The creation of emotionally attuned patterns through an analysis of line

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The creation of distinct pattern designs has been studied at the level of geometric transformations and culture, but its link with emotional experience is less well established. This paper seeks to reverse engineer the creation of pattern by examining the emotive status of abstract forms, in this case lines. By firstly establishing how line, shape and symmetry are the key building blocks of pattern and exploring the links between emotion and form perception, a study is presented designed to explore form expression and emotive meaning through the free-hand drawing of lines. The results of this study are then utilized to create a set of emotionally attuned pattern designs that are then subsequently analyzed in a separate study, establishing a link between form expression, emotional experience and pattern. These links are subsequently explored further and the implications for wider design practice and scholarship are discussed.

Introduction

Pattern is a powerful tool in design, manifesting in decorative aesthetic features, functional configurations and making methods. This paper draws on several previous studies and a diverse range of scholarship to explore the creation of emotionally attuned pattern work. Principally, this paper will utilize line as a key tool in which to explore pattern creation, drawing on the principles of form-perception to develop a set of unique pattern designs.

While pattern is an extremely common feature of the built environment and of the aesthetic make-up of artefacts or images, there has been a notable lack of focus on how these complex features are conceived and how they
have been utilized within a vast array of diverse human societies. Key studies from Washburn and Crowne [1], Wade [2] and more recently by Hann [3] have presented compelling analytics of the cultural differentials of pattern work between societies and how pattern can be broken down into basic symmetry operations. Continuing this line of study, this work seeks to expand the analysis of pattern by exploring pattern creation and how it can link to emotive experiences and semantic representation.

Firstly, the basic principles of pattern are discussed, detailing how a pattern is constructed from simple elements and rules. Furthermore, the relevance of pattern to art and expression at large is discussed, summarizing its relevance to design culture. Secondly, drawing from the literature in experimental aesthetics, we present a discussion on form-perception and how this links to pattern work with discussion deriving from previously published studies by the authors in which shape and line analysis play a key role [4, 5, 6]. This focus on line is then used as a framework for an experimental design in which participants use a free line drawing task to create subjective representations of emotion concepts e.g. “trust”. Combining this with the previous studies on pattern and shape interpretation, four bespoke “emotive patterns” are designed and subsequently studied to determine how effectively they can embody the distinct meaning of particular emotions. Lastly, the results are discussed referring to how they could inform future study and design practice with a particular exploration of human-centered design and design emotion.

What is a pattern?

Firstly, we must explore what a pattern is. While there are different definitions and uses of the word, we will limit the discussion in this case to tesselating geometry utilized in an aesthetic context. Pattern is essentially built from symmetry operations that transform geometric elements [3]. These operations provide an emergent tesselating complexity when applied to specific geometric shapes as illustrated below (Figure 1); A) Translation B) Rotation C) Reflection D) Glide reflection.

![Figure 1: Four symmetry operations](image)
Depending on the arrangements and combinations of the shapes and operations, great degrees of complexity can be achieved. 17 tessellation configurations can exist to create a two-dimensional pattern in which a plane can be perfectly covered without varying any of the geometric elements. This relates to the maximal six-order rotational symmetry based on the five Bravais lattice frameworks within crystallography [3].

Culturally, the emergence of pattern has a complex history – knowledge of pattern creation operations is evidenced in many ancient societies. Washburn and Crowe’s expansive study *Symmetries of Culture* [1] explored the set-theory basis of pattern design and how this can be linked to aspects of culture, essentially tied to the epistemological frameworks in which the societies functioned. Washburn and Crowe, through extensive scholarship, show how cultural knowledge is imbedded in the forms of symmetry that make up ornamental design work. Similar work has more recently been completed by Hann [7] who analyzed the dynamic differences of aesthetic cultures and the trends that link them.

