universität wien

MASTERARBEIT / MASTER'S THESIS

Titel der Masterarbeit / Title of the Master's Thesis

„Preference for Balance: Transitivity, Inversion, Knowledge and Interest"

verfasst von / submitted by

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

Master of Science

Wien, 2017

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 UG 2002
Betreut von / Supervisor:	Univ.-Prof. Dipl.-Psych. Dr. Helmut Leder

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1. Introduction

“Is beauty objective or is it in the eye of the beholder?” (Gregory, 2004)

„Good Lord Boyet, my beauty, though but mean,
Needs not the painted flourish of your praise:
Beauty is bought by judgement of the eye,
Not utter'd by base sale of chapmen's tongues.“
(The princess of france in William Shakespeares „Love’s Labour‘s Lost“, Act 2, Scene 1)

By definition aesthetics is “a part of philosophy which deals with the perception of the beautiful” and in relation to psychology this area is occupied with “sensations and emotions” that are linked with the perception of beauty (New Webster’s Dictionary and Thesaurus of the English Language, 1972, p. 13). What makes this field so fascinating and important is the fact that the aesthetic experience is a defining characteristic of human beings. To this effect, Schellekens and Goldie (2012) argue that the study of aesthetics and arts is a vast domain and offers the possibility to study humans from neuronal details to evolutionary history.

In the last years, different models have been used to explain the aesthetic judgment, one of them being the model of aesthetics preference by Leder, Belke, Oeberst and Augustin (2004). The model of aesthetic judgment (Leder et al., 2004) describes the aesthetic experience on the cognitive-affective level as a process of more than five hierarchical stages. The first information processing stage is about the basal perceptual analysis of the aesthetic object. Various individual influencing factors – such as contrast, symmetry or complexity – are processed in the preference judgment of visual stimuli. For example, the manipulation of contrast ratios or symmetry to change aesthetic preferences (Ramachandran & Hirstein, 1999). As a second information processing step Leder et al. (2004) describe an implicit (unconscious) integration of memory contents. These memory contents, such as familiarity or prototypicality, are based on the person's previous experience. Tinio and Leder (2009) showed that familiarizing participants to stimuli, influences their preference to that stimuli. The explicit classification means the arbitrary confrontation with the art object (Belke & Leder, 2006). The content and style of the work are important and the subjective meaning of style and content is determined by the expertise of the recipient. As a special feature of the last stage of the model, the integration of cumulative affective status can be considered.

The fourth stage of the model, the cognitive coping of the work of art, is connected to the previous stage of the explicit classification by a loop. This loop allows a repeated revision of the information at the subordinate level. At each stage (1 to 5) an independent affective status (positive or negative) is created. Both components, the cognitive and the affective responses, are evaluated jointly at the evaluation stage and result in two pronounced results (Belke & Leder, 2006) - aesthetic judgment and aesthetic emotion (Leder et al., 2004; Leather & Nadal, 2014). The model differentiates between the aesthetic emotion and the aesthetic judgment as a result of the processing process (Leder et al., 2004). The model will be described in detail in section 3.

The focus of this study is the field of perceptual analysis. Many perceptual factors as symmetry, contrast and complexity are considered in the model of aesthetic experience and studies have shown that each one of them influences aesthetic judgment (Belke & Leder, 2006; Jacobson, Schubotz, Höfel & Cramon, 2006; Tinio & Leder 2009). This work serves as an exploratory study to examine a lesser known perceptual factor called *balance*. This factor is investigated to the extent that the study of Wilson and Chatterjee (2005) is replicated to consider the possible influence of balance in the evaluation of visual stimuli. In their study, Wilson and Chatterjee (2005) introduced a new set of materials to determine if balance is preferred in aesthetic judgment. Furthermore, the factor is investigated in relation to art knowledge and the interest in art as well as transitivity. The first examines whether art knowledge and the interest in art have an influence on the subjective rating of balance, whereas the latter examines if balance can be a consistent factor in decision-making behavior.

This work starts with a brief historical overview, followed by an explanation of the model of aesthetic judgment by Leder et. al (2004). The model is followed by an introduction to the factor *balance* and how it may interact with the concept of transitivity. Afterwards the hypotheses will be discussed and it will be explained why they are important for the psychological research. Finally, the results will be presented and analyzed.

2. Historical Background

This study concentrates on visual aesthetics, a field of psychological research of which Gustav Theodor Fechner and Wilhelm Wundt are regarded as the founders, since they were the first to scrutinise visual aesthetic in experimental situations (Gregory, 2004). In his work *Vorschule der Ästhetik* (1876) Fechner established an experimental method in the field of aesthetic research by postulating an inductive approach on aesthetic judgment rather than a deductive. Wilhelm Wundt in addition made the first physiological research in his laboratory in Leipzig. He understood human and aesthetic perception as a conscious process. A short century later, Berlyne's *new experimental aesthetics* (1974) provided a further paradigm shift within empirical aesthetics (Martindale, Moore, & Borkum, 1990). It formulates the collative stimulatory properties, which are the result of an internal comparison of the perceived stimulus properties with those of the individual memory. The recipient finds similarities and differences between the environment and recalled memory. Berlyne (1971) reveals the following stimulatory features: complexity, novelty, ambiguity, ignorance, and divergence, which are reflected in the model of aesthetic experience (Leder et al., 2004). In the 21st century Leder and Nadal (2014) differentiate between the psychology of art and psychological aesthetics. Psychology of art attempts to describe the processes underlying the artistic perception, including the comprehension of symbolism and composition as well as the classification of a work of art into a historical context (Leder & Nadal, 2014). Psychological aesthetics on the other hand, tries to grasp the psychological processes which enable a person to perceive a multitude of objects as beautiful, ugly, or sublime, etc., as aesthetic. The interaction of both areas is found in the model of aesthetic experience (Leder et al., 2004). In the following this model will be explained to later provide the theoretical frame for this work.

3. Theoretical Background

3.1 Model of aesthetic experiences

The model of the aesthetic experience of Leder et. al. (2004) describes how information processing leads to the development of an aesthetic judgment and the development of an aesthetic-affective state (Figure 1). In relatively hierarchical (but not strictly sequential) cognitive processing stages, context conditions, affective states and

cognitive factors as well as other factors are mentioned to explain the process of aesthetic experience.

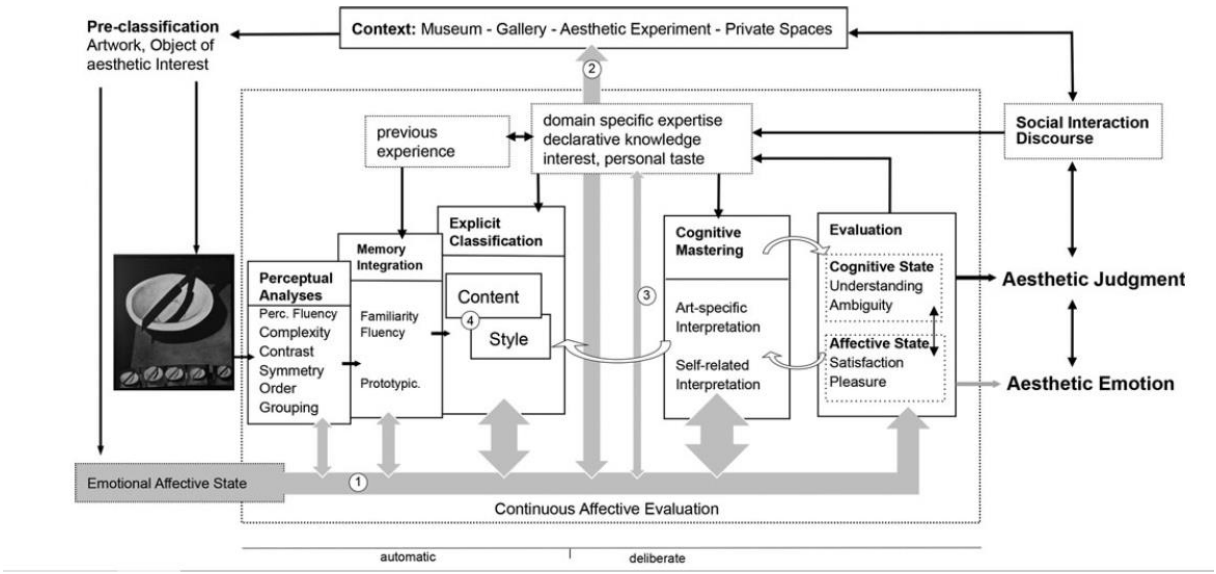


Figure 1. Adaption of Leder and Nadal's (2014) model of aesthetic experience.

Before the actual affective evaluation of an object of interest starts, contextual factors play a crucial role in the classification of that object (Leder et al., 2004). This means, that the context in which the object is presented – for example a museum or a private space – influences as what we classify that object of interest. In addition, another influential factor is the emotional affective state of the viewer. According to Leder et al. (2004) a negative affective state would hinder a positive aesthetic experience.

After the pre-classification of the object of interest the perceptual analysis starts. During this step, perceptual factors of the viewed object are examined, such as contrast or symmetry (Leder et al., 2004). Manipulation in these perceptual factors can influence the viewer's aesthetic judgment. For example, Berlyne (1974) examined how different forms of complexity influence the viewer's experience. Berlyne (1974) assumed that a moderate extent of complexity leads to a moderated activation potential and is therefore most preferred amongst viewers.

The next step of processing is called memory integration. Leder et al. (2004) describe this process as an implicit integration of memory, meaning that former experiences of the viewer unconsciously effect their aesthetic judgment. Three factors are mentioned in this process: familiarity, fluency and prototype (Leder et. al 2004). Familiarity is closely connected to the mere-exposure-effect, which means that sheer

repetitive presentation of stimuli influences the preference for that stimuli (Reber, Winkielman, Schwarz, 1998; Bornstein, 1989.). An explanation for this effect is the hedonic fluency model (HFM; Reber, Schwarz, & Winkielman, 2004; Reber, Winkielman, & Schwarz, 1998; Winkielman & Cacioppo, 2001). According to that model sheer repetition increases processing fluency and therefore goes along with a positive affect. This model was verified in different studies with electromyography measurements (Harmon-Jones & Allen, 2001; Winkielman & Cacioppo, 2001). Other forms of memory integration, which are good indicators for aesthetic preference are prototypicality (Hekkert & Van Wieringen, 1990) and the peak-shift effect, in which the peak-shift-effect is an extreme presentation of known visual features, which influences the preference for an object (Ramachandran & Hirstein, 1999).

