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The Impact of Visuomotor Fluency on the Affective Responses to Objects

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Abstract

Fluency can be described as the ease of cognitive information processing. Recent studies showed that this processing fluency can influence the affective response to objects (e.g., Reber, Winkielman and Schwarz, 1998; Winkielman and Cacioppo, 2001). Hayes, Paul, Beuger and Tipper (2008) could actually show that fluent interactions with objects evoke a positive affect. In their study, participants grasped and moved objects, using either a fluent action or a non-fluent (avoid an obstacle) action. In line with the fluent account, liking ratings were higher for objects in the fluent condition.

On the basis of these findings, the aim of this study was to find out if this effect can also be demonstrated in a computer simulation. Similar experiments, in which the participants had to follow moving objects on the screen by gazing at them with their eyes, couldn't show this effect. Hence, a visuomotor component was added in the study of this thesis by forcing simple hand-eye coordination. Participants were supposed to follow a grey coloured square on the screen (which either moved in a fluent or non-fluent way) with their index finger and then rate their liking of an appearing stimulus on the screen (Mondrian-like pictures and pictures of male and female faces were used as stimuli). In point of fact, the appearing stimuli were rated as more attractive in the fluent condition. These findings imply that visuomotor fluency influences the affective responses to objects. A previously performed fluent action suffices to evoke a positive affect.

Zusammenfassung

Unter dem Begriff “fluency” wird nach aktuellen Forschungserkenntnissen eine Vereinfachung kognitiver Verarbeitungsprozesse verstanden. Diverse Studien zeigten bereits, dass die fluide Verarbeitung eines Stimulus zu einer positiveren Bewertung desselben führt (e.g., Reber, Winkielman und Schwarz, 1998; Winkielman and Cacioppo, 2001). Hayes, Paul, Beuger und Tipper (2008) konnten in ihrer Studie erstmals zeigen, dass die Bewertung der Attraktivität von Objekten durch die ausgeführte Bewegung (fluent vs. non-fluent) bezogen auf das Objekt beeinflusst wird. Versuchspersonen mussten in ihrer Studie Objekte in einer „fluent“ oder einer „non-fluent“ (Umgehen eines Hindernisses) Bewegung von einer Plattform auf eine andere bewegen. Dabei wurden die Objekte in der „fluent“ Versuchsbedingungen attraktiver bewertet, als die Objekte in der „non-fluent“ Bedingung.

In Anlehnung an diese Forschungsergebnisse, war das Ziel der durchgeführten Studie, zu überprüfen, ob sich dieser Effekt auch in einer Computersimulation nachweisen lässt. In ähnlich durchgeführten Experimenten, in denen die Versuchspersonen die gezeigten Objekte am Bildschirm mit den Augen zielgerichtet folgen mussten, konnte dieser Effekt bisher nicht nachgewiesen werden.

In der vorliegenden Studie wurde deshalb, durch die Vorgabe einer einfachen Auge-Hand Koordination, eine visuomotorische Komponente hinzugefügt. Die Versuchsteilnehmer mussten vor dem Bildschirm die Bewegung eines grauen Quadrates mit ihren Zeigefingern nachzeichnen und anschließend das am Bildschirm aufscheinenden Objekt (Mondrian-ähnliche Bilder sowie Bilder von männlichen und weiblichen Gesichtern wurden vorgegeben) bewerten.

Dabei wurde herausgefunden, dass die aufscheinenden Stimuli attraktiver bewertet wurden, wenn dieser Bewertung eine „fluente“ Bewegung vorausging. Dieses Ergebnis zeigt, dass die Bewertung der Attraktivität von Objekten durch eine simple visuomotorische Bewegung beeinflusst werden kann.

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Introduction

The present study investigated a field of research that has not yet been focused to a great extent: the influence of visuomotor fluency on the affective responses to objects. Although many studies could prove that processing fluency can influence the affective responses to objects (e.g., Reber, Winkielman and Schwarz, 1998; Winkielman and Cacioppo, 2001), only few studies indicate that the quality of visuomotor interaction with an object can cause an affective response to the object.