**Pattern and the aesthetic perception**

**Pattern and meaning**

To get a grasp on how pattern interacts with human perception, we must consider the semantic status of pattern i.e. what do patterns mean within human culture? Ingold [8] in his study of lines has explored how arrangements of shapes will often have important cultural value ranging from decorative or aesthetic functions to patterning motions that create artefacts such as textiles – patterning being indispensable to making operations. Other notable work looking at pattern has examined its function as a kind of social or religious tool. As argued by Gell [9], pattern in many ancient cultures may have been used as a means of dispelling demonic forces believed to inhabit the environment. An evil spirit may be confused by the presence of a pattern and not enter a home – Celtic knot patterns may be an example to this practice. This form of pattern making, Ingold argues, is analogous to a maze or a labyrinth and believes that instead of confusing demonic forces, pattern making is a practice of trapping them in an environment of repeating loops. Ingold and Gell’s respective analyses are interesting as they suggest that pattern has both a semantic and functional dimension. Within design scholarship, this relates to Krippendorff’s studies [10, 11] who has explored how artefacts have “layers” of semantic meaning in which different parties can understand distinct elements of an artefact or piece of technology and Norman [12] who has closely considered affordances and signifiers with respect to artefact use and engagement. Ingold [13] has also argued that forms
are not just observed in a prescriptive and rational way, they are modes of expressing change; the flow of energy and material or what has been described as a “textility” present within made artefacts. In this sense, pattern making cannot be seen as simply an ornamental practice, the traditional view advanced by figures such as Owen Jones [14], but an expression of complex cultural beliefs that reflect a diverse range of meanings.

**Form and emotion**

To grasp the cultural status of pattern further, we must consider the links between form-perception, meaning and emotion. Recent work in experimental aesthetics is instructive and has suggested that humans have a possibly innate preference for particular kinds of forms and associate particular emotive experiences with abstract geometric arrangements – notably a curvature-angularity dichotomy whereby curvature is generally associated with positive emotions and angularity is generally associated with negative emotions within a given context [see 15, 16, 17, 18]. Many theorists have suggested these preference factors are at some level biologically predetermined.

Line is an important component within many of these studies as it allows forms and representations to be distilled down into very simple structures facilitating analysis. Combining these insights with an analysis of historical stylings, the authors developed the Line Model of Form and Emotion [blank for review] presented in a previous publication in which line is presented as a critical tool in the creation of key structural elements and a window into understanding the emotive and semantic connection particular aesthetic styles have for observers. Notably, this was observed in an early study by Poffenberger and Barrows [19] who examines pre-drawn lines finding that small changes to line design and orientation could dramatically change the semantic interpretation. Critically, the line analysis revealed the patterning that underlay the structural formations of artefacts leading to an interest in pattern.

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**Experimental protocol**

The studies presented in the following sections continue these analyses of pattern through the lens of form and perception. The first part of the study consisted of 30 participants aged between 20-35. Using Plutchik’s [20] emotive categories, a worksheet was provided to each participant with one of eight emotive terms and two points separated by blank space. The emotive terms refer to what Plutchik called “basic” emotions – the emotions most central to human experience and the key components of more complex emotional experience. Each participant was instructed to, in their own time, represent the emotive terms in the form of a continuous line. Ingold [8] has made plain that forms of representation through line can be laden with significant cultural and symbolic values. This is the key property that was to be explored – using an interpretivist approach, the lines would be analyzed for aesthetic trends or coherent geometric patterns. The emotive terms selected included fear, trust, anger, joy, anticipation, surprise, disgust and sadness. The terms were presented in that same order to each participant and were selected to explore a diverse range of emotive categories. Four of the terms were selected for their positive valence (following Ekman [21]) – trust, joy, surprise and anticipation. The other four were selected as examples of negative valence and are more unambiguously associated with unpleasantness.

The second part of the study involved a kind of validation of the assumptions of the first part whereby the emotive patterns were analyzed using normative scales. Each of the 62 participants again aged between 20-35 were presented with a worksheet containing a set of emotive terms (derived from Plutchik) and a scale of 0 to 10 and were directed to indicate the level of intensity each pattern conveyed to them for each emotion.

