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Applying Gestalt Laws through Somatic Sensibility

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ABSTRACT

Attending to the need to integrate somatic sensibilities into design education, this paper provides a walkthrough of a workshop activity devoted to introducing Gestalt laws through the cultivation of somatic sensibility. Instead of following a solely visually-oriented path to learning Gestalt laws, students were asked to use their senses and materials as vehicles to represent their felt, inner experience through their designs. By applying the proposed steps, it was observed that certain patterns of responses reporting on movement, intensity, and dissipation of awareness were associated with specific Gestalt laws. This article reports on the first approximations of this approach, suggesting future paths for design educators, such as the integration of both constraints and whole-body interactions with materials as students increase their somatic sensibility.

Keywords

Somatic education
Gestalt laws
Interaction design
Somatic sensibility
Soma design

AUTHOR

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Applying Gestalt Laws through Somatic Sensibility

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INTRODUCTION

Among our senses, the use of our sight is particularly dominant in design (Lupton & Lipps, 2018). This visualist approach influences the understanding of terms such as *aesthetics*, which is commonly interpreted as a mere matter of visual appearance (Löwgren, 2009). With the rise of phenomenology-oriented approaches and the influence of Deweyan Pragmatism in interaction design (Dewey, 1934), we have observed a shift towards understanding aesthetics as a more complex experiential matter, concerning the bodily dimension as part of our meaning-making process (Löwgren, 2009; McCarthy & Wright, 2004). Influenced by Somaesthetics, approaches such as soma design have highlighted the importance of integrating our whole bodies and movement into the interaction design process, making evident the need for methods that could sensibly connect students with both their somatic sensibility and their creativity (Höök, 2018; Tsaknaki et al., 2019).

Gestalt laws have been traditionally applied in graphic design, serving to aesthetically and functionally organize visual content (Moszkowicz, 2011). Nowadays, these laws are actively applied in the context of interface design (Koch & Oulasvirta, 2016), as well as in the design of tangible interfaces (Winther & Vallgårda, 2016). Although our visual sense functions as a means for our practical orientation in the world (Koffka, 2013), getting in contact with the rest of our senses is fundamental for the generation of rich multisensory interactive products (Loke & Núñez-Pacheco, 2018; Lupton & Lipps, 2018; Sonneveld et al., 2008). Some researchers have started to pay attention to the use of sensory strategies for design education (Schiphorst, 2011; Tsaknaki et al., 2019), including the transference of somatic knowledge (Loke & Núñez-Pacheco, 2018; Schiphorst, 2011). The use of anti-solutionist methods that put students in contact with their senses has started to be seen in interaction design classrooms (Tsaknaki et al., 2019). Examples of these approaches include the *A-Labs* method, which operates through sensory examination of performance and materials (Akner-Koler & Ranjbar, 2016); *Magic Machines* and its exploration to magic thinking — and making — as a source of idea generation (Andersen & Wakkary, 2019); and

Focusing as a method for evocation through our bodies (Núñez-Pacheco & Loke, 2018). The interest for these somatic methods in interaction design calls for the generation of new, creative ways to engage with materials while connecting with our bodies wholistically.

Central to the theme of this paper, the concept of *somatic sensibility* can be defined as an evaluative skill for discerning sensory qualities of design materials and scenarios through our bodies (Loke & Núñez-Pacheco, 2018), whilst recognizing the effect this process has *on the self* (Schiphorst, 2011). Somatic sensibility and material thinking are closely related since designers generate knowledge through their hands and their senses (Stolterman, 2008). For Schön (1984, 1992), this knowing-in-action process is embedded in activities such as sketching and prototyping, which function as active conversations between designers and materials. However, this way of performative thinking still keeps the knowledge encased in the designed artifact or prototype, without making explicit the link between how the body and its senses actually connect with the resulting object (Núñez-Pacheco, 2018). Consequently, designers not always have the means to express their implicit sensory knowledge, which is important for the generation of experience-centric artifacts (Höök, 2010). As a result of recognizing this gap, this paper offers a pedagogical approach to teaching Gestalt laws, making explicit that inner bodily sensations and its movements and flows serve as materials for visual composition, enabling designers to improve their sensory repertoire. The premise behind the use of somatic sensibility in design education lies in the need for methods acknowledging the active role of the senses in design, promoting a self-aware approach to enactive thinking through materials. Additionally, by connecting the learning process of Gestalt laws with corporeal experience beyond vision, we facilitate the process of meaning-making and long-lasting learning. This claim is supported by constructivist approaches to education, and in particular by John Dewey's integration of what he identified as *traditional* and *progressive* views on teaching (Dewey, 1938). In such integration, the prescriptive and retrospective content (in this case, the Gestalt laws as traditionally taught in design education) is examined through the progressive lenses of personal experience (their first-person somatic engagement). However, for this experiential knowledge acquisition to flourish, a balance between granting appropriate guidance and spaces for self-exploration is needed (Dewey, 1938), which resonates with Schiphorst's (2011) views on somatic connoisseurship as relevant for the appreciation and evaluation in the process of designing experiential technology.

