the **twelfth design** has achieved the **highest** result, while the sixteenth **design** achieved the **least** result

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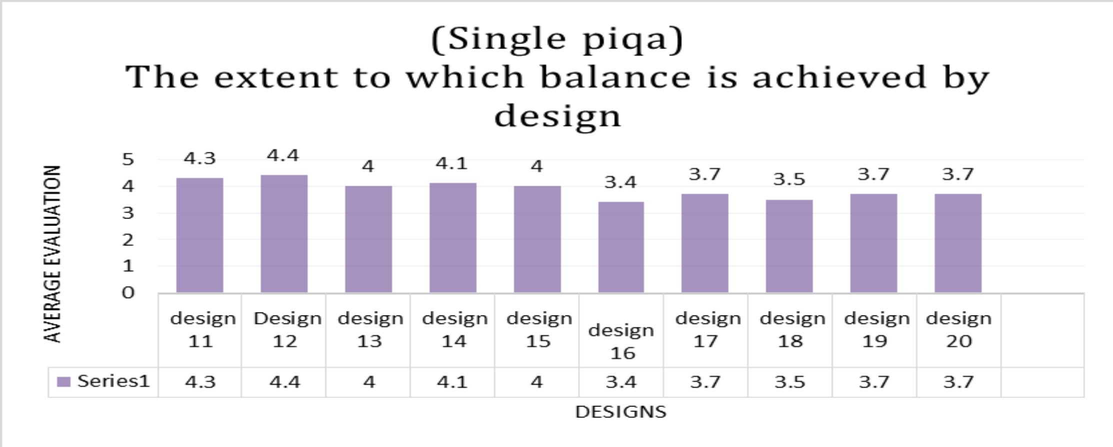

Fig14. The extent to which balance is achieved by design

The following **Figure 15** method shows the result of analyzing respondents' opinions on The extent to which proportionality is achieved by design in the plain structure, which shows that the second **design** has achieved the **highest** result, While the **fourth design &seventh design** achieved the **least** result.

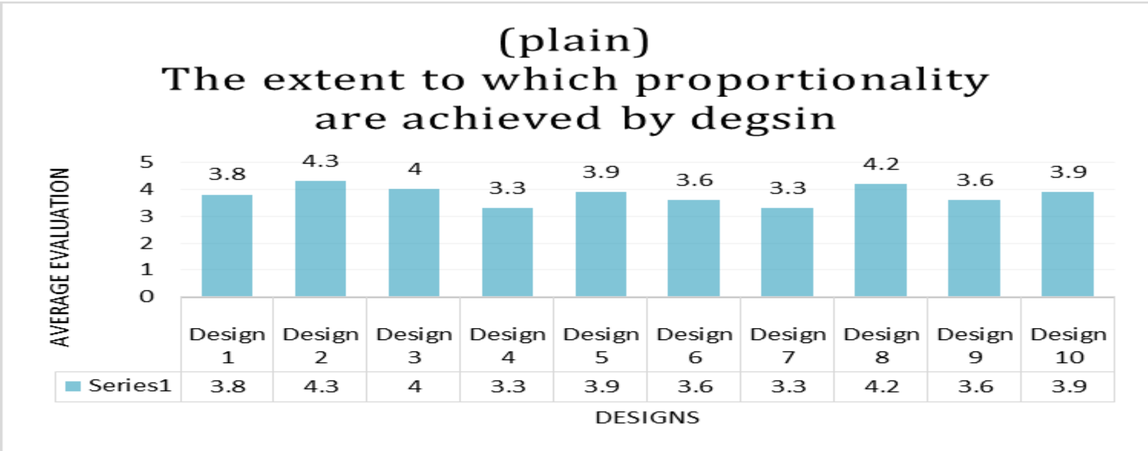

Fig15. The extent to which proportionality is achieved by design

The following **Figure 16** method shows the result of analyzing respondents' opinions on. The extent to which proportionality is achieved by design, in the single piqa structure, which shows that the **eleventh design& twelfth design** have achieved the **highest** result, While the **sixteenth design** achieved the **least** result

