



universität
wien

MASTERARBEIT / MASTER'S THESIS

Titel der Masterarbeit / Title of the Master's Thesis

Aesthetics in Everyday Life

Investigating aesthetic experiences with mobile eye tracking
in the real world

verfasst von / submitted by

Vanessa Mitschke, BSc

angestrebter akademischer Grad / in partial fulfilment of the requirements for the degree of
Master of Science

Wien, 2016 / Vienna, 2016

Studienkennzahl lt. Studienblatt /
degree programme code as it appears on
the student record sheet:

A 066 840

Studienrichtung lt. Studienblatt /
degree programme as it appears on
the student record sheet:

Masterstudium Psychologie

Betreut von / Supervisor:

Univ.-Prof. Dr. Helmut Leder

Mitbetreut von / Co-Supervisor:

Table of Contents

Abstract	5
1 Introduction.....	7
1.1 Aesthetic Experience and Context	8
1.2 Eye-tracking in Real World Settings	11
1.3 Field versus Laboratory Testing	13
1.4 Aim and Research Questions	14
2 Method	16
2.1 Participants.....	16
2.2 Apparatus	16
2.3 Eye tracking at the Danube Canal.....	16
2.4 Video and photo materials	18
2.5 Laboratory session	19
3 Results.....	21
3.1 Eye tracking	21
3.1 What objects captured gaze frequently?	21
3.2 Content analysis	23
3.3 Liking, Interest, and Viewing time	26
3.4 Art Interest and Expertise	28
4 Discussion.....	28
4.1. Fixation Location: What objects were frequently looked at?	29
4.2. Aesthetic value modulates viewing behaviour	31
5 Conclusion	32
References.....	33
Image Index	40
Table Index	41
List of Abbreviations	41
APPENDIX A.....	42
Zusammenfassung.....	43
CV	44

Abstract

Even an ordinary experience such as walking to the next subway station is lined with many chances to come in contact with art. This thesis investigates how people encounter art – and aesthetic objects- in everyday settings. Twelve participants engaged in a free exploration walk at the Danube canal Vienna equipped with a mobile eye tracker. In a follow up laboratory session participants freely commented on their personal walks (extracted as videos from the eye-tracking glasses). After watching the video participants rated the seen artworks, sculptures, advertisements and some exemplary nature scenes from the walk according to liking and interest. Analyses of eye movements revealed that participants spent up to 50% of overall fixation time exploring aesthetic objects and artworks. Combining the eye-tracking data with the personal statements and ratings revealed that aesthetic value (ratings of liking and interest) can indeed predict viewing time (measured in fixation duration and amount of fixations) in a positive linear relationship.

1 Introduction

“Imagine a city where graffiti wasn't illegal, a city where everybody could draw whatever they liked. Where every street was awash with a million colours and little phrases. Where standing at a bus stop was never boring. A city that felt like a party where everyone was invited, not just the estate agents and barons of big business. Imagine a city like that and stop leaning against the wall - it's wet.” (Banksy, 2007, p. 97)

Aesthetic decisions are made all around us. There are chances to discover and engage in aesthetic experiences almost everywhere. Nowadays with the rapid development of urban and street art¹ even an ordinary experience such as walking to the next subway station offers many chances to come in contact with art. This thesis investigated how people encounter art in an everyday setting.

Discussions about art are mostly dominated by fine arts and encounters with art in museums or gallery spaces (Irving, 2008). Aesthetic encounters in everyday settings are widely ignored in the research field of empirical aesthetics. In the realm of this thesis everyday aesthetics is defined as the encounter with aesthetic objects in common everyday settings. This definition is not interchangeable with current philosophical discussions about everyday aesthetics that usually refer to daily activities and common objects (Dowling, 2010; Melchionne, 2011).

Aesthetic experiences have been shown to be highly context sensitive. Every aspect of a museum for example is designed to achieve the most optimal experience for the viewer. Also the museum context has been shown to have profound impact on the liking of artworks as well as viewing times (Brieber, Nadal, & Leder, 2015; Brieber, Nadal, Leder, & Rosenberg, 2014).

However, since the research question of this thesis focuses on everyday life I decided to stretch the idea of traditional displays of art and chose an urban environment that featured both – fine art (sculptures) as well as urban art in the form of graffiti. Urban art and graffiti can be seen as especially context dependent since as part of the art form and its classification it has to be displayed in a street context or as Riggle (2010, p. 247)

¹ In the course of this thesis I will use the terms „urban art“, “street art“ and “graffiti” interchangeable since these concepts are interwoven and cannot be clearly differentiated from one another.

put it “an artwork is street art if, and only if, its material use of the street is internal to its meaning.”

Since graffiti art emerged in the 1960s it is one of the most publicly debated forms of art and is often classified as vandalism. One recent example for the divide between legal and illegal forms of graffiti is the graffiti artist “Puber” who is known for illegal graffiti all around Europe. While recently being sentenced to 10 months of probation after 4 months of custody his works are also featured in an art exhibition called “I write my name on your property” at the Ho Gallery, Vienna (Austrian Press Agency, Sprayer “Puber” wieder festgenommen, 2016). In 2013 a piece of a wall of an industrial building in London featuring a mural by famous street artist “Banksy” was illegally removed and put up for auction (Siddique, 2013). The attitudes towards graffiti and street art become increasingly more positive. Graffiti and street art can enhance the aesthetic value of a city, are sold and commissioned with increasing commercial value and can attract tourists (Austin, 2010). Still, graffiti and street artists often operate on the fine line between legal commissioned work and illegal destruction of property (Mulcahy & Flessas, 2016).

Some cities fight rigorous wars against illegal graffiti with official zero-tolerance graffiti policies (Schobe & Banis, 2014). Viennas city council on the other hand decided to integrate modern graffiti culture into the city streets by legalizing 480 m² wall space at the Danube canal. Legal graffiti areas can be found at 13 locations all over the city of Vienna. As the investigated everyday setting a legal graffiti area at the Danube canal, Vienna, was chosen.

1.1 Aesthetic Experience and Context

The aesthetic experience is a delicate interplay of cognitive, emotional and sensory processing (Chatterjee, 2004; Leder, Belke, Oeberst, & Augustin, 2004). Leder and Nadal (2014) recently updated the model of aesthetic experience stressing the importance of context. . Interestingly, according to the model, before any aesthetic experience unfolds the viewer is immersed in a certain context. First of all the viewer has to classify a given stimulus as art. Semantic framing methods showed remarkable changes in aesthetic liking due to the mere fact that an object is labeled as art. Kirk, Skov, Hulme, Christensen and Zeki (2009) investigated the neural correlates of aesthetic judgments during two different semantic framing conditions. One half of the artworks was labeled as

reproductions from a gallery the other half was labeled as computer generated by the researchers themselves and therefore not being art. Participants clearly preferred those artworks labeled as gallery reproductions. Simultaneously measured functional magnetic resonance imaging (fMRI) scans of participants' brains during the perception of the labeled artworks revealed unique activations in the medial orbitofrontal cortex (OFC). These activations correlated stronger with aesthetic ratings in the gallery context compared to the computer context, demonstrating that during aesthetic responses the medial OFC is sensitive to context. The OFC has also been associated with the appreciation of artworks in general (Vartanian & Goel, 2004). Context can classify even ordinary objects as art - the usage of common objects encountered in everyday life is not uncommon in fine art especially in contemporary art (Farias, 2011).

Gerger, Leder and Kremer (2014) also employed a semantic framing method either labeling stimuli as "real" (press photographs) or art works. This study revealed that negative stimuli labeled as art were evaluated as more positive than their "real" counterparts. These results suggest that context can modulate the perceived aesthetic value as well as the emotional response towards an artwork.

Boden (2007) discussed the low status computer generated artworks have. Original artworks are not only seen as more valuable (Newman & Bloom, 2011) authenticity also influences perceivers' evaluations of aesthetic liking. Most behavioural studies of visual art present the artworks as digital copies on a computer screen. Tinio and Leder (2009) showed that the quality of an image has an impact on the judgement of preference. Even if the artwork is presented in a high resolution it might be evident to the participant that it is not the original. Artworks experienced in a museum setting are rated as more enjoyable compared to their laboratory reproductions, although their perceptual low level features such as complexity or symmetry in both settings are the same (Brieber, Nadal, & Leder, 2015; Locher, & Dolese, 2004; Locher, Smith, & Smith, 1999).

The Duchamp fountain, an artistically unchanged urinal displayed by Marcel Duchamp in an art gallery, the beginning of the so called ready-mades is just one prominent example that signifies the profound effect the mere placement of an object inside an art gallery can have on its reception.

Up to now, research investigating the interplay of physical context and aesthetic experiences tended to focus on museums – the classic context where one might encounter art. Museums and galleries are designed and carefully arranged to display artworks of many kinds, places dedicated to the enjoyment of the visual perception of artworks.

Researchers in the field of empiric aesthetics have addressed important contextual factors that distinguish the experience of art in a museum from the laboratory. The museum context has been studied with regard to different contextual factors: one being the physical properties of a museum space sometimes referred to as a “white cube” (O'Doherty, 1986). Tröndle, Greenwood, Bitterli and van den Berg (2014) investigated how spatial arrangements change the aesthetic experience. They provided museum visitors with tracking devices monitoring their every move. Their findings suggest that spatial arrangements can direct visitor attention and behaviour.