While the first steps are running automatically or unconscious, the third step – explicit classification – is conscious and knowingly (Leder et al., 2004). During this step, content and style are processed while viewing art. The explicit knowledge of art and the experience of the viewer have an influence on the judgment. According to Leder et al. (2004) the approach on explicit classification depends on the amount of art expertise viewers have. This means, laypeople rather focus on the content of the paintings and what is depicted, where experts focus on the style or consider further information such as the painter's biography or the era it was painted in (Leder et al., 2004).

Cognitive mastering and evaluation are the last steps of the model and are highly connected to each other (Leder et al., 2004). The former is responsible for art-specific and self-specific interpretation of the viewed object. Leder et al. (2004) argue that personal or emotional taste can have an effect on the cognitive process during this step. Furthermore, in this processing step art expertise has an influence on the judgment. Since laypeople may only consider their own feelings and sensitivities in the cognitive mastering, experts have a deeper understanding of the painting and therefore consider more features in their cognitive processing (Leder et al., 2004). The cognitive mastering is followed by the process of evaluation. A successful evaluation would lead to a hedonic character and also to pleasure in viewing, where unsuccessful or ambiguities would lead back to earlier steps (Leder et al, 2004).

According the model of Leder et al. (2004) these steps lead to an aesthetic judgment and an aesthetic emotion, which are relatively independent from each other. An aesthetic emotion is created out of the change in affective state through the results of

every processing step. The successful cognitive processing can motivate the viewer to deal with the art work in later cases.

The model of Leder et al. (2004) is the theoretical frame for this current study. This study focuses on the step of perceptual analysis. During this part of the aesthetic evaluation, simple perceptual variables affect judgments as seen above. People prefer one object over another when one perceptual dimension is altered (Leder et al., 2014).

Since preference for certain paintings is influenced by sensory qualities, such as contrast and symmetry, altering one of those qualities can influence aesthetic judgment, emotion or preference (Wilson & Chatterjee, 2005). The focus of this work is to take a closer look on the perceptual features of *balance* and to see how viewer's preference is influenced by that factor. This factor was elaborately examined by Wilson and Chatterjee (2005) and will be explained later in detail. Furthermore, this study will examine if preferences for certain features are persistent over different conditions and if the choices remain consistent. In order to show which decisions are being discussed, the next section introduces the concept of transitivity and describes different decision models. The aim is to show why decisions are made as they are, what benefits decisions have and to what extent this has relevance for the topic of aesthetic evaluation and aesthetic judgment.

3.2. Transitivity of Preferences

Imagine going out to dinner with a friend twice a week for the last year. He is a very indecisive person and wants you to choose the restaurant you are going to eat and he always chooses between the options you give him. After some time, you start to notice, that your friend chooses most of the time Chinese food (A) over Italian food (B) and Italian (B) food over Austrian food (C). Therefore, you assume that your friend prefers A over B and B over C and probably A over C. After some time, you go out for Chinese food and change the restaurant you usually go to, but your friend does not want to go there and rather wants to eat Austrian food instead. You start to wonder what is wrong with your friend since he always made the same choice over the last couple of months. When confronting him with his decision, he gives you a simple yet interesting answer: Your friend did not care about the type of food he eats, rather the restaurant you chose to eat the food. Since he was satisfied with the restaurant, he did not mention any preference for his food option. As you changed the restaurant he changed his decision amongst your options.

Although you were thinking logically or rather rational of your friend's choice behavior, his thinking was different. A person, group, or society that prefers the option (a) over (b) and (b) over (c), but when someone is faced with similar choice options repeatedly, he or she does not always choose the same (Fig. 2). The correct term for this decisive behavior is called transitivity. The Oxford dictionary describes transitivity as "a relation such that, if it applies between successive members of a sequence, it must also apply between any two members taken in order. For instance, if A is larger than B, and B is larger than C, then A is larger than C" (transitivity. 2017. in *en.oxforddictionaries.com*).

Transitive relationships were predominantly a linguistic and mathematical focus until they found their way into the empirical and social sciences. Edwards (1954) describes in his study various forms of investigation on transitivity, which correspond to psychological or economic or even mathematical subject matter. He describes different choice models such as: risky choice, riskless choice, theory of games and theory of decision making, where the latter being crucial to this study. According to Edwards (1954), these theories can be partially explained by the utility theory, meaning that all actors in their decision want to have a positive outcome from their decisions and want to reduce a negative outcome. Simply put," Every object or action may be considered

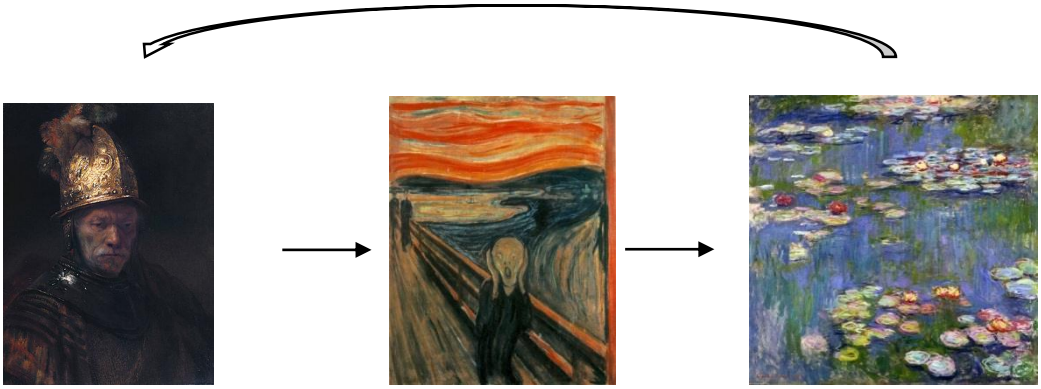
from the point of view of pleasure- or pain-giving properties. These properties are called the utility of the object, and pleasure is given by positive utility and pain by negative utility. The goal of action, then, is to seek the maximum utility this simple hedonism of the future is translated into a theory of choice. People choose the alternative, from among those open to them, that leads to the greatest excess of positive over negative utility" (Edwards, 1954, p. 382).

Since various studies have examined the utility theory or rational choice theory in other thematic emphases, this work aims to the topic of the aesthetic evaluation and the hedonistic character of the model. But how can aesthetic experience and evaluation of images be reconciled with a rational-oriented model?

The focus is on the aesthetic emotion or the hedonistic value of a positive evaluation of the observed visual stimulus. The factor *balance* will serve as a criterion to observe a transitivity in decision-making. Wilson and Chatterjee's (2005) study showed that balanced stimuli are positively valued. If you transpose this initial situation to several rounds of decision options, balance should be a measure of preferred decisions across all options.

In conclusion, there are many factors and variables that account for the preference or transitivity amongst different options. If we would transfer that idea into the field of neuroaesthetics, and simply show participants a set of pictures and let them decide, which one they prefer more, the data would be assumedly difficult to distinguish and hard to implement. The idea would be to focus on one perceptual factor and see, if it can be responsible for the consistent preference in choice-decisions.

But why is *balance* so important or what properties does it have, that it can influence consecutive choice behavior?



Picture A Picture B Picture C

Figure 2. Illustration of the idea of transitivity or transitive decision making. One would assume that if someone prefers picture A over picture B and picture B over picture C, that picture A must be preferred over picture C. Although this makes transitive choice behavior logical, it does not appear to happen all the time and is therefore not a transitive behavior. Picture A “The Man with the Golden Helmet”, Rembrandt van Rijn (around 1660); Picture B “The Scream”, Edvard Munch (1893); Picture C “Water Lilies”, Claude Monet (1916)

3.3. Preference for Balance

As mentioned above, decision-making and transitive behavior is moderated and influenced by the decision-makers preference (Regenwetter & Dana, 2011). Over all perceptual components which are included in the aesthetic model of aesthetic experiences, such as contrast, symmetry, complexity, etc., studies have shown, that depending on the presented stimuli and composition of the stimuli preferences are influenced by the stimuli appearance (Tinio & Leder 2009).

As mentioned before this work has its groundwork from Wilson and Chatterjee’s study (2005). The aim in their study was to keep the focus on the perceptual factor of *balance* and to introduce a new method or test, which can objectively quantify the factor *balance*.

But why is or could *balance* be so important? *Balance* can be seen as a central feature that contributes to the organizational structure of aesthetic visual stimuli or notions of harmony as a central feature of aesthetic images and guides the viewer’s gaze over an image and shapes the information (Wilson and Chatterjee, 2005).

It is a harmonic form of a visual stimulus, where somehow everything looks or seems just right. Arnheim (1954) already tried to explain how this “seeing” is done where he showed the importance of the distribution and position of elements in the visual field. Furthermore, he focused on the importance of the center of a certain stimulus and if it is perceived differently when it is placed in or out of the pictures center (Arnheim, 1988). Ever since then *balance* is considered a relevant factor in the appreciation and judgment of visual stimuli (Wilson & Chatterjee, 2005; Arnheim 1954; Arnheim1988). To understand *balance* it is important take it even one step further and to describe dynamic balance. Dynamic balance, is an organizational structure in which individual elements are not arranged symmetrically, but balance is achieved because the visual forces of these elements compensate for each other (Arnheim, 1988). Although the image seems somewhat disordered or messy, there is harmony even though it does not look right.

This kind of “looking” at the images is modulated by art knowledge. Nodine, Locher and Krupinski (1993) found that people trained in art, compared to untrained viewers had a smaller ratio of divisive to specific gazes for *balance* than untrained viewers. Therefore, it is interesting to observe if the level of expertise can influence the preference for balance or at least moderate the preference for balance. The topic of art expertise will be discussed later.

To examine this sort of *balance* Wilson and Chatterjee (2005) introduced a new method, the APB – assessment of preference for balance - to quantify this factor objectively. Although *balance*, in this case symmetry, has been observed in different studies to see if it is preferred (Enquist & Arak, 1994), the concept of dynamic balance has not been analyzed so far. Their aim was to examine if this dynamic of balance is preferred to unbalanced stimuli. In their experiment, Wilson and Chatterjee (2005) examined different forms of stimuli: hexagons, circles, and squares, all of which had a set of several images, and these images in turn had different balance scores. The results of the experiment showed that objective balancescores correlate with subjective ratingscores and that balance has an impact on the subjective rating of stimuli (Wilson and Chatterjee, 2005).

3.4. Art Expertise

Now that we have discussed the concept of transitivity and presented the factor *balance*, this section finally presents the final component of this work: art expertise.

Leder et. al. (2006) described expertise as a "temporally stable outstanding performance in a particular domain" (p. 136), which is associated with specialized knowledge and skills in this specific field. In a study by Augustin and Leder (2006) participants are asked to rate a set of illustrations of contemporary art. The participants were asked to divide the whole set into two groups and to name the groups they formed. These two groups should be further divided into two groups. This grouping task should be continued until it was finished according to the opinion of the participant. The type of grouping and the corresponding self-chosen denominations showed that arts experts compared to laypeople formed several groups and named them to their stylistic. The laypeople, on the other hand, frequently used to be sensitive to naming categorizations like positive or negative. For both groups, however, the differentiation between abstract versus representational was equally important. In addition, no differences in content-related categories are found.