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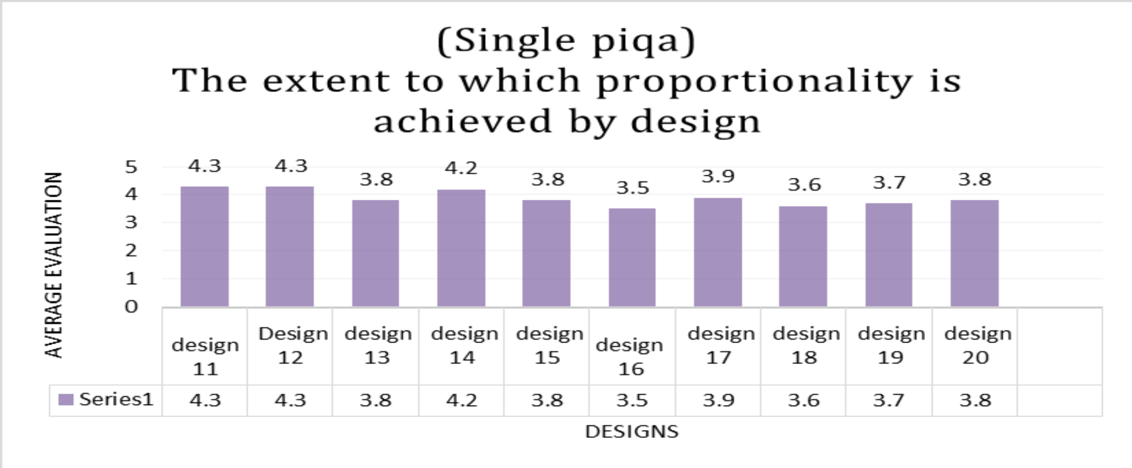

Fig16. The extent to which proportionality is achieved by design

The following **Figure 17** method shows the result of analyzing respondents' opinions on The extent to which innovation is achieved by design in the plain structure, which shows that the second **design & third design and eighth design** have achieved the **highest** result, While the **fourth design &seventh design** achieved the **least** result