This article describes a university class activity where Gestalt laws are applied to graphically represent bodily self-awareness of the face, accessed through guided exercises. First, it outlines the Gestalt laws taught to students, including figure-ground, proximity, closure, similarity, continuity, and common

fate. Then, after introducing the study methodology and the task — the design of a mask —, a walkthrough of the activities is described. Next, this article outlines a series of patterns of representation emerging from the use of Gestalt laws to describe the movements and qualities of bodily self-awareness. Finally, this article contributes with a novel activity to teach Gestalt laws through somatic sensibility, suggesting some future explorations in the light of the discoveries emerging from this exercise.

GESTALT LAWS AS DESIGN PRINCIPLES

Gestalt laws are used to articulate how we organize perceptual information, providing a scientific ground explaining how we cluster and arrange forms and figures in our phenomenological experience (Graham, 2008). The development of these laws was pioneered by Koffka (2013) and Wertheimer (1938), among others. However, the process of narrowing down and refining the meaning of each principle has been subjected to a series of iterations. As some of the applications of the laws, these have been used to provide visual structure in graphic design (Moszkowicz, 2011), interface design (Ripalda et al., 2020), dynamic interfaces (Ye et al., 2021), and in the context of product design (Holder et al., 2019). Table 1 shows the specific Gestalt laws discussed in class, which were used as a theoretical ground to understand visual composition.

Table 1: Gestalt laws, including some representations. Definitions adapted from Lidwell *et al.*, 2010.

Figure-ground	Proximity	Closure	Similarity	Continuity	Common Fate
Perceptual capacity to distinguish figure and ground, tending to individualize figure over ground in a more direct manner.	The relationship between proximity and relatedness is proportional: The closer the elements are arranged, the more explicitly these are perceived as related. Proximity is described as the most powerful strategy to illustrate relatedness.	The perceptual closure of incomplete or interrupted forms and patterns.	Similarity of forms grants a sense of visual relatedness.	The arrangement of figures as smooth curves or straight lines is perceived as a unity.	Things or elements that move in similar directions are perceived to be related.
					

METHODOLOGY: GESTALT AND FELT EXPERIENCE

This activity was delivered as part of the *Abstraction and Space* Studio course,[1] taught to twenty-seven first-year design students. The subject introduced them to the basics of composition and design principles through different means, materials, and sources of inspiration, which in this case centered around Gestalt and the human face. In this module introducing Gestalt laws, students were instructed to create masks of their faces and to personalize them according to the instructions to be presented in this walkthrough. Instead of following a solely visually-oriented path to learning Gestalt laws, students were asked to use them as a vehicle to represent their felt, inner experience through their designs. After four weeks of work involving lectures and tutorials, a total of 27 sets of materials (shown in Figure 1) were collected as part of the final deliverables. As illustrated in Figure 2, the final deliverables consisted of (1) a blank mask, representing a copy of the student's face; (2) a mask illustrating their felt experience through Gestalt principles; and (3) a small poster depicting how the Gestalt principles were applied to highlight predominant aspects of their sensory experience. The characteristics of these deliverables will be further detailed later.

The following sections show how the students followed a *Research through Design* process (Zimmerman et al., 2007) involving a detailed examination of themselves towards the creation of objects encapsulating the acquired knowledge accessed through the exercises. This methodology also follows the principles of soma design, as the self is used as a starting point for the design process, defamiliarizing the way we normally interact with the world (Höök et al., 2018). This is reflected in the nature of the following activities promoting self-awareness and examination, which represent an active, yet not habitual way of performing in the world (Gendlin, 1996).