The interplay between context and aesthetic value can also be shown on a physiological level: viewing time measured by eye movement parameters. Aesthetic appreciation can manifest itself in viewing time often measured in fixation duration. So far researchers have established a link between attractive faces and viewing time (Leder, Tinio, Fuchs, & Bohrn, 2010; Maner et al., 2003). Attractive faces embedded in real world scenes are fixated longer than their less attractive counterparts. Furthermore attractive faces have been shown to capture and hold attention longer than less attractive faces (Valuch, Pflüger, Wallner, Laeng, & Ansorge, 2015). The presence of a face has been shown to be a valuable predictor of attention in scene perception (Cerf, Frady, & Koch, 2009) and attractive faces even compete for attention with other cognitive tasks (Siu & Liu, 2009). In choice tasks longer viewing times have been shown to predict preference (Shimojo, S., Simion, Shimojo, & Scheier, 2003). Shimojo et al. (2003) also suggest that viewing behavior is actively involved in the formation of preferences.

Brieber, Nadal, Leder and Rosenberg (2014) compared viewing times and perceived aesthetic value in museum and laboratory settings. Artworks seen in the museum context were not only liked more but also viewing times were longer compared to the laboratory. Gartus, Klemer and Leder (2015) compared viewing times for two different styles of art (modern and graffiti) as well as in two different contexts (museum and street). To investigate the two different contexts they chose to employ a visual representation of each context thus embedding each artwork in either a museum wall or a street scene. Artworks embedded in a museum context were looked at longer than artworks embedded in a street context. Heidenreich and Turano (2010) on the other hand found no significant correlation between the aesthetic liking of artworks and viewing times inside the museum. However, they only presented 14 artworks to 4 participants. In testing a very small number of participants the differences in personal preference and viewing behaviour might outweighed any similarities.

Personal preferences can have an effect on the experience of the context itself. Gartus and Leder (2014) showed that context sensitivity with regards to urban art strongly depends on the viewers' personal preference. Participants that stated a high interest in urban art show a greater context sensitivity for urban compared to museum settings compared to the low interest in urban art group. To study this context effect the researchers chose to display the artworks either centered on a wall outside of a building (street context) or on a traditional white museum wall.

Not only sensitivity to context differs individually but also the overall aesthetic sensitivity. Aesthetic sensitivity has been shown to differ in everyday objects (Stich, Knäuper, Eisermann, & Leder, 2007), patterns (Jacobsen & Höfel, 2002) and of course artworks (Leder, Ring & Dressler, 2013). Neuronal activation also shows two distinct responses toward art one triggered by the stimulus itself reflected in cortical activations referred to as objective beauty and subjective beauty reflected in activations inside the amygdala which has been shown to be triggered by personal emotional response towards art (Dio, Macaluso, & Rizzolatti, 2007).

Participants might also greatly vary in their pre-existing art knowledge and interest. Museum studies vary in the choice of participant population and while some researchers chose to study real visitors (Tröndle, Greenwood, Kirchberg, & Tschacher, 2012) others employ students or other participants that might not have visited the exhibition otherwise (Brieber et al., 2015). Employing visitor questionnaires sheds light on the reasons why these persons chose to visit this certain exhibition. Reasons to visit a museum are diverse, from educational purposes till pure hedonic pleasure or social events (Mastandrea, Bartoli, & Bove, 2007). On the other hand museum studies that employ a student population might shed some light on more general processes and experimental groups might be more diverse in terms of art expertise and interest. For the present study a student population was chosen as the Danube canal could be seen as an urban art gallery but is of course not bound to visitors that enjoy the art but also part of Viennese infrastructure (bicycle and pedestrian route as well as subway stations).

1.2 Eye-tracking in Real World Settings

During one second the eye moves at least 3 times and most of the visual information is gathered within a relative stable phase of eye movement (fixation). Fixations allow the

fovea to relocate and thus creating sharp vision with full acuity. This control of gaze is an active and ongoing cognitive task. Eye movement recordings (eye tracking) can be used as a physiological measurement of cognitive processes such as attention. One important aspect of this thesis is to analyze what objects are attended to and how these objects relate to aesthetic experiences. During the perception of a scene (semantically coherent view of a real-world environment; see also Henderson, 2005) attention can be driven by various factors. One factor being the low level stimulus features such as colour, orientation or intensity. Combining these features computationally into saliency maps can predict viewing behaviour above chance (Itti & Koch, 2001). These bottom-up, low level based saliency maps can predict eye movements even better if additional high level features such as informational value or content are added (Cerf, Frady, & Koch, 2008; Tatler, Wade, Kwan, Findlay, & Velichkovsky, 2010; Wu, Wick, & Pomplun, 2014).

A wide range of studies investigating real-world perception employ static scene images. Static images always force the perceiver to view a certain visual angle. In employing mobile eye tracking the viewer is fully immersed in the environment and free to move and attend to each stimulus naturally without forcing the participant into a certain perspective. Natural vision is an ongoing process and certain stimuli do not just pop up in front of the viewer as it would happen in the laboratory on a screen with rapid stimulus onset (sudden onset bias). The sudden onset and offset of a picture violates real world viewing, which occurs as a continuous stream.

Another concern when investigating natural viewing behaviour is the fact that displaying images on a screen leads to a scene framing bias. When images are framed then fixations tend to be centred in the middle of the screen (Tatler, 2007; Vincent & Baddeley, 2005). However, static scenes cannot fully represent the dynamic and active nature of vision in natural settings (Tatler, Hayhoe, Land, & Ballard, 2011).

To investigate the engagement with art in a natural setting while measuring eye movements we decided to employ a mobile eye tracking device. Foulsham, Walker and Kingstone (2011) investigated natural viewing behaviour while participants took a walk among a university campus. While comparing their mobile eye tracking results with results obtained in employing videos from the walks they found similarities in viewing behaviour but also important dissimilarities. How and when objects were fixated differed between both eye tracking conditions.

Since the mobile eye tracking device is only capable of a sampling rate of 60 hertz it is impossible to detect and analyse very small and fast saccades. Therefore the

fixation location and duration is interpreted in this study and no inferences from saccades are drawn. One major concern during outdoor eye tracking is direct sunlight. Since infrared light is employed to record the gaze position all other sources of infrared light such as sunlight should be avoided as far as possible. To achieve the best possible tracking quality four participants were tested at a location similar to the one used in this study to check for lighting conditions.

1.3 Field versus Laboratory Testing

This thesis aimed to investigate an everyday context and thus a field experiment was conducted. To establish a foundation for testing cognitive processes in laboratory that can predict real life phenomena studies need to be grounded in real world observations (Kingstone, Smilek, & Eastwood 2008). Psychology has catered to these demands in broadening classical experimental paradigms. With the verge of research topics such as situated cognition (Smith, & Semin, 2004) or embodiment (Wilson, 2002) focusing on the interaction between persons and their environment, the fact that organisms are immersed in an active environment or context that has to be studied gained more and more importance (Barrett, Mesquita, & Smith, 2010).

Observing and analyzing data from real world settings differs from classical laboratory experiments. Classical laboratory experiments strive to minimize the complexity of any given environment to gain maximum control over all variables. These standard quality factors are very difficult if not impossible to recreate in natural environments. This study was designed to observe viewing behavior in a complex environment. The environment was in no way manipulated and could not be controlled since testing occurred in a public space. During the design of this study the possible benefits and of course experimental disadvantages were weighed against each other. To counterbalance for the complexity of the study environment three design considerations were made: First, we relied on very detailed systematic observation. Each participant was filmed and closely monitored. The environment was documented in great detail employing videos, photography and on site protocols.

Second, a mixed method approach was chosen to exhaust the potential of the study. Therefore we employed quantitative physiological (eye tracking) and psychological (rating procedure, questionnaires) measurements as well as qualitative

methods (verbal description task). Qualitative methods often suffer from a bad reputation since they employ subjective data directly from the participants which can be susceptible to the requirements of the researcher (Piccinini, 2003). Therefore strict guidelines for the acquisition and analysis were established. During this study two well-established and controlled qualitative methods were used: one being the employment of a modified thinking aloud task (Zhao, McDonald, & Edwards, 2014) and two being employing a standardized and transparent form of data analysis – qualitative content analysis (Mayring, 2010).

Third, parts of the study were conducted inside a controlled laboratory environment to integrate the complementary benefits of ecologically valid field testing and controlled laboratory environments. Individualized stimulus material for laboratory testing was obtained while eye tracking in a natural setting – ensuring the possible best fit between the outdoor eye tracking experience and obtaining further data in the laboratory. Observers are able to recognize their own viewing behavior (Foulsham & Kingstone, 2013), thus showing individualized video materials was employed to mimic the original experience as closely as possible.

1.4 Aim and Research Questions

This thesis examined how people engage and explore aesthetic objects in everyday settings. Therefore I chose the following variables to be investigated: viewing location and time, aesthetic value, subjective experience, as well as personal preference and expertise. Viewing location and time were chosen to investigate (1) if people engage with artworks even if they are not directly instructed to do so and how long they engage with artworks (measured in viewing time/ fixation duration). Research has already established a link between the aesthetic value of a face and viewing time. As part of this project I investigated (2, 3) if the aesthetic value (operationalized as liking and interest) modulates viewing behavior. In line with previous research I expected viewing times to be linked to liking and interest. The subjective experience each participant had was also considered and operationalized as a verbal statement task commenting on the individual videos of each walk (4). Further the personal art interest and expertise was considered as important variables that might modulate aesthetic value and viewing behavior (5).

AESTHETICS IN EVERYDAY LIFE

Due to that fact that little studies have been conducted in outdoor settings this thesis also aims to explore the possible benefits and challenges of designing and executing studies that investigate aesthetic experiences in outdoor settings.

This thesis examined how people encounter art in an everyday setting; therefore this thesis seeks to address the following questions:

(1) Which objects capture gaze frequently?