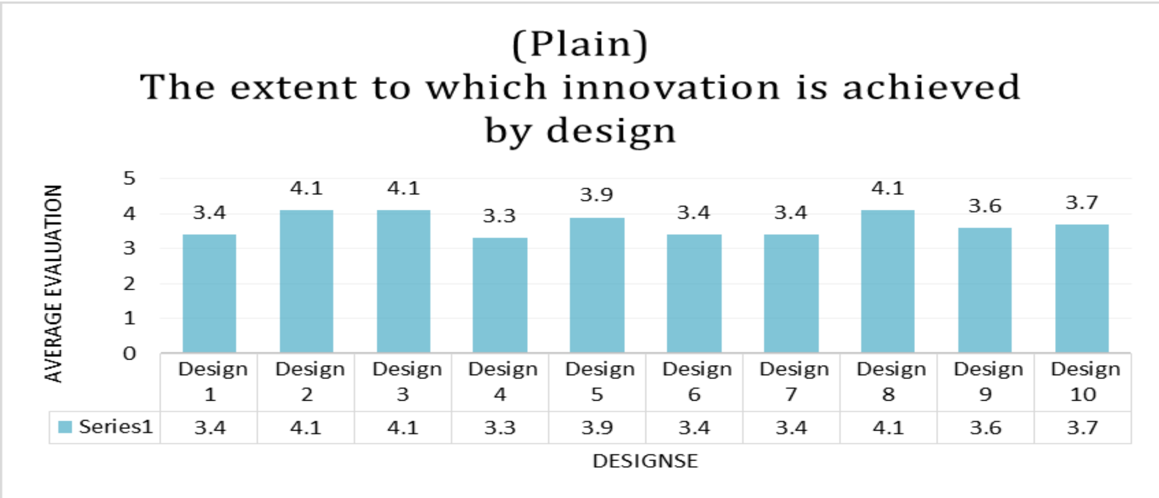

Fig17. The extent to which innovation is achieved by design

The following **Figure 18** method shows the result of analyzing respondents' opinions on. The extent to which innovation is achieved by design, in the single piqa structure, which shows that the **eleventh design &twelveth design** have achieved the **highest** result, While the **thirteenth design** achieved the **least** result

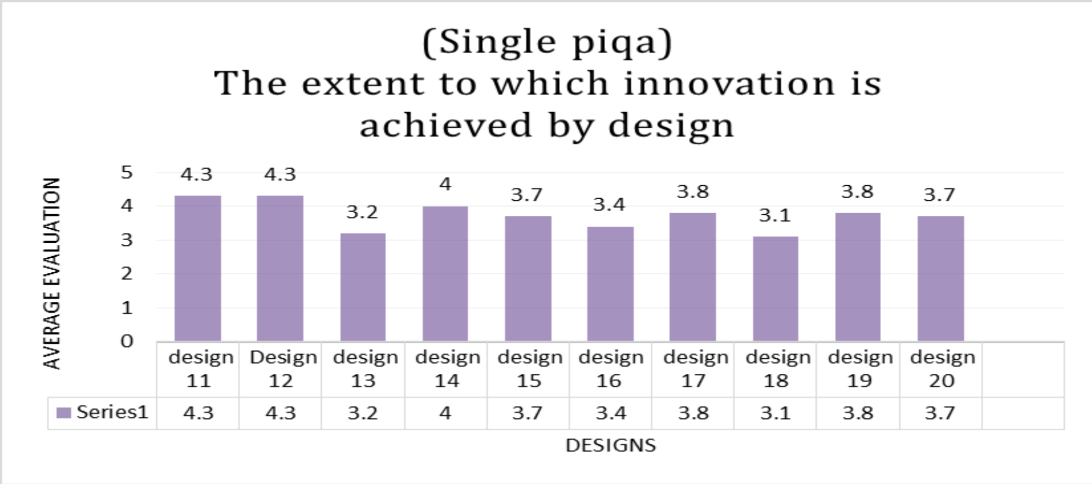

Fig18. The extent to which innovation is achieved by design

The following **Figure 19** method shows the result of analyzing respondents' opinions on. The suitability of the design to the Public Opinions as women's outerwear in the plain structure, which shows that the second **design** has achieved the **highest** result, while the seventh **design** achieved the **least** result

