

ART AND DESIGN X SCIENCE

Tsukuba Global Science Week 2020 Art & Design Session Proceedings

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University of Tsukuba

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Tsukuba Global Science Week 2020 Art & Design Session Proceedings

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FOREWORD



A handwritten signature in black ink, which appears to read 'Kyosuke Nagata'. The signature is written in a cursive style.

Kyosuke Nagata
President
University of Tsukuba

Dear Colleagues and Friends

It is my distinct pleasure to welcome everyone to Tsukuba Global Science Week (TGSW) 2020, which marks the 10th anniversary since its inception.

Last year, we newly launched Tsukuba Conference, whose basic concept is common to that of TGSW. For instance, young scholars are showcased and highlighted in both. TGSW is a stage to discuss research and its contribution to society, while Tsukuba Conference, whose main theme is “Science and Society,” provides a platform to debate social needs and the research necessary to meet these needs. These two forums are held in alternate years.

The history of the University of Tsukuba extends back almost 150 years with the Meiji government’s establishment of Japan’s first institution of higher education, a national teacher-training school. When it was relocated from Tokyo to Tsukuba City nearly five decades ago in October 1973, it was reborn as a comprehensive institution of higher education.

Since its inception, the University of Tsukuba has aimed to be open to society and the world, and to pursue interdisciplinary education and research. In accordance with these

principles, we are delighted to host TGSW which gathers together participants not only from a diverse range of academic fields but also from many different countries. Initially focusing on the medical sciences, TGSW has evolved to offer sessions in a wide variety of fields ranging from the natural sciences to the humanities with prominent researchers from more than 30 different countries.

TGSW is a platform to introduce world-class research conducted jointly by our faculty members with fellow scientists throughout the globe, including those in public and quasi-public institutions based in Tsukuba Science City and our international partners. But TGSW is more than that. The upheaval of globalization has brought with it a variety of global challenges, such as public health problems, food crisis, energy issues, environmental risks, never-ending wars, poverty. Solving these challenges requires trans-border collaboration for innovation so that the greater community of scientists, regardless of disciplines, citizenship, ethnicity, gender, faith, or world view, can join forces to work closely together. TGSW can serve as an invaluable forum for exchanging views on how to address these challenges in a way that breaks down traditionally conceived barriers.

The scope of TGSW is indeed broad and far reaching. By bringing together internationally renowned researchers and young aspiring researchers and students based in Tsukuba and beyond, it covers a wide range of topics and facilitates active exchanges across borders and disciplines. TGSW is also an ideal international networking opportunity for trans-disciplinary, trans-organizational and trans-border collaboration.

This year, the global outbreak of COVID-19 has caused all members of society to be confronted with the reality that we live in an increasingly globalized and uncertain society where the future is difficult to predict. Our social systems are in the midst of rapid upheaval. At this extraordinary time, when the world is facing such important, shared challenges, it is indeed the mission of TGSW to deepen diverse academic discussions and networks. For the first time, we are having TGSW 2020 online. We welcome the participation of a much wider audience beyond all borders.

In closing, I would like to thank all of you for your participation and sincerely hope that the range of sessions on offer will create fruitful conversations for us all.

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Keynote Lecture

Science Photography in the Marketplace

Kelley WILDER

De Montfort University

The business of science photography ran in all directions, especially after the 1850 introduction of wet collodion on glass technology and the numerous photographic exhibitions at London's Crystal Palace in 1851. Few markets went untouched: education, publishing, tourism, mining, printing, designing, paper making, art galleries, photographic industry, and government agencies to name only a few. This talk explores three of the main markets where science photographs circulated, highlighting the networks of science photographers, the photographic companies who promoted science, and finally government sponsored photographic campaigns.

Part 1: The Market of Natural Wonder

Geology, Meteorology and Microscopy formed their own grand tour of volcanoes, clouds, geysers, rock formations, crystals and more. Their often striking images were bought and sold around the world as research images, art, design motifs, tourist mementos, and publication illustrations. While they formed a significant part of most photographic exhibitions, they were also serious objects of scientific study. Some scientists made their own images, some collected images by others, and some did both. The network of scientists and the exchange of science photos reveals how closely the art and science were connected.

Part 2: Seduced by Colour

In the interwar period of the 1920s and 1930s, the science of colour photography and the colour photography of science advanced beyond all recognition. Companies at the forefront of colour technology, like Agfa and Kodak, actively pursued scientific ends for their colour materials. There was little talk of 'false' or 'colorized' colour, but much enthusiasm for the natural photographic colour palette. These two decades of optimism about the empirical promise of colour didn't last, but it did highlight the role of Industry in science photography.

Part 3: Government, Photography and Observation

From the early survey campaigns to extensive collections of photographs, government agencies have been the catalyst and main funder of some of our most iconic science photography. The government related observations, labs and projects pattern science photography with certain visual tropes and leave traces of political policies in their enormous archives. These archives in turn, pattern much following research.



Dr. Kelly Wilder

Opening Talk

Canning Time: Problematizing Time Poverty with Pinhole Cameras

Gary McLEOD

Faculty of Art and Design, University of Tsukuba

ABSTRACT

If visual literacy is a primary concern for university education in twenty-first century society, photomedia is central to tackling that concern. Learning analogue photomedia is a novel activity available only to those who have more time (i.e. temporally rich) or those seeking a challenge of doing ‘proper’ photography (e.g. amateur photographers, photography students). Although digital photomedia provides unfettered access to learning about photography, are those with less time (i.e. time-poor), less likely to question how photographic images are produced? Concerned with subtle distinctions between photomedia, this study looked at students’ experiences of time through a popular exercise of making pinhole cameras from aluminium cans. Between November and December 2019, an eight-day workshop was conducted with five university students from faculties other than art and design. Presenting initial findings from the workshop along with challenges faced, this paper invites discussion of temporality and advocates a temporal literacy in applications of photomedia outside of art and design faculties. An accompanying visual essay sharing documentation and images can be viewed here: <http://www.garymcleod.co.uk/cannedtime>

1. INTRODUCTION

Visual literacy (VL) is “a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences” (Fransecky and Debes 1972). Although visual literacy today favours the ‘reading’ of images rather than skills of creating images or even ‘thinking’ visually (Kędra 2018), cameras are central to developing visual literacy worldwide. This is most apparent in Literacy Through Photography (LTP), a teaching methodology co-developed by Wendy Ewald in partnership with the Center for Documentary Studies at Duke University and the Durham Public Schools. Yet even studies that use or follow LTP — a powerful way of supporting visual skills in children and adults — prefer not to recognize differences between cameras; rather, they favour whichever tools are most available to the learner: previously film cameras and now digital cameras (e.g. Ewald, Lord and Hyde, 2012; Costa 2019). To be clear, the act of creating photographic images is widely recognized as valuable, but medium specificity is often subject to how convenient it is. There is a risk that certain photographic mediums, hereby referred to as ‘photomedia’ (McKenzie 2020), are therefore unwittingly overlooked. While the making of photographic images with film cameras and digital cameras do indeed differ drastically in the length of time needed to see results, one should not be misunderstood as to be somehow ‘better’ than the other. Rather, understanding the temporality of each photomedia (Drucker 2010) — a temporal literacy — is arguably needed to appreciate their nuances. And yet time is always ‘short’.

The term ‘time poor’ was introduced as a way of re-defining the poverty status of a household according to work behaviour and number of hours spent working (Vickery 1977) Use of the term here in this paper, however, aligns with how contemporary visual culture is

rich with digital technology but lacking the time needed to appreciate the nuances of such technology¹). Analogue photomedia promises a ‘slower’ experience of photography but it is often niche and arguably practiced by those who have more time (i.e. temporally rich) or those seeking a challenge of doing ‘proper’ photography (e.g. amateur photographers, photography students). By contrast digital photomedia undeniably is faster, provides unfettered access to learning about photography, and can be said to be ‘creating’ time for other activities. However, such thinking indicates a genuine need for ‘gaining discretionary control or autonomy’ over time already available to users (Wajcman 2015: 164). In other words, are those with less time (i.e. time-poor) less likely to question and examine how photographic images are produced? If so, does that lead to automatic acceptance of a photograph’s message, or does it result in an indifference? To be clear, in trying to address these questions, the intention here is not to reignite a tired debate about differences between analogue and digital technologies; rather the aim is to remind the educational landscape of a need for diversity in photomedia literacy, and in particular for increased recognition and sensitivity toward the temporal nuances in each. The workshop in this study was developed to help understand how students considered their own relationship to time and did so by introducing participants to analogue pinhole photography, a simple and accessible technique made popular by UK photographer Justin Quinnell (2012).

2. METHOD

This workshop was conducted with five volunteers (B1–B5) that responded to an advertisement posted to university communication channels. They were all male, enrolled as full-time international students and represented four nationalities. None were attached to the Faculty of Art and Design. While all used digital photomedia on a regular basis (e.g. mobile phone cameras, digital SLRs), only two had used analogue photomedia previously in the form of monochrome 35mm film (B2 and B3), and only one had prior experience of a darkroom (B2). Regarding competency with digital photomedia, B3 described himself as an amateur photographer with knowledge of how to manipulate a camera to get intended results (i.e. aperture, shutter speed, lighting principles); B2 described himself as having some operational knowledge of cameras (film and digital); whereas B1, B4 and B5 stated that they simply enjoyed taking photographs and were keen to learn more. Eight days were allocated; initially intended as consecutive days. However, a busy academic calendar forced changes, eventually settling for eight consecutive Sundays beginning in November and finishing late December. Each day comprised three two-hour sessions (morning, mid-afternoon, late-afternoon) with breaks. Session timings were initially rigid, but started later, were truncated, or extended in order to accommodate fluctuations in participants’ schedules. Each day began with an introduction to activities and ended with individual interviews conducted by a research assistant. On day one, participants were introduced to the history of photography and learned how to make pinhole cameras from aluminium cans. Participants used those skills to make two basic kinds of photographic images during the rest of the workshop: a long exposure where the sunlight ‘burns’ an image into the light-sensitive paper — also known as a ‘solargraph’ — and a short exposure that produces a latent image within the light-sensitive paper²). Days one and two were initially reserved for making and reviewing long exposures whereby days three and four were reserved for making and reviewing short exposures, but it became necessary to introduce both together early on to ensure self-confidence. Moreover, creative tasks were given to support the new skills. The first task was to revisit and recreate a photograph of personal significance taken somewhere on campus. Adopting rephotography³), the second task was to revisit the first task and to reflect on

temporal differences between each visit. The third task was to work together as a group to complete a set of fourteen instructions that challenged the method taught, for example: photograph something tiny; photograph a photograph being made; photograph someone leaping; and make five photographs simultaneously. The fourth task was a small assignment to make a more refined image that conveyed a personal feeling of being 'time rich'. Participants were also set challenges as homework, which ranged from making week-long exposures at home to teaching someone else how to make a pinhole camera. Such challenges during and outside the workshop prepared participants for a field trip on day seven to Asakusa, a popular sight-seeing district of Tokyo, where participants were asked to visit seven shrines. Inspired by the 'seven god, seven shrines' visits in Japan⁴), the workshop participants were tasked with making a photograph using a different pinhole camera at each shrine. Comprising a series of at least seven images albeit with a common self-selected theme, the task required them to assess lighting conditions and exposure times as well as composition and a cohesive concept. Alongside the activities, time in the darkroom was scheduled for developing and fixing pictures. Semi-structured interviews were then conducted individually by a research assistant at the end of the day and by this author following completion of the workshop. Questions were arranged into themes that inquired about experiences with photomedia, experiences of time, experiences of looking again and experiences during the fieldtrip. Participants were encouraged to expand on the questions and invited to comment on any concerns on other aspects of the workshop not discussed.