Which objects are aesthetically valuable?

(2) How does the aesthetic value modulate viewing time?

(3) How is the subjective experience described?

(4) How is the aesthetic value linked to art interest and expertise?

2 Method

2.1 Participants

Twelve participants (5 female), ages between 25 and 32 ($M_{\text{age}} = 27.2$; $SD = 2.2$) were recruited for this study. The sample included seven psychology students who partly received course credit for participation. A small sample was chosen because of the expected difficulty of obtaining and analysing the eye tracking datasets. One participant was excluded due to technical issues (calibration error and resulting data loss). All participants reported normal or corrected to normal vision and no formal art training.

2.2 Apparatus

Gaze behaviour was measured employing mobile eye tracking glasses by SensoMotoric Instruments (SMI; Teltow, Germany). The eye tracker possesses three cameras. One camera aligns with the participants' eyes recording a first person view video. The other two cameras are placed inside the rim of the glasses to monitor the position of the pupil and the corneal reflection of both eyes. Data was stored with a rate of 30 hertz (binocular) on a mobile data recording unit. Participants carried the mobile unit inside a shoulder bag. To achieve a better tracking quality in direct natural light, the eye tracker was used with tinted glasses as suggested by the manufacturer. Calibration was achieved via 3 point calibration. As calibration points, three dots on a wall arranged like a triangle with a side length of approximately 1.5 m were used. All participants were placed at 2 meter distance to the calibration wall and verbally instructed to view the left, right, and upper middle dot twice.

2.3 Eye tracking at the Danube Canal

As an everyday *context* that displays artworks as well as natural sights (greens, water, and bushes) the Danube channel in the city of Vienna was chosen. For an overview of the walking path please see Figure 1. Participants walked about 220 m from the starting point to the finish line. This chosen section of the Danube channel is part of a

cultural enrichment programme by the city of Vienna called “Wiener Wand” (“Viennese Walls”). The so called “Viennese Walls” are publicly assessable walls where graffiti spraying is not only legal but even encouraged (for more information please see <http://www.wienerwand.at/>). Additionally, at the time of testing, this section of the channel featured an outdoor sculpture exhibition as part of a cultural and artistic open air event zone, called “Vienna Summerstage”. To further highlight the cultural importance of graffiti artworks, the outdoor sculpture exhibition featured welded metal sculptures by Hans Kupelwieser—an Austrian sculptor and mason that teaches sculptural design at the Technical University of Graz, Austria—which were additionally spray painted by Viennese graffiti artists to create three dimensional graffiti art pieces. All sculptures were displayed on platforms and accompanied by labels. Each label stated the name of the exhibition (Summerstage), the name of the artist that created the sculpture (Hans Kupelwieser) and the name of the graffiti artist. The labels provided no title or any additional information about the meaning of the sculptures.



Figure 1. (A) Google maps satellite picture, showing the eye tracking path at the Danube Canal in Vienna’s ninth urban district. The small embedded picture shows an example of a sculpture (*circle*), as a part of the “Summerstage” open air art exhibition. (B) A photo capturing the first person perspective at the starting point (start) of the eye tracking path. (C) A screenshot from the eye tracking camera, showing the second half of the path and the sculpture garden.

Before participation, participants received a detailed map with instructions about the meeting point. On their arrival, all participants were greeted and verbally informed about the procedure of the eye tracking session as well as the follow-up laboratory session. After filling out the consent form, participants were equipped with the eye-tracking glasses and were asked to wear a baseball cap, producing better lighting conditions. After adjusting the right fit of the glasses, calibration was performed. During the calibration procedure, participants were instructed to view specific points on a wall. Participants were then escorted to the starting point and instructed as follows: “Please take a walk. Please walk straight ahead. The walking time takes approximately 4 minutes. At the end you will see the word *finish* written on the ground and a second experimenter awaits you.” Participants were also told that during the walk, they could raise their arm to signal any discomfort or the wish to stop participation. Before starting the recording, participants were informed that the glasses will now record their gaze direction as well as video and audio recordings.

One experimenter followed the participants in a distance of about 10 m and made notes using a semi structured protocol. At the finish, participants were thanked and reminded about the date and time for the laboratory session.

2.4 Video and photo materials

During the eye tracking session, videos were recorded by an integrated camera placed between the two glasses. The camera displayed a visual field of 60° horizontal and 46° vertical and had a resolution of 960 × 720 pixels. For each participant, the individual video from the eye tracking session was cut, starting when they started walking until they passed the finish line.

Moreover, 51 photos were taken along the eye tracking path with a digital camera (Nikon D90). Of the 51 photos, 31 depicted a graffiti artwork, 5 a sculpture, 4 an advertisement, 9 a nature scene, and 2 nature and sculptures together. The photos were taken on the same day as eye tracking took place with a minimum distance of 3 meters. Due to varying sizes of all graffiti artworks (ranging from 1m length to 6m length) the distance was chosen individually to assure that every artwork could be photographed entirely in one frame. All photographs were later cropped to a 16:9 format. Sculptures

were photographed with their accompanying labels and also cropped to a 16:9 format. Nature scenes from the canal only displayed nature (trees, water, and greens) and no graffiti artworks or sculptures. All advertisements were in portrait format, however, to ensure a better comparability the photographs were also taken in landscape format.



Figure 2. Stimulus example of graffiti “Mermaid” cut to 16:9 format.

2.5 Laboratory session

All participants were invited to the laboratory about one week after the eye tracking session. In a first block, a verbal statement task was conducted to investigate the *subjective experience*. Therefore, all participants viewed their personal videos from the eye tracking session. The videos were presented full screen on a 24 inches monitor without audio. Participants thereby were instructed to verbally comment on what they see and what they like and dislike. Instructions were modified from thinking aloud tasks often used in usability research (Tombros, Ruthven, & Jose, 2005). An instructed evaluation approach was used (modified from Rieh, 2002; Tombros et al., 2005):

“Please think aloud while you are viewing the video. Please mention everything that you liked or disliked. Please keep constantly talking from beginning till the end of the task. Act as if you were alone, with no one listening, and just keep talking.”(Translated from German)

The instructions were given verbally by the researcher. To assure that all instructions were given in the exact same wording they were read to the participant. Before the video started, participants were informed that their voice will be recorded. According to standards for thinking aloud tasks, participants were only interrupted by the

researcher if they stopped talking for at least 5 seconds. The verbal statements were recorded on a smartphone (Samsung note 3). During the recording, the experimenter stood right behind the participants and observed their behaviour (semi structured protocol). After the video, participants were given a questionnaire with four questions about the video (see Table 1). All questions were answered via yes or no options. Only yes options included an open answer format.

Table 1

Items in the video questionnaire (translated from German)

- | | |
|----|---|
| 1. | Do you want to say anything further about the video? If yes, please fill in here. |
| 2. | Did you visit this section of the Danube channel before? If yes, please indicate why. |
| 3. | Would you like to visit this section of the Danube channel again in your leisure time? If yes, please indicate why. |
| 4. | Was that your video or the video of another person? Please indicate why. |

In a second block, personal *aesthetic judgement* was operationalized as liking and interest. These two variables are frequently used in empirical studies investigating aesthetic experiences (Leder, Cabron, & Ripsas, 2006; Leder, Gerger, Dressler, & Schabmann, 2012; Locher, Smith, & Smith, 1999) and cover the informational value as well as aesthetic appreciation of a given stimulus. The 51 photos were therefore presented in random order on a 24'' monitor without a time limit. Participants were asked to rate each photo for liking "How much do you like this scene/ artwork" on a seven Likert point-scale ranging from 1 (*do not like*) to 7 (*like it very much*) and for interest "How interesting is this scene/ artwork?" from 1 (*not interesting*) to 7 (*very interesting*). Liking ratings were given before interest ratings, whereat the according question and the scale were displayed beneath the photos. Ratings were obtained via pressing the respective number on the keyboard. A blank screen appeared for 500 ms between the photos followed by the next image.

In a third block, participants were asked to fill out two questionnaires: a questionnaire for art expertise and art interest (modified from Leder, Carbon, & Ripsas, 2006) and a questionnaire for graffiti and urban art interest (Gartus & Leder, 2014). After completion, all participants were debriefed and thanked.

3 Results

3.1 Eye tracking

The eye tracking data consist of videos recorded by the built in camera and frame-by-frame recordings of the gaze position. BeGaze software (version 3.5.101) was used for semantic gaze mapping. Each fixation was coded to a corresponding reference view of the scene manually. In total, 48 areas of interest (AOIs) were defined, 31 AOIs depicting graffiti artworks, 5 sculptures, 5 advertisements and one AOI each for cars, pedestrians, bicycles, nature, waterfront, pathway, and architecture. For each AOI, it was determined if a participant fixated on it and for how long. Please see Figure 3 as an example for AOI placement.