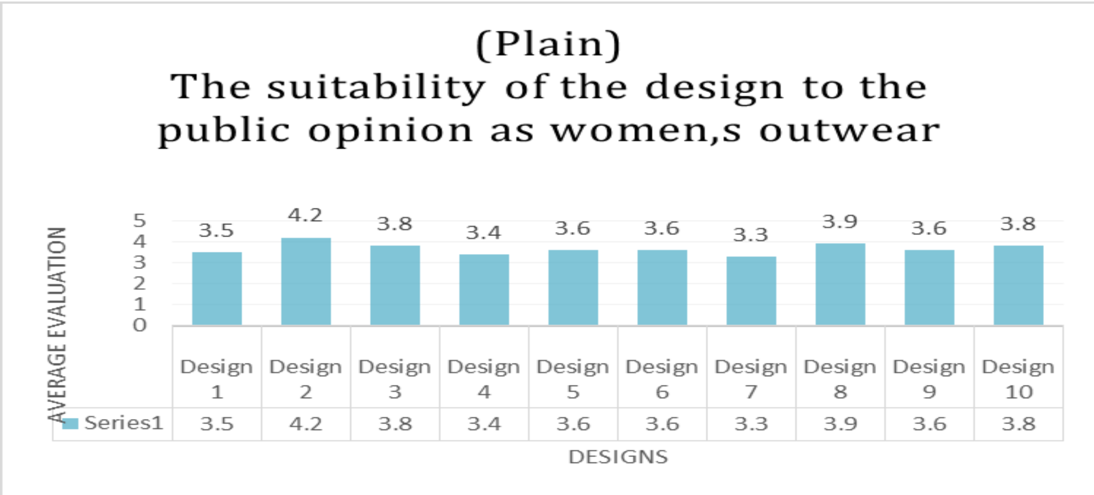

Fig19. The suitability of the design to the Public Opinions women's outerwear

The following **Figure 20** method shows the result of analyzing respondents' opinions on. The suitability of the design to the Public Opinionas,s outerwear, in the single piqa structure, which shows that the **twelfth design** has achieved the **highest** result, While the **eighteenth design** achieved the **least** result

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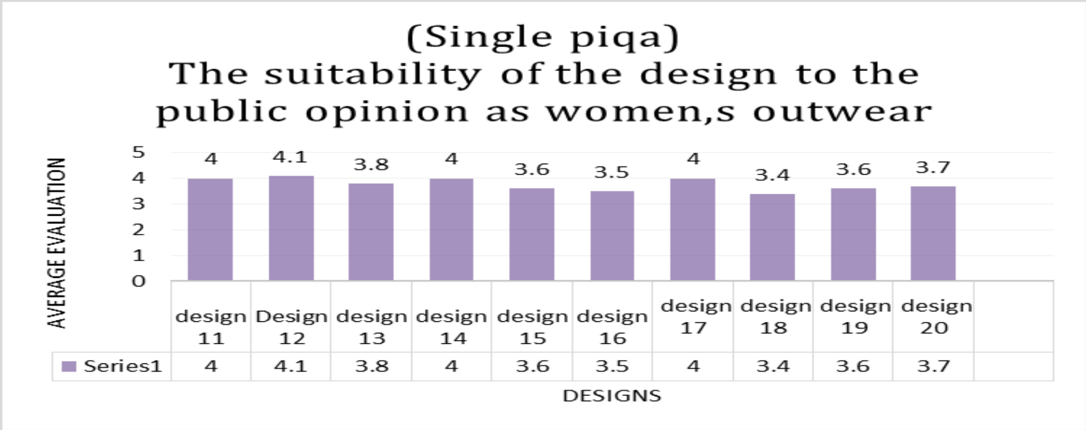

Fig20. The suitability of the design to the Public Opinion as women's outerwear

The following **Figure 21** method shows the result of analyzing respondents' opinions on. The appropriateness of the structural structure used to highlight the aesthetics of the design in the plain structure, which shows that the second **design** has achieved the **highest** result, while the seventh **design** achieved the **least** result