The subsequent analysis is subjective and interpretivist, bringing in ideas from aesthetic theory but grounding them in a cognitive understanding of expression and emotion and should not be seen as a definitive analysis.

**Representations of negative emotions**

Half of the words presented to the participants were ones conventionally associated with negativity or a negative valance in psychological terminology. Ultimately the goal was to examine how a set of participants would represent an emotion through line. Each negative emotion will be considered in turn starting with fear.

*Fear:* The key features seen below in Figure 2 is one of disunity and chaos as a patterning emerges across the lines. This kind of highly unstructured line was seen in most of the representations and may point to the feeling of powerlessness or submission mentioned before. The feeling of fear may bring about intense emotions of panic and is as such represented in a line...
that has no clear path or direction but is highly energetic. Geometrically, the lines are mostly of a curved quality, but this curvature is one that is more probably representing chaotic transitions as a sense of panic rapidly changes – a feature seen in other art forms such as music or film.

By contrast, another motif was common amongst the participants – one of a continuous spikey line with a high frequency of structured directional change. While this may also convey some of the chaotic sensations associated with fear, it is also possible this is something more primal. Some theorists have hypothesized that emotional responses to form may have evolutionary roots and are driven by survival. In this sense, these representations may point to an instinctive fear of teeth or claws or dangerous rocks. While this is not definitively clear, the line drawings do bear a striking resemblance to some of these natural threats [15].

**Anger:** Many of the motifs seen in the line representations were similar to that of fear validating the positive-negative dichotomy in some ways however there were a number of notable distinctions. Firstly, the representations made much more consistent use of angular geometry with less use of curving motifs and structures (Figure 3). The lines are also highly energetic whereby the changes in movement are dramatic and intense. Secondly, the lines on the whole were more structured – the motifs presented were interestingly quite consistent and were often drawn within a bounded area between the two points. The representations shown are similar to a number of the lines drawn for the fear exercise – suggesting the same link between anger and a symbolic representation of teeth.
When comparing these results to fear, there are some striking similarities, suggesting that people view the two emotions as experientially similar in character. Many researchers have noted that subtle changes in abstract geometry can change the overall perception of a line [see 15, 16, 17, 18]. Here these subtleties may also be at work with the fear lines being notably more chaotic. Although some examples from the anger exercise point away from this and can be viewed as equally chaotic as fear. The critical take away is the consistent use of angularity and the energetic nature of the line.

**Disgust:** Overall, the motifs presented for this emotion were very varied and made use of a range of geometry and visual energy. The diversity presented makes an absolute assessment of the lines difficult, however there are a few elements that can be discussed. One such element may be a consistent sense of discontinuity; the representations were often sharply non-linear with motifs present similar to those see in the fear and anger exercises. Considering the examples shown in Figure 4 below – while the chaotic nature of the other lines may not be present, there is certainly a similar dynamic visual energy. The emotion of disgust is related to feelings of hatred and disagreeableness – these forms may be representing these feelings through symbolic disorderliness, antithetical to the aesthetic of Western Classicism or High-Modernism. Additionally, it may be noted that some lines appeared to have a kind of temporality or narrative structure, suggesting a change in mood or character over time as if travelling through different states.

![Figure 4: Representations of “disgust”](image)

**Sadness:** The representations for this emotion were notable for their lack of visual energy and lower frequency of change across the line (Figure 5). In addition, it appears many participants treated the worksheet space as a kind of Cartesian grid where “above” the two points is seen as positive and “below” the two point is as negative. Pallasma [22] has pointed out that this tendency to associate “up” with betterness is deeply ingrained within Western thought with connections to religious ideas of the transcendent. With respect to this many of the lines in this part of the exercise were portrayed with this explicit depression in their journey across the page.
The lines meander like rivers on a map but have a clear directionality, flowing downwards relative to the composition of the page. In addition to this it should be noted that there was consistent use of curvature in the representations. This is counter to some of the evidence presented earlier from other scholars who have found angularity hugely dominant for interpretations using negative valence. Curvature does seem to have its own melancholic associations—perhaps related to the character of the experience itself as something more drawn out and less energetic and dynamic as anger or fear.