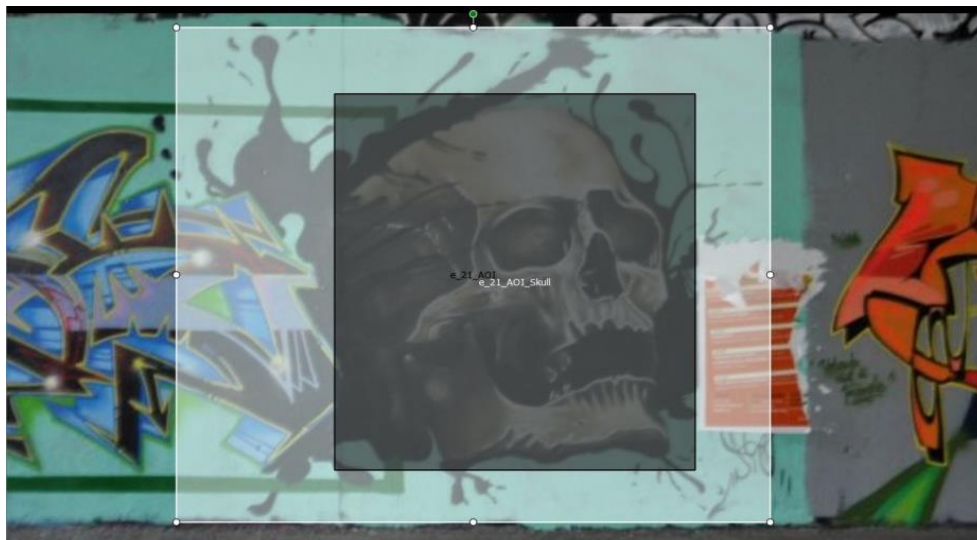


Figure 3. Example for AOI placement: grey AOI for the direct representational artwork, white AOI artwork backdrop. Since the artworks backdrop is part of the original artwork fixations on both AOIs were categorized as fixations within the artwork.

3.1 What objects captured gaze frequently?

During the walk, participants were confronted with a variety of objects. In order to determine what objects were fixated, each fixation was coded according to one of the following categories: advertisements, art (graffiti, sculptures), buildings, nature, traffic, pathway, and out. The category out consists of fixations outside of the video frame. These can be due to eye movements in the corner of the eyes and cannot be tracked since the

video angle is smaller than the angle of detectable eye movements. Fixations on persons, bicycles and cars all constitute the category traffic. See Figure 4 for the percentage of total fixation duration (TFD) that was spent fixating each category for each participant.

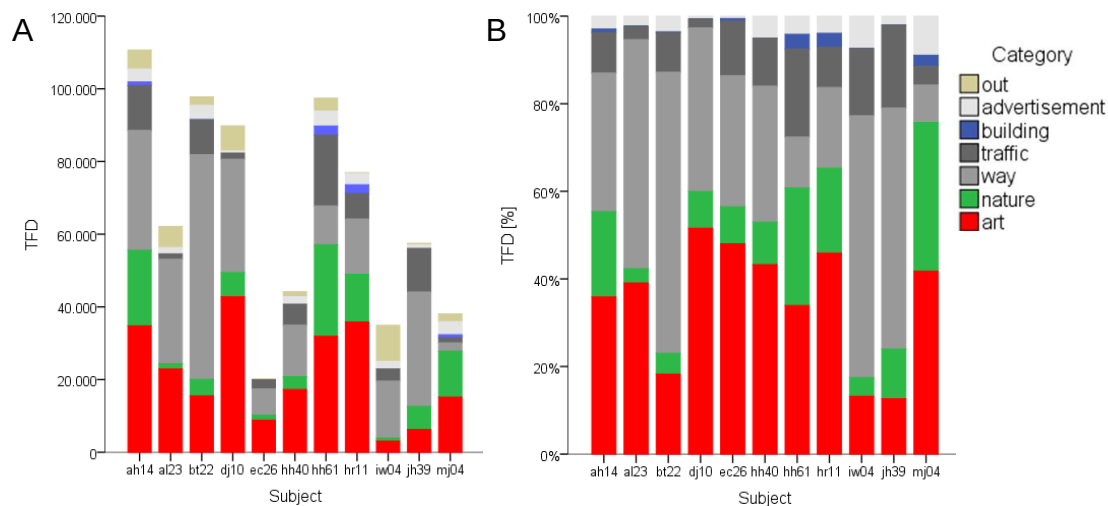


Figure 4. (A) Total fixation duration in ms grouped by categories. (B) Percentage of category fixations proportional to all fixations.

In natural scenes as well as in laboratory settings faces and texts are shown to capture gaze. My findings partly replicate these findings with regard to text. Although one could argue that some amount of the graffiti artworks displayed at the Danube channel consisted of artistically changed texts. An example of an artwork that was clearly read can be seen in Figure 5. Figure 6 displays an example for an artwork with focus on the representational elements.

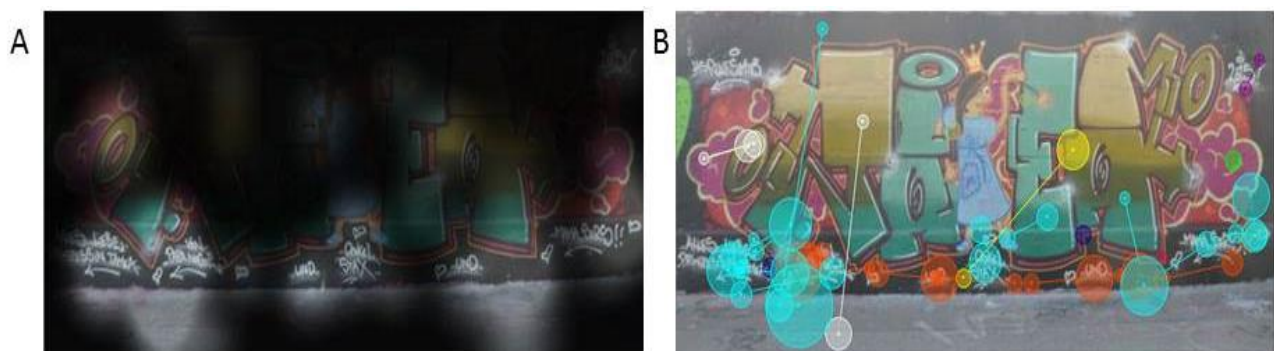


Figure 5. (A) Focus map highlighting the most often fixated areas. The focus map clearly indicates that participants rather spent time reading the accompanying text underneath the artwork. (B) Same stimulus with overlaid scanpaths.

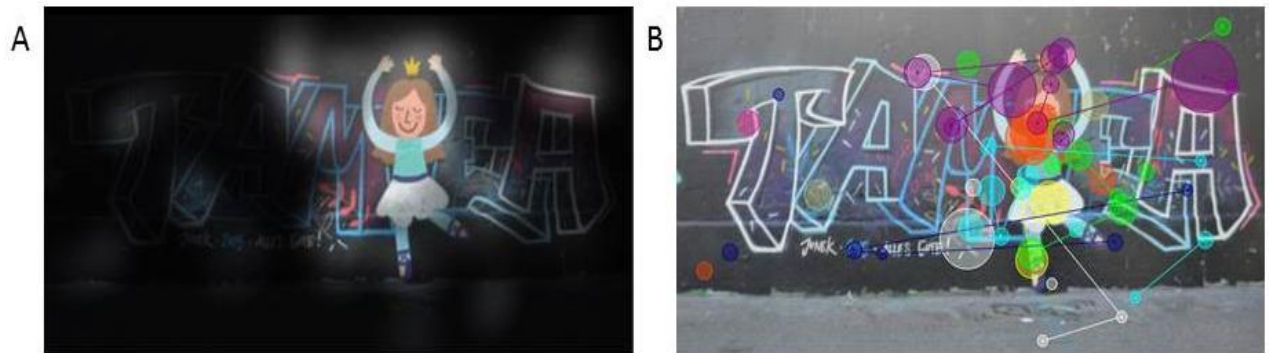


Figure 6. (A) Focus map highlighting the most often fixated areas indicating that the representational elements of the artwork were more often and densely fixated. (B) Same stimulus with overlaid scanpaths.

3.2 Content analysis

F4transkript software (Version 5.60.0) was used to transcribe the verbal statements of each participant. A standard and simple form of transcription style was chosen (Bohnsack, 2008). It was analysed which objects were named during the video presentation and how these objects were described. Therefore, terms referring to objects were assigned to one of the following categories: graffiti, sculpture, persons, bicycles, advertisements, nature, or architecture. For a list of all words please see Appendix A. Out of all statements during the verbal task 10.20% mentioned nature and 39.21% mentioned art (either graffiti or sculpture). Graffiti artworks were mostly mentioned if they displayed some form of representational element (66.00%) or referred to in generic ways (36.17%) and only 12.76% of all graffiti related statements mentioned artworks that did not have representational elements.

Additionally, a qualitative content analysis was conducted, structuring the verbal statements into inductively created categories (Mayring, 2010). Based on the research question and the experimental design the category criteria included all individually stated objects, evaluations of these objects, associations with regard to the objects as well as statements about the participation in the experiment itself or the viewing of the video. The level of abstraction was defined as concrete statements as well as generalized statements. The units of analysis consisted of a coding units, which are defined as meaningful elements of each transcript. The context unit comprehends all transcripts, protocol notes by the interviewer as well as the video sequences. These were especially important for coding object statements that did not include the actual naming of the object but instead a

referential pronoun such as “that”. All object references that were only accessible via the video and not uniquely stated are marked in all transcripts with the code “[vid]”. All eleven transcripts were analysed.