3. RESULTS AND DISCUSSION

The workshop provided an opportunity for participants to observe and reflect critically on temporal distinctions between analogue and digital photomedia. Firstly, it was recognized that analogue photomedia contains a perceivable delay between taking a photograph and seeing the result, whereas digital photomedia (i.e. the use of digital cameras) ensures the user can review the image almost instantly. Secondly, analogue photomedia can induce noticeable hesitations when taking a photograph as users are more aware of the costs of the materials involved, whereas in digital photomedia users are less likely to pause before opening the shutter because costs are embedded in the build of the digital camera and arguably hidden. There were also perceivable temporal distinctions between cameras that have lenses and those that don't. For instance, the arrangement of optics in lens-based cameras (i.e. any kind of camera with a fixed or changeable lens) appear to give greater control over the light passing through the aperture (i.e. the hole), whereas pinhole cameras (i.e. a box with a varying- sized and often hand-made hole) appear to offer less control. While simpler in operation, the length of time needed to make a correct exposure in a pinhole camera follows the same principles as lens-based cameras, suggesting differences lay in the perceptions of the user and therefore more vulnerable to inexperience, ignorance or bias. Moreover, the temporal difference between exposing for a latent image and a solargraph appeared to affect the possibilities afforded by the pinhole camera. When asked to respond to the creative challenges using the pinhole cameras, participants found it difficult to express their ideas. While pinhole cameras were put in a pond, affixed to bicycles and kicked through the air, short exposures were preferable to long exposures because they satisfied the curiosity of the experiment. Long exposures — precisely because they required much more time — were limited to choosing locations that would return a nice picture of the sun being tracked across the sky. Even though short exposures were necessary in the field trip, it was apparent that the group hadn't given thought to preparing enough materials to take with them.

4. CONCLUSIONS

The workshop saw participants learning and comparing two forms of analogue photomedia using self-made pinhole cameras. From discussions during and after, it was clear that the solargraph type exposure — where the camera produced a cumulative image over a lengthy period of time — was most thought-provoking for three reasons. Firstly, time required to maintain the camera was minimal. Other than needing to set up the camera, it did not take time away from participants' studies and other activities during their week. Secondly, it prompted some discussion about what can be considered a 'long' exposure: at what point does a latent image become a 'burned' image? Although a convincing answer is beyond this study, the asking of the question led to some informal contemplation by participants, which may lend value to follow-up inquiries later on. Thirdly, the solargraph type of pinhole photography could in no way be replicated or simulated by participants' digital cameras due to the properties of the light sensitive paper being more robust than the digital sensor. Despite that, there is arguably a concern that the long exposure was only used to make a particular kind of image, that of the sun being tracked across the sky. Therefore, while it may be interesting to use this particular technique in teaching photomedia literacy, conceptual and creative applications of it would appear limited from the examples created during this workshop.

Regardless of the exposure type of the pinhole camera, there was, however, notable integration between analogue and digital photomedia. This was through documentation (formally by the research assistant and informally by participants), through inverting negative images using a mobile application, and through using mobile phone cameras to 'preview' the composition that might be visible to the pinhole camera. This last point is particularly of interest in terms of visual literacy studies. That digital cameras offer a preview image, or 'protext' is said to increase understanding and engagement with the subject being photographed (see Johannessen and Boeriis 2019). Participants knew from experience in the workshop that the wide view afforded by the pinhole camera (approximately 180 degrees) was considerably wider than their mobile phone cameras could offer but they were content to accept this difference in favour of having a visual sense of the potential result. In other words, they were perceiving the difference when previewing. Using one media to preview another implies a temporality to digital photomedia akin to the process of sketching or diagramming. That, of course, presents more questions: is use of digital photomedia an intermediary step for camera users? If so, a step to what?

In setting out to problematize time-poverty, the workshop suggested photomedia — specifically analogue photomedia in the form of self-made pinhole cameras — as a means to draw attention to and contemplate nuanced temporalities within that and other photomedia. Although all participants saw themselves as time-poor in Vickery's sense, they were certainly able to manage their time according to their own schedules. What was apparent, however, was that participants didn't consider scenarios that might be encountered in the short-term future (e.g. not bringing enough photo-sensitive paper during the field trip). Such oversights are perhaps more contingent with a short-sightedness or 'temporal myopia' (Buonomano 2017) that could be explored further with larger groups of participants.

ACKNOWLEDGEMENTS

The author thanks the participants for their contributions and (most importantly) their time. Thanks is also given to the Faculty of Fine Art and Design at University of Tsukuba for kindly supporting the project through funding.

NOTES

- 1) This is attributable to artist Rebecca Salter who on numerous occasions has remarked that contemporary culture is digitally rich yet temporally poor (e.g. <https://www.puglieselevi.com/en/artists/rebecca-salter-ra>).
- 2) Much of photographic history is attributable to either of these two methods, although the latent image is far more common even if under-examined (e.g. Silverman 2015).
- 3) Rephotography is a diverse set of practices that involve revisiting locations in previously made photographs of pictures. See McLeod 2019.
- 4) Otherwise known as 七福神めぐり (Shichifukujin Meguri), the ‘seven gods, seven temples’ pilgrimage is usually undertaken in January whereby participants collect stamps from shrines in one local area that worship each of the seven gods. The one in Asakusa is one of the most well-known.

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Art and Design Session in TGSW2020



Oral Session I: Theory and Practice of Design

Analysis of Emotional Responses to Dot Patterns Using Physiological Measurement

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ABSTRACT

To explore emotional responses while observing dots placed on the human face, we examined how the pupils respond to dot patterns (i.e., clusters of dots) placed on the human face or on the gray background image. The participants were instructed to view an image of a face or a uniform gray square with/without dot patterns on it while pupillary responses were recorded. The results showed that transient pupil constrictions occurred in response to dot patterns on the human face at around the first 0.5–1.0 s, and pupil dilation was sustained thereafter. The changes in the pupil size suggest that we may simultaneously have two kinds of emotions, disgust and fear, or disgust and a positive emotion, to dot patterns on the face.

1. INTRODUCTION

Although patterns of figures, such as dot patterns are used as common decorative elements in visual design and daily products (e.g., curtains), some researchers reported that observation of dot patterns can induce discomfort (Cole & Wilkins, 2013). Interestingly, placing dot patterns on the human face increase discomfort significantly. This is called HASU-COLLA (HASU=lotus seed pods; COLLA [i.e., collage] = photomontage image). The discomfort to the dot patterns was originally thought to fear (Cole & Wilkins, 2013) but a recent study suggests that it could be disgust (Imaizumi et al., 2016). Although fear or disgust have considered as main emotional responses at the observation of dot patterns in recently documented physiological and psychological studies, it is not clear which emotional response dominates at the observation of dot patterns.

Physiological studies have shown that the human pupils change while viewing affective pictures, suggesting that the pupils constricted to disgusting images (e.g., contaminated and violent scenes) and they dilated to attractive or fearful images (e.g., erotic scenes) (Bradley et al., 2015; Hess & Polt, 1960). A recent study (Ayzenberg et al., 2018) reported that sustained pupils constricted to images of a group of holes within five seconds comparing with fear and neutral stimulus. This response was thought to be associated with disgust, not fear. However, physiological responses to the dot patterns are unknown. Therefore the present study aims to explore emotional responses during the observation of dot patterns on the human face and gray background image using pupillometry.

2. METHOD

2.1 Participants

Five adults (2 males and 3 females; mean age = 34±13.8 years) participated in the study. All participants had normal or corrected-to-normal vision. The experiments were conducted according to the principles of the Declaration of Helsinki and approved by the Ethics

Committee of the Graduate School of Art and Design, University of Tsukuba (Approval Number 29-11).

2.2 Stimuli & Apparatus

The 32 stimuli images were of four types: (a) dots on the human face (DOF), (b) dots on the uniform gray background image (DOG), (c) human face only (F), and (d) gray background image (G) as shown in (Figure 1). The human face images of eight frontal Japanese faces (four females and four males) were taken from Japanese and Caucasian Facial Expressions of Emotion (JACFEE) (Biehl et al., 1997). For the DOG images, we duplicated the same dot patterns that were used for the DOF images and presented dot patterns centrally on the uniform gray background images. All images were presented with the same brightness (mean grayscale value = 106, mean luminance = 9.23 cd/m², room light = approximately 913 lx) using Adobe Photoshop and SHINE toolbox for Matlab (Willenbockel et al., 2010). The image sizes were 48.5°×27.3°. Pupillary responses were recorded using the Tobii Pro TX300 eye-tracker (1920 × 1080 pixels, 300 Hz, Tobii Technology, Sweden).

2.2 Procedures

The experiment was conducted in a bright room (approximately 913 lx). Each participant was seated in a chinrest 60 cm from the screen. They were instructed to minimize body movements and keep their gaze directed toward the screen during viewing. Thirty-two trials (8 DOG, 8 G, 8 DOF, and 8 F respectively) were conducted in a randomized order. Each trial consisted of a 6 s fixation phase and a 6 s image phase. Each trial began with a fixation phase, followed by an image phase. For each trial, a 1 s pre-image phase baseline average was served as the pupillary baseline.

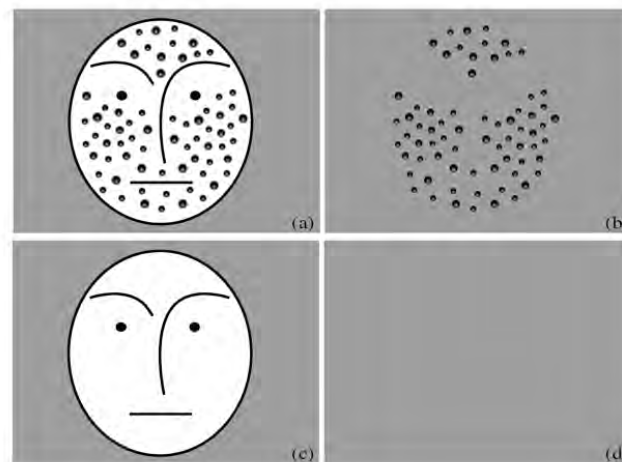


Figure 1: A simplified illustration of (a) dots on the face (DOF), (b) dots on the gray background image (DOG), (c) human face only (F), and (d) gray background image (G). All images have the same brightness (mean grayscale value = 106, mean luminance = 9.23 cd/m², room light = approximately 913 lx).