(1) The homunculus and the face

Before the presentation of Gestalt laws, students were introduced to the concept of the *somatosensory homunculus* (Penfield & Boldrey, 1937) to understand how the differences in bodily sensory perception are mapped out across the brain. These perceptual differences are graphically represented as a little human-like figure by tracing and distributing its different body parts along the somatosensory cortex. This representation showing enlarged and reduced body parts (Figure 3) is used to scaffold a visual understanding of our somatic responses, whilst offering a starting point for the representation of the exercise later described in step three. After this, students were introduced to the Gestalt laws of figure/ground, proximity, closure, similarity, continuity, and common fate, by alternating definitions with the examples presented in Table 1.

1 This module was taught at Universidad Austral de Chile in 2018.

Figure 1: Submission materials. Photograph: Claudia Núñez-Pacheco, 2018.

Figure 2: Example of the final set of deliverables, including a blank mask, the homunculus-inspired mask, and a small poster. Some of the features of the student's experience were described as a melting feeling caused by heat, a square-framed sensation on the forehead that shaped the head, and an eye sinking through the face, represented as a hollowed space. Photograph: Claudia Núñez-Pacheco, 2018.

Figure 3: Sensory Homunculus. **Source**: Wikipedia Commons (https://commons.wikimedia.org/wiki/File:Front_of_Sensory_Homunculus.gif).

The idea of using Gestalt laws and the homunculus together is grounded in two principles. First, that Gestalt laws cannot be deprived of their experiential focus, meaning that although these rules are useful for visual structuring, these also represent ways of perceiving the world. For example, our brains complete with meaning — and biases — what they partially understand, in the same way Gestalt laws explain how we tend to perceive phenomena wholistically rather than atomistically (Pohl, 2016). In this way, non-visual concepts can also be examined through the lens of Gestalt, making it a good tool for defamiliarization and analysis, since it demands individualizing and recognizing the different elements composing the usual *whole* of the experience. Secondly, that across different design disciplines, the exploration of the inner self *as such* is rarely a source of study. Considering the need to acknowledge the body for the design of interactive technologies (Loke & Núñez-Pacheco, 2018), this approach centers on relating visual principles with other perceptual qualities. The somatosensory homunculus is used as an inspiration and point of departure to collect and communicate information from the inner self. However, the spirit of this activity distances from the notion of universalizing the body, as suggested by the predetermined mapping of somatosensory qualities depicted in the original homunculus. On the contrary, we start from the assumption that each of us perceives the world differently, and therefore such representations differ according to several factors such as how we feel, and how our environment affects us.

Alluding to the diversity of somatic sensibilities, students were instructed to come up with their customized awareness representation inspired by the figure of the homunculus. To facilitate this process, they were asked to follow a *body scanning exercise*,[2] which invited them to keep track of their awareness of different parts of their faces. The idea of this guided exercise is for the students to pay attention to how each area was more or less sensitive to the sensations of their own presence, as well as how the environment was perceived in relation to the presence of the face. For example, some of the questions emerging from this exercise are: How do you feel one side of the face compared to the other? How does the outside temperature touching your nose feel? This activity is inspired by Shusterman's speculative proposal for teaching somaesthetic in the philosophy classroom, involving an active contact with the own body through body scanning exercises as an entry point to access self-knowledge in philosophy (Shusterman, 2012).

2 Body scanning are exercises designed to connect with our bodily self-awareness. Participants are asked to close their eyes and listen to a facilitator, who calmly guides them through perceiving different body parts, one by one.

(2) Documenting the experience of the inner self through annotations

Immediately after the guided exercise, students were asked to take notes describing their experience in detail, including how the different parts of the face were felt. They were encouraged to provide authentic accounts through evocative descriptions, by inviting them to disregard grammar rules, as well as other cultural con-

ventions. Table 2 shows an example of the kinds of descriptions emerging from the exercise. This particular narrative strictly concerns bodily sensations. In others, the use of evocative language was also used to describe instances of *letting go*.