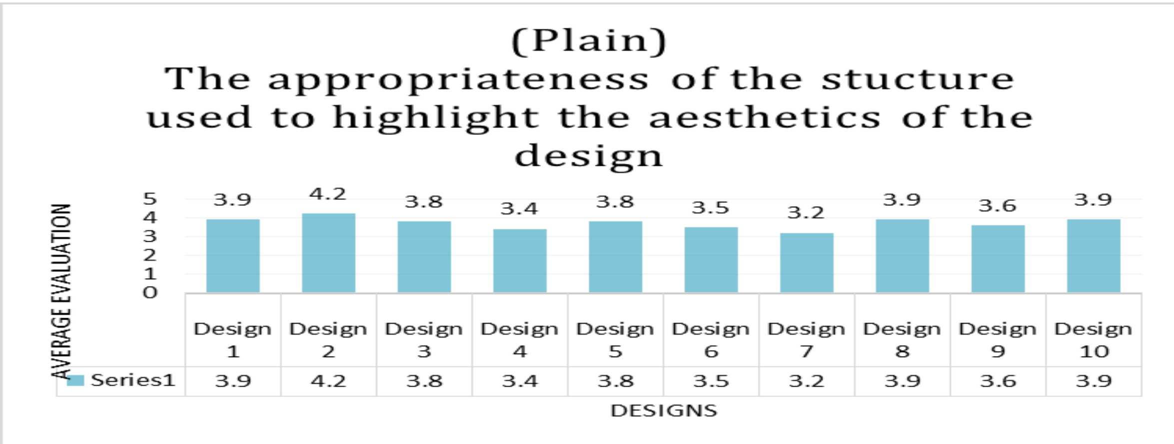

Fig21. The appropriateness of the structural structure used to highlight the aesthetics of the design

The following **Figure 22** method shows the result of analyzing respondents' opinions on. The appropriateness of the structural structure used to highlight the aesthetics of the design, in the single piqa structure, which shows that the twelfth design has achieved the highest result, While the fourteenth design achieved the least result

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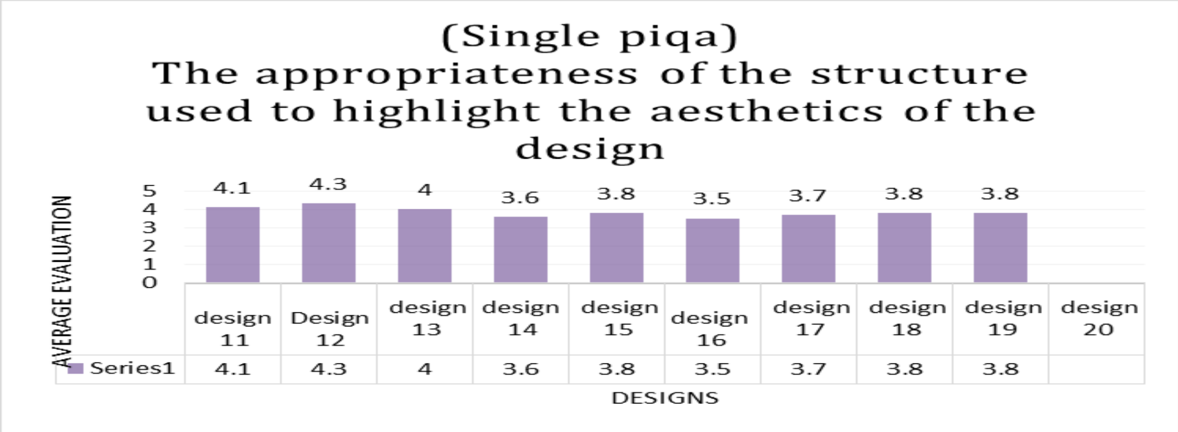

Fig22. The appropriateness of the structural structure used to highlight the aesthetics of the design

Figure 23. Shows the total opinions of the aesthetic values of the six axes of each design, which shows that the second design achieved the highest rate of satisfaction and acceptance, while the seventh design occupies the last rank

