

Aesthetic relationship between personality emotions and contemporary graphic design patterns on the surfaces of textiles

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ABSTRACT

In this work, five different types of animated graphic design ideas (traditional, 2D, 3D, stop motion, motion) were examined on three different textile fabrics (cotton, silk, polyester) through digital printing. Psychological-emotional expressions (openness, conscientiousness, extroversions, agreeableness, and neuroticism) were investigated that influenced the perceptual criteria. Lastly, a quantitative investigation was carried out from a sample of 300 students whose ages varied from 20 to 24 years old for an analysis of aesthetic appeal through a 5-point Likert scale. The results revealed that motion animation design has the most effective aesthetic appeal while the stop motion design pattern has the least aesthetic appeal. Silk fabric samples have better graphic consequences whereas polyester fabric samples have the least. Moreover, individuals with neuroticism emotional personality have the least effective response while agreeableness have the utmost for the sense of aesthetics. 71% students were accustomed to aesthetic appeal as compared to structural fabrics.

1. Introduction

In this digital era, we all are existing on a planet that is becoming progressively aesthetically centred [1]. This is due to the continuous technological advancements and the integration of visual designs, leading towards more exciting creations of visual objects [2]. Additionally, aesthetic standards are an integral feature of the aesthetic values which are needed in products like textile fashion apparel [3].

They are also known as the determining factors that influence any visual design [4]. The aim is to resolve issues using imagination, contribute positively, and grant the products a strong aesthetic culture [4]. Therefore, visual communication (virtual content i.e., graphic design) is serving as a catalyst for engaging the firms and the individuals' thoughts, concepts, information, and their interests (senses; feelings, and emotions) for conveying unique messages for marketing attempts which elicits a

strong emotional response from the audience or target markets [5]. However, with all this, the use of visual design aesthetics (which is a multiple combination of typography, photography, and any mix of media marketing) also generated discrepancies in conceptualizing rational persuasion while converting concepts into tangible objects [6]. For instance, visual stages of communications for effectiveness and expression of design patterns on the product like textile fabric surfaces [7].

Visual design (VD) is the coordination of symbols, forms, pictures, colours, patterns, variations, abstractions, interrelated as repetitive, homogeneous or heterogeneous, motifs and their repeat associated with the theme/idea, present information to a target by converting invisible into visible or tangible product [8]. Further, historical and psychological designs, patterns, traditions, customs, and perceptions all affect the creation of a design in the collaboration between the designer and the mentor [9]. Thus, VD is the application of beauty, emotion, attractiveness, style, and aesthetics to textile clothing (any covering for the human body) and accessories for fashion apparel (decorative coverings for the human body) [10]–[12]. Gibson explored some personality types that affected fashion choices [13]. Similarly, the feelings and emotions of an individual reflect in the wearing of textile fashion apparel [14]. Therefore, visual communication and textile fashion apparel have become important not only for covering the human body but also for altering external and internal means of gesture and expressions [15].

Howlett N. et.al. discovered that the individual's personality is enhanced through the clothing styles and fashion apparel [16], [17] that plays a significant character in strengthening personal factors (self and inter-personal realization for an individual beyond the circumstances over the time), identification, traits, state of mind, tone, expressions, and manners [18]. According to Johnson and Lennon, dress reflects emotional and social psychological concern and affects the conduct of oneself and towards others as well [19], thus creating a lifestyle, heritage, and art. According to Sutton and Altarriba, colour is a visual component that is regarded as non-verbal communication that psychologically affects human life since it enhances the identification, attention, feelings/emotions, or physical state of an individual [20]. Caddel demonstrated the relationship between individual characteristics and the textile shades for the preference for cool colours and colour combinations [21]. Through the use of Dewey Colour System Test, Lange and Jason discovered the

subjects prevailing characteristics of social neuroticism, conscientiousness and insecurity preferred dark colours while Cigic and Bugarski exposed preferring vivid colours among individuals possessing violent behaviour [22], [23]. Stimpson revealed that visual colour prevailing differences between males and females, since males valued yellow colour more than females [24]. Upadhayay and Babolhavaeji, K. et.al. explored that girls liked bright and vibrant textures while boys supported light-coloured clothing [25], [26]. Similarly, Wendy Moody et. al. evaluated the demographic state of the fashion consumer relationship between clothing design, appetite, individual factors, emotions, and feelings [3].

Therefore, this study deals with the influence of graphic design ideas, and their stages of communication for effectiveness and expression of design patterns on textile fabric surfaces in the textile industry. The authors have not found any comprehensive reported literature to evaluate the influence of graphic design ideas. So, drawing a comparative analysis of designs on textile fabrics is of high significance at present. This research was based on three steps, the first step was to create the five different graphical pattern designs with a selected work of art and design theme, which was Super Mario on adobe Photoshop and then digitally printed on three different structural selected fabrics (cotton, silk, and polyester). The second step was the investigation of psychological emotional expressions (interaction and emotional states) for printed designs. The third step was quantitative investigation from a sample of 300 students aged from 20 to 24 years old for an analysis of aesthetic appeal through a 5-point Likert scale. Two different types of questionnaires were distributed to examine the aesthetic appeal of the apparel and second to find out the relation between the personality/ emotional state and patterns respectively.

2. Material and Experimental Work

2.1 Selection of Textile Fabrics and Their Characteristics

Three different types of textile fabrics i.e., cotton, silk, and polyester, were selected for experimental work. Cotton and Polyester fabrics were obtained from a local domestic company, TASK Digital Printing, Lahore, Pakistan. Silk fabric was purchased from the fabric sourcing house (imported the fabric from China). The characteristics of the designated fabrics are enlisted in Table 1.

Table 1.

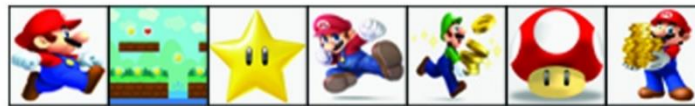
Textile fabrics with their characteristics

Sr. No	Textile Fabrics	GS M g/m ²	Construction	Weave	Fabric width inches
1	Cotton	145	40*40/120*96	Plain	58
2	Silk	145	40*40/120*96	Plain	58
3	Polyester	145	40*40/120*96	Plain	58

2.2 Selection and Preparation of Five Graphical Design Patterns

Fig. 1 has shown five different foundational types of animated graphic design patterns i.e., conventional/traditional graphic design in Fig. 1(a), 2D in Fig. 1(b), 3D in Fig. 1(c), stop motion design in Fig. 1(d) and motion design in Fig. 1(e). These were prepared using different tools on the Adobe Photoshop software (2020) while considering a Super Mario game as a theme for graphic design work. These foundational animations of character

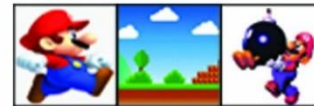
images were organized in a size of 20\20 inches and assembled into a different rotational composition of graphical patterns as depicted in Fig. 2. Different Mario characters from Fig. 1(a) were assembled in a single design pattern. The final graphical image Fig. 2(a) was achieved by the orientation of the design repeat. Similar steps were followed for all the graphical pattern designs. Fig. 2(b) portrayed the 2D design pattern with the blending of a single Mario running character having the background of cubic face design. Fig. 2(c) exhibited a 3D graphical image that involved the running and playing of Mario characters with the clouds by using a pen tool and the design was oriented in different directions. Fig. 2(d) specified the accumulation of different Mario characters and coins in a single image through blending to create a stop-motion animation pattern after the orientation of the design is repeated. Fig. 2(e) has described a motion animation pattern as a wallpaper that was composed of different playing Mario characters. The design was cropped and orientated in different directions for the final image.