Table 2

Thematic categories with example phrases

Code	Thematic category	Example Phrase (English translation)	Example Phrase (German original)
A1	Video origin	<i>Is that mine, is that what I have seen?</i>	<i>Ist das meins, was ich gesehen habe oder wie?</i>
A2	Assigning adjectives	<i>Um, yes, the graffiti are relatively interesting.</i>	<i>Ähm, ja, die Graffiti sind relativ interessant.</i>
A3	Assigning personal meaning/association	<i>[...] I looked at it because it reminded me of an app – a unicorn game which I used to have on the cell phone.</i>	<i>[...] habe ich mir angeschaut, weil’s mich an eine App erinnert – also ein Unicorn-Spiel das ich auf dem Handy gehabt habe.</i>
A4	Walking experience	<i>Um, I just realize that it wasn’t that annoying that you followed me. Actually, I did not notice that at all.</i>	<i>Ähm, wobei mir grad einfällt dass das gar nicht so gestört hat, dass ihr hinten nachgegangen seid. Das hat man dann eigentlich überhaupt nicht gemerkt.</i>
A5	Neutral object mention	<i>On the ceiling it says Caton or so.</i>	<i>Oben an der Decke steht Caton oder so.</i>

Table 2 shows the coding categories with statement examples. Since all verbal statements were given in German all example phrases will be quoted in German to avoid translation errors and stay as close to the original material as possible.

Overall, 255 statements were coded into five main categories (See Table 3). Categories A2, A3 and A5 were divided into either positive or negative (A2) and object categories: graffiti, sculpture, writing, nature, architecture, advertisements (A2) and persons (only A5). Statements in category A3 were only divided between graffiti, sculpture and nature. All percentage values were calculated in proportion to the number of total statements among all categories (255). Most statements were coded in category A2. For a detailed analysis of category A2 please see Table 4. The amount of positive

statements about graffiti artworks correlated positively with the amount of positive statements about sculptures $r = .776, p = .005$. Category A5 is comprised of neutral statements and was divided into 5 object categories, please see Table 5 for the content analysis.

Table 3

Content analysis of inductive categories overview

	A1	A2	A3	A4	A5
Count	15	117	24	17	82
%	5.88%	45.88%	9.41%	6.67%	32.15%
Participants	6	11	9	6	11

Table 4

Detailed content analysis category A2 (assigning adjectives)

Object category	Positive			Negative		
	Count	%	Persons	Count	%	Persons
Graffiti	33	12.94	9	14	5.49	6
Sculpture	11	6.67	7	4	1.57	2
Writing	0	0.00	0	17	6.67	6
Nature	17	4.31	6	2	0.78	1
Architecture	6	2.35	5	0	0.00	0
Advertisement	0	0.00	0	7	2.75	6

Table 5

Detailed content analysis category A5 (neutral object mention)

	Graffiti	Sculpture	Nature	Person	Architecture
Count	8	5	9	23	5
%	3.14%	1.96%	3.53%	9.02%	1.96%

The video questionnaire revealed that 8 out of 11 participants visited the section of the Danube canal before and that all participants would like to visit the section again in their leisure time. Ten out of eleven participants indicated they had recognized the video as their own.

3.3 Liking, Interest, and Viewing time

Mean liking was highest for the category nature, followed by sculptures (see Table 6); although on the individual stimulus level the most liked three stimuli consist of two Graffiti artworks. The top rated graffiti artwork (“Mermaid”; $M = 6.17$, depicted in Figure 2) showed a mermaid the second most liked graffiti artwork (“Skull”, $M = 5.92$, depicted in Figure 2) showed a skull. Only the third most liked artwork was a sculpture (“Circle”, $M = 5.42$, depicted in Figure 7). Mean liking was significantly higher for artworks that had representational ($M = 4.43$) elements compared to those that did not feature any representational element ($M = 2.88$), $U = 259.00$, $z = 3.07$, $p < .000$, $r = .60$ (see Figure 8). Mean interest was also significantly higher for artworks that had representational ($M = 4.30$) elements compared to those that did not feature any representational element ($M = 2.70$), $U = 252.00$, $z = 3.38$, $p < .000$, $r = .56$ (see Figure 8). Liking and interest ratings were highly correlated, $r = 0.73$, $t(10) = 3.42$, $p = .006$.

Table 6

Mean liking and interest ratings for each object category

Object category	<i>N</i>	Liking		Interest	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Advertisement	4	2.95	1.45	2.62	1.55
Graffiti artwork	30	3.34	1.69	3.08	1.69
Nature	9	5.00	1.49	3.55	1.03
Sculpture	5	4.00	1.72	4.48	1.73

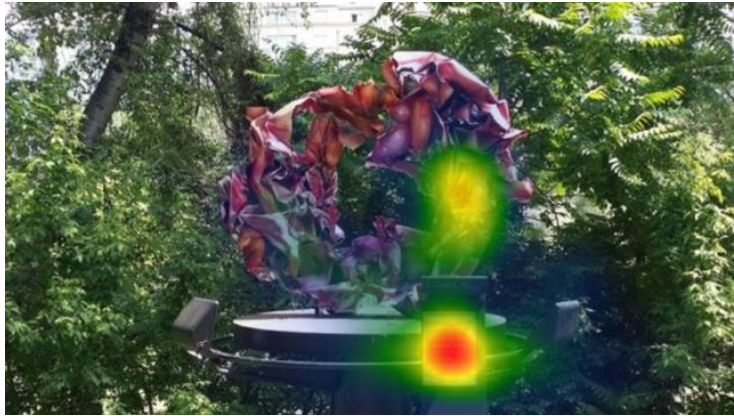


Figure 7. Heat map of most liked sculpture (“Cirlece”).

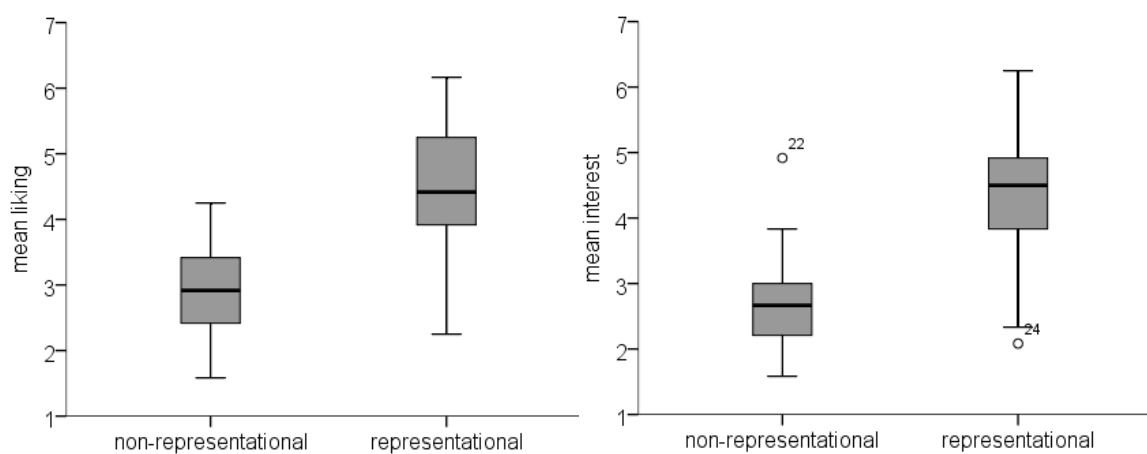


Figure 8. Distribution of liking and interest ratings for each stimulus group (representational and non-representational artworks) with whiskers showing minimum and maximum value.

To investigate which role the aesthetic value plays in modulating viewing times, two linear regression analyses were conducted with TFD as dependent variable and liking and interest as predictors. For the regression analyses, only graffiti artworks and sculptures were included. See Figure 9 for regression graph. For each object a mean value for TFD and liking, and interest was calculated. Liking positively predicted TFD, $R^2 = .218$, $t(30) = 2.84$, $p = .008$, $b = 144$, $\beta = .467$. Interest ratings also positively predicted TFD, $R^2 = .294$, $t(30) = 3.47$, $p = .002$, $b = 155$, $\beta = .542$.

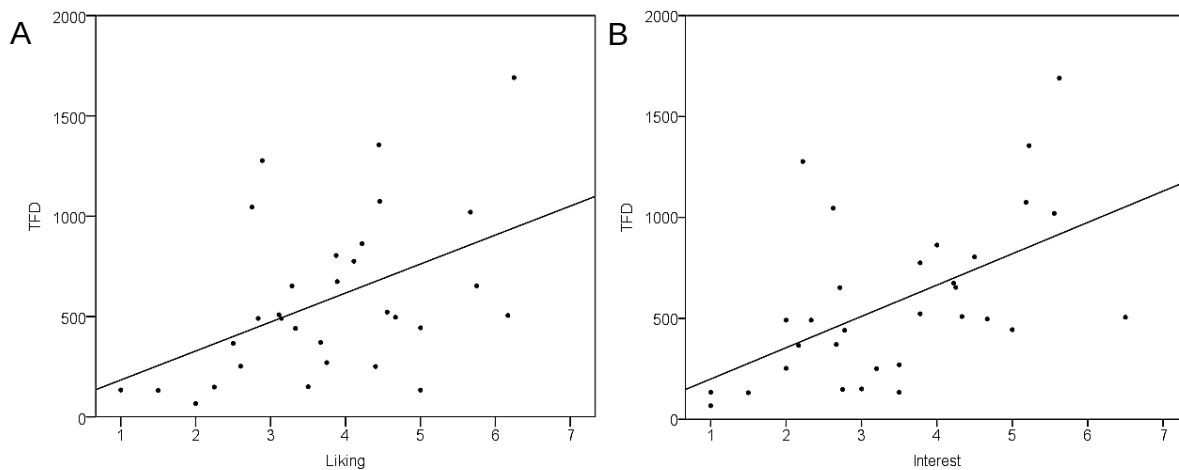


Figure 9. Linear relation between liking and TFD (A) as well as interest and TFD (B). Each dot represents one artwork (graffiti or sculpture).