3. RESULTS

The mean percentage changes in pupil size during the image phase from each pupillary baseline were analyzed. A two-way repeated measure analysis of variance (ANOVA) revealed a significant main effect of time $F(59, 2124) = 15.460, p < .001, \eta^2 = .30$, and a main effect of stimulus type $F(3, 108) = .856, p = .466, \eta^2 = .023$ (Figure 2 (a)). These main effects were qualified by the predicted interaction between stimulus type and time, $F(177,$

6372) = 2.58, $p < .001$, $\eta^2 = .067$. Analyses of variance (ANOVAs) conducted for each time point with stimuli type as a factor and corrected for least significant difference (LSD) demonstrated that reductions in pupil size in response to the DOG were significantly greater than those to G ($ps < .001$, $DOG < 0, G > 0$) between 0.5–1.0 s; F than to DOF ($ps < .05$, $DOF > 0, F > 0$) at 2.3 s; and G than to DOG ($ps < .05$, $DOG > 0, DOG > G$) between 3.7–4.1 s, suggesting that pupil changes were greater in response to images with dots than images without dots.

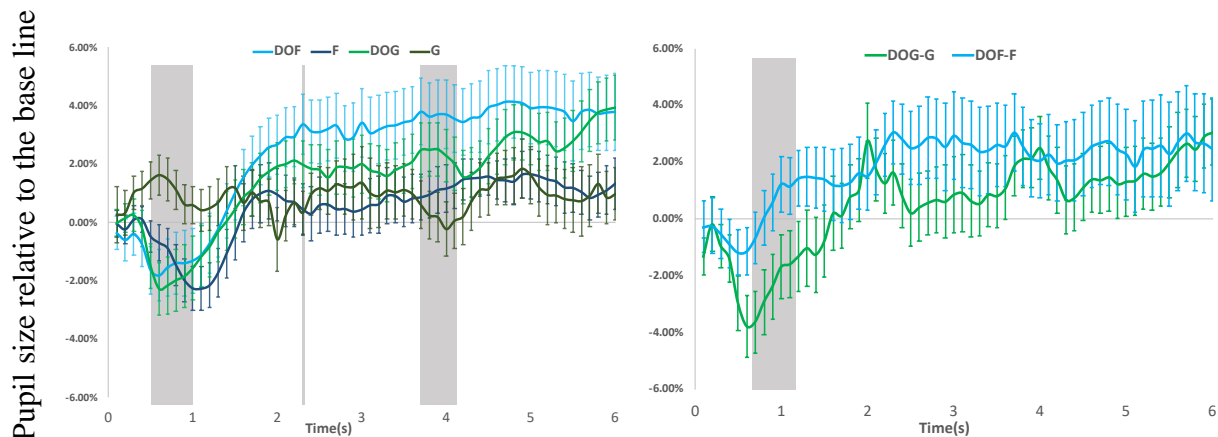


Figure 2: Pupillary waveforms reflect the percentage changes of pupil size from baseline. The x-axis represents trial time in seconds (s), and the y-axis represents the percentage changes of pupil size relative to the baseline. The negative percent represents pupil constriction, whereas positive ones represent pupil dilation. Vertical line represent the standard error of the mean (SEM). The rectangular gray regions represent (a) from left to right, greater pupil constriction to DOG than to G during 0.5–1.0 s ($ps < .001$); F than to DOF at 2.3 s ($ps < 0.5$); G than to DOG at 3.7–4.1 s ($ps < .05$); (b) greater pupil constriction to the DOG-G than to DOF-F at 0.7–1.2 s ($ps < 0.5$).

To assess the dot effect in different background images (i.e., F vs. G), we compared the simple effect of the difference between DOF and F (i.e., DOF-F) and the difference between DOG and G (i.e., DOG-G) (Figure 2 (b)). Paired samples t-tests demonstrated a greater reduction in pupil size in response to the DOG-G than to the DOF-F ($ps < .05$, $DOG-G < 0$, $DOG-G < DOF-F$, 1.4s: $p=0.05$) between 0.7–1.2 s, which suggested a greater reduction in pupil size in response to dots placed on the gray background images between 0.7–1.2 s.

4. DISCUSSION AND CONCLUSION

In this study, we examined how the pupils responded to the images of dot patterns placed on the human face and gray background images. Our results showed that there was a reduction in pupil size (Figure 2(a)) between 0.5–1.0 s during the image phases of dots on the gray background image (i.e., DOG) compared to those without dots (i.e., G). However, there was an increase in pupil size between 3.7–4.1 s and at 2.3 s during the image phases with dots (i.e., DOG and DOF) compared to those without dots (i.e., G and F). For the evaluation of dot effect, the reduction in pupil size between 0.7–1.2 s (Figure 2(b)) in response to the image of dots on the gray background image (i.e., DOG) was compared to the image of dots placed on the human face (i.e., DOF). The results showed a greater pupillary response to the images with dot patterns (i.e., human face and gray background image) than those without, while dot patterns on the gray background made more pupil constriction than dot patterns on the human face during the first 1 second, although participants felt more disgust to dot

patterns on the human face. During the following seconds, however, the results indicated significant reduction in pupil size to dot patterns on the human face. Taken together, the results suggest that we may simultaneously have two kinds of emotions such as disgust and fear, or disgust and a positive emotion such as being attracted. This study provides preliminary observational data indicating pupillary responses to dot patterns on the human face. Future research will involve more subjects so that it may contribute to a better understanding of a relationship between emotional responses and dot patterns.

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Ways to Include Taiwan's Aboriginal Culture into Wristwatch Designs and Branding

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ABSTRACT

The purpose of this research is to provide a creative way for the rich culture of Taiwan's aborigines to share their culture to others in Taiwan and abroad. It also provides the native population with an additional avenue to generate income via watch sales, which will be sold at tourist destinations and online.

The watch designs are created by encouraging indigenous designers to use watches as a creative platform and making sure that the key characteristics of their native culture are included into their watch designs.

Keywords: aboriginal culture, branding, watch design, Taiwan tourism

1. INTRODUCTION

This research is based on the application of Taiwanese aboriginal elements or totems in the design of watches. The research intends to provide another avenue for the indigenous people of Taiwan to promote their rich culture to tourists and everyone interested in the rich history and culture of Taiwan's indigenous population.

This research directly consults experts of Taiwan's aboriginal culture, which ensures that each design deeply appreciates the rich heritage of the native population.

The technical support for this research comes from Taiwan's foremost wristwatch company. This approach ensures that each watch concept can be realized. This approach also ensures that the supply chain is backed by an experienced company and delivery promises made to shops selling aboriginal goods can be kept.

This research serves as a brand promoter as it cultivates emerging Taiwanese designers of aboriginal origin to create watch designs together with local watch brands. This research uses indigenous artists and provides them with a platform. Via this approach the key characteristics of Taiwanese cultural and creative industries are preserved. The researchers believe that this approach will eventually facilitate the creation of a genuine brand experience which in turn will help market the watch(es) worldwide.

2. METHOD

This research plans to design ten (10) mass-produced aboriginal watches which will be based on already existing and available watch cases. The aboriginal watches will be designed in a modular way. This economy of scale method will allow for a reduction in production cost and thus the production cost of the watches will be competitive.

In order to achieve this, the researchers collaborated with Shifeng Co. , Ltd.. The company, headquartered in Tainan City, was established in 1987, and has locations in Taiwan, Hong Kong, and China. The company has more than 200 people employees and tested and proven Standard Operating Procedures (SOPs). Furthermore, the company has its own brands, fully set up brand management and sales as the company also owns two well-known Taiwan watch brands: GOTO and LOVME.

Furthermore, Shifeng Co. has a well-established sales network and receives celebrity endorsements. This research will provide the company with new products targeting.

2.1 Sample Preparation

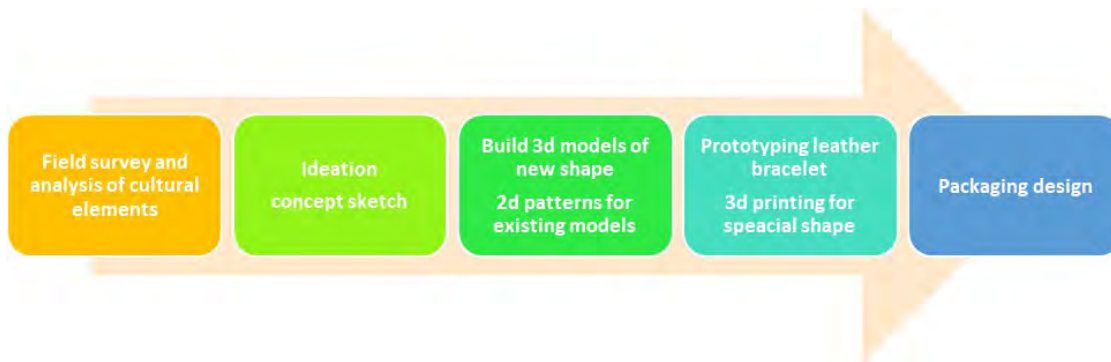


Figure 1: The 5 phases of the research

The research process was divided into five phases, as shown in figure 1 above:

The researchers visited the Pingdong Aboriginal Cultural Park, in Pingdong Country, Taiwan. The researchers photographed aboriginal costumes and used them as a reference, in order to understand the colorful and meaningful art of the indigenous people.

As the research provides a deep understanding of the many elements of Taiwan’s indigenous population, it was decided to feature many printed designs on the watch surface and mix them with elements of existing products.

In the field survey and analysis of the cultural element phase this research uses the “First Nations ribbon industry” to understand a variety of patterns and totems. These findings can then be combined with leather straps and thus providing each watch with straps that are directly inspired by the aboriginal culture. This will be further looked at in 2.2.

2.2 Experimental Procedure

During the performance of the research, the researchers visited the Pingdong Aboriginal Cultural Park where a large amount of different aboriginal costumes, national dresses and ornaments were photographed and catalogued for reference (see Figure 2). This part of the research was done to understand the vibrant and transforming art of the indigenous people.

Cultural color analysis was also carried out to extract the colors that most represent the elements of aboriginal culture. The styles shown are inspired by the combination of metal jewelry and a modular hand form, while the totem incorporates geometric images of a snake and an eagle.

The industrial advisers indicated that material can be finished by the dewax casting method, while the wood requires the four-axis computer numerical control (CNC) processing method. This



is because the watch surface is designed to be dominant on the wrist. The research identifies the advantages of this size factor; for example this eventually will allow the watch to receive certain ‘smart’ updates such as a heart rhythm measurement module and other smart enhancements which can be included in a possible smartwatch design.