(a). Type 1: Characters of traditional/ handmade pattern



(b). Type 2: Characters of 2D animation pattern



(c). Type 3: Characters of 3D animation pattern



(d). Type 4: Characters of Stop motion animation pattern



(e). Type 5: Characters of motion animation pattern

Fig. 1. Five Types of Animated Graphic Design Patterns Characters

2.3 Application of Five Types of Animated Graphic Design Patterns on Different Textile Fabrics Through a Digital Printing Technique

These five creative designs of Fig. 2 (accomplished through Fig. 1) were applied to the textile fabrics (cotton, silk, and polyester) through digital printing technique (F7200), since it prints the design directly onto the media substrate, efficiently and cost-effectively [27]. Table 2 has shown the application of five graphical designs (traditional, 2D, 3D, motion and stop motion) on three different fabrics. The second column (C2) in the table indicated the graphical design patterns without printing on the textile fabrics while the same graphical designs were applied to the textile fabrics shown in column (C3: cotton, C5: silk, and C7: polyester). All the respective columns (C2, C3, C5, and C7) are showing variations in aesthetic appeal with respect to the types of graphical patterns including the shade and lustrous appearance, etc.

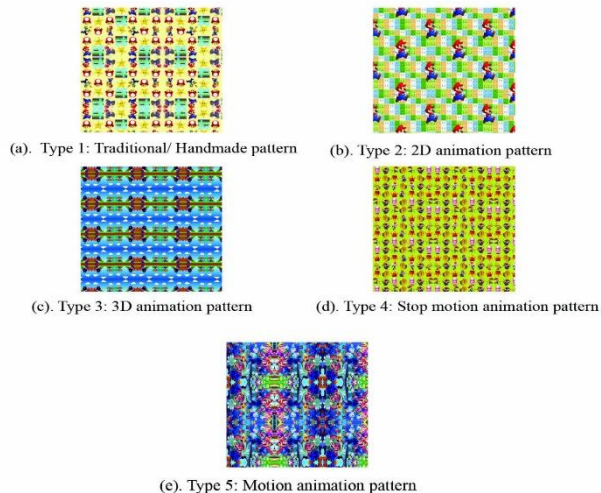






Fig. 2. Five Drafted Types of Composition of Animated Graphic Design Patterns

Table 2

Application of five graphical design patterns on three different textile fabrics and percentage ratios of individual sentiments

Type of graphical designs	Original graphic design patterns	Application of graphical designs on textile fabrics and percent ratio of emotional expressions					
		Cotton		Silk		Polyester	
		R1	R2	R1	R2	R1	R2
Traditional animation							
	R3:C1			O: 15% C: 10% E: 15% A: 50% N: 10%		O: 20% C: 5% E: 10% A: 60% N: 5%	
2D animation							
	R4:C1			O: 15% C: 5% E: 15% A: 50% N: 15%		O: 20% C: 5% E: 10% A: 55% N: 10%	
3D animation							
	R5:C1			O: 20% C: 15% E: 10% A: 55% N: 10%		O: 10% C: 20% E: 5% A: 60% N: 5%	
Motion animation							
	R6:C1			O: 10% C: 5% E: 15% A: 70% N: 0%		O: 5% C: 0% E: 5% A: 90% N: 0%	

Stop Motion animation. R7:C1	R6:C2 	R6:C3 	R6:C5 	R6:C7 	
	O: 20% C: 10% E: 10% A: 50% N: 10% R7:C4	O: 25% C: 0% E: 10% A: 65% N: 0% R7:C6	O: 30% C: 0% E: 10% A: 60% N: 0% R7:C8		
	R7:C2	R7:C3	R7:C5	R7:C7	

* O: Openness, C: conscientiousness, E: Extroversions, A: Agreeableness, N: Neuroticism; R: Row, C: Column

2.4 Investigation of Psychological Emotional Expressions (OCEAN) From A Sample Of 300 University Students on Different Textile Fabrics

Five psychological emotional expressions, abbreviated as “OCEAN”, openness (O: evaluates the area of motivation seeking and appreciation of experience), conscientiousness (C: evaluates an individual’s standard of the institution, determination, and motivation in their goals), extroversions (E: evaluates the quality and identity of interpersonal relations), agreeableness (A: evaluates with the quality of a person’s interpersonal positioning), and neuroticism (N: deals with the emotional fluctuations) [28], related to aesthetic appeal, were investigated from a sample of 300 university students, whose ages varied from 20 to 24 years, through a 5-point Likert scale. The investigations were especially performed at the beginning of the day from 9:30 AM to 11:30 AM. The reason was to avoid the unrest or sleeping mood of the participants. Further, the participants were entertained with the refreshment for their keen interest and motivation as well. The data were collected in two stages in the form of a questionnaire i.e., stage 1: Relationship between the personality/emotional states and design patterns and evaluated through statistical software.

2.5 Analysis of The Aesthetic Appeal Of The Finished Textile Products

A Survey of aesthetic appeal data of the finished textile products was collected from the same set of 300 university students through a questionnaire.

3. Results and Discussion

3.1 Consequences of Psychological Emotional Expressions (OCEAN) On Different Textile Fabrics

Among 300 students, the personality test was conducted through Big Five Personality Test (BFPT). The students were asked to answer the questions (50-item tool) in 20 minutes. Persons answered questions on a scale of 1-5 (Disagree-Slightly Disagree-Neutral-Slightly Agree-Agree). The data was collected, distinguished, and segregated into

proportions. It was observed from the data of sample size, 90 students (30%) pertained the personality trait of agreeableness, 81 (27%) students were possessing an attitude of openness, 63 (21%) owing to conscientiousness, 36 (12%) were holding extroversions trait and the remaining 30 (10%) students kept neuroticism personality traits.