The influence of art expertise on the perception and cognitive processing of art is also reflected in studies that, besides the subjective ratings of rating scales, used other methods. Studies with eye movement measurements for example show that aesthetic stimuli are judged differently by experts than by laymen. Vogt and Magnussen (2007) showed photographs of scenes with varying aesthetic quality and different level of abstraction. Laypeople, in comparison to experts, viewed known objects, or less abstract stimuli, more often. More or less abstract structural features of the photographs, however, were more frequent viewed by the experts. Similar results have been found with paintings as stimuli. Laypeople would prefer painting with certain characteristics, whereas in the case of art experts structural features were more important (Nodine et. al, 1993).

According to the model of Leder et al. (2004), successful aesthetic processing results in a mostly positive affect and self-indulgent aesthetic experience. Differences in the aesthetic experience of art laypeople and experts should also be reflected in different activity patterns of neural networks. Kirk, Skov, Christensen and Nygaard (2009) studied the brain activity with functional magnetic resonance imaging (fMRI) of experts and laypeople while they were exposed to architectural photographs. Although there were no significant differences between the aesthetic judgments of the two

groups, the experts showed stronger activity patterns in brain regions which are associated with reward (Kirk et. Al, 2009).

4. Hypotheses

The study presented below is based on the theoretical considerations and empirical findings of the preceding sections. The center of the research interest is the perceptual factor *balance*, transitivity and art expertise.

As mentioned before this study will replicate the study of Wilson and Chatterjee (2005). In their study *balance* influenced the preference of the presented stimuli for different shapes of stimuli: circles, hexagons and squares. Since only circles and hexagons were significantly influencing balance ratings, this study examines circles and hexagons.

The replication of Wilson and Chatterjee's (2005) work is supplemented by another condition: namely, Inversion, i.e. that the stimuli are rotated by 180° and are presented to the participants. This study aims to examine that the inversion of the images should not influence a change in the rating, because the balance scores of the images do not change due to the inversion. Wilson and Chatterjee's (2005) stimuli are designed so that there should be no change. This additional investigation is entirely explorative and should check whether the subjective rating can be influenced by it. This test is explained later in more detail the methods section, since the experiment of Wilson and Chatterjee will be repeated, but the result show, that objective parameters of *balance* highly correlate with subjective preferences (Wilson & Chatterjee, 2005).

Additionally it is assumed that there is no difference in preference-ratings between hexagon and circle stimuli. The first part of the explorative approach is regarding to inversion. The reasoning behind this approach is: if Wilson and Chatterjee's (2005) stimuli are well constructed, then the inversion of the images should have no effect on preference scores. This, until now, is an assumption. It therefore merits testing. The presented stimuli will be flipped resulting in a different image, but having the same balance score. It is assumed that there will be no difference in preference-ratings between original and inverted pictures, since the controlling factor should be *balance* and therefor similar results as for the original pictures are predicted.

According to the model of the aesthetic experience, Leder et al. (2004) have assumed that the art expertise significantly affects the aesthetic judgment and the aesthetic emotion in the consideration of art. On the one hand, differences between

art experts and laypeople should be brought out because of the varying intensity of stylistic and contextual characteristics. On the other hand, the experience and knowledge about art should facilitate the successful cognitive coping with art experts, thereby promoting an understanding of the respective work of art.

Wilson and Chatterjee (2005) suggested that, since they used participants with no formal art training, that art expertise can influence the preference ratings. Therefore, one part of the experiment focuses on the creating of an art expertise score to differentiate eventual art experts and laypeople and to subsequently compare the preference ratings concerning their respective expertise. It is assumed that for higher expertise scores balance will positively influence preference ratings.

The last part which is examined is the observation of choice behavior. As mentioned before transitive behavior in aesthetic judgment is rarely studied. This explorative approach tries to research if the decisions and choices participants make are influences by *balance*. It is assumed that preference for *balance* will show moderate transitivity, meaning the decisions will not be fully transitive, but also not intransitive.

5. Methods

5.2. Participants and Procedure

In this experiment 40 participants (24 female and 16 male) have been tested. They were between 19 and 30 years old (*M*= 24.93, *SD* = 1.87). Concerning their nationality 48,8% of the participants were German, 41,8% were Austrian and the other 9,3% came from Luxembourg, Croatia and Belgium. Regarding educational achievement 44,1% of the participants stated a general qualification for university entrance, 39,5% stated a bachelor degree and 16,2% stated a different educational achievement. The participants were recruited through personal contact. No information was given beforehand to the participants and all participants participated voluntary without any monetary reward. An informed consent regarding data rights was filled out by all participants before the experiment started.

The experiment was conducted in the laboratories of the Faculty of Psychology of the University of Vienna, Liebiggasse 5, 1010 Vienna. There were two experimenters conducting the experiment giving the same instructions. The participants were picked up in front of the laboratories by the experimenter and were brought to a laboratory with two computers. The experiment was done with up to two participants simultaneously. To avoid experimenters' influences all further instructions were given at the computer. Before the experiment started there was a brief explanation about the procedure and an opportunity to ask questions. During the briefing a code was generated for every participant to match the data in the later analysis.

5.3. Used Stimuli

5.3.1. Circles and hexagons

This study used stimuli, which were composed of geometrical figures, constructed by Wilson & Chatterjee (2005) to test for balance. In the present study, some of these stimuli have been altered to match the specific condition. Therefore, two different sets of stimuli were used: Original stimuli from Wilson and Chatterjee (2005) (circles and hexagons) and a set of those stimuli inverted (circles and hexagons). The original stimuli were constructed via Adobe Photoshop 7.0. Wilson and Chatterjee (2005, p. 168) created the balance scores through symmetry by dividing a 750 by 750 pixel field into a vertical, horizontal and two diagonal axes, as well as adding inner and outer columns (see figure 3). To calculate the balance scores, pixels have been count and

mathematically determined. For a complete description of the stimuli construction, see Wilson and Chatterjee (2005). For the present study, it is important to note, that stimuli with a small balance score have a high balance and conversely, stimuli with a high balance score are less balanced.

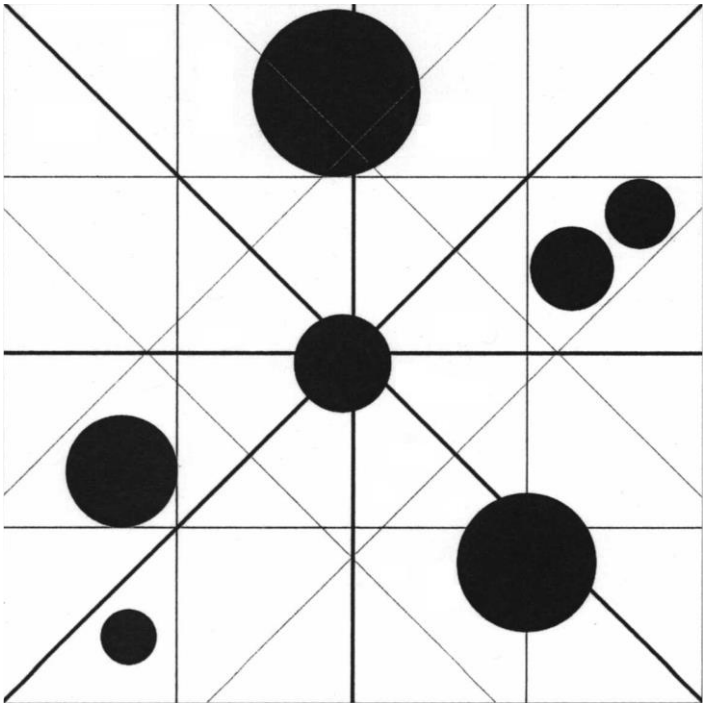


*Figure 3***.** This graphic is adapted from Wilson and Chatterjee (2005) and displays the grid containing the axes as well as the inner and outer columns, which have been used to create the different stimuli with different balance score. This particular picture has a balance score of 8,58% (Wilson & Chatterjee, 2005).

5.3.2. Inverted Circles and Hexagons

They original images were inverted on the horizontal axis for 180° using Irfan View version 4.42. The images were scaled to 380x380 pixels so that they can fit on a 1280x720 screen. The inverted stimuli are the same as the original ones, meaning they don't differ in balance score at all, since the distribution of elements remains the same and so does the balance score. The inverted images have been presented on a grey background with a black frame.

5.3.3. Stimuli in the transitivity condition

In the transitivity condition the above-mentioned stimuli were paired. For circles and hexagons separately, the range of balance scores was divided into 12 points. For each of these points the figure with the closest balance score was selected. This resulted in a subset of 12 circles and 12 hexagons varying in a stepwise manner from progressively less to more balance, with each step approximately equal to others in balance difference magnitude. To determine how to pair them, the objective balance measurement of Wilson and Chatterjee (2005) by 30 subjects was used. The balance scores used for the distribution in the transitivity condition were generated with the mean balance score of all circles and the mean balance score of all hexagons. The mean balance-scores for circles were 6,38 and for hexagons 6,27.

In sum we therefore have 12 images for each image group and an equal of 132 pairs, but to eliminate repeated exposure of paired stimuli, the amount has been halved to 65 paired images. The presented stimuli where shown randomly on the left and right side of a flat screen with 1280x720 resolution with grey background and black frame, in a random presentation order (see table 1).

Table 1

Balance scores of the used stimuli

Circles		**Hexagon**	
Stimuli	*Balance-Score*	**Stimuli**	*Balance-Score*
1	3.63	**1**	4.42
5	8.58	**5**	8.34
10	14.97	**11**	14.11
17	20.68	**17**	20.66
26	25.45	**23**	27.07
32	31.53	**28**	31.21
36	37.14	**32**	37.6
43	43.80	**38**	41.58
48	48.79	**48**	47.91
54	55.14	**53**	53.18
59	60.23	**58**	58.28
65	65.91	**65**	63.8

5.3.4. The Visual Aesthetic Sensitivity Test (VAST)

Visual aesthetic sensitivity is measured with the Visual Aesthetic Sensitivity Test (VAST) (Götz, Borisy, Lynn, & Eysenck, 1979). The test is composed of 50 pairs of abstract drawings, where one drawing of each pair is altered to be less harmonious than the other one. Participants are informed that one of both drawings is less harmonious and their task is to choose which one that is. The participants where explicitly asked not to choose the preferred drawings but the one they think is correct. Content validity of the drawings was recognized by agreement between both experts' judgments and consensual judgment, telling actual objective differences in harmony within the material of the VAST (Frois & Eysenck, 1995). Wilson and Chatterjee (2005) acknowledged that one of the key strengths of the VAST is its strong ecological validity, as the items resemble actual paintings.