3.4 Art Interest and Expertise

Participants showed a mean art interest score of 58.75 ($Mdn = 60$, $SD = 13.96$, range: 25 – 79) on a scale from 15 to 105. The mean graffiti interest was 66 ($Mdn = 66.00$, $SD = 15.88$, range: 30 – 90) on a scale from 10 to 90. Mean art expertise was, $M = 10.33$ ($SD = 4.08$, range: 4 – 15) on a scale from 0 (no correct answer) to 26 (all questions answered correctly).

Art interest and graffiti interest showed a high positive correlation, $r = .82$, $t(10) = 4.55$, $p = .001$. Also, art interest and liking were positively correlated, $r = .639$, $p = .034$.

4 Discussion

During their daily activities humans explore and engage a wide range of objects that are designed to attract attention. Urban art and graffiti has found a way to the streets of every city. In the course of this thesis I investigated how pedestrians engage and explore urban art. Therefore a walk at one of Vienna's most frequented outdoor urban art displays was analysed in terms of viewing behaviour. The whole walk was recorded and fixations were mapped and analysed according to their location and duration. In a laboratory session participants commented the video from their personal walk and rated objects from the walk according to liking and interest.

The results indicate that liking and interest can predict the total fixation duration on artworks in a positive linear manner. Further, fixation locations combined with fixation duration indicate that people spent up to 50% of their total fixation duration time visually exploring artworks. Moreover, the results indicate that artworks featuring representational elements were preferred over non-representational artworks.

4.1. Fixation Location: What objects were frequently looked at?

Every detected fixation was categorized according to object categories. Results revealed that participants spent up to 50% of their total fixation duration time on fixating on artworks or sculptures. Nevertheless these percentages vary greatly from participant to participant. This finding is especially important since we did not instruct participants to view the artworks. The walking path and the accompanying task were chosen to allow naturalistic and unconstrained viewing behaviour.

Nature scenes were the highest rated category. Nature scenes have often been shown to be preferred over scenes depicting human made objects (Biederman & Vessel, 2006; Han, 2010; Tinio & Leder, 2009). Participants who verbally stated a high interest in nature and frequently mentioned the category nature show a more balanced ratio between fixations on artworks and nature. However, the time percentage spent looking at nature never exceeded the time spent looking at artworks. Of course the results presented in this study are limited to one location – the Danube channel. The link between viewing time and liking could not be predicted for nature scenes in the course of this study. A direct comparison to human made artworks and objects must be clarified in a more controlled environment. During the interview nature was mentioned and described by every participant and all statements concerning the trees, greens and riverbank were positive, while mentions of artworks greatly varied in their valence.

Still, the most liked artworks had one thing in common: they had representational elements. Each artwork depicted either a representational element (mermaid, skull) or at least a form that was recognisable (circle). Artworks that did not depict any representational element were liked less. The content analysis also revealed that graffiti artworks with representational elements were more often mentioned and described. Only two participants verbally commented on graffiti artworks that did not include any representational element. This result is in line with prior research about art novices.

Abstract and non-representational art are liked less by lay persons with lower art expertise (Flexas, Rossello, de Miguel, Nadal, & Munar, 2014; Pihko et al. 2011; Silvia, 2013). Nevertheless this relationship could be moderated by personal preference (Cattaneo et al., 2014).

Sculptures mean liking ratings were higher than mean liking ratings for graffiti art. This result could be due to several reasons. First, all five sculptures had been designed by the same artist. In contrast, the graffiti artworks showcased many different styles of application by different artists with varying technical skills. Second, the presented sculptures could be easily classified as fine art since they were presented on platforms and accompanied by labels. Directly labeling an object as art can lead to higher aesthetic value (Kirk et al., 2009). During the verbal commenting task all eleven participants mentioned the sculptures in a positive way and several participants stated that they were unsure about the meaning of the sculptures and therefore read the accompanying labels (*“[...] die äh seltsamen Kunstwerke auf der rechten Seite [sculptures] die ich schon mal gesehen habe, natürlich ähm ja das [label] habe ich gelesen, das weiß ich noch.”*; german original). The tendency to read e.g. focus on the accompanying labels is also supported by the eye tracking analysis, which shows dense and long fixation patterns on the labels (see Figure 7 as an example). This result is in line with previous research indicating that text attracts visual attention in scene perception (Wang & Pomplun, 2012).

Fixation patterns on graffiti artworks also showed participants tendency to read the accompanying writings – if present. Fixation patterns on the graffiti artworks that combined text and artworks indicate that the high percentage of fixations on graffiti artworks is not due to the fact that participants tried to read the artworks (See Figure 6 for a focus map example). Interestingly almost all artworks displayed on the first half of the walk consisted of the same word (“Tamea”). Only one participant stated the word and its reappearance right after the walk. Additionally this participant showed high fixation counts on all written language and also studied German philology. The link between personal expertise not only in art but also language or design and fixation locations and patterns should be considered in future studies. The difference in expertise and interest in specific object domains could further explain intricate differences in viewing behaviour. Personal expertise might change how persons prioritise the informational value an object has and therefore guide visual attention (Gegenfurtner, Lehtinen, & Säljö, 2011).

4.2. Aesthetic value modulates viewing behaviour

Participants liking and interest ratings predicted the total fixation durations on artworks in a positive linear matter. This finding underpins the assumption that aesthetic value can guide visual exploration. The positive linear relationship was even stronger for interest. Interestingly this result does not apply to the most liked artwork. This finding could be due to the study design. The most liked artwork was located right at the beginning of the walking path. This leads to two basic errors: one being the fact, that participants were calibrated under a shadowy bridge and stepped outside into full sunlight right at the beginning of the walk. This drastic change in lighting caused a considerable amount of tracking loss at the first 10 seconds of each walk. A second being the position of the most liked artwork. To focus on the artwork participants had to tilt their head to the left while standing on the starting point otherwise the artwork could not be seen. These two design considerations should be kept in mind for future outdoor eye tracking studies. Drastic lighting changes should be avoided. For the design of future studies it is advisable to start the eye tracking device earlier and leave at least 1 minute between the environmental pathway of research interest and the calibration procedure. Tracking loss and bad placement might account for the rather short fixation duration on the most liked artwork. In contrast the second most liked artwork (the skull) was located approximately in the middle of the whole pathway in a shadowy area. Hence, lighting and therefore tracking conditions were much better during the section where the skull was located.

Further the task design of studies investigating natural eye movements and behaviour should be considered. As a first step towards investigating aesthetic experiences in everyday settings we chose a free exploring paradigm. A task that allows natural eye movements and behaviour leaves the participant fully immersed in a natural environment. However, since eye movements are highly task dependent (Hayhoe & Ballard, 2005) future studies should further examine the predictive effect of aesthetic value on viewing behaviour while employing varying tasks. Sui and Liu (2009) showed that attractive faces can have distracting effects on covert attention. Effects and assumptions like these can only be investigated in systematically varying tasks and environments employing larger confirmatory studies.

5 Conclusion

Eleven participants walked 200m along the Danube canal wearing mobile eye tracking glasses. The results of this mixed method study indicate that people engage with graffiti and fine art placed in public everyday settings and that the level of engagement can be predicted by the perceived aesthetic value of artworks. Even in an everyday outdoor setting clear differences in engagement and evaluation of fine and graffiti art were observed – indicating that the labelling of fine art even in unusual locations still increases its value although they were placed nowhere near a museum setting. Graffiti art and displays of fine art in public spaces enrich the cities profile and are even more recognized and valued if they are displaying representational elements. This study provides valuable insights into the allocation of attention in a natural setting. Free exploring gave the participants the freedom to interact with the environment and thus being fairly uncontrolled yielded valuable results about the modalities of attention beyond the classical low level feature approach. In combining and validating these results in future laboratory studies employing personalized video material the aesthetic value an object possesses could lead to a deeper understanding of individual viewing behaviour.

All of the participants wanted to come back to the Danube canal in their leisure time. Some had been there already showing that the graffiti and art display is appreciated by them not only for the sake of art but also because of its embeddedness in complementary nature. All in all this study highlights the importance and possible benefits of art displays in everyday life and hopefully inspires more cities to legalize walls and public spaces for the display of art supporting the urban art movement and its stance as a public asset.

References

- Austin, J. (2010). More to see than a canvas in a white cube: For an art in the streets. *City: Analysis of Urban Trends, Culture, Theory, Policy, Action*, 14(1), 33–47. doi:10.1080/13604810903529142
- Banksy (2007). *Wall and Piece*. London: Century.
- Barrett, L. F., Mesquita, B., & Smith, E. R. (2010). The Context Principle. In *The Mind in Context* (pp. 1–22). New York: Guilford Press.
- Biederman, I., & Vessel, E. A. (2006). Perceptual pleasure and the brain. *American Scientist*, 94, 247-253.
- Boden, M. a. (2007). Authenticity and computer art. *Digital Creativity*, 18(1), 3–10. doi:10.1080/14626260701252285
- Bohnsack, R. (2008). *Rekonstruktive Sozialforschung*. Opladen & Farmington Hills, MI: Barbara Budrich.
- Brieber, D., Nadal, M., & Leder, H. (2015). In the white cube: Museum context enhances the valuation and memory of art. *Acta Psychologica*, 154, 36–42. doi:10.1016/j.actpsy.2014.11.004
- Brieber, D., Nadal, M., Leder, H., & Rosenberg, R. (2014). Art in time and space: Context modulates the relation between art experience and viewing time. *PLoS ONE*, 9(6), 1–8. doi:10.1371/journal.pone.0099019
- Cattaneo, Z., Lega, C., Gardelli, C., Merabet, L. B., Cela-Conde, C. J., & Nadal, M. (2014). The role of prefrontal and parietal cortices in esthetic appreciation of representational and abstract art: A TMS study. *NeuroImage*, 99, 443–450. doi:10.1016/j.neuroimage.2014.05.037
- Cerf, M., Frady, E. P., & Koch, C. (2008). Using semantic content as cues for better scanpath prediction. *Proceedings of the 2008 Symposium on Eye Tracking Research & Applications - ETRA '08*, 1(212), 143. doi:10.1145/1344471.1344508