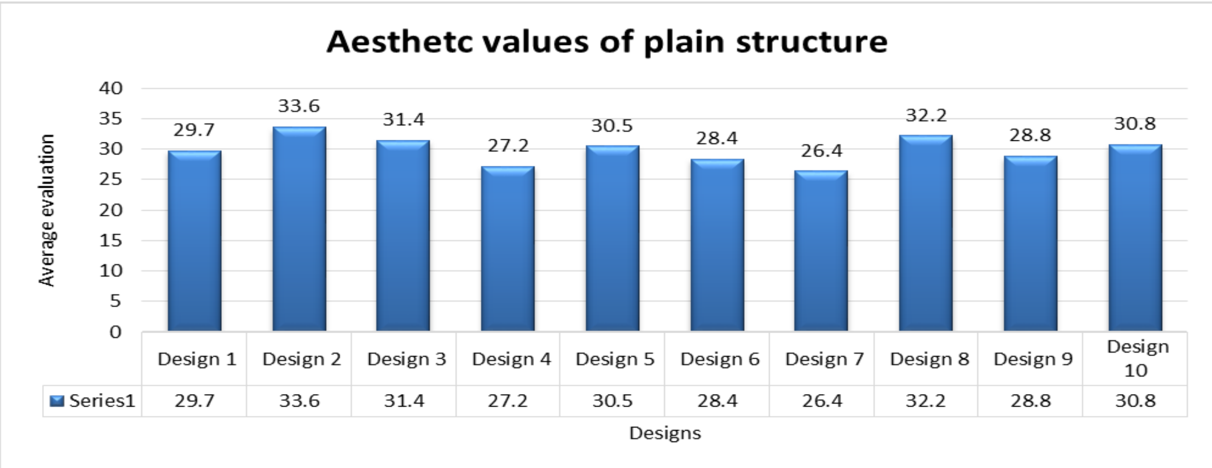

Fig23. Aesthetc values of plain structure

Figure 24. Shows the total opinions of the aesthetic values of the six axes of each design, which shows that the **Twelfth design** achieved the **highest rate** of satisfaction and acceptance, while the **eighteenth design** occupies the **last rank**

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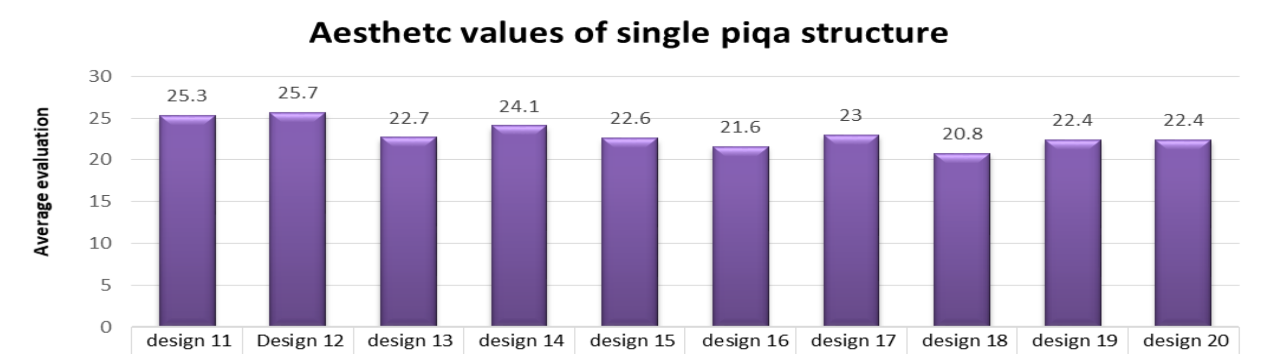

	design 11	Design 12	design 13	design 14	design 15	design 16	design 17	design 18	design 19	design 20
Series1	25.3	25.7	22.7	24.1	22.6	21.6	23	20.8	22.4	22.4

Fig24. Aesthetc values of single piqa structure

- Tuck Stitches: Used in single piqa fabrics, tuck stitches trap more air and yarn within the fabric, resulting in increased weight and thickness, but potentially reducing air permeability due to the denser structure.

3. Yarn Consumption:

- The presence of tuck stitches in single piqa structures means more yarn is required per unit area compared to plain jersey structures. This higher yarn consumption contributes to the greater weight and thickness of single piqa fabrics.

4. Air Permeability:

- Plain Jersey: The simple knit structure of plain jersey fabrics tends to have larger, more regular interstices, which allow for higher air permeability.
- Single Piqa: The addition of tuck stitches in single piqa structures reduces the size of the interstices and increases the overall fabric density, thus decreasing air permeability.

5. Color Fastness:

- Plain Jersey: The uniform structure of plain jersey fabrics might provide a more consistent surface for dyeing, leading to better color fastness in both dry and wet conditions.