5.3.5. Kunstwissen und -interesse Fragebogen (KiF)

To determine Art expertise and art knowledge we conducted the Kunstwissen und -interesse Fragebogen (KiF). The KiF is subdivided in 4 parts (A – D). Part A captures the art interest as well as the contact with art in everyday life. Examples of items would be: “In erster Linie muss ein Kunstwerk schön sein, um mir zu gefallen” (First and foremost, a work of art must be beautiful to please me), “Ich suche immer wieder neue künstlerische Eindrücke und Erlebnisbereiche.” (I always look for new artistic impressions and experiences) or “Kunst sollte in erster Linie dekorativ sein.” (Art should be primarily decorative.). The items must be rated on a Likert-scale from 1 to 7, where 1 stands for not at all and 7 for complete approval. Furthermore, it is asked how often participants visit the museum, artistic events or how often they read art-specific books or look at paintings.

Part B and C ask for specific art knowledge. In Part B the questions are presented in a multiple choice format of 4 possible answers, where one answer is correct. Examples for the questions would be: “Wann starb Picasso” (When died Picasso?) or “Welcher Maler malte das bekannte expressionistische Bild „Der Schrei?” (Which painter painted the well-known expressionist picture "The Scream"?). Whereas in Part C participants had to name artists and the paintings which was presented to them (Graphic). Part D consisted of social demographic data and a question regarding if the participant has extra education in the field of art. For our experiment only part B and C were important, since we were interested in art expertise. The questionnaire has been presented in German.

Bild 1:

Ist das Bild bekannt? ("Ja" bzw. "Nein")	
KünstlerIn:	
Kunstrichtung/Epoche/Stil	

Figure 4. An example for the second expertise part of the KIF, where participants received of folder of 8 pictures in same order and to answer the question, if they know the picture, if they can name the artist and to tell in which epoch the picture was painted. Every correct answer concerning artist and epoch equaled one point in the complete expertise score.

5.4. Procedure

The experiment consisted of four parts, where each part was conducted for one of the hypotheses and in which participants either had to judge visual stimuli or choose which stimuli they preferred. Table 2 shows the method-design and the composition of the experiment as a whole. To distinguish and erase confounding variables, the participants were randomly assigned into different groups. Furthermore, to establish an implementation objectivity, recruited participants have always been tested by the experimenter, with no relationship to the participant.

Table 2

Design and procedure of the experiment

	Study 1	**Study 2**		
Group 1	Transitivity for	Condition 1: O – I	VAST	KiF
Hexagons - Circles	Preference	Condition 2: I – O	VAST	KiF
Group 2	Transitivity for	Condition 1: O – I	VAST	KiF
Circles Hexagons	Preference	Condition 2: I - O	VAST	KiF

Note. O = Original stimuli; I = Inverted Stimuli; VAST = Visual Aesthetic Sensitivity Test; KiF = Kunstwissen und –interessenbogen.

As you can see in Table 2 participants have been distributed in two different groups, where group one has to rate circles first and in the second study hexagons and the other group vice versa. In total 40 Participants have been randomly assigned to either group one or group two and in addition randomly in another condition. The first group judges hexagons in the first study followed by circles in the second, whereas group 2 judges circles in the first and hexagons in the second. Condition 1 describes that participants see inverted pictures at first followed by the original one and condition 2 is vice versa. Group 1 hexagons-circles had to rate hexagons in the transitivity part of the experiment and circles in the part where participants have to rate their preference for balance and group 2 had to do it vice versa. This was intended to avoid the possibility that participants could adapt to the presented stimuli and get the idea that, stimuli they preferred earlier, should also be high preferred in the next part.

5.5. Experiment

5.5.1. Phase 1

The first part of the experiment was to determine the transitivity or transitive choice behavior due to the balance scores of presented stimuli and therefore to check our first hypothesis: *preference for balance will show moderate transitivity (not full, not absent)*

Participants have been randomly assigned to either group 1 or group 2. An introduction was presented at the beginning of the task and was identical for both groups. The participants were asked to either prefer the right or the left image, which is presented to them by pressing either “f” or “j” on the respective keyboard. The order

of the pairs was randomized as well as the side on which each stimulus of each pair is displayed. Before the actual experiment participants had to do a test trial, were they could ask questions. There was no time limit for the completion of the task. The participants were offered a short break or they could immediately continue with the experiment by pressing any key.

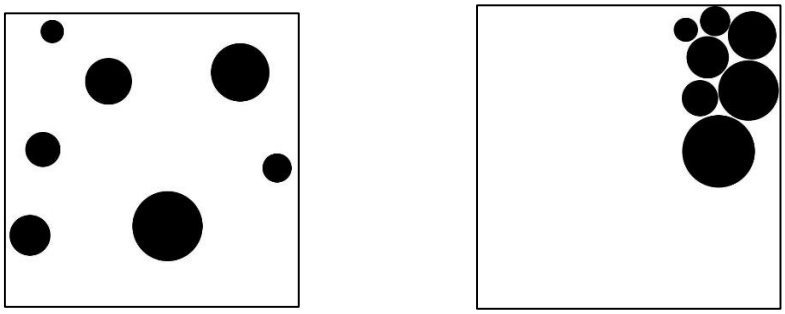


Figure 5. The left stimulus has a lower balancescore (meaning it is more balanced) than the right stimulus. Participants have to choose which one of both stimuli they prefer. The stimuli have been presented in randomized order. The side, on which they have been displayed, was also randomized.

5.5.2. Phase 2

The second part of the experiments intended to research the third and fourth hypotheses: *Difference in Preference-ratings between original and inverted pictures* and *Difference in Preference-ratings between hexagon and circle group*. The stimuli used were the “original” ones. In this part the participants had to rate two blocks of 65 stimuli, either hexagons or circles (depending in which group they were), on a scale from 1 to 5, where 1 was least preferred and 5 high preferred. The groups where split in two additional subcategories, were condition 1 had to rate original pictures first, followed by inverted ones and condition 2 had to rate the stimuli vice versa.

As in the first part of the experiment there are two groups, where one has to rate circles and the other one hexagons. This is, as mentioned before, related to the first part and participants which rated circles have to rate hexagons that we exclude potential confounding variables. The idea behind this study is to determine if there is a difference in balance rating by the comparison between the original and inverted rating.

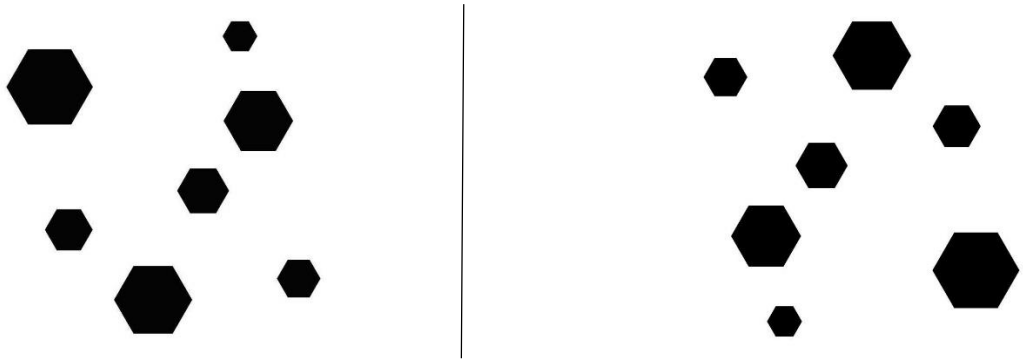


Figure 6. The displayed figure shows the stimuli the participants had to rate on a scale from 1 to 5. Although the stimuli do not look alike, they still have the same balance-scores. Each of the stimuli were displayed on its own.

5.5.3. VAST

Similar to the first study participants were asked to choose which of the presented stimuli they prefer by pressing either “f” or “j”. There was a test trial were participants could point out dubieties or ask questions. There was no time limit for the task. The test is explained in figure 7.

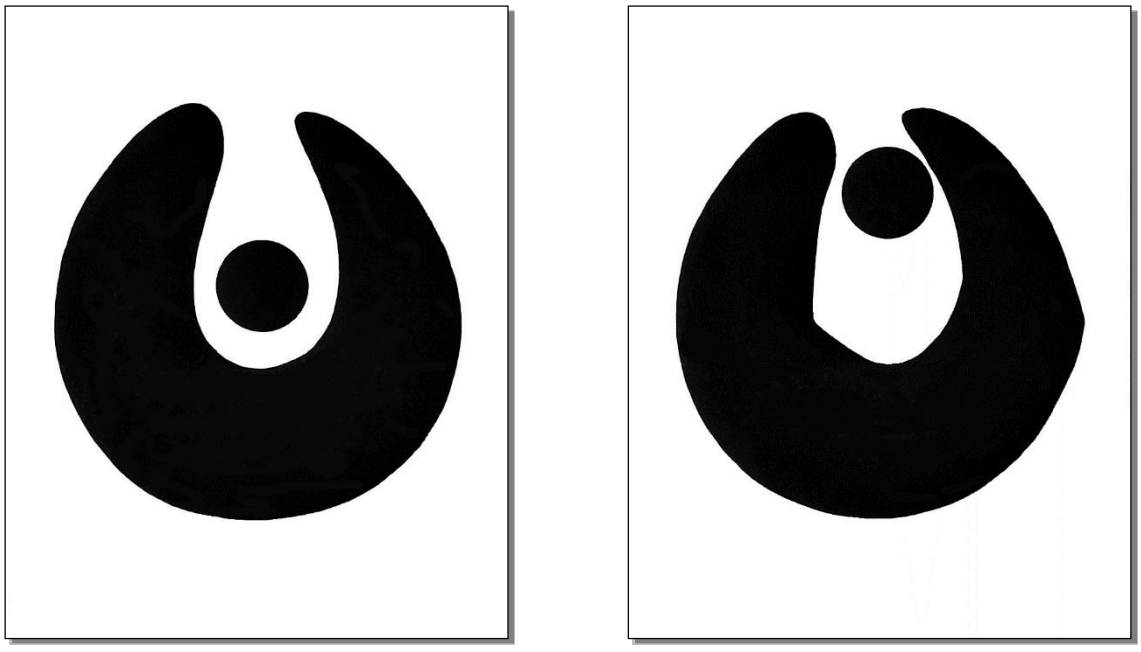


Figure 7. 2 similar pictures are presented on a 1280x1080 screen in randomized order, whereas one picture is more harmonious than the other. The task of the participant is to determine which one is more harmonious or rather which the correct one is. The VAST-score has maximum of 52 points and the score accounts for each correct given answer.