**Representations of positive emotions**

*Trust:* The key features of the trust lines were that of simplicity and symmetry. The geometric elements tended towards abstraction with minimal dynamic changes in direction and a lack of visual energy or movement. One motif that was seen frequently was that of a near straight line from one point to the other—this is shown in Figure 6 below.

The two examples shown above are strikingly similar and there are perhaps two interpretations that can be made for this kind of representation. The first is that the lines relate to the idea of (and actual aesthetic of) a bridge. A bridge, in static engineering terms, is a solid structure that connects two otherwise disconnected geographical points. It is a solid and ridged structure that is structurally designed to be extremely safe. Relating trust to this kind of motif suggests that the emotion is related to concepts of flatness, solidness and unambiguousness that are paramount in the structural
The creation of emotionally attuned patterns through an analysis of line

design of bridges. The other interpretation is that of the path or the journey. This is also discussed by Ingold [8] were a kind of “straightness” has come to be representative of rationality in Western culture. This kind of thinking may be influencing the representations where a simple and direct line is viewed as more decisively rational and trustworthy than one that travels around the page unpredictably.

Another important motif that was explored by many participants was that of symmetry and balance and particularly the use of curving motifs. Again, the page seems to have been naturally split into quadrants by the participants with lines of symmetry running from point to point and splitting the page in two across its length. The theme of ordered and balanced curvature was consistent. Some examples, not shown for brevity, explore the aesthetic motif of a wavy line, similar to repeating a sine wave. It is not clear exactly why many of the participants were drawn to this motif, but it is certainly congruent with aesthetic simplicity and, in many places, symmetry.

Joy: Representations of this emotion were coherent, with many participants aligning around several simple motifs. Similar to the motifs expressed for trust, wave-like forms were very often produced by the participants. One noticeable difference was the use of overlapping lines, a line that looped across its own path. Examples of this are shown below in Figure 7.

![Figure 7: Representations of “joy”](image)

The visual energy present in these lines is clear and both lines travel across a large amount of the page. Arnheim [23] has pointed point that visual energy can be conveyed by the Gestalt principles of balance and proximity. In this case, the drawing on the top left is less balanced compositionally but makes more use of the page, the line on the top right makes more direct use of proximity and is more balanced – both however achieve a similar visual character. The movement of the lines could perhaps relate to a bouncing motion; indeed, aspects of the drawing could theoretically map the path of a bouncing ball as it travels through space. Additionally, the bouncing motion may have a physically connection with positive feelings of excitement.
Notably, the lines are all of a curved aesthetic, substantiating the link between curvature and positive valance.

**Anticipation:** Although it may be viewed as generally more positive, there is a noted ambiguity – one may anticipate an event in a negative way, evoking feelings of discomfort. The results for anticipation were also quite diverse and there was no clear preference for either curvature or angularity within the depictions. One interpretation that can be explored is viewing the lines as not just a journey across the page but in some regard a temporal journey - a journey in time and an emotional transition through time. Anticipation has an implicit sense of time within its definition – its meaning is derived from the feeling of expectation for some future event, contrasting with other emotions which may not have the same temporal dimension but are experienced more as a visceral present. It is possible that this aspect of the emotion was the key inspiration for the representations that the participants produced. To look at some examples (Figure 8), both these lines can be seen as a kind of temporal journey with the left point representing a metaphorical present and the right point a metaphorical future. The line on the left explores angularity and the line on the right explores curvature but both have a similar temporal structure that can be seen as a map of the emotion. The experience of anticipation can be viewed as a kind of build-up of feelings that climax in one way or another. With respect to this, both lines have this sense of build-up and climax – the “climax” expressed through a semblance of dynamic shapes.