- So we can say that in terms of aesthetic values in plain structure, the **second design** has achieved the **highest satisfaction** rate by respondents, while single piqa structure the **Twelfth design has achieved** the **highest satisfaction** rate by respondents.

Discrepancies in the test results for weight, thickness, air permeability, and other functional properties between plain and single piqa weft knitted fabrics can be attributed to several key factors:

1. Fabric Structure:

- Plain Jersey: This is the simplest and most basic weft knitted structure, consisting solely of knit stitches. The uniform and straightforward structure of plain jersey typically results in lighter and thinner fabrics.
- Single Piqa: This structure incorporates tuck stitches along with knit stitches. The tuck stitches create additional loops and bulk within the fabric, leading to a denser, thicker fabric compared to plain jersey.

2. Stitch Type:

- Knit Stitches: Found predominantly in plain jersey fabrics, these stitches create a smooth, flat surface which allows for better air permeability and lighter fabric weight.

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analyzed statistically and graphically. The summary of the results was:

- Weight and thickness: Single pika fabrics are heavier and thicker than regular jersey fabrics due to the additional threads required for the tuck stitches.
- Air permeability: Plain jersey fabrics have higher air permeability due to their simpler and more open structure.
-Color fastness: Plain jersey fabrics generally show better color fastness due to their uniform surface.
- Aesthetic superiority: Pica singleton fabrics often have superior aesthetic properties due to their textured and visually interesting surface, which can be more attractive for women's outerwear.

By understanding these factors, designers and manufacturers can make informed decisions about the type of fabric to use based on the functional and aesthetic properties required for women's outerwear.

As we have seen, we conclude it as follows

- Single Piqa: The more complex structure with tuck stitches might create uneven surfaces and different tensions within the fabric, potentially affecting how the fabric holds color and resulting in slightly lower color fastness.

6. Aesthetic Properties:

- Plain Jersey: Known for its simplicity and uniformity, it provides a smooth, flat appearance which might be preferred for certain aesthetic applications.
- Single Piqa: The tuck stitches create a textured surface, adding visual and tactile interest to the fabric, which might enhance its aesthetic appeal for specific designs and applications.

5- Conclusions:

The current study aims to establish a specific relationship between the structure of individual derivatives and their functional and aesthetic properties.

The different effect of different types of structural derivatives (single pica) became clear when the results were

No	Comparison	Plain	Single Piqa
Functional Properities			
1	Wight		The samples were the heaviest
2	Thickness		The samples were the thickest
3	Air Permeability	The samples were the most air-permeability	
4	ColorfastnessDry&Wet		The samples were the most Colorfastness in dryness and wetness.
Aesthetic properities			
1	The extent to which color compatibility and adaptation are achieved according to the design		The samples were the most satisfying
2	The extent to which balance is achieved by design		The samples were the most satisfying
3	The extent to which proportionality is achieved by design		The samples were the most satisfying

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4	The extent to which innovation is achieved by design		The samples were the most satisfying
5	The suitability of the design to the general taste as women,s outerwear		The samples were the most satisfying
6	The appropriateness of the structural structure used to highlight the aesthetics of the design	The samples were the most satisfying	

References

[1]A K M Mobarok Hossain, Md Abdullah Al Mamun, A T M Faiz Ahmed, & Md Ruhul Amin. (2023). Evaluating width-wise contraction of different cotton single knit structures due to the positioning of tuck and miss loops at different locations in the structural repeats. Journal of Engineered Fibers and Fabrics, Volume 18: 1–10.

[2]David J Spencer. (2001). KNITTING TECHNOLOGY-A comprehensive handbook and practical guide-Third edition. Woodhead Publishing Limited, Abington Hall, Abington.

[3]Govindan, A. A. (2020). Physical properties of single jersey derivative knitted cotton fabric with tuck and miss stitches. Journal of Engineered Fibers and Fabrics.