Table 2 shows the percentage ratios of the individual sentiments for the graphical pattern designs on three different textile fabrics, i.e., cotton, silk, and polyester. The table depicted that the individuals with the emotional expression of agreeableness (A) have the highest percentage, ranging from 45-85, represented in blue colour (C4, C6, and C8) for the graphical patterns on all textile fabrics. Whereas the individual having the emotional expression of neuroticism (N), possessed the least percentage, ranging from 0-15, for the graphical patterns of all textile fabrics. After agreeableness, individuals with emotional openness (O) had the most percentage ratio, ranging from 10-30 while conscientiousness (C) have a nominal ratio, ranging from 0-15 in all the textile fabrics. Although the people with neuroticism and conscientiousness emotions have equal ranges (0-15), however, the people with conscientiousness have greater appealing $\{(10+5+5) + (5+5+10) + (15+20+20) + (5+0+0) + (10+0+0)\} = [110\%]$ than the people with neuroticism emotions $\{(10+5+5) + (15+10+10) + (10+5+10) + (0+0+0) + (10+0+0)\} = [90\%]$. Table 2 also depicted that print designs on silk fabric are more lustrous than polyester and cotton fabric (has the least lustrous). The reason was due to the internal build-in properties of the substrate for example silk has the longest and finest filament yarns in comparison to polyester (man-made) and cotton (natural fibre). Cotton fabric has a dull aesthetic appearance in all five graphic design patterns.

3.2 Appealing and Significant Relationship Between Traditional Designs Printed Patterns and Personality Traits

Fig. 3 shows the aesthetic appeal relationship of traditional design printed patterns on three different fabrics and five different personality traits. The

individuals possessing openness (O) emotions were more attracted to the graphical designs on polyester fabrics while they were least attracted to the design on cotton fabric samples. The individuals with conscientiousness (C), extroversions (E), and neuroticism (N) emotions, have a similar trend of appeal on the surfaces of three fabrics, i.e., they were appealed more towards designs printed on cotton fabrics and least towards designs printed on polyester fabrics. Individuals with agreeableness emotions have a diverse appealing pattern. They had the highest appeal for all the categories. However, they were attractive more towards the designs on silk fabrics as compared to the designs on cotton and polyester fabrics which have an equal ratio of appeal for them.

Genetic algorithm is used to get the optimized and economic path for the traveling salesman. This work focuses on the practical approach to get the shortest path for the travelers of the Khyber Pakhtunkhwa province of Pakistan. The solution provided in the paper was able to save time and cost at a factor of 2.4. The developed Graphic user interface can be used by the courier companies to get the optimized path and the cost of travel for the optimized path. The problem is solved using Python programming and the results are generated compared and presented in this work. The study can be extended to other geographies as Khyber Pakhtunkhwa has been used as a test case. Further, the solution can be deployed for logistics, transportation, mobile robots in industries, drone applications, and routing of large circuit boards.

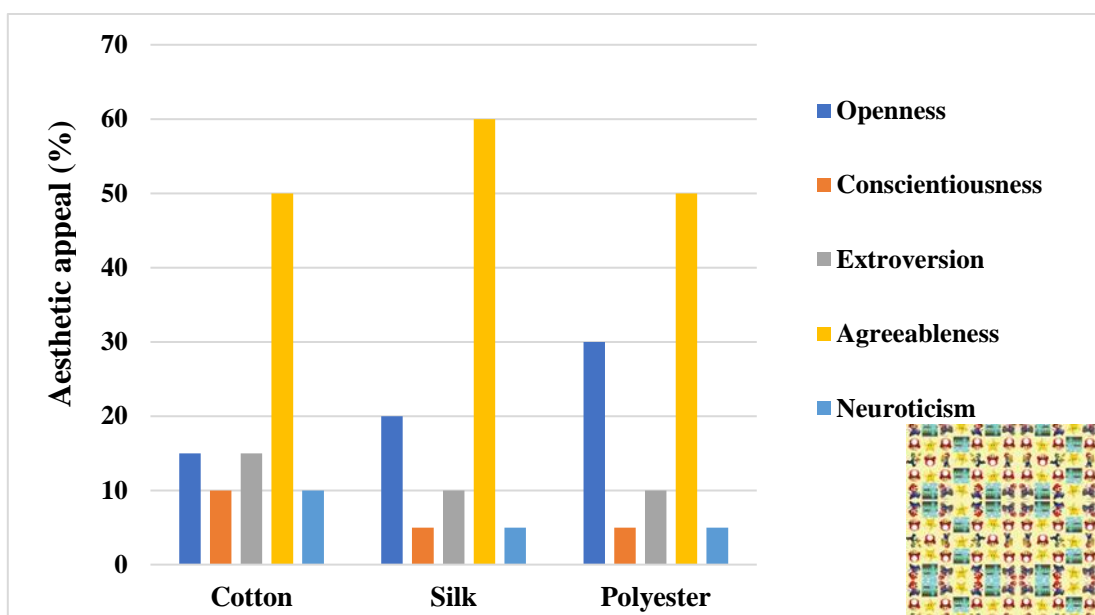


Fig. 3. Relationship Between Traditional Designs Printed Patterns and Five Different Personality Traits

Figure further depicted that in the cluster of cotton, the highest aesthetic appeal was observed in the individuals with agreeableness (A) emotions. Persons with extroversion (E) emotion were ranked second while the other three were equally ranked third (least), i.e., the individuals with openness (O), conscientiousness (C), and neuroticism (N) emotions have a similar fondness of designs printed on cotton fabrics (since these types of individuals stuck to one brand colour and design). Likewise, in the cluster of silk and polyester, where a similar pattern of aesthetic appeal existed, i.e., agreeableness has the highest appeal. Individuals with openness (O) trait was ranked second (individuals stuck to one brand colour and design), extroversion (E) was ranked third (individual were open to every colour design and fabric), conscientiousness (C) and neuroticism (N) equally ranked fourth (least).

Thus, in the nutshell, after silk cotton fabric is the most suitable fabric for traditional pattern designs since a more percentage of individuals was attracted. Therefore, the textile companies working on traditional print designs focus more on cotton fabrics since more groups have an equal attraction for aesthetics as compared to silk and polyester.

3.3 Appealing Relationship Between 2D Designs Printed Patterns and Personality Traits

Fig. 4 shows the aesthetic appeal relationship between 2D design printed patterns on the surfaces of three different textile fabrics and five personality traits. The individuals possessing openness (O) emotions were equally attractive to the graphical designs on silk and polyester fabrics while they were least attractive to the design on cotton fabric samples. The individuals with conscientiousness (C) emotions

were more attractive to the design on polyester fabric samples while they were equally least in aesthetic appeal for silk and cotton fabrics. The individuals with extroversion (E) and neuroticism (N) emotions have a similar trend of aesthetic appeal in three fabrics, i.e., they appealed more towards designs printed on cotton fabrics and equally least towards

designs printed on silk and polyester fabrics. The individuals with agreeableness (A) emotions have a diverse aesthetic appealing pattern. They were attractive more towards the designs on silk fabrics as compared to the designs on cotton and polyester fabrics which have an equal ratio of appeal for them.