With finishing the VAST, participants did no longer had to work on e-prime, but where to ask to answer the KiF-questionnaire on an internet browser. As mentioned and described above, participants had to answer the sections A-D of the KiF respectively.

5.5.4. Questionnaires

Part three of the experiment tests the second hypotheses: *For higher expertise scores, balance will positively influence preference ratings more*. This was conducted via two tests. The first one the “Visual Aesthetic Sensitivity Test (VAST)” and the second one was the “Kunstwissen- und Kunstinteressensfragebogen (KiF)”

6. Results

The data has been cleaned in some ways to establish ideal conditions for the linear-mixed-effect-models. In this case extreme values have been examined to see if there are any suspicious values, which should be excluded from the study.

6.1 Effects on Inversion for preference for balance

Outlier analysis

Response times of the participants have been checked to see if there are any extreme values. Responses and response time values associated with extremely long or extremely short response times have been removed prior to analysis. Extreme response times are considered below Q1-1.5*IQR or over Q3+1.5*IQR. This procedure led to the exclusion of 316 trials, that is to say, 5.79% of the total. The number of removed trials per participants ranged from 2 (1.54%) to 15 (11.54%).

Data analysis

One of the main objectives of this study was to determine whether inversion of figures varying in balance affects preference for balance. In order to address this issue we set up a linear mixed effect model that predicted participants' preference for an image based on the interaction among the image's *condition* (whether the image was upright or inverted), *figure* (circles or hexagons) and *balance* (numerical score according to Wilson & Chatterjee, 2005). The model also included the *trial order*, and participants' *sex*, *VAST score*, *art interest score*, *art knowledge-questionnaire score*, and *art knowledge-identification score*. All categorical predictor variables have been sequential contrast coded. Furthermore the continuous predictor values have been centered to reduce multicolinearity and aid interpretation. All data is therefore displayed in its centered units. The model also included the random effects of the interaction between *condition* and *balance* within participants and *condition* within stimuli. The results of this model were assessed using Cook's distance to identify influential outliers among the participants. This analysis revealed two influential participants. We therefore removed these two participants and conducted the analysis again. The results reported below were obtained from this latter model.

Results

The model specified above revealed an overall positive preference by participants (β_0 = 2.827; t = 41.564; p < .001). That is to say, in general participants expressed a positive preference towards the stimuli. None of the variables pertaining to the stimuli had any significant effect on preference scores ($\beta_{condition}$ = 0.05; t =1.099; p = .279; β_{figure} = 0.199; t = 1.444; p = .1565; $\beta_{balance}$ = 0.0083; t = 1.637; p = .1094), nor did any of their two- or three- way interactions (all ps > .112). There was an effect of sex on preference (β_{sex} = 0.356; t = 2.498; p = .0177), such that men awarded higher preference scores (m = 2.95) than women (m = 2.60). The two art knowledge scores also predicted preference scores. Higher scores on the art knowledge questionnaire were associated with lower preference scores ($\beta_{knowlegde\text{-}q}$ = -0.08; t = 2.432; p = .0206), and higher scores on the art knowledge interest test were associated with higher preference scores ($\beta_{knowlegde\text{-}i}$ = 0.047; t = 2.169; p = .0374).

6.2 Transitivity of preference for balance

This part of the study aimed to determine whether preference for balance is transitive. In order to do so, we calculated, for each participant his or her ranking of the stimuli based on the repeated presentation of the stimuli. Each time a stimulus was chosen over another in the paired presentation, it was awarded 1 point. If it was not chosen, it was awarded 0 points. This way, stimuli could be arranged from least preferred to most preferred for each participant. In this context, thus, a transitive choice can be defined as a choice between two stimuli that is in line with a given participant's preference ranking (Chatterjee, pers. comm.). For instance, a participant who prefers stimuli A, with 9 points in her ranking, over stimuli B, with 6 points in her ranking, is making a transitive choice. However, if in a trial he or she chooses B over A, even though A is higher in her personal preference ranking, he or she is making an intransitive choice. The first step in this analysis, thus, was to determine for each trial and participant, whether the choice was transitive (in line with his or her particular ranking) or intransitive (against the particular ranking).

Outlier analysis

As before, response times of the participants have been checked to see if there are any extreme values. Responses and response time values associated with extremely long or extremely short response times have been removed prior to analysis. Extreme response times are considered below Q1-1.5*IQR or over Q3+1.5*IQR. This procedure led to the exclusion of 154 trials, that is to say, 5.56% of the total. The number of removed trials per participants ranged from 0 to 8 (12.12%).

Data analysis

As in the analysis of the impact of inversion on preference for *balance*, we used linear mixed effects modelling to determine the relation between balance and transitivity. In this case, the outcome variable was defined as the transitivity of choice (transitive or intransitive, as defined above) made by a given participant on a given trial. The model included the interaction between *figure* (circles or hexagons) and the *difference* between the balance scores of the two stimuli presented in each trials as main predictors. The model also included participants' *sex*, *VAST score*, *art interest score*, *art knowledge-questionnaire score*, and *art knowledge-identification score*. All categorical predictor variables have been sequential contrast coded. Furthermore the

continuous predictor values have been centered to reduce multicolinearity and aid interpretation. All data is therefore displayed in its centered units. The model also included the random effects of the interaction between *figure* and *difference* within participants. The results of this model were assessed using Cook's distance to identify influential outliers among the participants. This analysis revealed no influential case.

The model revealed an extremely high prevalence of transitive responses (β_0 = 1.223; z = 23.021, p < .0001). This means that participants' choices were transitive in 77.26% of trials, and implies that, generally speaking, participants' preferences were transitive, and could reliably be aligned along a consistent particular ranking. The model also revealed that none of the presumed predictor variables had any significant effect on the chances of making a transitive choice (all ps > .292). In particular, transitivity of choice was not affected by figure (β_{figure} = 0.003; z = 0.026; p = 0.979), nor by difference in the balance of the presented pair of stimuli ($\beta_{difference}$ = 0.0002; z = 0.060, p = 0.952). Thus, participants' responses were highly transitive, irrespective of whether figures were circles or hexagons, and irrespective of the differences in balance between the stimuli in each pair. They were also unaffected by participants scores on the VAST and KIF.

7. Discussion

The focus of this study was to replicate Wilson and Chatterjee's (2005) study and to examine the influence of balance on the preference for visual stimuli containing that factor. Based on that assumption this study aimed to research the influence of expertise, particularly distinguish art experts and laypeople, and to examine the influence of that level of expertise regarding the preference for *balance*. It was aimed that preferences, decisions and judgments are mostly transitive and therefore consistent.

7.1 Preference for balance

Wilson and Chatterjee (2005) showed that high balance scores in circles and hexagons influence the preference ratings of the presented stimuli (Wilson & Chatterjee, 2005). The results of this study showed that there is a general preference for high balance scores. The further research of differences in preference ratings concerning the shape of the presented stimuli and the inversion of said ones showed, that due to the similar values of balance in the presented stimuli no difference in ratings

could be determined. As expected inversion did not influence the preference ratings of the shown stimuli and *balance* remained consistent in the rating of said stimuli. Wilson and Chatterjee's (2005) APB research showed how balance can impact the aesthetic assessment of visual stimuli. They have also come across the problem in their study that vertical and horizontal edges of shapes can create unpredictable local group tensions which can affect dynamic balance. In fact, Silvia and Barona (2009) found that curved or arcuate stimuli are valued more positively than edged ones. When examining preferences for the visual stimuli, the form of the stimulus alone can be decisive for the evaluation. By replicating Wilson and Chatterjee's (2005) work it is clear that *balance* can influence the rating of presented stimuli. If the finding are transferred to the model of aesthetic experience, it can be assumed that *balance* plays an important role in the perceptual experience of presented stimuli. But as mentioned before in the study of Silvia and Barona (2009), the sole form of a presented stimuli, be it balanced or not, can interact with the form itself. This means that *balance* can be influenced by a certain shape and therefore should be examined with more different shapes to distinguish different effects and interaction.

7.2 Art expertise and preference for balance

Although studies showed that art expertise can influence the viewer's judgment (Nodine et. al, 1994; Leder et. al, 2004) the results of this study indicated that there was no significant results whatsoever. The easiest explanation is that balance is actually a strong determinant of preference, one which is not easily acted by the degree of art knowledge and interest acquired by the tested participants. Expertise does not influence the judgment of visual stimuli of its self. According to the model of Leder et. al (2004) experts consider many information to evaluate the experience and emotions they perceived, but since in this study there is no further information than the stimuli itself, it makes it hard for experts to have a crucial influence.

Further reason could be the lack of expertise. Since the average expertise score is pretty low we have no reference group to see if there is a crucial influence. More data and higher expertise score is required to make meaningful results. Again, Silvia and Barona (2009) found in their study that art expertise has different influences on the evaluation of visual stimuli. In their study, subjects rated angular and arch-shaped visual stimuli, depending on their art expertise. These found divergent results in terms of art expertise, as it has played a role in laypeople and experts in various fields and

thus was not a consistent factor in evaluating the stimuli in the study. Similar results are found in this study. The results show that art knowledge scores predicted preference scores. Higher scores on the art knowledge questionnaire were associated with lower preference scores and higher scores on the art knowledge interest test were associated with higher preference scores. The question raised in this study is if art interest and art expertise can be distinguished and how those factors influence laypeople and experts.

7.3 Transitivity for preference for balance

The aim of this study was to present an approach to examine choice behavior in consistency in choices. Although the results show a high prevalence for transitive choices, they choices are not influenced by the predicted variables. This implies that, although participants' preference for the stimuli was transitive, this transitivity was unrelated to, or at least unconstrained by, *balance*. Whatever feature in the stimuli that was guiding participants' transitive responses, it was not *balance*, contrary to the study's initial hypotheses. Considering the model. Based on utility theory (Edward, 1954), subjects may benefit from the decision to always make consistent decisions, even if it is not due to the factor *balance*. Since the decision on the options are at a perceptual level, presumably subconsciously, a survey of the subjects after the experiment is not possible. The question or further investigation could be concerned with which variable or which factor is decisive for a transitive decision behavior. The results show that there are consistent patterns but unfortunately the motivations for this decision cannot be named. This also raises the question of whether there is a subconscious hedonistic motivation and, if so, which factor could be responsible or has an impact on it. Future research could identify the missing variable.