[4]Rashed, & Md. Mahamudul Islam. (may 2014). EFFECT OF TUCK LOOP IN BURSTING STRENGTH OF SINGLE JERSEY KNITTED FABRICS. international Journal of Research in Engineering and Technology.

[5]Su Liu, Jiahui Tong, & Chenxiao Yang and Li Li. (2017). Smart E-textile: Resistance properties of conductive knitted fabric – Single pique. Textile Research Journal, 2017, Vol. 87(14) 1669–1684.

[6]yassin, m. (2023). Engineering and technology of production Structures of weft knitted. Under publication.

[7]Rajesh Mishra, Hafsa Jamshaid, Sheraz Hussain Siddique Yosfani, Uzair Hussain, Muhammad Nadeem, Michal Petru, . . . Miroslav Muller. (2021). Thermo physiological comfort of single jersey knitted fabric derivatives. fashion and textiles.

[8]Boos, A. D., & Tester, D. (1994). A System for Fabric Objective Measurement and its Application in Fabric and Garment Manufacture. Textile and Fibre Technology .

(٩)نورهان, & فيروز ابو الفتوح الجمل, نجلاء طعمية حمدي محمد. (2021). التركيب البنائي لأقمشة تريكو اللحمة ذات الغرز المعلقة وأثره علي خواص أقمشة ملابس السيدات. مجلة الفنون والعلوم التطبيقية - جامعة دمياط-كلية الفنون التطبيقية.

(١٠)أميرة, & نجلاء محمد طعيمة, ايهاب فاضل ابو موسي سامي عبد الحي. (2021). تصميمات مقترحة لملابس السيدات مستوحاة من التراث الافريقي (قبيلة الماساي بكينيا) بأستخدام التطريز اليدوي. مجلة الفنون والعلوم التطبيقية - جامعة دمياط-كلية الفنون التطبيقية.

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دراسة مقارنة بين أقمشة تريكو اللحمة الملون السنجل الجيرسيه (السادة والسنجل بيكيه) من حيث الخواص الجمالية والوظيفية المستخدمة كملابس خارجية للسيدات

ملخص باللغة العربية :

في هذه الدراسة تم عمل مقارنة للتحقق من تأثير التراكيب البنائية لتريكو اللحمة المشتقة من السنجل جيرسيه (السادة والسنجل بيكيه),وقد تم إنتاج (٢٠)عينة مقلمة ملونة مقسمة كالتالي (١٠ تصميمات مقلمة ملونة لتركيب السادة-١٠ تصميمات مقلمة ملونة لتركيب السنجل بيكية),وقد تم الانتاج بضبطات ماكينة متطابقة .

وقد أظهر التركيب البنائي للقماش تأثير كبير علي الخصائص المختلفة لاقمشة التريكو اللحمة المنتجة حتي مع تثبيت بعض العوامل مثل (نمرة الخيط وجوج الابر).

ونبحث في هذه الدراسة عن تأثير أثنين من التراكيب البنائية لتريكو اللحمة المشتقة من السنجل جيرسيه (السادة-السنجل بيكيه)علي عدة خصائص وظيفية مثل (الوزن –السمك-نفاذية الهواء-ثبات اللون للاحتكاك في الحالة الجافة والرطبة) وقد أظهرت نتائج الاختبارات ان السنجل بيكية قد تفوق من حيث الوزن والسمك ,في حين تفوق السادة من حيث نفاذية الهواء وثبات اللون للاحتكاك في الحالة الجافة والرطبة .

وبمقارنة القيم الجمالية لكل من عينات السادة والسنجل بيكية يتضح تفوق السنجل بيكيه في غالبية محاور استبيان القيم الجمالية .

الكلمات المفتاحية:

تركيب السنجل جيرسيه، تركيب السنجل بيكيه،القيم الجمالية، القيم الوظيفية، الملابس الخارجية للسيدات .

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