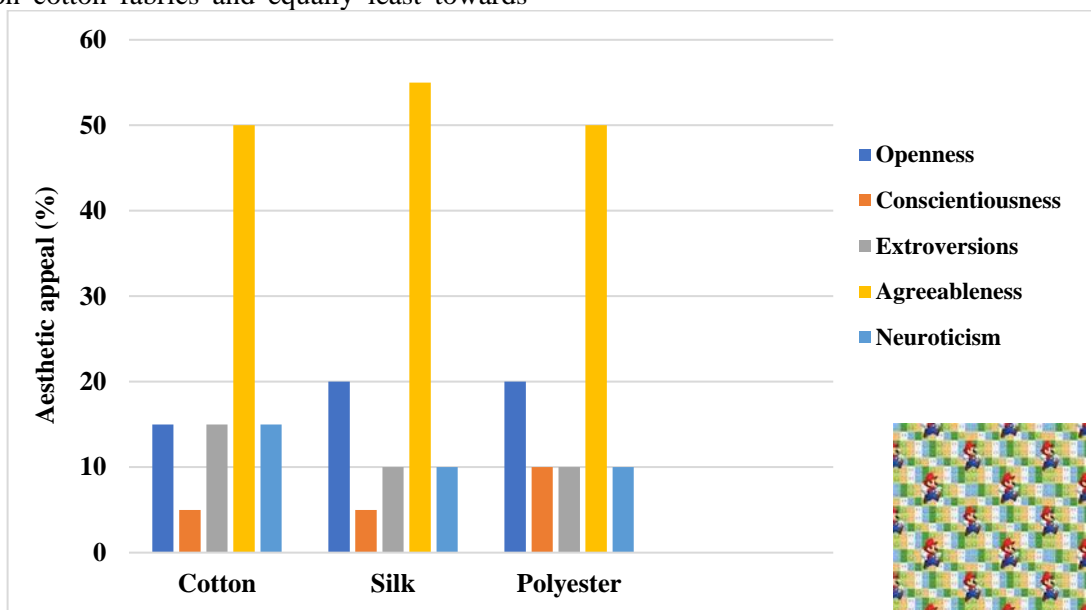


Fig. 4. Relationship Between 2D Designs Printed Patterns and Five Different Personality Traits

The figure further predicted that in the cotton cluster, the highest aesthetic appeal was observed in the individuals with agreeableness (A) emotions. Conscientiousness (C) was ranked least while the other three were equally ranked second, i.e., the individuals with traits of openness (O), extroversions (E), and conscientiousness (C) emotions have a similar liking of design printed on cotton fabrics. Additionally, the silk and polyester clusters have an almost similar trend of aesthetic appeal, except for the conscientiousness emotion. The individual with conscientiousness (C) emotions has the least aesthetic appeal (more brand conscious) for designs on silk fabrics while equally least attractive along with extroversion (E) and neuroticism (N) for designs on polyester fabrics. The individuals with agreeableness were highest ranked (better in silk) while the openness (open to every colour, fabric, and design) was equally ranked second for aesthetic appeal. The individuals with extroversion (do not stick to one brand whereas neurotic people stick to one colour and fabric) were equally ranked third, in both clusters.

Thus, after silk cotton fabric is the most suitable fabric for 2D pattern designs since a more percentage ratio of individuals with personality traits were attractive towards it. Therefore, the textile companies working on 2D printed designs focus more on cotton

fabrics since more groups have an equal attraction for aesthetics as compared to silk and polyester.

3.4 Appealing Relationship Between 3D Designs Printed Patterns and Personality Traits

Fig. 5 shows the appealing relationship between 3D design printed patterns on three different fabrics and five personality traits. The individuals possessing openness emotions were more attractive to the graphical designs on cotton fabrics while they were equally least attractive to the design on silk and polyester fabric samples. The individuals with conscientiousness (C) emotions were least attractive to design on cotton fabrics and equally most attractive to silk and polyester fabrics. The individuals with extroversion (E) were more attracted to designs on cotton fabrics while equally least attractive to designs with silk and polyester fabrics. The pattern of aesthetic appeal was different for agreeableness (A). The personalities with agreeableness have more aesthetic appeals for designs on silk fabric while they have equally least attraction towards the cotton and polyester fabrics. The people with neuroticism (N) emotions possessed the least aesthetic attraction to designs on silk fabric while equally more attractive to cotton and polyester fabrics.

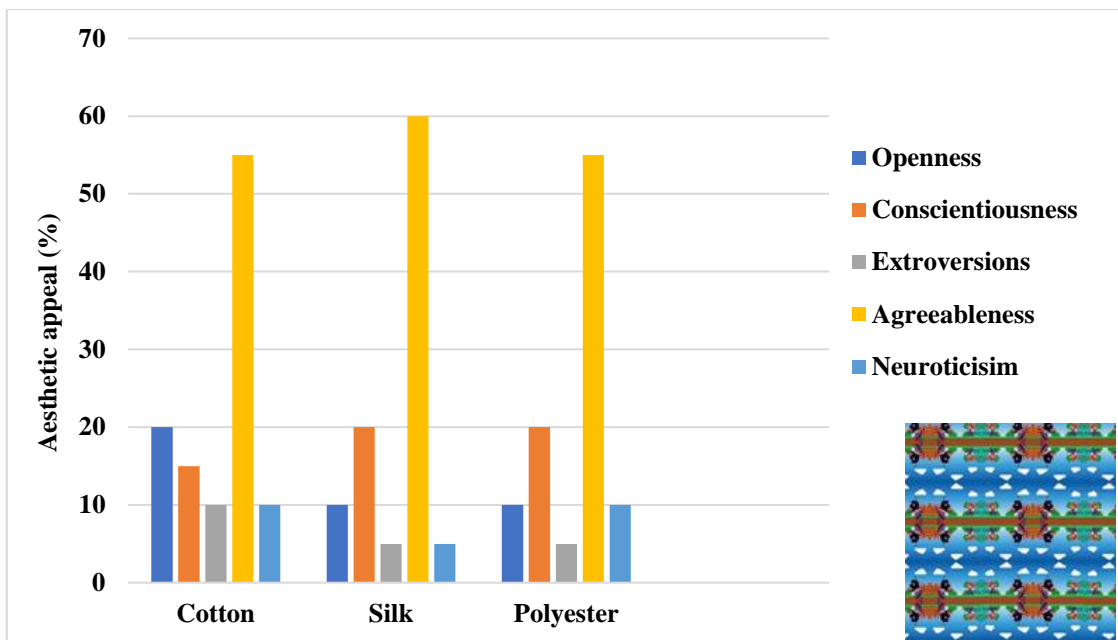


Fig. 5. Relationship Between 3D Design Printed Patterns and Five Different Personality Traits