- Cerf, M., Frady, E. P., & Koch, C. (2009). Faces and text attract gaze independent of the task: Experimental data and computer model. *Journal of Vision*, 9(12), 10.1–15. doi:10.1167/9.12.10
- Chatterjee, A. (2004). Prospects for a cognitive neuroscience of visual aesthetics. *Bulletin of Psychology and the Arts*, 4, 55–60.
- Dio, D. C., Macaluso, E., & Rizzolatti, G. (2007). The golden beauty: Brain response to classical and renaissance sculptures. *PLoS ONE*, 2(11). doi:10.1371/journal.pone.0001201
- Dowling, C. (2010). The aesthetics of daily life. *British Journal of Aesthetics*, 50(3), 225–242. doi:10.1093/aesthj/ayq021
- Duncum, P. (1999). A Case for an Art Education of Everyday Aesthetic Experiences. *Studies in Art Education*, 40(4), 295–311. doi:10.2307/1320551
- Farias, G. (2011). Everyday aesthetics in contemporary art. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 3(3), 440–447.
- Foulsham, T., & Kingstone, A. (2013). Where have eye been? Observers can recognise their own fixations. *Perception*, 42(10), 1085–1089. doi:10.1068/p7562
- Foulsham, T., Walker, E., & Kingstone, A. (2011). The where, what and when of gaze allocation in the lab and the natural environment. *Vision Research*, 51(17), 1920–1931. doi:10.1016/j.visres.2011.07.002
- Gartus, A., Klemer, N., & Leder, H. (2015). The effects of visual context and individual differences on perception and evaluation of modern art and graffiti art. *Acta Psychologica*, 156, 64–76. doi:10.1016/j.actpsy.2015.01.005
- Gartus, A., & Leder, H. (2014). The white cube of the museum versus the gray cube of the street : the role of context in aesthetic evaluations. *Psychology of Aesthetics, Creativity, and the Arts*, 8(3), 311–320. doi:http://dx.doi.org/10.1037/a0036847

- Gegenfurtner, A., Lehtinen, E., & Säljö, R. (2011). Expertise Differences in the Comprehension of Visualizations: A Meta-Analysis of Eye-Tracking Research in Professional Domains. *Educational Psychology Review*, 23(4), 523–552. doi:10.1007/s10648-011-9174-7
- Gerger, G., Leder, H., & Kremer, A. (2014). Context effects on emotional and aesthetic evaluations of artworks and IAPS pictures. *Acta Psychologica*, 151, 174–183. doi:10.1016/j.actpsy.2014.06.008
- Han, K. (2010). An Exploration of Relationships Among the Responses to Natural Scenes. *Environment And Behavior*, 42(2), 243–270. doi:10.1177/0013916509333875
- Hayhoe, M., & Ballard, D. (2005). Eye movements in natural behavior. *Trends in Cognitive Sciences*, 9(4), 188–194. doi:10.1016/j.tics.2005.02.009
- Heidenreich, S. M., & Turano, K. a. (2010). Where Does One Look When Viewing Artwork in a Museum? *Empirical Studies of the Arts*, 29(1), 51–72. doi:10.2190/EM.29.1.d
- Henderson, J. (2005). Introduction to real-world scene perception. *Visual Cognition*, 12(6), 849–851. doi:10.1080/13506280444000544
- Irvin, S. (2008). The pervasiveness of the aesthetic in ordinary experience. *British Journal of Aesthetics*, 48(1), 29–44. doi:10.1093/aesthj/aym039
- Jacobsen, T. (2002). Aesthetic Judgments of Novel Graphic Patterns: Analyses of Individual Judgments. *Perceptual and Motor Skills*, 95(7), 755. doi:10.2466/PMS.95.7.755-766
- Kingstone, A., Smilek, D., & Eastwood, J. D. (2008). Cognitive Ethology: a new approach for studying human cognition. *British Journal of Psychology*, 99, 317–40. doi:10.1348/000712607X251243

- Kirk, U., Skov, M., Hulme, O., Christensen, M. S., & Zeki, S. (2009). Modulation of aesthetic value by semantic context: an fMRI study. *NeuroImage*, 44(3), 1125–32. doi:10.1016/j.neuroimage.2008.10.009
- Leder, H., Belke, B., Oeberst, A., & Augustin, D. (2004). A model of aesthetic appreciation and aesthetic judgments. *British Journal of Psychology*, 95(4), 489–508. doi:10.1348/0007126042369811
- Leder, H., Carbon, C.-C., & Ripsas, A.-L. (2006). Entitling art: Influence of title information on understanding and appreciation of paintings. *Acta Psychologica*, 121(2), 176–98. doi:10.1016/j.actpsy.2005.08.005
- Leder, H., Gerger, G., Dressler, S., & Schabmann, A. (2012). How art is appreciated. *Psychology of Aesthetics, Creativity, and the Arts*, 6(1), 2–10. <http://dx.doi.org/10.1037/a0026396>.
- Leder, H., & Nadal, M. (2014). Ten years of a model of aesthetic appreciation and aesthetic judgments : The aesthetic episode - Developments and challenges in empirical aesthetics. *British Journal of Psychology*, 105(4), 443–64. doi:10.1111/bjop.12084
- Leder, H., Ring, A., & Dressler, S. G. (2013). See me, feel me! Aesthetic evaluations of art portraits. *Psychology of Aesthetics, Creativity, and the Arts*, 7(4), 358–369. doi:10.1037/a0033311
- Leder, H., Tinio, P. P. L., Fuchs, I. M., & Bohrn, I. (2010). When attractiveness demands longer looks: the effects of situation and gender. *Quarterly Journal of Experimental Psychology*, 63(9), 1858–1871. doi:10.1080/17470211003605142
- Locher, P., & Dolese, M. (2004). A Comparison of the Perceived Pictorial and Aesthetic Qualities of Original Paintings and Their Postcard Images. *Empirical Studies of the Arts*, 22(2), 129–142. doi:10.2190/EQTC-09LF-JRHA-XKJT
- Locher, Lisa Smith, and Jeffrey Smi, P. (1999). Original Paintings Versus Slide and Computer Reproductions: A Comparison of Viewer Responses. *Empirical Studies of the Arts*, 17(2), 121–129. doi:10.2190/R1WN-TAF2-376D-EFUH

- Maner, J. K., Kenrick, D. T., Becker, D. V., Delton, A. W., Hofer, B., Wilbur, C. J., & Neuberg, S. L. (2003). Sexually selective cognition: beauty captures the mind of the beholder. *Journal of Personality and Social Psychology*, 85, 1107-1120. doi:10.1037/0022-3514.85.6.1107
- Mastandrea, S., Bartoli, G., & Bove, G. (2007). Learning through ancient art and experiencing emotions with contemporary art: Comparing visits in two different museums. *Empirical Studies of the Arts*, 25, 173-191. doi:10.2190/R784-4504-37M3-2370
- Mayring, P. (2010). *Qualitative Inhaltsanalyse: Grundlagen und Techniken*. Weinheim:Belz.
- Melchionne, K. (2011). Aesthetic experience in everyday life: A reply to Dowling. *British Journal of Aesthetics*, 51(0), 437–442. doi:10.1093/aesthj/ayr034
- Mulcahy, L., & Flessas, T. (2016). Limiting Law: Art in the Street and Street in the Art. *Law, Culture and the Humanities*, 1–23. doi:10.1177/1743872115625951
- Newman, G. E., & Bloom, P. (2012). Art and authenticity: the importance of originals in judgments of value. *Journal of Experimental Psychology: General*, 141(3), 558–69. doi:10.1037/a0026035
- O'Doherty (1986). *Inside the White Cube*. San Francisco, CA: Lapis Press.
- Pelowski, M., Tao, L., Palacios, V., & Akiba, F. (2014). When a Body Meets a Body: An Exploration of the Negative Impact of Social Interactions on Museum Experiences of Art. *International Journal of Education & the Arts*, 15(14), 1–10.
- Piccinini, G. (2003). Data from Introspective Reports: Upgrading from Common Sense to Science. *Journal of Consciousness Studies*, 10(9-10), 141–156.
- Pihko, E., Virtanen, A., Saarinen, V.-M., Pannasch, S., Hirvenkari, L., Tossavainen, T., Hari, R. (2011). Experiencing Art: The Influence of Expertise and Painting Abstraction Level. *Frontiers in Human Neuroscience*, 5(10), 1–10. doi:10.3389/fnhum.2011.00094

- Rieh, S. Y. (2002). Judgment of information quality and cognitive authority in the Web. *Journal of the American Society for Information Science and Technology*, 53(2), 145–161. doi:10.1002/asi.10017
- Shimojo, S., Simion, C., Shimojo, E., & Scheier, C. (2003). Gaze bias both reflects and influences preference. *Nature Neuroscience*, 6(12), 1317–22. doi:10.1038/nn1150
- Siddique, H. (2013, February 18). Banksy mural torn off London Pound- land store for Miami auction. *The Guardian*. Retrieved from <http://www.guardian.co.uk/artanddesign/2013/feb/18/banksy-london-miami-auction>
- Smith, E. R., & Semin, G. R. (2004). Socially Situated Cognition: Cognition in its Social Context. *Advances in Experimental Social Psychology*, 36, 53–117. doi:10.1016/S0065-2601(04)36002-8
- Stich, C., Knäuper, B., Eisermann, J., & Leder, H. (2007). Aesthetic properties of everyday objects. *Perceptual and Motor Skills*, 104(3), 1139–1168. doi:10.2466/PMS.104.3.1139-1168
- Sui, J., & Liu, C. H. (2009). Can beauty be ignored? Effects of facial attractiveness on covert attention. *Psychonomic Bulletin & Review*, 16(2), 276–81. doi:10.3758/PBR.16.2.276
- Sprayer “Puber” wieder festgenommen. (2016, April 12). Retrieved from http://diepresse.com/home/panorama/wien/4965508/Wien_Sprayer-Puber-wieder-festgenommen/
- Tatler, B. W. (2007). The central fixation bias in scene viewing: selecting an optimal viewing position independently of motor biases and image feature distributions. *Journal of Vision*, 7(14), 4.1–17. doi:10.1167/7.14.4
- Tatler, B.W., Wade, N. J., Kwan, H., Findlay, J. M., and Velichkovsky, B. M. (2010). Yarbus, eye movements, and vision. *i-Perception*, 1, 7–27.
- Tinio, P. P. L., & Leder, H. (2009). Natural scenes are indeed preferred, but image quality might have the last word. *Psychology of Aesthetics, Creativity, and the Arts*, 3, 52–56.