The watchstraps will be crafted in the styles of indigenous leather carving. This research intends to design ten (10) mass-produced aboriginal watches in currently existing watch case in a modular way (see Figure 3). In addition, the intention is that the watch surface (for example the watch dial) can be customized by Ultraviolet printing (UV printing) and color laser engraving.

Figure 2: Aboriginal dress, picture taking during visit to Pingdong Aboriginal Cultural Park

3. RESULTS AND DISCUSSION

Two (2) of the ten (10) watches designed by students with an aboriginal family heritage are shown in this chapter. These watches are 3D and 2D models. As mentioned in 2.2 these aboriginal watches match existing watch cases (ensuring an easy transition from concept to production) and are rendered in Rhinoceros 3D and grouped in Adobe Photoshop.

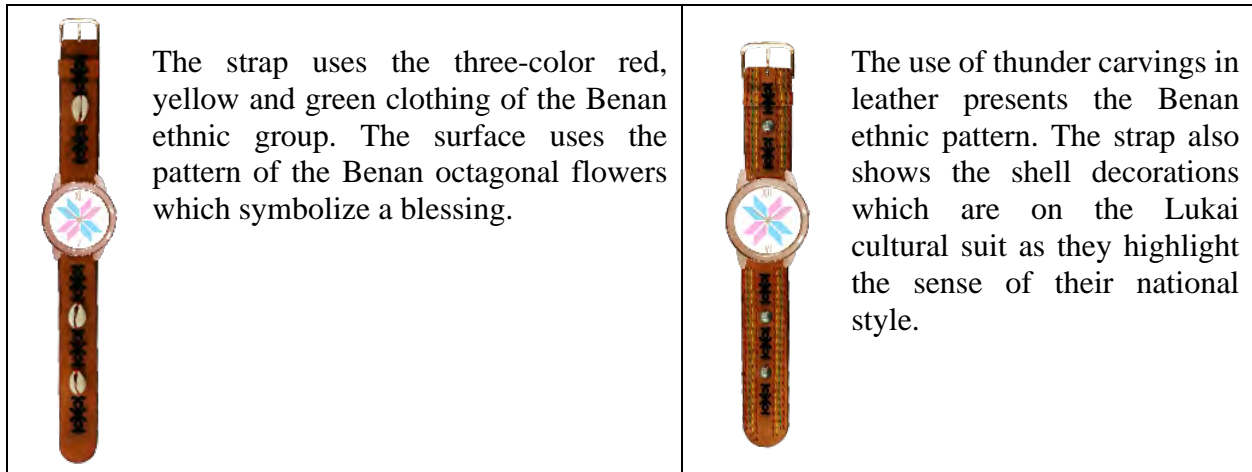


Figure 3: Two (2) of ten (10) watches designed by students with aboriginal family heritage

Currently, this research is in the process of identifying which of the ten (10) watch designs will be the most impactful in the marketplaces. A marketing and branding campaign backing the chosen design will be implemented once the design is identified. Further discussion with indigenous people will have to take place before a consensus and final decision can be made.

It has been agreed that the aboriginal watches will be sold at aboriginal tourist destinations, as well as online, where the watches will be made available to a worldwide customer base.

4. CONCLUSIONS

The intention of his research is that when the research is fully operational and sold through various channels, the aboriginal watch provides the aboriginal population of Taiwan with an additional avenue to generate income from tourists and interested customers located worldwide. The research done serves to provide awareness of Taiwan's rich and diverse aboriginal heritage and helps preserve, as well as appreciate, that history to current and future generations.

It has been decided that a booklet explaining cultural and historical details of the native population will come with each watch and will be included in the watch box. Such a booklet will explain the inspirations behind each watch design and thus allow anyone interested in aboriginal culture to learn about Taiwan's aboriginal people. Although Taiwan has a rich and interesting aboriginal culture; the relative obscurity of Taiwan's native population remains a challenge.

By providing Taiwan's indigenous people with a platform to share their native culture and designs, this research profoundly believes that Taiwan's indigenous people deserve a strong national as well as a world-wide audience and a worldwide marketplace.

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Categorizing Robot Appearance Attributes by Way of an Experimental Research Design

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ABSTRACT

This research mainly discusses the categorization of human's appearance attribute characteristics of robots and the image concept represented by appearance attribute characteristics in the connotation and extension of the category. The experimental design is divided into two stages. In the first stage, 6 design experts are invited to perform mixed-using the KJ method, along with the expert evaluation. and the categories are divided according to the appearance attributes of the robots for 106 different robot graphics cards. In the second stage, the focus group method is carried out according to each category, and then grounded theory coding is used to find out the image represented by the connotation and extension of the constituent category. The first level is the "five body" and "five unknown". The lower sub-levels of "Five body" is "humanoid", "Anthropomorphism", "animal shape " and "non-human as well as non-animal". The lower levels of "Anthropomorphism" and "non-human as well as non-animal" are "expression" and "flexibility" in order. The key feature point that affect "expression" is "the degree of changing in the eyes" and the key feature point that affect "flexibility" is "head to body ratio". However, the "flexibility" influenced by the "proportion of head and body" has opposite meanings under the categories of "non-human, non-animal" as well as "anthropomorphism".

1. INTRODUCTION

As the interactions between robots and human beings are increasing, robots are being recognized as social creatures. The interactions between human beings and robots are under the influence of the robot's appearance, facial expressions, gestures, voices and so on (Bartneck and Forlizzi, 2004; Kirby, Forlizzi and Simmons, 2010; Woods, 2006). However, the appearance of a robot is the first impression it gives to the user. And the appearance as well as the shape of a product can be composed by one or several shape features, and those different shape features will let people to have different feelings over different images, and eventually arouse remote or related attachments. Norman (2004/ Wang, Weng, Zheng and Zhang, 2014) points out that when he mentioned about the three levels of design and emotions, that the instinctive level of stage is the moment when the product appearance exerts the greatest influence, and it is also the time when the first impression is made. At that stage, people's reaction is an immediate perception.

Ever since Mori (1970) proposed the uncanny valley theory, a large number of researches that focused on the appearance characteristics of robots have been developed on the basis of anthropomorphism and the uncanny valley theory. Fong, Nourbakhsh and Dautenhahn (2003) proposed to classify the appearances of robots into four types: anthropomorphism, animalization, cartoon and function. Pütten and Krämer (2014), applied the cluster analysis to identify those common design characteristics shared by robots with the same adjective images, however, the identified sequences of each image characteristics or the connection between the designed feature and the connotation remain unknown. Current studies that are

focusing on the appearance of robots mainly explore the influence of the level of anthropomorphism has on people's feeling. Anthropomorphism is important, still, it may be simply one of the many identifying features. Entities which belong to the same category share same important characteristics. Therefore, through the understanding of human beings' categorization process of robots, the research further explores the important appearances, shape, attribution characteristics as well as their priorities with the certain categories.

2. METHOD

The cognition and **categorization** experiments of robots' appearances and shape as well as attribution characteristics are mainly conducted through the form of Focus Group workshops. The cognition of robots' appearances and poses as well as attribution characteristics are described and discussed mixed-using the KJ method, which was initiated by Kawakita Jiro, along with the expert evaluation. The experimental design is divided into two phases: the first phase is to collect a large number of picture samples of robots; the second phase is to held a focus group interview. On the basis of the "similarity between appearance and image", the appearance attributions of robots were grouped, and then each group was named according to their group, in the mean time, the most representative robot sample of each group was selected

2.1 Sample Preparation

The collection of picture samples of robots adopted online searching as methods. Three design experts were invited to collect a large number of robot pictures. Pictures collection time is two weeks. The repeated robot images were screened out, and a total of 106 original robot pictures were collected. Upon the completion of collecting the robot pictures, the robot pictures were processed by gray scale and printed out, the production size is of 8×8 cm image card, and each robot picture is coded in card.

2.2 Experimental Procedure

In order to further explore the cognition and the categorization method of robot appearances, shape attributions and characteristics, Invite six design-related experts to participate in the workshop of focus group interview. Participants shall classify the similarities of robot's appearance, shape attributions and characteristics according to the "Similarities between Appearance and Images. Each classified group shall then be named and select the most representative sample of robots from each group.

According to the profile data of audio and video recorded in the workshop, First carry out textual processing and organize it into verbatim drafts. Secondly, with the application of grounded theory in coding, conducting a coding analysis on the contents of the verbatim script. First, performing the open coding and the coding level are as follows: "punctuate the verbatim sentences" and "speaker", and "remarks" are needed to write down. Through comparative analysis, the surrounding text will be analyzed, compared and examined, and a paragraph of text will be named after an abstract concept so that it could define the "categorization category of human to robot appearances, shape attributions and characteristics", and then continue to analyze the nature and orientation of each category. Secondly, proceeding the Axial coding. Last but not least, the study summarizes and analyzes the cognitive concepts and categorization concepts of human beings on the appearances and shape attributes of robots, and establishes the categorization theory of human beings on the appearance and shape attributions of robots.

Table 1. Summary of the results from the experiment.

Conceptua Code	Code	Contents of Verbatim Script	Appendix
b.1	002-E	His Feature characteristic is with feet	Specify the boundary of the problem after defining the feature of the appearance attribution

3. RESULTS AND DISCUSSION

In the process of group division, study participants will not completely focus on one single group, but to constantly compare with the existing and clearly defined groups according to the attribution cards of robots that they selected. Only when the robot map of attribution is in line with the categorization feature points card, can the round map of categorization be placed to the recognized group position. Among them, participants in the study will also examine the clustering of robot cards while categorizing the robot cards, so the the consensus of the clustering partitioning strategy can be determined.