8. Conclusion

Balance, like many other perceptual factors, can be found in various aspects of everyday life - basically in all visual stimuli, be it art, design (Locher and Stappers, 2002, Barry and Rerup, 2006, Frenkel, 1999) or even contemplation of food (Zellner, Lankford, Ambrose and Locher, 2010). However, this study shows that it still needs further research to find out which factors influence the assessment of *balance.* It is assumed that *balance* interacts with other perceptual factors and can modulate the evaluation of these stimuli, as well as other factors can influence balance. By this is

meant that balance occurs in different forms and stimuli, but other factors also play a significant role in the evaluation of these stimuli. It would be difficult to isolate balance as a single factor and to examine the extent of its influence. In the model of Leder et. al. (2005), aesthetic experience is a near-hierarchical process that interacts with other factors. Similarly, balance is a factor that interacts with other factors of perception and should therefore be further investigated in this interaction. This work has addressed various areas of the model of Leder et. al (2004) and tries to explain the relevance of *balance*. Future research should continue to focus on the interactions between other areas and stages of the model of aesthetic experience to show more clearly the relevance of *balance* at other levels.

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10. Appendix

Abstract

Over the last century, psychology has become increasingly concerned with the question of aesthetic perception and experience of visual stimuli. The model of aesthetic experience describes different levels of cognitive and affective processing as it comes to aesthetic experience. In this work, the influence of the perceptional factor balance on the preference of visual stimuli is examined. It examines how art expertise and art interest can affect valuation and whether balance is a factor in a transitive decision model. Forty subjects were examined in a computer test in which visual stimuli were presented and were art expertise and art interest were collected. The results of a linear-mixed-effect-model show that there is a preference for balanced stimuli, but that balance is not influenced by the examined variables and that balance cannot be mentioned as an influencing factor in transitive decision models.

Keywords: balance, aesthetic experience, transitivity, art knowledge, art interest

Abstrakt

Im Laufe des letzten Jahrhunderts hat sich die Psychologie zunehmend mit der Frage der ästhetischen Wahrnehmung und Erfahrung von visuellen Reizen befasst. Das Modell der ästhetischen Erfahrung beschreibt über verschiedene Ebenen der kognitiven und affektiven Verarbeitung, wie es zu ästhetischer Erfahrung kommt. In dieser Arbeit wird der Einfluss des Wahrnehmungsfaktors *balance* in Bezug auf die Präferenz von visuellen Reizen untersucht. Dabei wird untersucht inwiefern Kunstwissen und Kunstinteresse sich auf die Bewertung auswirken können und ob *balance* ein Faktor in einem transitiven Entscheidungsmodell hat. Untersucht wurden 40 Versuchspersonen im Rahmen eines Computertest, bei dem visuelle Reize bewertet wurden und Kunstwissen, sowie Kunstinteresse erhoben wurden. Die Resultate eines linear-mixed-effekt-modells zeigen, dass eine Präferenz für Reize mit hoher *balance* gegeben ist, jedoch *balance* nicht von den untersuchten Variablen beeinflusst wird und *balance* nicht als Einflussfaktor bei transitiven Entscheidungsmodellen genannt werden kann.

Schlagwörter: balance, ästhetische Erfahrung, Transitivität, Kunstwissen, Kunstinteresse

A. Table

B. Figures

C. Stimuli

Original Stimuli from Wilson and Chatterjee (2005)

circle01.jpg	circle02.jpg		
circle03.jpg	circle04.jpg	circle05.jpg	circle06.jpg
circle07.jpg	circle08.jpg	circle09.jpg	circle10.jpg
circle11.jpg	circle12.jpg	circle13.jpg	circle14.jpg
circle15.jpg	circle16.jpg	circle17.jpg	circle18.jpg
circle19.jpg	circle20.jpg	circle21.jpg	circle22.jpg
circle23.jpg	circle24.jpg	circle25.jpg	circle26.jpg
circle27.jpg	circle28.jpg	circle29.jpg	circle30.jpg
circle31.jpg	circle32.jpg	circle33.jpg	circle34.jpg
circle35.jpg	circle36.jpg	circle37.jpg	circle38.jpg

circle39.jpg	circle40.jpg	circle41.jpg	circle42.jpg
circle43.jpg	circle44.jpg	circle45.jpg	circle46.jpg
circle47.jpg	circle48.jpg	circle49.jpg	circle50.jpg
circle51.jpg	circle52.jpg	circle53.jpg	circle54.jpg
circle55.jpg	circle56.jpg	circle57.jpg	circle58.jpg
circle59.jpg	circle60.jpg	circle61.jpg	circle62.jpg
circle63.jpg	circle64.jpg	circle65.jpg	hexagon01.jpg
hexagon02.jpg	hexagon03.jpg	hexagon04.jpg	hexagon05.jpg
hexagon06.jpg	hexagon07.jpg	hexagon08.jpg	hexagon09.jpg
hexagon10.jpg	hexagon11.jpg	hexagon12.jpg	hexagon13.jpg
hexagon14.jpg	hexagon15.jpg	hexagon16.jpg	hexagon17.jpg
hexagon18.jpg	hexagon19.jpg	hexagon20.jpg	hexagon21.jpg
hexagon22.jpg	hexagon23.jpg	hexagon24.jpg	hexagon25.jpg
hexagon26.jpg	hexagon27.jpg	hexagon28.jpg	hexagon29.jpg
hexagon30.jpg	hexagon31.jpg	hexagon32.jpg	hexagon33.jpg
hexagon34.jpg	hexagon35.jpg	hexagon36.jpg	hexagon37.jpg
hexagon38.jpg	hexagon39.jpg	hexagon40.jpg	hexagon41.jpg
hexagon42.jpg	hexagon43.jpg	hexagon44.jpg	hexagon45.jpg
hexagon46.jpg	hexagon47.jpg	hexagon48.jpg	hexagon49.jpg
hexagon50.jpg	hexagon51.jpg	hexagon52.jpg	hexagon53.jpg
hexagon54.jpg	hexagon55.jpg	hexagon56.jpg	hexagon57.jpg

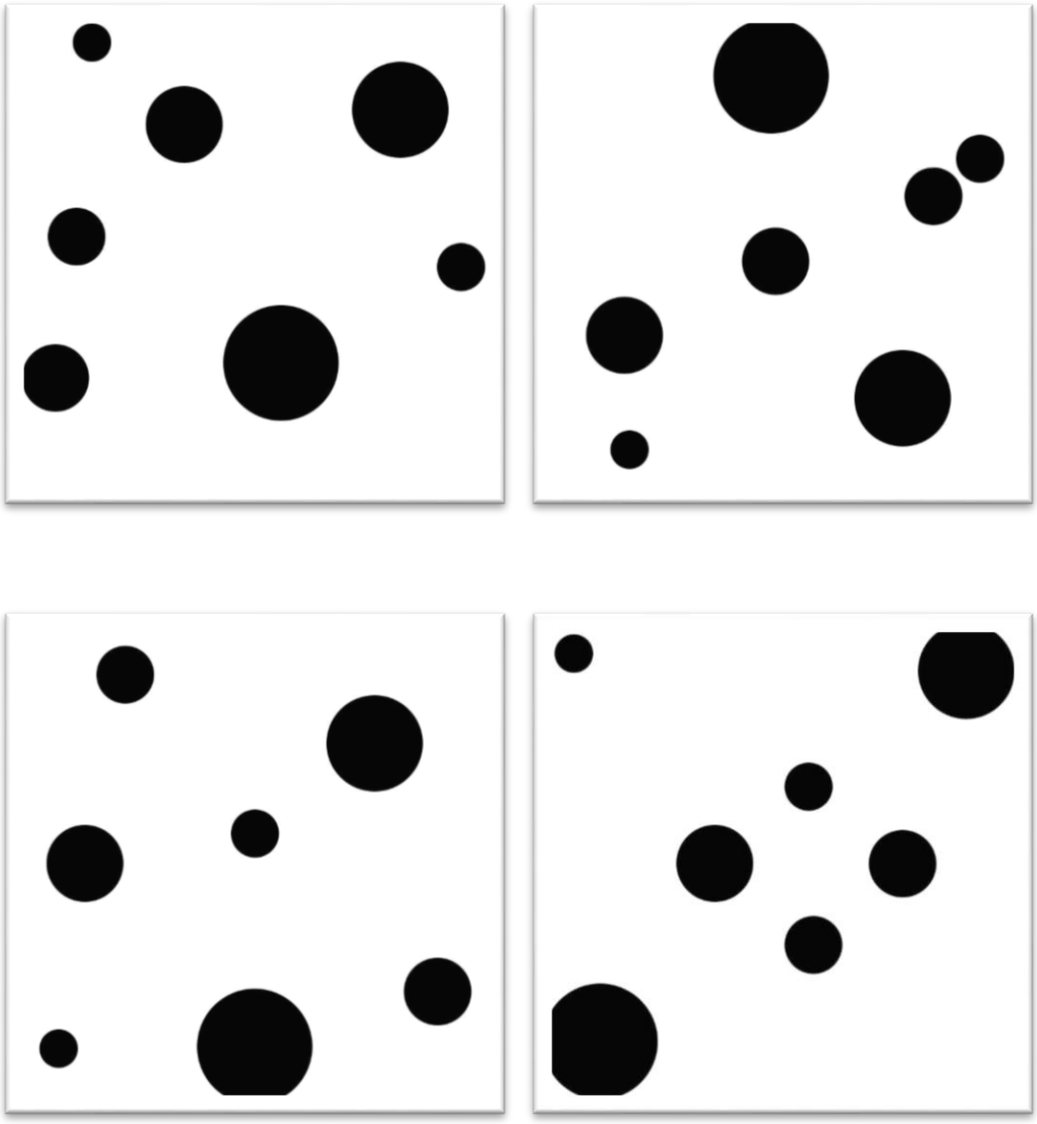
hexagon58.jpg	hexagon59.jpg	hexagon60.jpg	hexagon61.jpg
hexagon62.jpg	hexagon63.jpg	hexagon64.jpg	hexagon65.jpg

Stimuli VAST (used from Görtz et. al, 1979)