Table 2: Description of the face-scanning experience (translation from Spanish)

The upper part of the face felt rounded and not very sensitive.
I could feel a soft line on the forehead.
The bones underneath my eyebrows appeared intensely angular and close together.
My nose felt elongated and also bony. I could feel my nostrils on the periphery.
The edge of my lips felt very defined and cold in the middle.
My breath causes that the center of the mouth feels quite soft and moist.
The jaw [appeared as] straight and strong, and the chin rounded and soft.
The line on the cheekbones [felt] straight and bony, and the left side [felt] more sensitive.
Under the cheekbones felt almost like hollowed.
Eyes not well defined.
The nose connected to my eyebrow's bone.

(3) Symbolizing the sensory experience through sketches

After the process of written documentation, students were asked to draw a symbolic representation of how the face was felt (Figure 4), by highlighting or enlarging the volume of those areas perceived as sensitive whilst reducing or disregarding what was not felt. Since the inner felt sense cannot be seen, this step of the exercise is crucial to later recreate the experience through the lens of Gestalt laws and articulate new ways of dealing with the semantics of shape.

Figure 4: Three examples sketched by different students. Some common aspects described through sketches and notes deal with temperature, a feeling of pressure, the presence of breath, the predominance of one side of the face, or the perceived absence of some areas.

(4) A three-dimensional exploration: Transferring the homunculus into material

In this step, inner experience is revisited through the interaction with materials. This way, sensory information could be explored through the lens of not only inner but also outer experience, providing new clues for meaning-making. Students were asked to assist each other to craft two masks each by using a wet plaster cloth on their faces. As per the instructions, one of the masks would represent a printed version of the face as it is, whilst the other would be intervened to resemble the homunculus sketch. As a safety measure, students were required to use plenty of vaseline over the face, particularly paying attention to the brows and eyes. Cling wrap was also used to protect their eyes and hair. To finish, these were covered with gypsum plaster and sanded after the surface completely dried out.

(5) Gestalt principles as the semantics of inner experience

At the final step, students were instructed to personalize their homunculus mask by using two Gestalt laws that could help them represent the experience emerging from the guided exercise. To build this representation, dots (of any size) and lines (both straight and curved) were used as elements for the composition on their masks. They were also asked to use two colors, without any further specific instruction. Applying Gestalt principles on the material involved returning to their written notes to ideate a strategy for the application of the principles, whilst reflecting the description of the inner experience. An example of this reflection is illustrated in Figure 5 and Table 2.

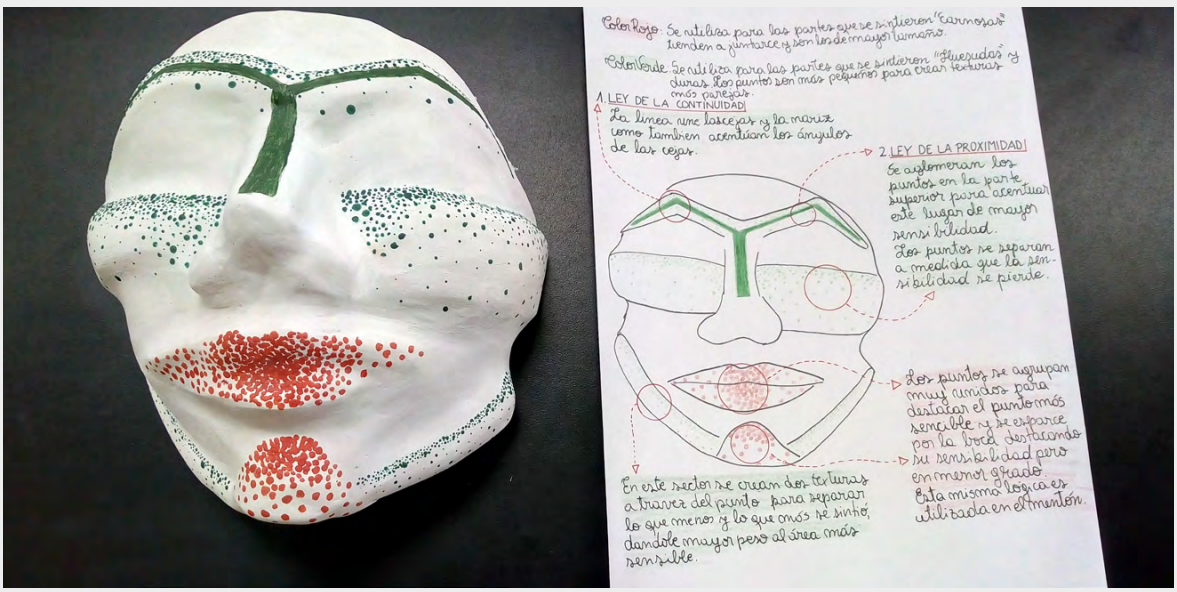
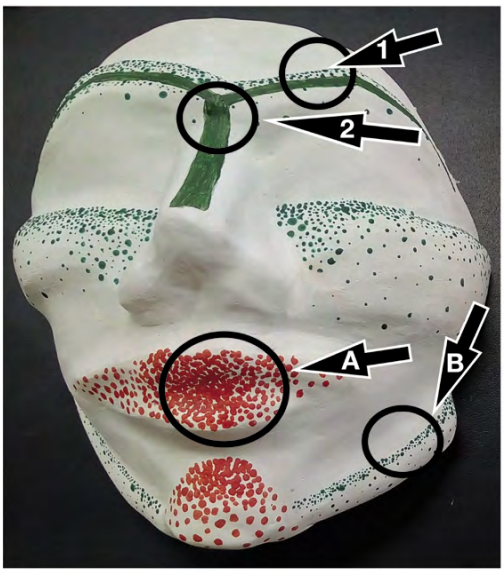