Fig. 5 further demonstrated that in the cotton cluster, for instance, the highest aesthetic appeal was observed in the individuals with agreeableness emotions. The individuals with openness (O) traits had an aesthetic appeal that ranked second while individuals with conscientiousness (C) traits were ranked third. The other two were equally ranked fourth (least), i.e., the individuals with extroversion (E) and conscientiousness (C) emotions have a similar liking of designs printed on cotton fabrics. Likewise, in the silk cluster, the individuals with agreeableness (like to try new designs and techniques) have the top ranking of aesthetic appeal while people with extroversion (not brand conscious) and neuroticism (stick to solid colours) emotions have the equally lowermost aesthetic appeal. Besides, the individuals with conscientiousness (brand conscious) emotions ranked second while the individuals with openness emotions ranked third for the aesthetic appeal of silk fabrics. Similarly, in the polyester cluster, the individuals with agreeableness traits have the top ranking of aesthetic appeal while people with extroversion emotions have the least aesthetic appeal. The individuals with conscientiousness (C) emotions ranked second while the individuals with openness (O) and neuroticism (N) emotions ranked third for the aesthetic appeal of polyester fabrics.

Thus, the cotton fabric was the most suitable fabric for 3D pattern designs since a more average

percentage ratio of individuals was attracted to the design. Therefore, the textile companies working on 3D print designs focus more on cotton fabrics since more personality groups have an attraction for aesthetic appeal as compared to the silk and polyester fabric samples.

3.5 Appealing Relationship Between Motion Designs Printed Patterns and Personality Traits

Fig. 6 shows the appealing relationship between motion design printed patterns on the surfaces of textile fabrics and five personality traits. The individuals possessing openness (O) emotions were more attractive to the graphical designs on polyester fabrics while they were least attractive to the design on silk fabric samples. The individuals with conscientiousness (C) emotions had no attraction to the design on silk and polyester fabrics however they have limited attraction to the design on cotton fabrics. The individuals with extroversion (E) emotion were more attracted to designs on cotton fabrics while less attractive to designs with silk fabrics. They had no attraction for the designs on polyester fabrics. The pattern of aesthetic appeal was different for agreeableness. The personalities with agreeableness (A) have more aesthetic appeal for designs on silk fabric while they have the least attraction towards the cotton fabric as compared to the design on polyester fabrics. The people with neurotic emotions possessed no aesthetic attraction to designs on any fabric.

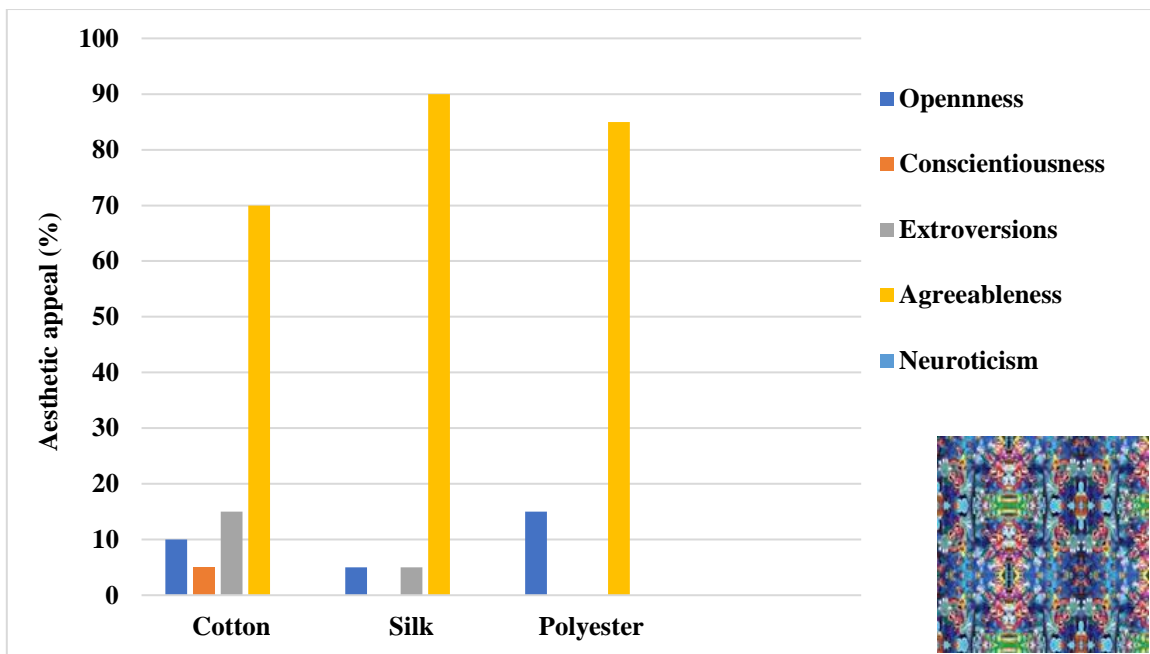


Fig. 6. Relationship Between Motion Designs Printed Patterns and Five Different Personality Traits

Fig. 6 also established the comparison of three clusters, for instance, the highest aesthetic appeal was observed in the individuals with agreeableness (always try new designs, colours, and techniques) emotions in the cotton cluster while the people with neuroticism (stick to one solid colour) emotion had no appeal for designs. The personalities with extroversion (not brand conscious) traits ranked second in aesthetic appeal on cotton fabrics while the individuals with openness (open to every colour and design) traits ranked third. Likewise, in the silk cluster, the individuals with agreeableness (A) have the top ranking of aesthetic appeal while the people with conscientiousness (brand conscious) and neuroticism (N) emotions had no aesthetic appeal. Furthermore, the individuals with openness (O) and extroversion (E) had equality in aesthetic appeal after the personality with agreeableness emotion. Correspondingly, in the polyester cluster, the individuals with agreeableness have the top ranking of aesthetic appeal while people with openness emotions (O) have the second-ranked in aesthetic appeal. The individuals with conscientiousness (C), extroversion (E), and neuroticism (N) emotions had no appeal for the aesthetic appeal of polyester fabrics.

Thus, the cotton fabric was the most suitable fabric for motion pattern designs since a more average percentage of individuals was attracted to the designs on it. Therefore, the textile companies

working on motion printed designs focus more on cotton fabrics since more personality groups have an attraction for aesthetic appeal as compared to the silk and polyester fabric samples.