![Figure 8: Representations of "anticipation"](image)

Another motif that proved popular amongst the participants was one of a bounded wave-like patterns. Anticipation, for many people, may have associations with feelings of sustained excitement or ever nervousness. The feelings associated with anticipation may relate to this aesthetic representation; the physicality of excitement or nervousness manifests in many ways such as foot tapping, or other obsessively repeated movements and the repeated wave forms of the lines may represent this (repeated motions across a sustained time). Overall, this emotion was notable for its variety of representations.
The creation of emotionally attuned patterns through an analysis of line

**Surprise:** Many of the lines can also be interpreted as having a temporal dimension, showing explicit changes in dynamic as they travel across the page. The main difference however is that these lines are kind of mirror images of some of the anticipation lines. As anticipation suggests a waiting or a sustained feeling leading to some kind of climax, the feeling of surprise comes from something unexpected that may be highly engaging. Interestingly, in Plutchik’s model, surprise is placed at a diametric opposite to anticipation, sits subjectively between amazement and distraction and is related to the complex emotions of awe and disapproval. In this sense, we can see this represented in the lines. Considering the lines below in Figure 9, if they are read left to right in an orthodox (Western) fashion, all the lines begin with dynamic and energetic movement (the example on the right in particular). This dynamic visual energy that is present at the beginning of the line dissipates by the time it travels to the far side. It is possible these are, in some ways, representations incorporating a temporal dimension where the initial feeling or shock or excitement is followed by a calming of mood or a resolution.

![Figure 9: Representations of "Surprise"](image)

Not all the lines drawn for surprise had an identifiable temporal dimension that could be interpreted. The generated motifs were quite diverse overall but were mostly visually energetic with lots of changes in the directions of the line. While their geometric qualities are distinct and there is no clear alignment to either angular or curving motifs. Broadly they are characterized by a journey that is undulating. The visual energy implicit within these lines indicates that surprise is viewed by many as a visceral emotional experience. As there is no clear alignment with either curvature or angularity, it is possible that the emotion is viewed with some ambiguity, characterized by feelings of the unexpected or a shock and not necessarily positive or negative in nature.

Taken together, these results and interpretations reveal a complex and layered story of form perception, emotional interpretation and form expression. Many of the participants within the study utilized principles or repetition, patterning and symmetry to build their motifs. Symmetry was often used in association with emotions of a positive valence and repetition of
forms used to highlight a sense of balance. Additionally, these rules led to interesting displays of “narrative” within the forms – as if the lines contained stories

**Creating bespoke emotive pattern designs**

How can this knowledge gained from the study of pattern and aesthetics more generally be applied? The model of form and emotion developed by the authors [4] illustrated how discreet geometric elements (notably lines) could be used within the framework of design to create both emotively and semantically resonant products and product stylings. The next logical step is to validate these initial findings by creating and testing bespoke emotive patterns. This could have wide applications in design styling and aspects of product function. This section will describe the creation of the bespoke pattern designs by firstly deriving what are considered emotively resonant geometric shapes, lines and motifs and then applying these to a symmetric rule structure.

**Table 1: Aesthetic motifs derived from line and pattern studies**

<table>
<thead>
<tr>
<th>Aesthetic motif</th>
<th>Description</th>
<th>Emotive and semantic relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Wave motif" /></td>
<td>Wave motif, transitioning curved form</td>
<td>Associated with feelings of joy, happiness or calmness. Semantic relations to water, fluidity and serenity</td>
</tr>
<tr>
<td><img src="image" alt="Spike motif" /></td>
<td>Spike motif, angled transitions</td>
<td>Associated with feelings of fear, anger or excitement. Semantic relations to danger and instability</td>
</tr>
<tr>
<td><img src="image" alt="Bursting outwards motif" /></td>
<td>Bursting outwards motif, outward energy</td>
<td>Associated with surprise, excitement and anticipates. Semantic relations to expansion, seeing or focus</td>
</tr>
<tr>
<td><img src="image" alt="Interlocking rings motif" /></td>
<td>Interlocking rings motif, a “Vesica Piscis”</td>
<td>Associated with trust and joy. Semantic relations to unity, security and strength</td>
</tr>
</tbody>
</table>