- In the beginning and because of the exert influence on much of the research on processing fluency, a chronological reference to the mere exposure effect will be given. Also, the general role of fluency in cognitive processing will be discussed.
- As a next step, concepts of fluency will be discussed to investigate and exemplify the reasons behind the fluency effect. Here the main focus will be on the topic of perceptual fluency and its influence on affective responses, also outlining the “hedonic fluency model” of Winkielman, Schwarz, Fazendeiro and Reber (2003).
- Furthermore, a selected review of recent and current areas of fluency research, developed on the basis of relevant and important research results, will be given.
- Because of the exerted influence on the conducted study, a detailed description of the study by Hayes, Paul, Beuger and Tipper (2008) follows. In their study, Hayes et al. (2008) investigated “whether the quality of motor interaction with an object influences affective response to the object” (p. 461) and actually showed that fluent interactions with objects evoke a positive affect.
- Finally, the conducted study will be presented and discussed, with regard to the previously conducted pre-study.

1. Theoretical Background

1.1. Mere Exposure Effect

Zajonc (1968) postulated that the repeated presentation of a stimulus causes a higher liking rating. He named this the mere exposure effect. The mere exposure effect indicates that we prefer those stimuli that are more familiar. Zajonc (1968) assumed that pre-cognitive processes are responsible for the mere exposure effect. Hence, he claimed that pre-cognitive processes can discriminate instantaneously between familiar and new objects.

In contrast, Berlyne (1970) presumed that a moderate arousal potential is crucial to cause a positive affect. Stimuli with a high degree of novelty cause a high degree of arousal potential and will be judged negatively. Repeatedly exposed stimuli become familiar and can be processed at a moderate arousal potential, causing a positive affect. And according to Gordon and Holyoak (1983) the repeated-exposure paradigm can be explained by implicit processes.

According to Bornstein and D'Agostino (1992) the repeated exposure allows an ease of perceptual processing. They further claimed that "the perceptual fluency underlies the exposure effect" (Bornstein and D'Agostino, 1992, p. 550).

Again Zajonc (2001) postulated that the mere exposure effect "shows to be a robust phenomenon that cannot be explained by an appeal to recognition memory or perceptual fluency" (p. 224).

Although there is no agreement about the processes that are responsible for the mere exposure effect, several studies proved that the mere exposure effect can be demonstrated across diverse types of stimuli (e.g. visual, acoustic, subliminal) and different forms of presentation (e.g., Moreland and Zajonc, 1977; Wilson and Zajonc, 1980; Gordon and Holyoak, 1983). Bornstein (1989) gave a review about the variables that influence the mere exposure effect. He analyzed and reviewed studies about the mere exposure effect that was published in the years from 1968 to 1987 and found out that "stimulus type, stimulus complexity, presentation sequence, exposure duration, stimulus recognition, age of subject, delay between exposure and ratings, and maximum number of stimulus presentations all influence the magnitude of the exposure effect" (Bornstein, 1989, p. 265).

1.2. Processing Fluency

According to the fluent account, people tend to prefer stimuli to which they are exposed again and again, because the processing of a repeated stimulus is facilitated. Several studies in which the ease of processing was manipulated, tried to prove this explanation. For example, Reber et al. (1998) could prove in three experiments that perceptual fluency increases liking, even when the stimuli have not been exposed repeatedly. In experiment 1, a subliminal identical prime caused higher liking ratings. In experiment 2, participants rated stimuli as prettier, when the contrast of the stimulus against the background was increased. In experiment 3, stimuli with a slightly longer presentation time were preferred.

Winkielman and Cacioppo (2001) also showed that easy-to-process pictures cause a positive affect. In their study participants watched neutral pictures of everyday objects while the processing ease was manipulated in two different ways. In experiment 1 the processing ease was manipulated by a prime that either matched or mismatched the target. And in experiment 2 processing ease was manipulated by an increase of the presentation duration for some pictures. In both experiments the easy-to-process pictures caused an increase in zygomaticus activity, reflecting a positive affective reaction. These findings imply that we can understand processing fluency as the ease of which cognitive information will be processed. As a consequence of the facilitated information processing, it influences the affective responses to objects.

Various studies also showed that processing fluency not only influences the affective response. For example, Jacoby, Kelley, Brown and Jasecko (1989) could show that names are mistakenly considered famous when they were presented once in an experiment 24 hours before. Besides, Reber and Schwarz (1999) showed that perceptual fluency affects judgements of truth. In their study, statements were judged as truer when the statements were easy to read. Together, these results suggest that fluency plays an important role in various forms of cognitive processing and influences different kinds of decision processes.