3.6 Appealing Relationship Between Stop Motion Designs Printed Patterns and Personality Traits

Fig. 7 shows the appealing relationship between stop motion design printed patterns on three different textile fabrics and five personality traits. The individuals possessing openness (O) emotions were more attractive to the graphical designs on polyester fabrics while they were least attractive to the design on cotton fabric samples. The individuals with conscientiousness (C) emotions had no attraction to the design on silk and polyester fabrics however they have limited attraction to the design on cotton fabrics. A similar pattern trend was observed for the individuals with extroversion (E) and neuroticism (N) emotions, i.e., diminutive attraction for cotton and no aesthetic appeal for designs on silk and polyester fabrics. The personalities with agreeableness (A) have more aesthetic appeals for designs on silk fabric while they have equally least attraction towards the designs of silk and polyester fabrics.

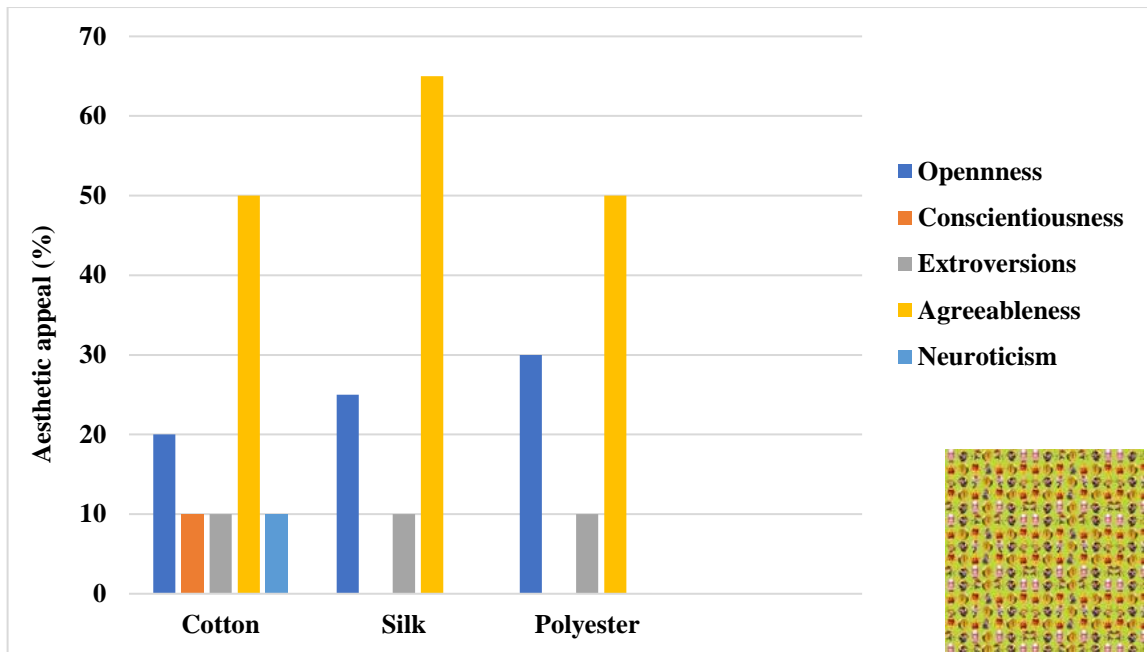


Fig. 7. Relationship Between Stop Motion Design Printed Patterns and Five Different Personality Traits

Fig. 7 further depicted that in the cluster of cotton, the highest aesthetic appeal was observed in the individuals with agreeableness (always try new trends, techniques, and designs) emotions while the people with conscientiousness (brand conscious), extroverts (not brand conscious) and neuroticism (stick to one solid colour and design) emotion had equally least appeal for designs. The personalities with openness (open to every colour and design) traits ranked second in aesthetic appeal on the cotton fabrics. Additionally, in the silk cluster, the individuals with agreeableness have the top ranking of aesthetic appeal while the people with conscientiousness and neuroticism emotions had no aesthetic appeal. Furthermore, the individuals with openness had equality in aesthetic appeal after the personality with agreeableness (A) emotion. Correspondingly, in the polyester cluster, the individuals with agreeableness have the top ranking of aesthetic appeal while people with openness emotions have the second-ranked in aesthetic appeal. The individuals with conscientiousness (C) and neuroticism (N) emotions had no appeal for the aesthetic appeal of polyester fabrics. The individuals with openness emotions ranked second for aesthetic appeal in the polyester fabrics.

Thus, the cotton fabric was the most suitable fabric for stop-motion pattern designs since a more average percentage of individuals was attracted to it. Therefore, the textile companies working on stop motion printed designs focus more on cotton fabrics since more personality groups have an attraction for aesthetic appeal as compared to the silk and polyester fabric samples.

3.7 Comparison Analysis of Five Graphical Designs and Their Influence with Different Personalities

Fig. 8 shows the comparative analysis of aesthetic appeal in five graphic designs and their relationship with the five different personality traits. The figure predicted that the individuals with agreeableness emotion were attracted more towards the graphical designs on textile fabrics since they had higher values of aesthetic appeal for motion and 3D designs whereas the traditional, 2D, and stop motion designs had medium values for aesthetic appeal. The individuals with neuroticism emotion ranked second for the aesthetic appeal based on the values of attraction of design, i.e., traditional, 2D, 3D, and motion animation. The design stop motion had a lower value of aesthetic appeal.

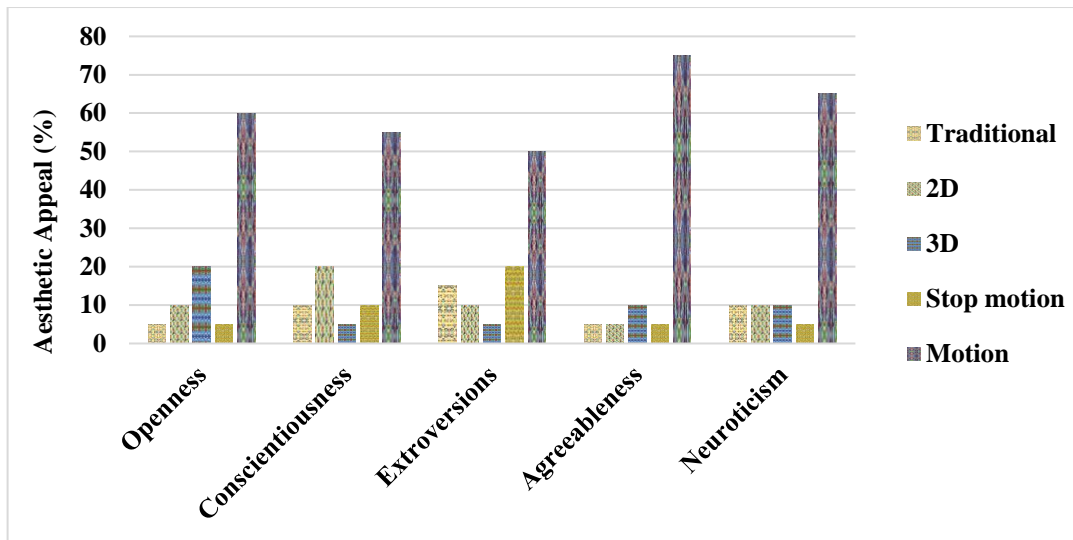


Fig. 8. Comparison Analysis of Five Graphical Designs with Different Personalities