Figure 5: Another submission example (homunculus mask and poster). Photograph: Claudia Núñez-Pacheco, 2018.

RED
Red was used for those areas that felt as "fleshy", which tended to gather on a larger extension [than green dots described below].

GREEN
Green was used for those areas that felt 'bony' and hard. The dots were represented as smaller [than the red ones] to create visually smoother textures.



1. LAW OF PROXIMITY
The dots gather on the upper part [of the brows] to highlight this sensitive area. These dots spread out as sensibility diminishes.

2. LAW OF CONTINUITY
A line connects the brows and the nose, whilst accentuating the angles of the brows.

A. These dots are placed close together to highlight the most sensitive part [of the face], spreading through the lips and highlighting its sensibility, yet in a lesser degree [than the center of the mouth]. The same logic was used on the chin.

B. In this area, two dotted textures were drawn to separate which felt the most and the least, giving more presence to the most sensitive area.

Figure 6: Applying the Gestalt laws (translation of poster from Figure 5). Photograph: Claudia Núñez-Pacheco, 2018.

OBSERVATIONS ON PATTERNS OF REPRESENTATION

The following are some of the common patterns observed as a result of the students' explorations connecting proprioceptive sensation with Gestalt laws, represented as a personalized homunculus masks.

(1) The use of figure-ground to represent embodied presence or absence

As expected, if an area of the face was felt during the body scanning exercise, this was somehow graphically illustrated. Enlarged areas of the masks were predominately highlighted with graphical elements representing Gestalt laws, showing a correspondence between bodily awareness and visual strategies. A typical pattern in the submissions was the connection between white space and lack of awareness of the specific area. This pattern was also quite noticeable in the case of the protruding regions of the face, which rarely were left unattended. In some instances, lack of awareness was represented as a dark surface actively denoting the disappearance of such body parts.

(2) Proximity and similarity of small elements illustrating transition of awareness

The representation of small elements — predominantly dots — in close proximity was widely used to denote awareness of body areas activated during the exercise. In some cases, these elements were also illustrated as spreading and dissipating, showing the fuzzy edges of awareness, from very present to fading. Figure 5, for

instance (translated in Figure 6), shows how dots spread out down the cheeks as awareness becomes less predominant.

(3) The use of continuity to emphasize movement and connection

Continuity was reported particularly through the use of long lines to express the flow of awareness movement or connect areas of the face where awareness was perceived as similar. Figure 7 shows the example of a mask displaying lines to represent how "both the right and the left side were felt similarly."

Figure 7: Law of continuity to express connection. Photograph: Claudia Núñez-Pacheco, 2018.

(4) Closure was barely reported

The use of closure involves an active decision to leave open spaces for the viewer's mind to complete with meaning. The lack of projects deliberately reporting on closure makes sense, since (a) these could have illustrated more ambiguous and subtle types of awareness that are not easily perceived by designers with little

training in somatic awareness, and (b) during the exercise, reports predominantly described either the static predominance of strong awareness in some areas or movement around the face.