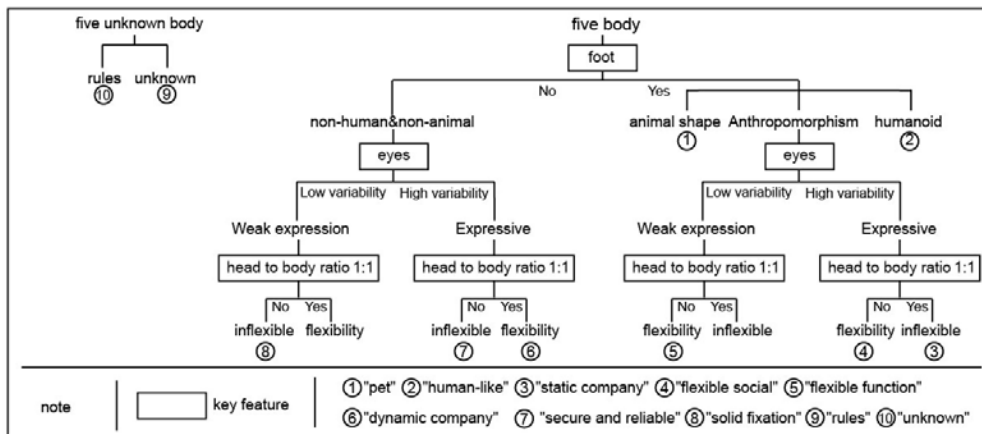


Figure 1 : The Tree Diagram of the categorization Category Pattern for the Robot Appearance, Shape attributions and Characteristics

According to coding result that generated from the induction and analysis that the research participants performed on the robotics cognitive concept and characteristic of appearance attribution, and from the grouping method that research participants used, the first level is the "five body" and "five unknown". "Five body" has lower sub-levels of categorization, while the "five unknown body" is not limited to the zero lower levels of categorization. The second level of the "five body" is "humanoid", "Anthropomorphism", "animal shape" and "non-human as well as non-animal", among which "humanoid" and "animal shape" are not divided into lower sub-levels; The next level of "anthropomorphism" is "expression", while its key feature point is "the degree of changing in the eyes"; The key characteristic of "flexibility" of the next level is "head to body ratio"; The lower levels of "non-human and non-animal" are also "expression" and "flexibility", and the key feature are also "degree of changes in eyes" and "proportion of head and body". However, the "flexibility" influenced by the "proportion of head and body" has opposite meanings under the categories of "non-human, non-animal" as well as "anthropomorphism". The categorical pattern tree of the

coding analysis results is shown in Figure 1. On the basis of the results of the various aspects, the research participants proposed the names of images feelings of each field. So it can be divided in 10 groups, such as "secure and reliable", "solid fixation", "dynamic company", "static company", "flexible function", "flexible social", "human-like", "pet" and "rules" and "unknown".

4. CONCLUSIONS

In accordance with the "The Tree Diagram of the categorization Category Pattern for the Robot Appearance, Shape attributions and Characteristics" one can see that people's perception of the appearance attribution of robot is derived from the "differences between self", which is in line with Progoras (cited from what Plato/He, 2016) who believe that "Man is the measure of all things". The perception of people toward all kinds of people, things and objects of cognition, are all from the perspective of self standard, and then compared with its own state for further analysis. Understanding the way to divide the above mentioned category could help to understand consumers' expected images of robot appearances during the designing of robots in different fields.

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Oral Session II: History and Theory of Art

Visualization of Myth: The Mythical Representation of the Birth Pithos

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ABSTRACT

The so-called “Birth pithos,”¹⁾ thought to have been produced on the island of Tenos during the first quarter of the 7th century BC, approximately 1 m high, is regarded as one of the most important examples of this group. In previous studies, several scholars focused on the interpretation of the subject matter of the neck panel (*Figure. 1*), specifically, whether or not it portrays the Birth of Athena, because the depiction of the main figure is extraordinary in comparison with the visual language of ancient Greek art.

This paper examines not the main figure—Zeus—but the figure of Athena, which has been given less attention in previous research. In contrast to the curious representation of Zeus, Athena of this pithos shows quite a canonical form: fully armored figures are common in representations of the archaic period. I will clarify the figure’s innovative quality by observing other examples of 7th and 6th centuries BC that represent the Birth of Athena. I will point out the necessity to reconsider the Birth pithos in the extremely new movement of visualization of epic and myth.

1. INTRODUCTION

In the Aegean islands, notably northern Cyclades, many huge storage vessels—pithoi—with elaborate relief decoration were produced from the 8th to the 7th century BC. The relief pithoi of the Tenian-Boeotian group are known to include some of the earliest representations of mythological scenes in ancient Greek art. The so-called “Birth pithos,” thought to have been produced on the island of Tenos during the first quarter of the 7th century BC, approximately 1 m high, is known for having one of the earliest representations of mythological scenes in ancient Greek art. It has a neck panel on its main side depicting the Birth of Athena (*Figure. 1*).

The Birth of Athena, patron goddess of Athens, was a popular artistic subject, especially in the archaic period. According to Hesiod (*Theogonia*, 924—926), Athena was born from the head of Zeus. Zeus swallowed Metis, the goddess of “cleverness” whom he had made pregnant. He was afraid she would invent a stronger child than him. After this fierce event, Athena was born out of Zeus’s head. The so-called “Homeric Hymn (XXVIII)” to Athena tells us that Athena suddenly emerged from Zeus’s head,

stood before him and shook her spear. The myth is a part of what it told about the destiny of the gods in general. The original father of the gods is displaced by his son, who is subsequently overthrown by his own son. This myth—with Athena’s extraordinary birth preventing the Olympian gods from being overthrown—was so popular in the archaic period because it assured the stability of the universe. According to some later authors, the lyric poet Stesichorus (c. 630—555BC) was the first to mention that the goddess was born in full armor²). Strabo mentions a painting of the Birth of Athena by Kleantes of Corinth in the Sanctuary of Artemis at Olympia. Kleantes must have lived in the 7th century BC. The aim of this paper is to reconsider the importance of the representation of Athena on the Birth pithos.

2. DESCRIPTION

The chief character on the neck panel of the Birth pithos is a winged figure seated on a chair with bird head decoration. The lower body is in profile, and the chest, head, and arms are frontal. The hair is half-length and the dress reaches down to a little above the knees. The figure has thin wings bent upwards, and the arms are bent and raised. From the main character’s head, a small, winged, fully armored figure protrudes, visible from the waist up, holding a spear in the right hand and a short, sticklike object in the left hand (*Figure. 2*). This object has been interpreted as a distaff, branch, javelin, thunderbolt, or shield. The attendant winged figure with a sickle or a surgical knife to the left is interpreted as Eileithyia, the goddess of childbirth. In the lower-right part of the field, a naked, winged figure sits with his legs under him, and holds a short staff-like-object close to a tripod. In the upper-right zone of the field, there is a fragmentary winged and naked figure who turns his head toward the incredible birth scene, holding one hand on his chest, as if he is astonished.



Fig. 1 Drawing of neck panel of the Birth pithos



Fig. 2 Athena of the Birth pithos

3. ICONOGRAPHICAL TRADITION

Due to the non-canonical and extraordinary representation of the seated figure, several

scholars have proposed many possible interpretations of the subject matter of the pithos. Is this the Birth of Athena or is it a different mythic event? The point of their discussions is whether the seated central figure is male or female. Simantoni-Bournia summarize the former research and points out that the knee-length dress and half-length hair indicate a male in this period and dismisses the idea that the traces of a beard of the seated figure resulted from an incorrect repair in comparison with examples from the same period. Then, she concludes that the seated figure represents Zeus³).

The depiction of Athena of this pithos, however, has been given less attention in previous research. The position and portrayal of the small figure of the goddess protruding from Zeus's head has a lot in common with later archaic examples of this subject matter. The bronze relief in Olympia (a. 600BC) shows the archaic canonical type of the Birth of Athena. Zeus is seated on a chair, Eileithyia is standing close to him, and Hephaistos is shown to the right moving off the scene, looking round toward Zeus. Athena—equipped with a helmet, spear, and shield—is above the head of Zeus. The Tyrrhenian amphora by Kyllenios Painter (570—560BC) shows Athena visible from the hips upwards above Zeus's head, fully armored with an Attic helmet, shield on her left arm, and spear in her right hand. A little later than the Kyllenios Painter, the C Painter adapted the same theme to decorate the pyxis in the Louvre (a. 560BC). Here- Athena has here almost completely emerged. Examples of the Birth of Athena became less frequent in the later 6th century. The myth would have appeared grotesque to the anatomical understanding of Classical times. The Antimenes Painter attempted to resolve the problem by standing Athena before Zeus in fully grown splendor, like lines of the Homeric Hymn.

4. VISUALIZATION OF MYTH

Among the Tenian-Boeotian pithoi, we find some exceptionally brutal scenes: the slaughter of women and children, birds picking at bodies, lions attacking men, and so on. The Birth pithos also shows a hopeless combat between a man and a beast on the shoulder relief. The Mykonos Pithos (a. 670BC) shows scenes of the slaughter of Trojan women and children by Greeks on the belly. Birds in the battlefield pick at soldiers' bodies on some fragments of relief pithoi from Tenos and Eletria (a. 680BC). Why did the 7th century Cycladic artists choose these brutal motifs? According to Vermeule, these brutal representations might single-mindedly reflect and echo literary expressions, in particular Homer⁴). In the *Iliad*, Odysseus insults the Trojan warrior Sokos by saying the following passage to him:

It is not your mother and father who will clean your eyes when you are dead, but the birds who eat flesh raw will pluck them out as they strike you all over with their wings (XI.454)

Some images of the birds in the battlefield act as similes of the soldiers' tragic end in the *Iliad*. Additionally the combat between the Greeks and Trojans is likened to an animal fight between a carnivorous animal and an herbivorous animal. The image of lion aggression is used more than 25 times to describe the heroic onslaught in Homer's works. This motif might have been considered appropriate as a literary device to represent the heroic triumph. On the shoulder frieze of the Birth pithos, there is a scene depicting two lions attacking a deer. This motif is represented on countless works in early Greek art.

5. CONCLUSION

In contrast to the curious representation of Zeus, the depiction of the goddess protruding from Zeus's head in full armor is considered as an advanced and canonical representation ahead of later archaic examples. In the late 7th or early 6th century, Stesichorus mentions Athena's Birth in full armor. It would be reasonable that 7th-century artists understood the details of this mythological episode. Considering the Birth pithos in the contemporary movement of visualization of myth, the depiction of Athena, springing out from the head of her father in full armor matches the trend: 7th-century artists attempted to precisely visualize myth.

NOTES

- 1) Relief pithos. Tenos Museum. Cycladic c. 680BC. From Tenos.
- 2) Robbins, 2013, 9.
- 3) Simantoni-Bournia, 2004, 83-85.
- 4) Vermeule, 1979, 83-116.

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Hercules Segers' Techniques of Printmaking and Their Purposes

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ABSTRACT

Hercules Segers (1589/90–1633/40), a 17th-century Dutch painter and etcher, created unprecedentedly pioneering etchings by various techniques, i. e. hand-coloring, varnishing, multiple-plate color printing, lift-ground, drypoint hatching, and using oriental paper or cloth as print support. All 182 surviving impressions of his 53 etchings are different from each other, although prints were generally produced with the purpose of multiple homogeneous images.

It is still unexplained why Segers devised such techniques. In this paper, the author argues that three previously published hypotheses could be disproved with the evidence that has already been reported by scholars. Furthermore, the author hypothesizes that Segers attempted to create unique works of art that are difficult to classify into paintings and prints by a kind of mixed technique of painting and printmaking.

1. INTRODUCTION

Hercules Segers, a 17th-century Dutch painter and etcher, is known for creating unprecedented etchings by various techniques. Almost all of his prints were colored using color inks or by hand-coloring after printing; pretreatment of coloring was often carried out on the support in advance. It has been difficult to precisely identify the coloring process of each impression because these methods of applying color were frequently combined in his prints¹⁾.

However, recent advanced scientific analyses have been revealing²⁾. According to the latest research, Segers executed the second state impression of *Landscape with a Plateau, a River in the Distance* by using two different plates³⁾. Multiple-plate color printing had been used for chiaroscuro woodcuts from the beginning of the 16th-century, but it began to be used for intaglio printing after the 17th-century⁴⁾. Therefore, Segers' use of this printing method for etching was extremely early.