The individuals with the openness (O) trait ranked third for the aesthetic appeal based on the values of attraction of design, i.e., 3D and 2D. The designs traditional and stop motion had medium values of aesthetic appeal. Likewise, the individuals with the conscientiousness (C) trait were ranked fourth in the aesthetic appeal towards the graphical designs on textile fabrics based on the values of attraction of design, i.e., 2D, traditional, and stop motion. The 3D design had the lowest values of aesthetic appeal. In this, motion design has the highest value, while 3D

design had the lowest value. Lastly, the individuals with extroversion (E) emotion ranked fifth for the aesthetic appeal based on the values of attraction of design. People of this type have more aesthetic appeal with motion design, while the least attractive with 3D designs. The design 3D and traditional ranked third and fourth with respect to aesthetic appeal. Mathematically, it can be expressed as (Agreeableness > Openness > Conscientiousness > Extroversions > Neuroticism) as shown in Fig. 9.

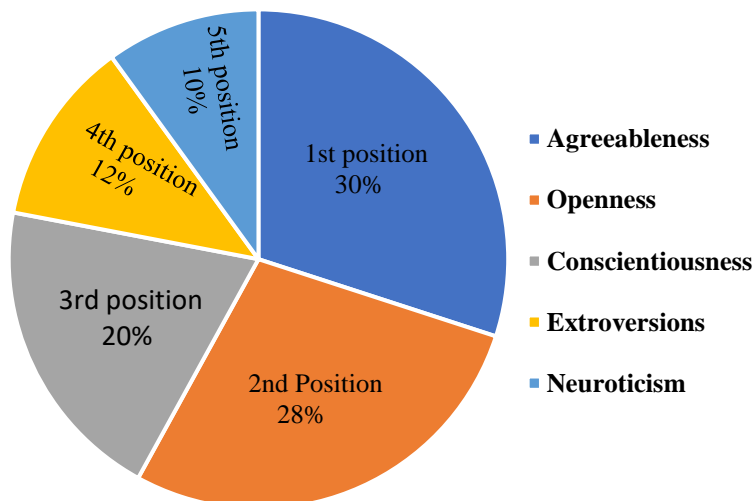


Fig. 9. Analysis of Personality Traits For Grading Of Attractiveness

In the nutshell, motion design was the most accepted design for aesthetic appeal in all the categories of individuals. Therefore, it was graded first among all selected designs. The 3D design ranked the second position (since it appeared at a secondary place in openness, tertiary place in neuroticism and agreeableness, and fifthly place by means of

conscientiousness and extroversions). Therefore, it was ranked the second position in all the selected designs. The 2D design was ranked in the third position amongst all selected designs since it scored third place by means of four categories, i.e., the individuals with neuroticism, agreeableness, extroversion, and openness emotions, while the only

conscientiousness category ranked it at a secondary place. Similarly, the stop motion design was ranked the fourth position amongst all the elected designs since it scored secondary place using the extroversion category, tertiary place in conscientiousness, and lastly placed in openness, agreeableness, and neuroticism categories. Thus, it ranked in the fourth position. Lastly, the traditional design scored the fifth position since it was accepted by two categories i.e., the individuals with agreeableness and openness emotion, and the same designs were accepted in fifth place using other two categories i.e., the individuals with conscientiousness and neuroticism emotions. Thus, traditional design ranked fifth amongst all selected designs for aesthetic appeal. Mathematically, the explanation could be expressed as Motion > 3D > 2D > Stop Motion > Traditional (Fig. 10).

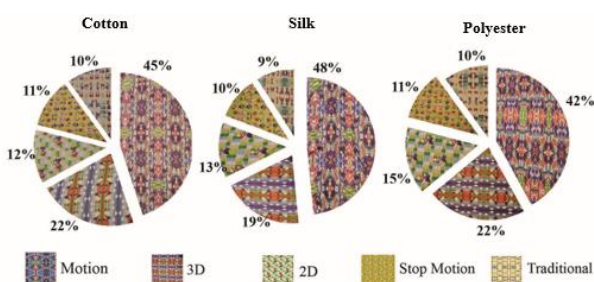


Fig. 10. Analysis of Five Graphical Designs for The Aesthetic Appeal (%).

4. Conclusion

In this paper, five different graphical design patterns were constructed through adobe Photoshop. They were applied to the three different textile fabrics (cotton, silk, and polyester) through digital printing for the investigation of an individual's sentiments of psychological emotional expressions (openness, conscientiousness, extroversions, agreeableness, and neuroticism) and the aesthetic appeal for apparels. The important results of the study under discussion can be summarized as follows.

- (1) The distribution of O: C: E: A: N is obtained from the questionnaire filled by 300 students 90 (30%) persons belonged to agreeableness personality traits, 81 (27%) belonged to openness, 63 (21%) belonged to conscientiousness, 36 (12%) belonged extroversions and 30 (10%) belonged to neuroticism.
- (2) 71% of people are addicted to the aesthetic appeal of fashion and apparel design.
- (3) Motion Animation patterns ranked first in all textile fabrics whereas Stop Motion animation ranked least. Further, conventional, 3D, 2D ranked 2nd, 3rd, and 4th respectively.

- (4) Silk fabric ranked first due to its lustrous property, cotton ranked 2nd. and polyester ranked least.
- (5) Agreeableness ranked first in all whereas Neuroticism ranked least. Further, openness, conscientiousness, and extroverts ranked 2nd, 3rd, and 4th respectively.

It can be concluded that the major proportion of the population was habituated towards the aesthetic appeal of textile surfaces. There is a strong influence on types of textile fabrics and contemporary graphic design patterns. For instance, the best results were obtained from silk fabrics with motion animation patterns. The research work is supportive to the textile apparel industries in forecasting the designs and prints for their aesthetic appeal with better textile materials utilization.

5. Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

6. References

- [1] I. Xenakis and A. Arnellos, "Aesthetic perception and its minimal content: a naturalistic perspective," *Frontiers in Psychology*, vol. 5, pp. 1-15, 2014. <https://doi.org/10.3389/fpsyg.2014.01038>.
- [2] A. M. K. Nabil, "Characteristics of design as an academic and creative discipline," *KnE Social Sciences*, vol. 2020, pp 294-298. kss-v4i11, 2020. doi: 10.18502/kss.v4i11.7560
- [3] W. Moody, P. Kinderman, and P. Sinha, "An exploratory study: Relationships between trying on clothing, mood, emotion, personality and clothing preference," *Journal of Fashion Marketing and Management: An International Journal*, vol 14, no. 1, pp. 161-179, 2010. <https://doi.org/10.1108/13612021011025483>
- [4] C.-C. Hsu, "Factors affecting webpage's visual interface design and style," *Procedia Computer Science*, vol. 3, pp. 1315-1320, 2011. <https://doi.org/10.1016/j.procs.2011.01.009>
- [5] G. Cattani, S. Ferriani, F. Godart, and S. V Sgourev, "The aesthetic turn in strategy: Creating value with style," *Aesthetics and style in strategy*, vol. 42, pp. 1-15, 2020. <https://doi.org/10.1108/S0742-332220200000042024>.

- [6] E. B. Oladumiye, S. R. Ogunduyile, and B. A. Ogunlade, "Aesthetic analysis in the study of graphic design visual perception in advertisement of products in south western Nigeria: A case study of Akure consumer of products," *Scottish Journal of Arts, Social Sciences and Scientific Studies - ISSN 2047-1278*, vol. 16, no. 1, pp. 38-55, 2013. <http://scottishjournal.co.uk>
- [7] M. Bruns Alonso, C. Hummels, D. V Keyson, and P. P. M. Hekkert, "Measuring and adapting behavior during product interaction to influence affect," *Personal Ubiquitous Computing*, vol. 17, no. 1, pp. 81–91, 2013. <https://doi.org/10.1007/s00779-011-0472-3>.
- [8] J. Blomkvist, "Conceptualising prototypes in service design." Faculty of Arts and Sciences thesis, Linköping University, Sweden, Electronic Press, 2010. ISBN: 978-91-7393-158-8.
- [9] S. M. Minhus, T. Hui, and L. Huie, "Indigenous costume color of Bangladesh: A traditional context for cultural revival," *Fibres Textile Eastern Europe*, vol. 152, no. 2, pp. 123-132, 2022.
- [10] U. Bhandari, K. Chang, and T. Neben, "Understanding the impact of perceived visual aesthetics on user evaluations: An emotional perspective," *Information and Management*, vol. 56, no. 1, pp. 85–93, 2019. <https://doi.org/10.1016/j.im.2018.07.003>
- [11] B. R. Das, "UV radiation protective clothing," *The Open Textile Journal.*, vol. 3, no. 1, pp. 14-21, 2010.
- [12] S. H. Hassan and H. Ara, "Thematic analysis of hijab fashion from Muslim clothing retailers perspective," *Journal of Islamic Marketing* vol. 13, no. 4, pp. 2462-2479, 2022. <https://doi.org/10.1108/JIMA-03-2020-0066>.
- [13] B. S. Gillani, S. Haider, and F. A. Jan, "The relationship of clothing with personal identity of different clothing style personalities among working women," *Journal of Management Info*, vol. 3, no. 1, pp. 1–4, 2016. DOI:10.31580/jmi.v9i1.43.
- [14] R. P. Rubinstein, "Dress codes: Meanings and messages in American culture", Routledge, 2018. ISBN: 9780429495281. DOI:10.4324/9780429495281.
- [15] S. Uğur, "Wearing embodied emotions: A practice based design research on wearable technology", Springer, 2013. ISBN 10: 8847052467 ISBN 13: 9788847052468. Springer.
- [16] N. Howlett, K. Pine, I. Orakçioğlu, and B. Fletcher, "The influence of clothing on first impressions: Rapid and positive responses to minor changes in male attire," *Journal of Fashion Marketing and Management: An International Journal* vol. 17, no. 1 pp. 38-48, 2013. DOI:10.1108/13612021311305128.
- [17] T. Stolovy, "Styling the self: Clothing practices, personality traits, and body image among Israeli women," *Frontiers in Psychology* vol. 12, pp. 719318, 2021. doi: 10.3389/fpsyg.2021.719318.
- [18] K. K. P. Johnson, J. Yoo, M. Kim, and S. J. Lennon, "Dress and human behavior: A review and critique," *Clothing and Textile Research Journal.*, vol. 26, no. 1, pp. 3–22, 2008. <https://doi.org/10.1177/0887302X07303626>.
- [19] K. Johnson, S. J. Lennon, and N. Rudd, "Dress, body and self: Research in the social psychology of dress," *Fashion and Textiles*, vol. 1, no. 1, pp. 1–24, 2014. <https://doi.org/10.1186/s40691-014-0020-7>.
- [20] T. M. Sutton and J. Altarriba, "Color associations to emotion and emotion-laden words: A collection of norms for stimulus construction and selection," *Behaviour Research Methods*, vol. 48, no. 2, pp. 686–728, 2016. <https://doi.org/10.3758/s13428-015-0598-8>.
- [21] K. W. Caddel, "The relation between personality traits and color selection of fabric as found in a group of students at Texas Technological College." Texas Tech University, 1966. <http://hdl.handle.net/2346/18243>.
- [22] R. Lange and J. Rentfrow, "Color and personality: Strong's interest inventory and Cattell's 16PF.," *North American Journal of Psychology*, vol. 9, no. 3, 2007.
- [23] D. Cigić and V. Bugarski, "PERSONALITY traits and colour preferences razlike u osobinama ličnosti između tipova ispitanika formiranih na osnovu preferencije boja," *Curr Top Neurol Psychiatr Relat Discip.* vol. 18, no. 4, p. 28-35 2010.

- [24] D. V Stimpson and M. F. Stimpson, "Relation of personality characteristics and color preferences," *Perception Motion Skills*, vol. 49, no. 1, pp. 60–62, 1979. doi: 10.2466/pms.1979.49.1.60.
- [25] R. Upadhayay, "A comparative study of colour preferences towards clothing among young girls and boys," *International Journal of Research–Granthaalayah*. vol. 2, no. 3, pp. 1–5, 2014. [https://doi.org/10.29121/granthaalayah.v2.i3S E.2014.3532](https://doi.org/10.29121/granthaalayah.v2.i3S.E.2014.3532).
- [26] M. Babolhavaeji, M. A. Vakilian, and A. Slambolchi, "Color preferences based on gender as a new approach in marketing," *Advance Social Humanitarian Managment*, vol. 2, no. 1, pp. 35–44, 2015.
- [27] J. Wiklund et al., "A review on printed electronics: Fabrication methods, inks, substrates, applications and environmental impacts," *Journal of Manufacturing and Materials Processing*, vol. 5, no. 3, pp. 89, 2021. <https://doi.org/10.3390/jmmp5030089>.
- [28] M. Ziegler, K. T. Horstmann, and J. Ziegler, "Personality in situations: Going beyond the OCEAN and introducing the situation five.," *Psychological Assessment*, vol. 31, no. 4, pp. 567–580, 2019. DOI:10.1037/pas0000654.