(5) Misuse of the laws

Gestalt laws were misused or under-utilized in some cases where the guided face-scanning exercise was not helpful to connect with subtle qualities of self-awareness, such as movement, flow, connection, or dissipation. In the example shown in Figure 8, a student reported pressure on the forehead, sleepiness, and a little cold on the left cheek and chin. Although the representation of laws was not *per se* incorrect, the use of dots — except by the cheek — was displayed as squared areas that roughly pointed to the places *where* the sensations were supposedly felt, however, without providing visual clues onto *how* these were perceived.

Figure 8: Gestalt laws make sense, but not in the context of how awareness is perceived in the body. Photograph: Claudia Núñez-Pacheco, 2018.

DISCUSSION

As a first approximation of both somatic sensibility and Gestalt laws, this exercise shows how their use made sense in order to illustrate movement and intensity of awareness across the face, which could be potentially extended to the rest of the body. However, this sense-making process goes beyond solution-oriented applications where designers employ strategies over flat canvases such as screens and images. The irregular surface of the face homunculus aims to capture an interactive moment within the self, pinpointing the trajectory and location *where* awareness was perceived. The use of the laws further assisted in communicating the qualities of *how* this awareness manifested.

In terms of the significance of this work, one unexpected outcome of this exercise is how it effortlessly reveals the gaps of understanding between the theoretical content and the actual bodily engagement. For instance, it became evident which results literally translated the laws into their designs without taking into account somatic experience. In such cases, students dismissed the curvature of their faces to highlight the mere existence of the laws as detached from their sensing. On the other hand, students who could deeply engage somatically with the exercise did not have difficulties integrating their sensations with the given theoretical concepts. Through this exercise, we did not have cases of students misunderstanding the theoretical rules of Gestalt laws. These outcomes might suggest (a) that theory is easier to grasp than somatic examination, and (b) that somatic engagement aids the understanding of Gestalt laws, given that all students who engaged somatically grasped the instructions correctly. If the latter is the case, the integration of sensory self-examination — beyond sight — opens the door for rethinking alternative ways of teaching design principles. In this regard, training designers to acknowledge the full range of our sensory repertoire is relevant for the design of richer interactions taking the aesthetic aspect of our everyday experiences (Loke & Núñez-Pacheco, 2018; Sonneveld et al., 2008).

Nowadays, there is a lack of methods to teach designers to explicitly connect with their somatic sensibilities to inspire design knowledge (Núñez-Pacheco & Loke, 2018). Echoing Dewey's view on constructivist pedagogy (Dewey, 1938), for this sensory approach to have a longer-lasting impact in education, more exercises connecting somatic sensibilities and design principles are needed. Alluding to the patterns of responses supported by somatic engagement, some appeared as more evident to map specific sensations — such as continuity to illustrate movement, proximity to symbolize awareness spreading out, and figure-ground to represent contrasting sensations. However, some questions remain unanswered, such as what would happen if the application of the laws is restricted to those that were less utilized. Would these still make sense to represent their qualities of awareness? And even further, would these new constraints

have an impact in shaping their awareness of the self and their understanding of the laws?

CONCLUSIONS AND FUTURE WORK

This walkthrough has illustrated how inner experience can be used as material to articulate the understanding of Gestalt laws. This exercise aims to communicate inner experience, starting as sensory information crystallized in writing and later explored through the hands. Since design is mainly a discipline in which theory is generated through making, approaches that train designers on self-awareness and the articulation of bodily experience would contribute to a more nuanced communication of meaning for design critique.

As for future work, further iterations are needed to unfold its potential in the area of interaction. It can offer some exciting avenues for the development of notation of face movement for artistic projects. Somatic sensibility is an ability built over time, requiring more exercises to keep working on both accessing their sensory repertoire and connecting it with the laws. As a next step, as students gain more sensibility to connect with their inner experience, new constraints can be applied to see if more subtle representations can be accessed. Conversely, this somatic approach could also be used to explore other visual design principles in action, as well as being extended to other parts of the body, opening up for the application of this somatic approach to Gestalt in other domains, such as wearable fashion and the use of shape-changing materials. ⊡

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