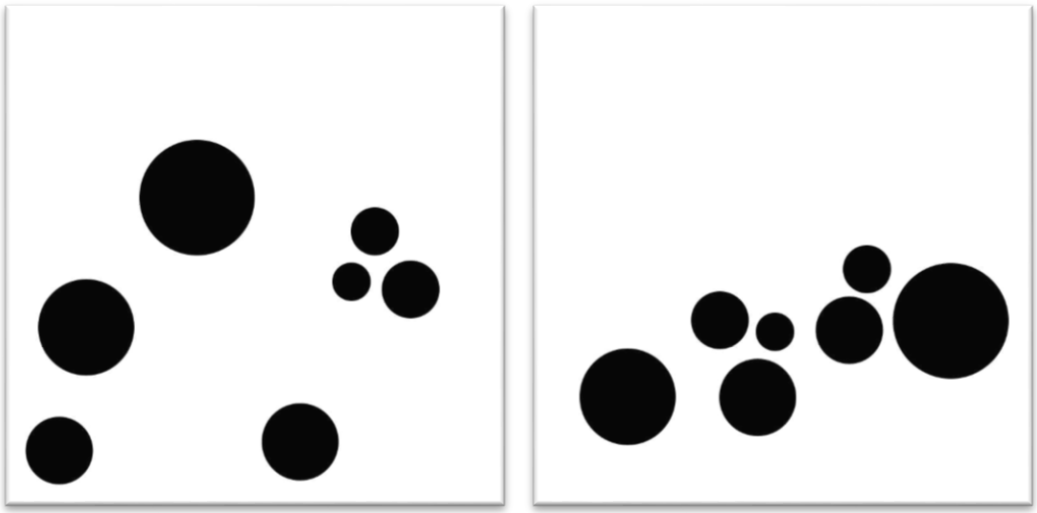
1f.png	1c.png	2c.png	2f.png
3c.png	3f.png	4c.png	4f.png
5c.png	5f.png	6c.png	6f.png
7c.png	7f.png	8c.png	8f.png
9c.png	9f.png	10c.png	10f.png
11c.png	11f.png	12c.png	12f.png
13c.png	13f.png	14c.png	14f.png
15c.png	15f.png	16c.png	16f.png
17c.png	17f.png	18c.png	18f.png
19c.png	19f.png	20c.png	20f.png
21c.png	21f.png	22c.png	22f.png
23c.png	23f.png	24c.png	24f.png
25c.png	25f.png	26c.png	26f.png
27c.png	27f.png	28c.png	28f.png
29c.png	29f.png	30c.png	30f.png
31c.png	31f.png	32c.png	32f.png
33c.png	33f.png	34c.png	34f.png

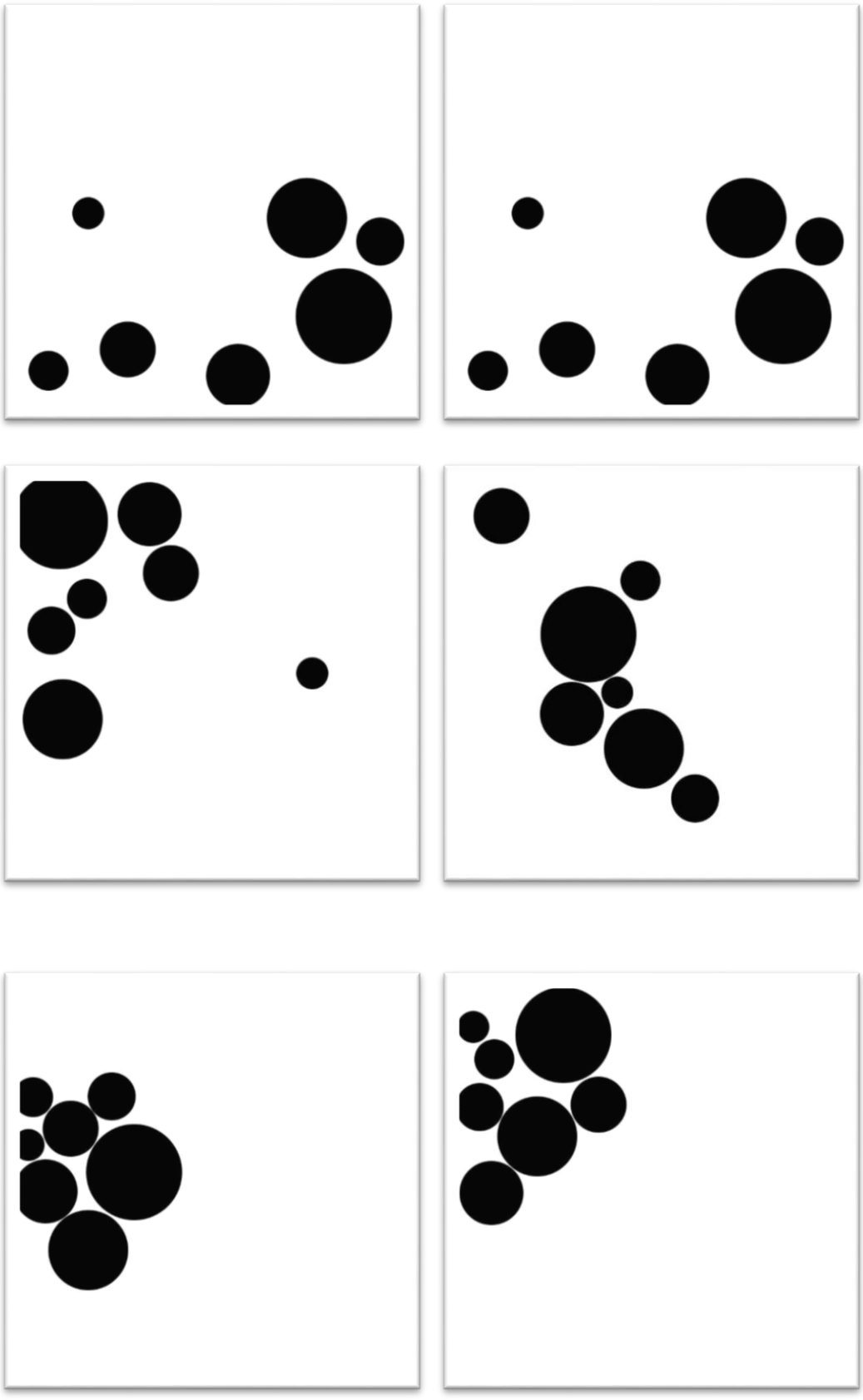
35c.png	35f.png	38c.png	38f.png
39c.png	39f.png	40c.png	40f.png
41c.png	41f.png	42c.png	42f.png
43c.png	43f.png	44c.png	44f.png
45c.png	45f.png	46c.png	46f.png
47c.png	47f.png	48c.png	48f.png
49c.png	49f.png	50c.png	50f.png
exampleAl.png	exampleAr.png	exampleBl.png	exampleBr.png
exampleCl.png	exampleCr.png		