**Final designs**

From the pervious studies by the authors and the line study presented above, four bespoke designs were generated additionally drawing on the motifs that are distilled in Table 1 above. The emotions of trust, joy, surprise and fear
were selected as they had some of the clearest representational alignments. The completed designs are shown below in Figure 10. Each design has been created by the authors so also represents a subjective piece of design styling. The design work has however drawn on the evidence gathered by the authors’ previous studies and completed multiple iterations to achieve the finalized designs shown below. Abstract, as opposed to realist motifs were used to construct the designs given the focus on abstract shape and line throughout the reviewed scholarship.

![Figure 10: Bespoke emotive pattern designs - a) Trust b) Joy c) Fear d) Surprise](image)

**Results from visual assessment**

The presented patterns were designed in order to represent emotive concepts; visual form as embodying a subjective meaning. We have seen how this idea has notable coherence across experimental aesthetics and theories of art more generally. This work proposed to explore if this could be extended to pattern with respect to the many scholarly efforts to establish how pattern plays a role in kinds of cultural expression and knowledge. The patterns will be discussed in turn and in the same order they were presented to the participants, with principal reflection orientated around how the emotive assessments reflect those modelled by Plutchik [20].

This pattern was conceived to be a representation of trust, or more broadly, positive feelings of happiness or connection following an analysis conducted previously by the authors. The design made notable use of the
structural motif of overlapping rings which, it was postulated, capture some semantic representation of the feeling that is designates as a principle emotion. Upon analysis, it was noted that demarcating the male results from the female results showed no significant differences in the overall responses. With respect to this, the results were taken together and analyzed accordingly.

Results and discussion

It is clear that the design has been successful as an abstract representation of trust with the emotion receiving the highest overall rating (2.72) in terms of a perceived visual representation (see Figure 1). Additionally, the emotions of optimism, joy and love received high rankings, suggesting that the pattern may have the potential to relay more complex emotions and feelings. The negative emotions received contrastingly low ratings from participants, suggesting that while there was the subjective possibility that these emotions were present in some regard, the general affect was towards a “positive” interpretation. The emotions span a range of perceived intensities with notable coherence around positive valence when compared with negative valence. Trust, optimism, joy and love have very high average ratings compared with their emotional opposites such as aggressiveness and disgust.

![Figure 11: Pattern 1 results](image)

Like pattern 1, pattern 2 has essentially achieved its envisioned design goal of embodying the emotion of surprise with this emotion receiving the
highest intensity rating (2.69). Comparatively, emotions such as sadness and remorse received low scores suggesting a coherent semantic distinction. Furthermore, the ambiguity between a positive valence and a negative one that may be present in definitions of surprise, it seems is more difficult to achieve in a visual context as there is a clear skewing towards a more positive interpretation of the forms. Joy and optimism received notable high scores suggesting that these feelings are more directly related to understandings of surprise as a feeling.

Pattern 3 was conceived along similar lines to pattern 1, drawing from the previous studies by the authors and other evidence drawing on curvature preferences to present a representation of joy. Unlike pattern 2, this was conceived to be a clearer representation of the emotion and positive emotions more broadly. The results shown in Figure 13 demonstrate that while a positive interpretation has been achieved, the participants cohered around an arguably more complex emotion; love.
Love is an extremely complex emotion, characterized as a feeling drawn from not only joy and trust but feelings of serenity, acceptance, and ecstasy too [20]. Love received a rating of 2.46, closely followed by optimism at 2.20 and awe measuring 2.11. In contrast, emotions such as anger and contempt received relatively low scores indicating a semantic coherence within the design tending towards a positive valence.