Apart from the printing methods, he used pioneering etching techniques, i. e. lift-ground and drypoint hatching. He invented the lift-ground technique many decades earlier than when Paul Sandby (1731–1809) was supposed to have introduced it in the 18th-century⁵⁾. The lift-ground technique allowed drawing a design on the copper plate with relatively soft and fluid strokes. He also executed drypoint hatching. Drypoint without hatching had been used by others, e. g. Albrecht Dürer (1471–1528)⁶⁾, but insofar as is known, no one used hatching by drypoint needle to create tone before Segers⁷⁾.

Segers' prints are also unusual for their supports. It has long been known that he printed impressions not only on paper but also on cloth such as cotton and linen⁸⁾. In addition, recent research has demonstrated that he used oriental paper, as well as western paper, which was the common support for prints at the time⁹⁾. The first state impression on

oriental paper of *Landscape with a Plateau, a River in the Distance* is, albeit only provisionally, dated ca. 1622–25¹⁰). As far as is known, Segers was the first European printmaker to use oriental paper, more than twenty years before Rembrandt van Rijn (1606–1669), who began to do it from ca. 1647¹¹).

Moreover, all 182 surviving impressions of his 53 etchings are different, although prints were generally produced to have multiple homogeneous images.

It is still unexplained why Segers devised such techniques. This paper's author would argue that three previously published hypotheses could be disproved with the evidence already reported by scholars. Furthermore, the author would present another hypothesis that Segers attempted to create unique works of art that are difficult to classify into paintings and prints by mixed techniques of painting and printmaking.

2. SEGERS' PURPOSES FOR PRINTMAKING PRACTICE

Firstly, Wilhelm Fraenger attempted to psychoanalytically deduce Segers' personality from his desolate landscapes. As a result, Fraenger regarded Segers as a socially isolated and mentally abnormal person and thought that his peculiar printmaking relied on his unsocial personality¹²). Such an interpretation is convenient for explaining Segers' unprecedented styles and techniques and makes it unnecessary to guess some rational reason for the laborious and costly printmaking practices.

However, 17th-century literary documents show that Segers had relationships with people of high social status and was frequently appointed a witness for their notarial deeds¹³). The witness had to be a reliable person since such deeds were legally void without the witnessing¹⁴). In other words, the existence of notarial deeds witnessed by Segers suggests that he was considered reliable. Therefore, we should not regard him as an isolated and abnormal person.

Secondly, Seiro Mayekawa presumed that all of Segers' prints were not completed works but sketches for paintings¹⁵). However, there is a certain oil painting as a counterexample to this hypothesis.

Segers' first state impression of *River Valley with Four Trees* in the British Museum and the oil painting in the Mauritshuis are mirror images of each other. According to an examination of the painting using infrared reflectography by Arie Wallert, there was a free underdrawing consisting of short, sketchy annotations¹⁶). Hence, the painting was created first, and then the etching was executed based on the painting. Therefore, all of Segers' prints were not sketches for paintings.

Thirdly, Jun Nakamura insisted that Segers originally didn't intend to sell the prints, and the printmaking was merely an experiment for him¹⁷). In fact, as Nakamura pointed out, the dirt and markings found on the prints and the fact that only a few works survive indicate their experimental nature.

However, the watermarks of western paper that Segers applied to the print supports suggest that there must originally have been a far greater number of his prints than are surviving¹⁸). To date, a total of 35 watermarks of 15 different types have been identified among his 146 extant works on western paper, including two oil sketches¹⁹). Considering that generally several quires of western paper for printing, corresponding to roughly 25 sheets²⁰), were purchased at a time, the wide variety of watermarks implies that this is but a small fraction of the total quantity. Therefore, it seems that his prints were sold due to the

required time and material costs. It is suggested that the use of various techniques was not limited to the experiment but was practical in printmaking for sale.

3. CONCLUSION

As mentioned above, the present author re-examined the three preceding hypotheses concerning Segers' purposes of using exceptional printmaking techniques. It was confirmed that the hypotheses could be denied.

Now, it is worth noting that no platemark is left on Segers' prints. The platemark is the line of indentation in the margin of intaglio prints, generated by the edges of a metal plate in the pressing process²¹⁾. This mark's presence on the surface of a work on paper proves that the work is an impression printed from a metal plate — in a word, a print. Nevertheless, all of Segers' prints without exception are trimmed within the platemark; thus, they often cannot be recognized as prints at a glance, and some of them look like paintings rather than prints.

On the other hand, the images of the etchings are also stylistically different from his oil paintings, and the characteristics unique to the printmaking techniques are striking. After all, the etched lines and the brushed lines radically differ.

Furthermore, the author would underline again that no two impressions from the same plate are alike. The basic function of prints is to mass-produce the homogeneous images, but it seems that Segers did not attach importance to the function. On the contrary, it cannot be denied that he may have disliked the relatively decreasing value of his works, which could have been caused by the presence of the same images. In any case, Segers' attention in printmaking is likely not the convenience of multiplying images but the aesthetic effects peculiar to etching. Also, he executed painterly methods, such as hand-coloring and varnishing.

Therefore, the author would reason that Segers tried to create unique works of art that are difficult to classify into paintings and prints through trial and error. As a result, it can be said that he practiced various pioneering mixed techniques of paintings and prints.

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Knowing and Not-Knowing: The Photograph as Experiment in Marina Gadonneix's *Phénomènes*

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ABSTRACT

The photographic image, when used in the context of scientific enquiry, produces an image with a language and signification that the conventional photographic viewer cannot access. Seemingly abstract or oblique, what is sought is not the summative photographic event: as Michael Doser has stated in his studies of the collapse of antimatter using photographic emulsion, the photographic process may not even be used in ways proposing conventional relationships to light, space or time. Such propositions might in fact cause a reconsideration of what we understand photography to be.

This paper proposes to examine Marina Gadonneix's photographic series *Phénomènes*, produced in France and the United States in Research Laboratories recreating planetary and extra-planetary phenomena, to ask questions about photographic representation and the limits of visibility as a condition for knowledge. Gadonneix's images move between fragmentary representations of laboratory space and spectacular experiments in action, maintaining an abstract sense of encounter which is resistant to the expectations of the image to explain and reveal. Conducting a reading of Gadonneix's images through theories of photographic failure – Flusser, Silverman and Geimer – this paper ultimately proposes to see Gadonneix's works not as recordings or as distant observations, but as experiments in knowing and not knowing, in which the scientific process might resituate the photographic act as a generative and not static activity.

INTRODUCTION

In his popular history of scientific development *The Invention of Science*, with its focus upon the revolutions of scientific method in the 1600 and 1700s, David Wootton reveals that the experiment posed a problem for the established mode of knowledge of the time, reason. Aristotle's deductive method was dominant: reason assumed an innate and coherent understanding of the world that could be formed within the mind. By contrast, the experiment introduced an empirical acquisition of knowledge, produced from proposition, testing and observation, making and seeing. An alignment between experimental method and the development of optics – with its own embedded empiricism privileging vision – is one of the subjects of this current research, though here only preliminary remarks can be made. In one key example, Wootton notes that extra-mission – the belief that vision took place through light emitted from the eyes to illuminate its objects – remained common wisdom up to six centuries after Ibn Al-Haytham (c.965-c.1040AD) had proven that light was received by the eye. Such was the persuasive and political power of conventional logic in the academy, that it was not until Johannes Kepler's (1571-1630) study of optics, that the slow but persistent diffusion of Al-Haytham's thought – sometimes distributed, at other times appropriated – showed itself to be a foundation for the experimental method, and the development – which Wootton describes as the beginning of a culture of discovery – that would include a train of technical progress giving rise to what we now call photography.

French artist Marina Gadonneix returns continually to sites of testing and rehearsal, where reality is simulated and also formed. At the edges of each of Gadonneix's discrete projects is the conviction that the world is not as it already appears, simply there to be documented, but is continually brought into being, made, and re-made, shaped and moulded. Sites of training might appear to simulate the world – to provide an imitation or repetition of the world as it is, but are also the production of models, the structuring of possibilities: a process of practicing which has forming and making at its centre. The humble training site is always already the enacting of a subtle shift of a world to come, made by proposition, encounter or rehearsal, analysis, and repetition.

An early project by Gadonneix records what appears to be a training ritual, which reveals a complex array of operations simultaneously at work. In *The House That Burns Everyday* (2013), Gadonneix has produced images from the site of a fire training operation. We can see the site simply – this is where fires are put out - but a more complex reading would identify the iterative creating of fires and their extinguishing, the consumption and destruction of consumer goods, and the modelling of and traversing of vernacular architectures, which are examined repeatedly. Paul Virilio notes that the invention of the automobile is the invention of the automobile crash: “To invent the sailing ship or the steamer is to invent the shipwreck. To invent the train is to invent the rail accident or derailment. To invent the family automobile is to produce the pile-up on the highway” (Virilio, P: 2007:10). This site might similarly be construed as a part of a network of architectures which model practices and consequences. Gadonneix's *Landscapes* and *After the Image* record sites of production – filmic, televisual and photographic studios – with similar, if seemingly very different functions. As with training and the control of fire, we should be cautious in considering sites of televisual and photographic reproduction as either fully-fledged fictions or as their apparent opposite, documents and records. We cannot describe them as either mirrors or windows, but as intersections where choices are made about the world and its representations. The philosopher Vilém Flusser wrote, in a lecture to the Ecole Nationale Supérieure de la Photographie in Arles, France, that photographs, and equally television, are models. He stated: “*The true photographer intends to make pictures which may be used as models for the experience, the knowledge, and the evaluation of their receivers.*” (Flusser, V: 1977: np) Gadonneix is indeed presenting us with images for our evaluation, from which we might determine how to think and act. In the blue and green-screen environments of the *Landscapes*, she seeks to pause, to allow us our conclusion. She records the studio out of use, at a moment of disconnection: these, we come to note, are elaborate non-places which facilitate the presentation of elsewhere. What is produced here, and after Flusser, which direction will it take in showing, or concealing the world we occupy?

Phénomènes

It is in her *Phénomènes*, a multi-year study of research laboratories, that Gadonneix looks directly at the scientific experiment. A multi-layered visual study, *Phénomènes* approaches the reconstruction of natural phenomena where large-scale climactic, atmospheric, and chemical events are created in miniature for the purposes of study and examination. Such sites are conventionally recorded as dense forests of cables, or sites of human activity, tropes which mistake quantity for complexity, and human intervention for enquiry or knowledge acquisition. In their place, Gadonneix's photographs are ambiguous but immersive images of space, which absorb the body of the view into the space, without recourse to traditional tropes of grounding perspective or human scale.