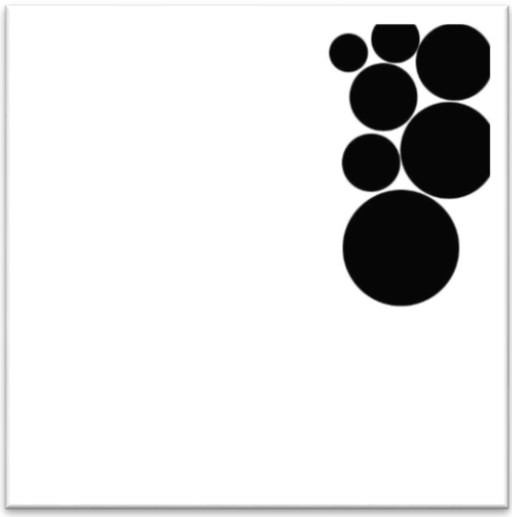
Selected circles for transitivity



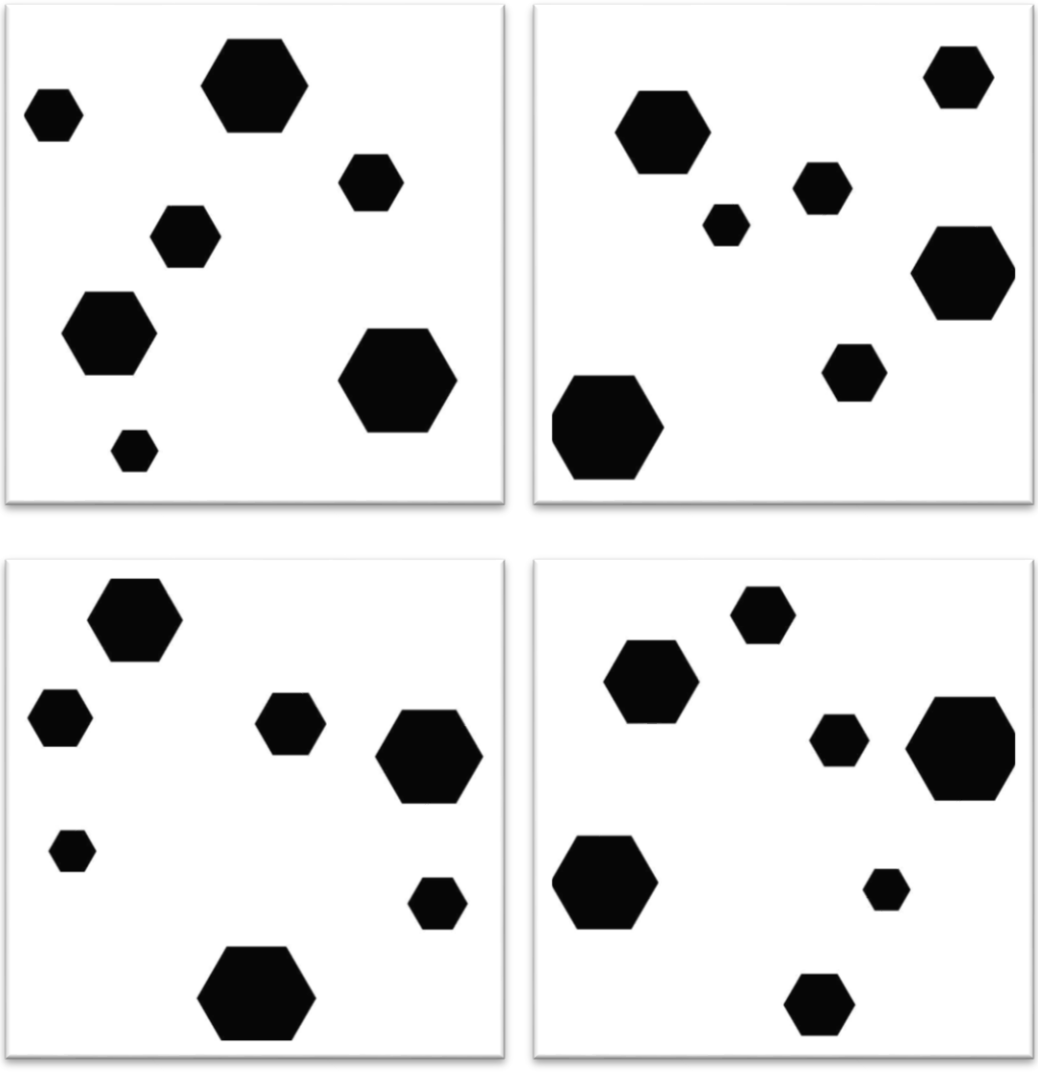
Blan

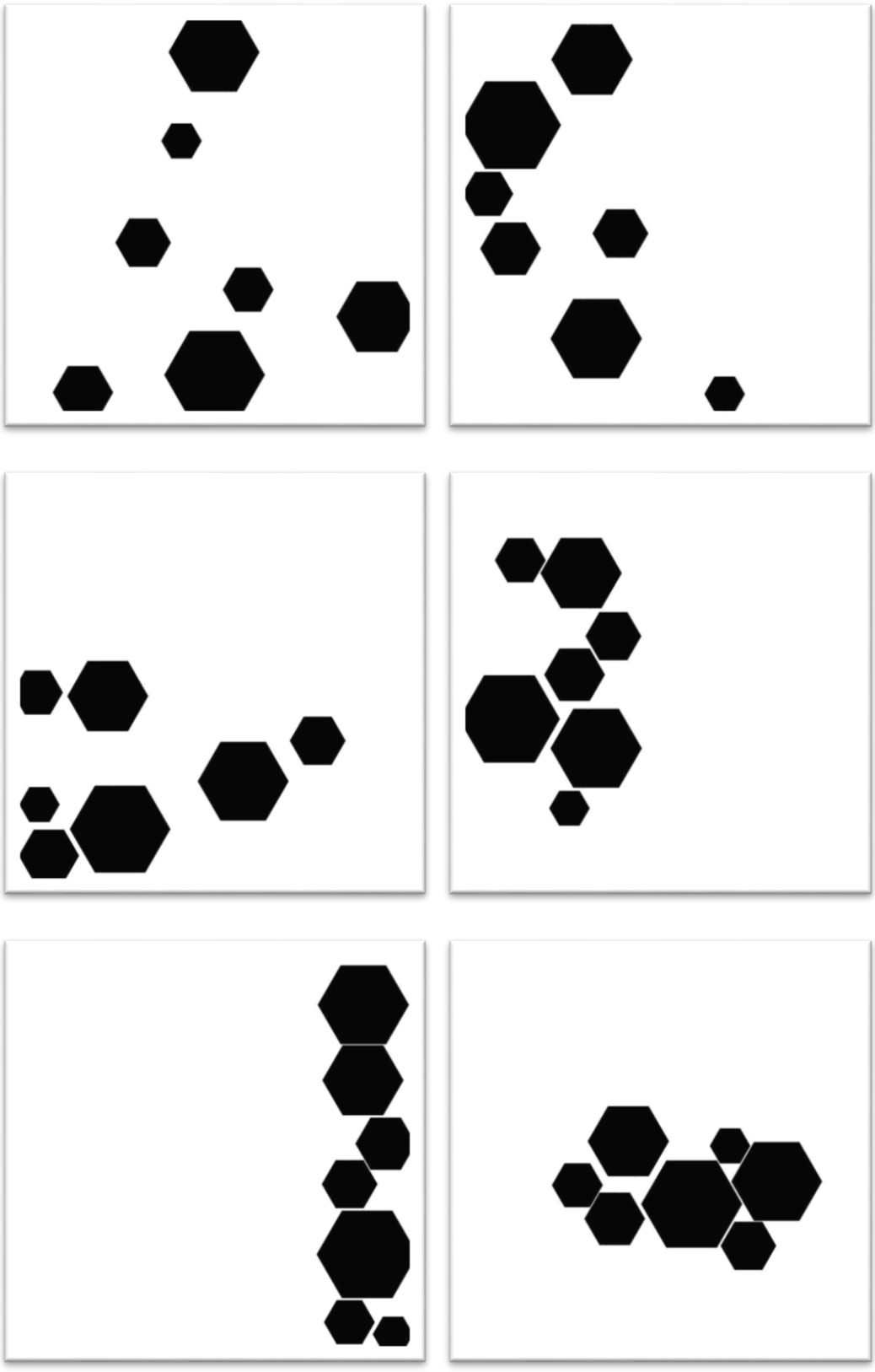


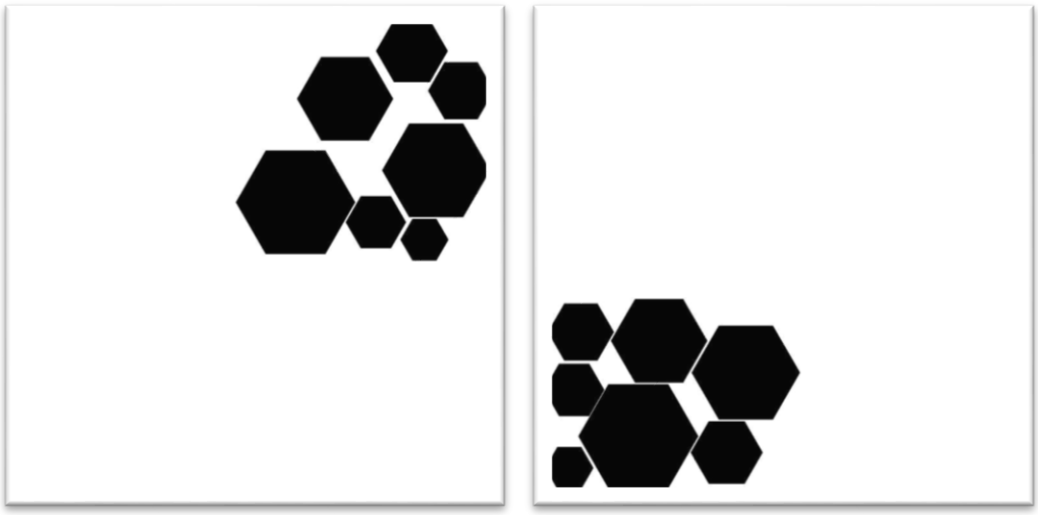




Selected hexagon stimuli







DD. Questionnaire

Fragebogen Initialen: Alter: Geschlecht:
Kunstinteresse

Vielen Dank für Ihre Teilnahme an dieser Untersuchung.
Wir möchten in unseren Studien die individuellen ästhetischen Vorlieben und den Prozess des ästhetischen Erlebens untersuchen und besser verstehen lernen. Dabei ist uns bewusst, dass ästhetische Vorlieben und Einschätzungen nicht unabhängig davon sind, ob man sich für Kunst, Design etc. interessiert und welches Vorwissen der einzelne Teilnehmer mitbringt. Deshalb bitten wir Sie, den folgenden Fragebogen zu bearbeiten.
Zu Beginn finden Sie eine Reihe sehr verschiedener Aussagen vor, die sich ganz allgemein mit Kunst und Kunstinteresse beschäftigen. Geben Sie bitte an, in welchem Maße Sie den einzelnen Aussagen zustimmen.

	Stimmt überhaupt nicht ⟷ völlig								
Um mir zu gefallen, muss ein Kunstwerk hauptsächlich schön sein.	O	O	O	O	O	O	O	O	O
Kunstwerke haben immer eine Bedeutung, man versteht sie nur manch mal nicht.	O	O	O	O	O	O	O	O	O
Ich habe den Kunstunterricht in der Schule genossen.	O	O	O	O	O	O	O	O	O
In meiner Freizeit oder aufgrund meines Studiums besuche ich Veranstaltungen zu Kunst oder Kunstgeschichte.	O	O	O	O	O	O	O	O	O
Was viele sogenannte Künstler da produzieren, könnte ich auch.	O	O	O	O	O	O	O	O	O
Ich unterhalte mich gerne mit anderen Leuten über Kunst.	O	O	O	O	O	O	O	O	O
Ich habe viele Freunde/ Bekannte, die sich für Kunst interessieren.	O	O	O	O	O	O	O	O	O
Hässliche Kunstwerke kann ich nicht leiden.	O	O	O	O	O	O	O	O	O
Ich lese gerne Texte von Künstlern oder über Kunst allgemein.	O	O	O	O	O	O	O	O	O
Moderne Kunst ist oftmals belanglos.	O	O	O	O	O	O	O	O	O
In der Kunst sollte es um eine möglichst genaue Darstellung der Umwelt gehen.	O	O	O	O	O	O	O	O	O
Ich interessiere mich für Kunst.	O	O	O	O	O	O	O	O	O
Kunst sollte hauptsächlich dekorativ sein.	O	O	O	O	O	O	O	O	O
Ich suche immer wieder neue künstlerische Eindrücke und Erlebnisbereiche.	O	O	O	O	O	O	O	O	O
Es passiert mir häufiger, dass ich im Alltag spontan auf ein Kunstobjekt aufmerksam werde, das mich fasziniert.	O	O	O	O	O	O	O	O	O
Ich gehe häufig in Kunstausstellungen.	O	O	O	O	O	O	O	O	O
Ich komme aus einer kunstinteressierten Familie.	O	O	O	O	O	O	O	O	O
Die Künstler und ihre Werke sind so verschieden, dass man sie immer wieder `mit anderen Augen betrachten´ sollte.	O	O	O	O	O	O	O	O	O

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➢Was verstehen Sie im Bezug auf Kunst unter dem Begriff „Moderne"?

Da es sich bei dem zu bewertenden Stimulusmaterial ausschließlich um Abbildungen von Gemälden handelte, möchten wir auszugsweise von Ihnen erfahren, wie gut Sie sich im Bereich der Bildenden Künste auskennen. Bitte verstehe dies nicht als Test. Es dient nur dazu die Urteile detaillierter auswerten zu können.
Hierzu werden Sie in der unten stehenden Tabelle die Namen einiger Künstler vorfinden. Geben Sie bitte zu jedem Künstler an, ob er Ihnen zumindest vom Namen her bekannt ist. So Sie eine Vorstellung davon haben, geben Sie bitte auch an, welcher Nationalität er Ihrer Meinung nach angehört(e) und mit welcher Stilrichtung dieser Künstler hauptsächlich in Verbindung gebracht wird.
Wenn Sie sich nicht sicher sind, können Sie auch einfach raten.

Künstlername	Bekannt (ja/nein)	Nationalität	Kunstrichtung/Stil
Henri Matisse			
Joseph Beuys			
Salvador Dali			
Pablo Picasso			
Jackson Pollock			
Piet Mondrian			
Ernst- Ludwig Kirchner			
Andy Warhol			
Victor Vasarely			
Anselm Kiefer			

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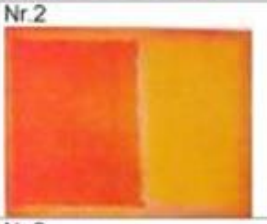
Zum Abschluss zeigen wir Ihnen eine Auswahl von Bildern moderner Künstler. Bitte geben Sie wiederum an, ob Sie die Bilder kennen. So Sie eine Vorstellung davon haben, geben Sie bitte auch an, von welchen MalerInnen die Gemälde stammen könnten. In die letzte Spalte tragen Sie bitte ein, welchem Kunststil Sie das Gemälde zuordnen würden.

Bilder	Bekannt (ja/nein)	Namen der MalerIn	Stilrichtung
Nr.1 			
Nr.2 			
Nr.3 			

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