- Tombros, A., Ruthven, I., & Jose, J. (2005). How users assess web pages for information-seeking. *Journal of the American Society for Information Science and Technology*, 54(4), 327–344. doi:10.1016/j.buildenv.2006.10.027
- Tröndle, M., Greenwood, S., Bitterli, K., & van den Berg, K. (2014). The effects of curatorial arrangements. *Museum Management and Curatorship*, 29(2), 1–34. doi:10.1080/09647775.2014.888820
- Ulrich, R. S. (1983). Aesthetic and affective responses to natural environments. In I. Altman & J. F. Wohlwill (Ed.), *Behavior and the natural environment* (pp. 85–125). New York: Plenum Press.
- Valuch, C., Pflüger, L. S., Wallner, B., Laeng, B., & Ansorge, U. (2015). Using eye tracking to test for individual differences in attention to attractive faces. *Frontiers in Psychology*, 6, 1-13. doi:10.3389/fpsyg.2015.00042
- Vartanian, O., & Goel, V. (2004). Neuroanatomical correlates of aesthetic preference for paintings. *Neuroreport*, 15(5), 893–897. doi:10.1097/01.wnr.00001
- Wang, H.-C., & Pomplun, M. (2012). The attraction of visual attention to texts in real-world scenes. *Journal of Vision*, 12(6), 1–17. doi:10.1167/12.6.26
- Wilson, M. (2002). Six views of embodied cognition. *Psychonomic Bulletin and Review*, 9, 625–636.
- Wu, C.-C., Wick, F. A., & Pomplun, M. (2014). Guidance of visual attention by semantic information in real-world scenes. *Frontiers in Psychology*, 5, 1-13. doi:10.3389/fpsyg.2014.00054
- Zhao, T., McDonald, S., & Edwards, H. M. (2014). The impact of two different think-aloud instructions in a usability test: a case of just following orders? *Behaviour & Information Technology*, 33(2), 162–182. doi:10.1080/0144929X.2012.708786

Image Index

Figure 1. (A) Google maps satellite picture, showing the eye tracking path at the Danube Canal in Vienna's ninth urban district.	17
Figure 1. (B) A photo capturing the first person perspective at the starting point (start) of the eye tracking path.	17
Figure 1. (C) A screenshot from the eye tracking camera, showing the second half of the path and the sculpture garden.	17
Figure 2. Stimulus example of graffiti called "Mermaid" cut to 16:9 format.	19
Figure 3. Example for AOI placement	21
Figure 4. (A) Total fixation duration in ms grouped by categories.	22
Figure 4. (B) Percentage of category fixations proportional to all fixations.	22
Figure 5. (A) Focus map highlighting the most frequented areas.	22
Figure 5. (B) Same stimulus with overlaid scanpaths.	22
Figure 6. (A) Focus map highlighting the most frequented areas.	23
Figure 6. (B) Same stimulus with overlaid scanpaths.	23
Figure 7. Heat map of most liked sculpture ("Cirlce").	27
Figure 8. Distribution of ratings for each stimulus group.	27
Figure 9. (A). Linear relation between liking and TFD	28
Figure 9. (B). Linear relation between interest and TFD.	28

Table Index

Table 1. <i>Items in the video questionnaire (translated from German)</i>	20
Table 2. <i>Thematic categories with example phrases</i>	24
Table 3. <i>Content analysis of inductive categories overview</i>	25
Table 4. <i>Detailed content analysis category A2 (assigning adjectives)</i>	25
Table 5. <i>Detailed content analysis category A5 (neutral object mention)</i>	25
Table 6. <i>Mean liking and interest ratings for each object category</i>	26

List of Abbreviations

fMRI	functional magnetic resonance imaging
TFD	total fixation duration
OFC	orbitofrontal cortex

APPENDIX A

Table A1

Statement analysis synonymous word groupings.

object	synonyme	AOI	objectclass
Totenkopf	Schädel	21	Graffiti
Skulpturen	Müllskulptur, Kunstwerk(e), Schrott, Reifen, abstraktes Bleigießen, Statuen, Figuren, Haufen	37 - 41	Sculpture
Personen	Frau, Mann, Leute, Gruppe, Passanten, Menschen, Guy		Persons
FahrradfahrerInnen	RadfahrerInnen		Bycicle
Natur	Bäume, Büsche, Fluss, Wasser, (Grün-)Streifen, Sonne, Landschaft, Früchte, Sträucher, Gras, Grün		Nature
Architektur	Gebäude, Geländer, Container, Häuschen, Hütte, Skyline, Ausschluss Orientierung (Brücke)		Architecture
Werbung	Schilder, Reklame, Werbetafeln, Plakate	33 - 36	Adver- tisements
Graffiti	Schrift / Schriftzüge Zeichnungen, Graffitizeug, Zeichen	1-32	Graffiti
Pferd	Einhorn	11	Graffiti

Note. Due to the fact that all statements were given in German all direct quotations from transcripts will be displayed in German.

Zusammenfassung

Auch in alltäglichen Umgebungen wie beispielsweise auf dem Weg zur nächsten U-Bahn-Station bieten sich viele Gelegenheiten mit Kunst in Kontakt zu kommen. In der vorliegenden Arbeit/Studie wurde untersucht, wie Menschen auf Kunst in einer solchen alltäglichen Umgebung reagieren. Von insgesamt 12 Versuchspersonen wurden dazu die Blickbewegungen während eines Spaziergangs am Donaukanal in Wien mit einem mobilen Eye-Tracker aufgezeichnet. In einer anschließenden Labortestung sollten die Versuchspersonen ihre eigenen Rundgänge/Spaziergänge/Wege (als Videos mittels mobilen Eye-Trackers aufgezeichnet) kommentieren. Außerdem wurden die Kunstwerke, Skulpturen, Werbungen und einige exemplarische Naturbilder vom Donaukanal hinsichtlich des Gefallens und Interesses bewertet. Bis zu 50% der gesamten Fixationszeit verbrachten die Versuchspersonen mit dem Betrachten der Kunstwerke und Skulpturen (gemessen über die Augenbewegungen). Es zeigte sich, dass eine längere Betrachtungsdauer der jeweiligen Skulpturen und Kunstwerke (operationalisiert durch die Anzahl und Dauer der Fixationen) durch eine höhere ästhetische Wertschätzung (Gefallen und Interesse) vorhersagt werden kann.

CV

Vanessa Mitschke
01.10.1990 Wismar (Germany)

Education

- | | |
|---------------------|---|
| 03/2014 – (06/2016) | Master of Science, Psychology
University of Vienna

Master Thesis

<i>Aesthetics in Everyday Life</i>
<i>Investigating aesthetic experiences with mobile eye tracking in the real world.</i> |
| 10/2010 – 06/2013 | Bachelor of Science, Psychology
University of Vienna

Bachelor Thesis 1 (empirical)

<i>Soziale Interaktion und Hilfeleistung</i>
<i>Beeinflusst Nachahmung die prosoziale Hilfeleistung?</i>

Bachelor Thesis 2

<i>Das Multiple Attraktivitätskonzept.</i> |
| 09/2012 – 01/2013 | Erasmus semester at University of Helsinki |
| 09/2003 – 06/2010 | Abitur , Pestalozzi Gymnasium Idstein (Germany) |
| 08/2007 – 01/2008 | Exchange semester, Rexburg Idaho (USA) |
-

Professional Experience

- | | |
|----------------------|---|
| 02/2016 – 06/2016 | Project Staff
Department of Basic Psychological Research and Research Methods,
Psychology Institute, Vienna |
| 03/2015 – 31.01.2016 | Student Assistant
Department of Basic Psychological Research and Research Methods,
Psychology Institute, Vienna |
| 03/2015 – 10/2015 | Internship
Department of Basic Psychological Research and Research Methods,
Psychology Institute, Vienna |
| 08/2015 | Internship
European Conference of Eye Movements (ECEM), Vienna |

Language

German	native
English	fluent
Swedish	basic

Methods

SR Research stationary eye tracker
SensoMotoric Instruments eye tracking glasses
Facial EMG

IT

SoSci Survey, Lime Survey, ePrime
MS Office
Data management: SPSS, R, Matlab, BeGaze

Personal Interests

Special Effect Make Up
Classical Singing