What might surprise us is how Gadonneix plunges us quickly into the condition of not knowing: elaborate tools and spaces, are seen from carefully chosen, often singular positions. We do not know automatically or rapidly, and cannot depend on a carefully placed descriptive label (deferred in the book, and made distant in her exhibitions. It is not clear what each experiment reveals or enacts. We must approach each event and observe, and from our observation, ask questions. Gadonneix has not taken us to the site of the experiment to show us its utilitarian environment, to wow us with its technicality, to awe us with equipment and black boxes. She has resisted the documentary mode of recording, where a narrated event is performed for the camera. Instead, in the essence of a search for phenomena, she has begun with a condition that phenomenology urges us to confront: the encounter, which begins from without.

Eva Diaz, writing on art's relationship to the experiment in the context of the Black Mountain College, reminds us that:

Experiment shares with *empirical* and *experience* a common root in the Latin *experiri*, "to try or put to the test." Until the eighteenth century, *experience* and *experiment* were interchangeable in English usage, though subsequently experience came to indicate that which has been previously tested, a past accumulation of knowledge or skill." Diaz (2014:5)

Experience and Experiment are intricately linked. Wootton, in his history of science, notes that from the 1600s, as *experimentum* and *experientia* began to be gradually separated, Francis Bacon proposed that experiment was a specifically formed or sought experience. Is the photograph also an experiment? It has been reduced to observation, but we might expand our conception of the image to include a process of seeking. We can see it as not only representation, but as proposition, and test. Such a photography would require a revision to our histories of fixed and complete images. Work here has begun, with Kaja Silverman, who has re-examined the '*unstoppable development*' of photochemistry at the moment of the medium's public announcement, and Peter Geimer, whose *Inadvertent Images* supplies the revelation that the image does not emerge fully formed or perfect. It is Geimer who remarks that the photograph emerges from the fog of abstraction, and not abstraction that comes about in later photography. There emerges a photograph amongst accident and failure, knowing and not knowing, seeing and not seeing.

Gadonneix shifts between the general and the particular, the abstract and the concrete, the specific and the universal, continuously adopting shifting points of view. A series of intervening book pages, held in hands that emerge from the space of the viewer, take us to study and discourse, whilst sequences of instruments and markers, including point-cloud readers, remind us that measurement and information is both abundant and outside of the range of the human eye. Science moves between the empirical and systems of thought. If we too can move between positions, we might access the generative capabilities of the experiment. Shifting between phenomena, discourse, and tool, Gadonneix is situating is placing us in an active position, beyond that of the passive observer. We are not privileged viewers with window seats to the world of spectacle: Gadonneix is examining the laboratory, and performing an experiment with photography at one and the same time. She is inviting us along.

Conclusion

Much has been written about the artistic experiment, and the experiment in the history of science. It has been my intention here to propose that, to revisit the photograph's capabilities

and potentialities, that we explore the photograph as an experiment in looking, seeing and acting, which must contend with the conditions of knowing and not knowing. I have argued that Marina Gadonneix performs a model of this practice: in fact, we might suggest that as she documents the work of the laboratory, she produces an experiment in parallel, surrounding knowledge, encounter and reception. She is aware that the camera brings the controlled conditions of the laboratory towards us, though as we have seen, this does not fit squarely into the role of documentation, or evidence, not least because she reveals sites of testing, and rehearsal against the grain of their standard representations. She sets us down inside the laboratory, and leaves us there. We are left in a space, without a knowledge of its rules. From here, a different version of photography can begin.

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Lightning Talk

Sign Planning for Pedestrians and Autonomous Vehicles: Design for a Next-Generation Road Environment

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ABSTRACT

While there have been a remarkable number of trials of autonomous vehicles in recent years, a suitable road environment for them has not yet been developed. This study was therefore conducted with the aim of creating an environment in which pedestrians and autonomous vehicles can communicate with each other and use roads safely. We conducted an experiment using 11 signs to determine which ones were easy for pedestrians to understand. A total of 60 subjects in each age group evaluated each sign, and we observed the actions of the subjects with respect to each sign making use of virtual vehicles in the “LargeSpace” virtual reality system. The results showed that signs indicating both pedestrian and vehicle behavior were the easiest to understand and least likely to be misunderstood.

1. INTRODUCTION

These days, roadway environmental design using colored pavement is on the rise across Japan to promote a reduction in traffic accidents (Hashimoto et al., 2015). On the other hand, a road system called Shared Space, which gives all road users a sense of “sharing the road,” is starting to be used in sightseeing and residential areas (Nakagawa et al., 2017). Yamamoto, Nishikawa, et al. are investigating the methods and conditions of Shared Space in Europe and the United States, and are considering its full-scale introduction in Japan (Nishikawa et al., 2011; Yamamoto et al., 2011). Ozaki et al. found that the pavement design that was most effective in inhibiting vehicle speed was an oblique grid pattern (Ozaki et al., 2017).

It is hoped that easing vehicle congestion and preventing accidents will be possible as the technology related to autonomous driving improves. However, if the era of unmanned autonomous vehicles on public roads arrives, there could be situations in which pedestrians are stranded on a roadside or in the middle of a road, unable to make eye contact, as there is no driver in the vehicle. Toward solving this problem, we created a sign that indicates the intention of an autonomous vehicle as it approaches. The aim of having these presented on the road is to facilitate communication between pedestrians and vehicles. The purpose of this study is thus to propose a next-generation road environment design. We will produce a road environment design that takes into account future technological developments in autonomous driving so that road users can use roadways safely.

2. METHOD

For this study, we conducted an experiment using the virtual reality (VR) system “LargeSpace” which Iwata et al. developed at the University of Tsukuba (Takatori et al., 2016). “LargeSpace” is a 15 × 25 × 7.7-meter all-round display with dedicated projectors and motion capture sensors. These projectors are used to show the road environment and a

moving virtual vehicle on the displays. Also, we produced 11 road signs projected from another projector to the floor and conducted an experiment to ascertain which signs are easy for pedestrians to understand. The 11 signs are linked to the actions of autonomous vehicles, and each is associated with either “Pedestrian Stop: Vehicle Passing” or “Pedestrian Crossing: Vehicle Stopping.” Sixty Japanese subjects, 10 men and 10 women in each of three age groups (20s, 45–55, and 65–75 years old), were recruited to participate. The experiment was conducted from Jan. 23, 2020, to Mar. 22, 2020.

2.1 Sample Preparation

First, we created two signs, A and I, to use as a reference. Sign A means “Pedestrian Stop: Vehicle Passing,” and sign I means “Pedestrian Crossing: Vehicle Stopping” (Table 1: red frame). A total of 14 road signs were produced, varying the shape and color of Sign A and Sign I. Eleven road signs were used in the experiment, excluding those that were not expected to be effective (Table 1).

Table 1. List of road signs.

Sign	Angle	Color	Movement	CAV* mark	"Pedestrian Crossing" mark	"Pedestrian Stop" mark	Sign meaning
A	 Acute angle	Red	Move	Not included		Arrow sign	Pedestrian Stop
B	 Obtuse angle						Pedestrian Stop
C	 Yellow	Yellow					Pedestrian Stop
D	 Green	Green					Pedestrian Stop
F	 Still		Still				Pedestrian Stop
H	 Included			Included			Pedestrian Stop
L	 Footprint					Footprint	Pedestrian Stop
N	 Sign A + L					Sign A + L	Pedestrian Stop
I	 Car stop					Car stop	Pedestrian Crossing
J	 Footprint					Footprint	Pedestrian Crossing
M	 Sing I + J					Sing I + J	Pedestrian Crossing

* Connected Autonomous Vehicle

2.2 Experimental Procedure

(1) After explaining the experiment, the participants were asked to fill in certain attributes (gender, age and usual mode of transportation) and their impressions of each sign. (2) We then moved on to the main experiment. At the experimenter’s cue, a virtual vehicle and a random sign were shown to the participants. (3) Subjects were asked to judge whether the road sign is “Pedestrian Stop: Vehicle Passing” or “Pedestrian Crossing: Vehicle Stopping,” and to act accordingly. (4) The experimenter then made the following three observations: 1. whether the subject crossed the street without waiting for a car; 2. how long it took for the road sign to start moving after it was posted; and 3. where the subject was looking and how often. (5) After posting all the road signs to the subjects, a sign meaning “Pedestrian Crossing: Vehicle Stopping” was posted. However, the vehicle caused an accident when it passed. Following this, 11 road signs were posted again, one at a time at random. We then checked to see if the action was slower than before the accident. (6) Finally, the participants were asked to complete a survey.

3. RESULTS AND DISCUSSION

The results of the experiment showed that the movement began within 2.0–3.0 seconds for all genders and ages (Figure 1*). However, the time it took to start moving was faster after the accident. In other words, the effect of experimental procedure (5) was not obtained. For Sign J only, men aged 65–75 years showed a significant trend, with $p < .059$. Participants in their 20s and 65–75 years old were more likely to act immediately after the signs were

presented. On the other hand, the subjects aged 45–55 years tended to wait for a while before they acted. Also, women tended to take longer to act than men. The graph shows that more than 70–80% of the people correctly understood the meaning of signs (Figure 2*). Also, based on answers to the questionnaire at the end of the experiment, Sign M was rated as the most obvious sign (Figure 3). (* The graph shows only the results before the accident.)

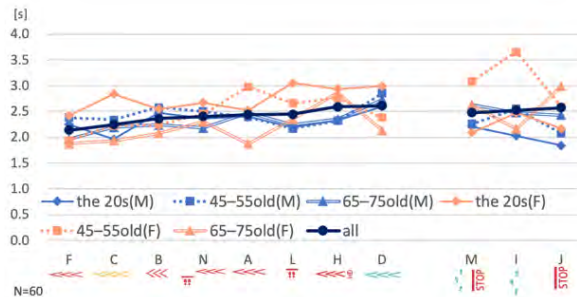


Figure 1. Average time between sign presentation and subject's movement.

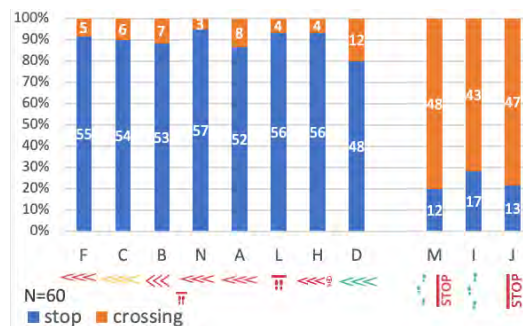


Figure 2. Subject's move after the presentation of a sign and until the vehicle passes by.