The final pattern was designed to represent a subjectively negative emotion, for the purposes of the task fear was selected as a useful starting point though the broader goal was to represent a negative valence. The principle guidance for the design was the use of angularity to counter the curvature preference. As with pattern 3, pattern 4 did achieve the negative response predicted, however, the consensus showed that the pattern was more representative of anger and aggressiveness. The mean results are presented in Figure 14 below.
Interestingly, this pattern saw high scores for aggressiveness and anger – 3.37 and 2.69 respectively – but notably received a high score for surprise, also measured at 2.29. This introduces some complexity into the interpretation of the results as surprise was unambiguously cast within a framework of positive valence. It may be that the uncertainties that have already been discussed regarding surprise as an experience are manifest here in the subjective interpretation of this pattern.

Implications for design practice

How can the conclusions presented here feed our wider understanding of design? What is interesting is the link between meaning and abstraction, unifying in the interobjective formulations of pattern. As stated earlier, patterning can have aesthetic uses (decoration or composition), functional uses (structural requirements in engineering or architectural contexts) and uses within making (weaving or sewing). But how can this study enhance these formulations?

In essence, this study has tried to deconstruct pattern into abstract or simple elements in order to penetrate how in could be applied in specific design contexts. What was most revealing is how the exercise of expression-through-line, as informed by other studies in experimental aesthetics, led to forms of basic patterning, with the repetition of motifs in order to convey subjective understandings of emotions and feelings. Additionally, complex features such as narrative were also observed as a possible semantic interpretation of the line forms.
In practice, this shows that pattern can emerge in very simple forms but can also convey very complex ideas such as emotions or stories. The emotive power of designed artefacts has been well understood for two decades [see 24, 25, 26] but this decomposes these analyses further by drawing a link between abstract representations and the end artificial result. With respect to this, this study represents a kind of methodology for the create of attuned emotive forms. In essence, this is an exercise in co-design whereby the subjective experiences and understanding of a set of participants is utilized to elicit a specific design result and aesthetic schema. While this work has focused of decorative pattern forming, similar exercises could be applied to design other kinds of objects as seen in other interesting studies [27].

Furthermore, the relationship between pattern and emotion presents possibilities in practical aesthetics and design-interaction properties such as product texturing. Could patterns for instance be used to elicit particular behaviors or enhance certain moods in specific environments? Additionally, do patterning motions elicit feelings? As scholarship from Ingold [8, 13] has explored, the actual practice of creation relies of patterning motions – it may be possible to explore this further, examining further how emotional expression manifests through the processes of making and manufacturing at both the level of craft and industrial production (e.g., the patterning implicit in the movements of CNC milling tools). Such work has already been explored by Karana et al [28].

Conclusion

This work has sought to build upon a set of previous studies conducted by the authors and combine it with a new study to explore the relationship between line, patterning, and emotion.

Firstly, some background on pattern and pattern creation was provided and how shape interpretation and form perception can be used to inform the understanding of pattern. From there, the previous studies conducted by the authors were elucidated, providing foregrounding for the studies presented within this paper which are a logical extension of those.

The paper subsequently presented two linked studies. The first study considered lines and how they can embody particular emotions. The results from this study clearly showed a convergence around certain sets of aesthetic themes and motifs such as interlocking rings and dynamic forms seeming to embody a narrative. Based on the results of this study and taking results previously gathered by the authors regarding the interpretation of
The creation of emotionally attuned patterns through an analysis of line

pattern, four bespoke patterns were developed to embody four specific emotions, namely joy, fear, surprise, and trust. These designs were subsequently analyzed within the second study.

The results of the second study, in which each bespoke pattern was interpreted against a list of emotive terms, showed that the designs broadly achieved the subjective emotive responses predicted by the line and pattern studies. Notably, the trust and surprise designs corresponded directly with those emotive terms, but the joy and fear design diverged, aligning towards the related emotive concepts of love and optimism, and aggressiveness and anger respectively. This highlights that the context of shape within a pattern structure is important and may lead to interpretations beyond the ones derived for the discrete elements of the patterns taken as abstract components. Overall, this study, while being experimental and interpretivist in formulation, shows how forms taken as abstract discrete elements can be utilized to attune more complex aesthetic structures around specific emotive experiences and interpretations.

References

4. [blank for review]
5. [blank for review]
6. [blank for review]