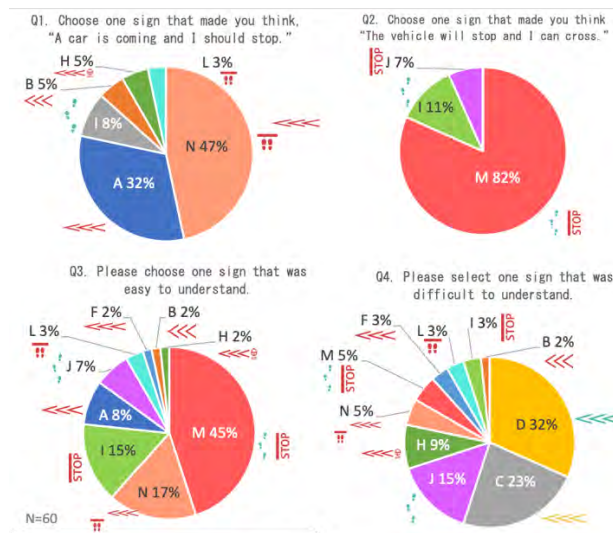


Figure 3. Survey results: Easy-to-understand signs and confusing signs.

It is likely that the subjects learned during the experiment and guessed the meaning of the signs and as a result accelerated the speed of their actions. However, Sign D had an overall slower rate of action, and this may be due to the subjects possibly considering whether to cross. Meanwhile, despite Sign M being chosen as a "most obvious sign," the subjects' rate of action was not fast. This may be because the sign is made up of two figures, and thus it takes time to understand their meaning. We also speculate that the speed at which subjects can move and the speed at which they can make decisions differ with age, leading to some

differences in results. Since signs N and M are shown for vehicle and pedestrian, we can assume that the subjects had an easier time deciding on their actions. Conversely, Sign D is inappropriate as a warning sign because of the strong individual differences in understanding. This suggests that the shape and color of a sign as indicating the intention of an automated vehicle should be determined by who is looking at the sign. In the case of this study, the use of footprints may have encouraged pedestrians to take the correct action.

4. CONCLUSIONS

In this study, we examined the colors and shapes of signs that are easy for pedestrians to understand and not easy for them to mistake. The results showed that signs indicating pedestrian and vehicle behavior were valid regardless of gender and age. A more detailed study will have to be conducted in the future. To this end, the direction of the signs, the hours of posting and the location will be adjusted. In addition, we will develop a next-generation road environment design that utilizes this research.

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The Visual Arts as Means of Teaching History of World Wars I & II

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ABSTRACT

This proposal attempts to connect the visual arts with history in the pedagogical field, especially in teaching the World Wars I & II. The works of art can be considered as a source of History but also as an object of art, which causes aesthetic emotion in students. Paintings, sculptures, engravings and photographs offer information about the events and circumstances of the time and even about their reception then and later, supporting the historical narrative, but also causes aesthetic emotion and affects in many ways emotionally and mentally. The "reading" of art brings various benefits to students, contributing to aesthetic education. With the elaboration and interpretation of the work of art, they practice in the sensory and experiential perception, they become sensitized and understand the functions of art, aesthetic and social, as well as its importance as an expression of collective consciousness. This paper highlights the role of art as a historical source and a valuable helper in the teaching of history. In particular, the experiential approach of historical events is sought through the "reading" and interpretation of documentary sources and specifically of historical paintings, seeking an alternative visual and critical view of historical events and persons. The aim is to highlight the importance and use of the visual arts in the teaching of World Wars I & II by verifying and consolidating historical events, offering an interdisciplinary reading of history and art. A brief role or a bibliographic search related to the specific historical event plays a decisive role in the most effective interpretation of each work, with the aim of a more complete elaboration of the details. In the case of this period, studying a number of works, we find that they cover a variety of topics, so that they correspond to the corresponding themes of history, which is no longer limited to political and military events, but to all aspects of life.

1. INTRODUCTION

The visual arts are art forms such as painting, drawing, sculpture, ceramics, photography, filmmaking and design. Promoting critical thinking, the visual arts as a complementary factor in the teaching of history and specifically the controversial events of World War I and II, gives stimuli to students while providing them with an interesting aesthetic experience. The visual arts immediately attract interest while still acting as a shaper of historical thought, simulating situations. The use of visual material, even in fragments, gives the ability to visualize important content in an effective way, facilitating the processing of more information with faster analysis, contributing to the cultivation of historical consciousness. A thorough examination of this period is expected to raise awareness of the terms genocide and holocaust, while highlighting individual rights, universal values and students' awareness of minorities and diversity. Through drawing and painting they produce a variety of visual forms, the expression of which is a powerful means of capturing thoughts, ideas, feelings, expectations of their creators, a window into their inner world (Anning & Ring, 2004). Research has also shown that the contribution of the visual arts contributes to the positive attitude of students towards school and consequently to their school success. In fact, when

used in lessons (interdisciplinary designs), the visual arts contribute to the provision of high quality learning (Bamford, 2006). The outbreak of World War I coincided with an era in which the arts and letters flourished. The period up to 1914 was associated with the European avant-garde, an artistic movement that transcended narrow national boundaries and promoted the dialogue of artists in a common, European space. It is also worth noting that the production of works of art, which depict moments or consequences of the war, is of the utmost importance as it captures the influence of historical moments in art. Many artists were inspired by the era and experimented with new techniques.

2. DISCUSSION

Works of art are evidence through which the perceptions of an era and the general trends of a culture are expressed, while at the same time they constitute an international code of communication (Gloton, 1965). As for the history lesson, art is an element of culture while we can not overlook the works of art that are historical sources for the way of life of people, the times they live, the situations and events that concern them. In the case of World Wars, the visual arts fully capture the facts. A preparation however is required before using the visual arts. It is advisable to organize these actions in five phases: a) didactic analysis and documentation, b) preparation, c) projection, d) elaboration and e) evaluation of the project and didactic intervention (Kittelberger & Freisleben, 1994; Sofos & Kron, 2010). It is necessary to explain to the students the purpose of the project, to know what they are going to get and what will be asked of them after the activity. According to the Perkins model, the approach to works of art takes place in four stages: a) spontaneous observation b) open and adventurous observation c) analytical and deep observation d) holistic review of the process (Perkins, 1994). World-class works capture people from despair to rebellion and claim of their rights. They represent torture, retaliation, self-sacrifice, fear but also the expectation of a better life. During the war, artists enlist in the cause of the nation. They captured the horror of war on the battlefields. It should be noted, however, the different perspectives with which the artists created in the western and eastern states dealt with war issues. The visual arts captured the Holocaust worldwide. We come across paintings which were created either by eyewitnesses and artists who experienced the concentration camps or by witnesses-observers of the time. Numerous visual performances are also available for the battles and operations of the wars on the fronts in almost all countries, displaying the soldiers, the sacrifice for the homeland, but also the death and the hardships. The life of the civilian population could not go unnoticed by the artists of the time. It depicts the hunger, the agony, the losses they experienced in their families, but also the offer and help to those who fought. If the “Guernica” of the Spanish Civil War can be considered to mark the violent beginning of World War II, the “Charnel House” marks its frightening end. Picasso, moved by the horror of the Holocaust through photographs of war correspondents and *L' Humanite* newspaper articles about the crematoria of the Nazi Natzweiler-Stroth camp, which contained the last horrific detail, could not help but capture them. The bound hands and the piles of corpses are reminiscent of the first photographs of the camps - and the devastation of the war (1810-20) by Francis Goya, images at the same time unprintable and unforgettable. Black, gray and white return to the style of “Guernica” to express the horror of war. In the field of sculpture we find the aforementioned themes but in this case we move on to the field of public history and especially to the way of managing memory at the public level, as monuments are an important carrier of memories as they are integrated into society. Attention needs to be paid to the distinction of works, which come from the same era or are later. Works such as the Memorial to the Murdered Jews of Europe in Berlin, the Memorial to the Children Victims

of the War in Lidice in Czech Republic and Nagasaki National Peace Memorial Hall for the Atomic Bomb Victims, are just a few examples. The works that ultimately cause horror are those of the artists who felt the breath of World War I very close to their faces. Like the German sculptor Wilhelm Lehmbruck (1881-1919), who had served in a military hospital in Berlin and created "The Fallen Man" (1915-16), a monumental sculpture for a war cemetery in Duisburg. Apart from these viewing a movie or video is an audiovisual stimulus, so extracting information through such a process is a much easier process. In addition, movies that are based on historical events often differ from each other, even if they are based on the same event. This teaching tool is very easy to apply in a classroom, given that most modern schools include media such as internet and projector. The visual arts depict both heroism and bravery but at the same time the misery of war. It would be interesting if teachers would stop a scene and ask students, for example, to predict the sequel. The films that are proposed are indicative, they only cover the last decade with an extremely short summary and it is understandable that some of them are called to be shown in fragments due to the harsh images and the use of indecent vocabulary. Starting in chronological order, in 2008 the film "The Wave" written by Dennis Kiesel concerns a German high school teacher who, on the occasion of a student's comment that "there can be no fascism again today", applies a peculiar experiment in order to teach the regime of totalitarianism and the ease of manipulating the masses, with dangerous developments. Later that year, John Boyne's "The Boy in the Striped Pyjamas" was about a young eight-year-old German's friendship with a Jewish peer who develops in a concentration camp in the face of tragedy and conflict. In 2009, the film "The Courageous Heart of Irena Sandler" by Anna Miskowska was released, based on a true story, about the action of the nurse of the same name in Poland who escaped and saved thousands of children of Jewish origin from the danger of Nazi occupation. Brian Percival's "The Book Thief" premiered in 2013 and is now an approach to the immediate aftermath of World War II and the Holocaust through the eyes of little Liesel, who steals books first out of curiosity and later as rebellion in reaction against the Nazi party. In 2014, Robert Enchel's "Men of Monuments", based on a true story, was screened focusing on the events of World War II, with an emphasis on protecting Western cultural treasures from Nazi destruction and looting.

3. CONCLUSIONS

In conclusion, the visual arts could help as secondary sources in an emotional and multifaceted approach to history in the classroom enhancing historical understanding as art tends to evoke and externalize emotions more easily as a means of creative learning and expression. Of course, the problem of historical inaccuracies clearly cannot be ignored or eliminated, but this is not enough to undo the great contribution of art to the history lesson by making student participation more active. Students may be interested in issues such as diversity, trauma, the presence of the past in the present, cultural identity, minorities and human rights. It is understood that this didactic approach presupposes the active involvement of the students and the collaborative teaching. Experiential learning through art is now a dynamic part of the field of education. That is why it is considered necessary to use the arts in education as well as the training of teachers, in order to provide students with a comprehensive education based on creative learning, which aims at the global development of the student's personality and the cultivation of his emotional and social intelligence (Goleman, 2007). The teacher, as a coordinator and mentor, regardless of the subject matter he uses to contribute to the formation of the student's personality, must be inspired by the basic assumption that, like any human being, so every student is a separate entity that has the right to equal conditions and opportunities to participate in the learning process. It is

believed that is served with the visual arts and their subject matter when they are included in the teaching consistently. We observe, therefore, that the enrichment and flourishing of teaching with the involvement of the visual arts offers the educational process vitality, interest, delight and knowledge, opening new avenues of expression and thought. Future investigations are necessary to validate the kinds of conclusions that can be drawn from this study.

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