1.3. Concepts of Fluency

In their research study, Winkielman et al. (2003) investigated the complexity of mechanisms that help us to identify and evaluate situations:

“Each organism faces a variety of evaluative tasks. We need to distinguish what is hospitable and what is hostile, what to approach and what to avoid, what is valuable and what is worthless, what to pursue and what to abandon. We make these judgments often, we make them throughout life, we make them about trivial issues, and about issues of substantial consequences. Psychological research echoes these observations and increasingly adds to the image of the social perceiver as the evaluating human - homo evalescens.” (Winkielman, Schwarz, Fazendeiro and Reber, 2003, p. 190).

According to Winkielman et al. (2003), the concept of fluency can be seen as an important mechanism “with which information about the target can be processed” (p. 190). Based upon this mechanism, decisions are made, judgements are delivered and a specific attitude or behaviour will be initiated.

1.3.1. Perceptual and Conceptual Fluency

We can describe perceptual fluency as the ease with which perceptual stimuli can be processed. It follows that perceptual fluency can be manipulated by variables which have a great influence on perceptual processes (e.g., repetition, contrast, time of presentation, etc.), for example, by manipulating the reaction time to identify a stimulus (Jacoby and Dallas, 1981). According to Winkielman et al. (2003) perceptual fluency “reflects the ease of low-level, data-driven operations that deal primarily with surface features of the stimulus, or its perceptual form” (p. 194).

Conceptual fluency on the other hand refers to processes of higher-order terms (e.g., semantic issues or meaning of an event). Whittlesea (1993) suggested “that conceptual processing is more salient or important for subjects in making familiarity decision” (p. 1250).

Furthermore, Whittlesea (1993) showed that conceptual fluency, as well as perceptual fluency, can influence attribution processes.

Further studies also tried to examine the impact of conceptual fluency on diverse attribution processes, as measured, for example, by recognition memory (e.g., Roediger, 1990; Weldon, 1993).

1.3.2. Hedonic Fluency Model

In the previous chapters, fluency has been described as the ease of which cognitive information is processed. It was also mentioned that fluency can evoke a positive affect (e.g., Reber et al., 1998; Winkielman and Cacioppo, 2001). But what exactly are the reasons why fluency seems to be hedonically regarded?

Winkielman et al. (2003) proposed that the “fluency signal itself is hedonically marked” (p. 195) and that fluency can be seen as:

- a. a cue to familiarity
- b. a cue to prototypicality
- c. a cue to cognitive progress

Ad a) According to their assumption, the reason why familiarity leads to a positive affect might be based on a biological predisposition for attention in confrontation with novel stimuli. Hence novel stimuli occur more subversively, whereas familiar stimuli seem to be more harmless and, as a consequence, this sensed familiarity elicits the positive affect.

Ad b) As for prototypicality and symmetry, Winkielman et al. (2003) supposed that prototypicality and symmetry stimuli can be processed more easily and that prototypical stimuli are preferred over less prototypical ones. They also proposed that the concept of prototypicality implicates familiarity.

Ad c) Winkielman et al. (2003) proposed that “fluency may trigger affective responses because it provides feedback about the ongoing cognitive operations” (p. 196). According to their assumption, fluent processing is characterized by a successful identification and interpretation of the stimuli, and it can be perceived as rewarding and eventually causes a positive affect.

1.4. Review of Recent Fluency Research

The research to date has shown that processing fluency can influence the affective response to objects as well as it can influence different kinds of decision processes. Here, recent fluency research is mainly focussed on the manipulation of the perceptual fluency setting.

1.4.1. Fluency and Familiarity

As mentioned in the chapters before, previous studies could show that fluent processed stimuli appear to be more familiar. Kelley and Rhodes (2002) showed for example that the ease of processing influences the subjective experience of memory. They presumed that “people could assess the qualities of ongoing experience, such as enhanced perceptual identifiability of words, and interpret those qualities as a sign of a particular past experience. In doing so, they would have an experience of familiarity rather than of fluent processing” (Kelley and Rhodes, 2002, p. 293). According to Wittlesea and Williams (2000), the feeling of familiarity is only partially influenced by fluency, but rather the result of a perceived discrepancy between actual and expected fluency of processing. A fluent performance can therefore be perceived as coherent in one case and incoherent in another. The authors presume that the perception of this discrepancy plays a major role in producing feelings of familiarity.

1.4.2. Fluency Makes the Choice

Novemsky et al. (2007) could show that the choices we make are largely influenced by fluency effects. According to their assumption, we tend to favour such choices that are subjectively perceived as easier to be made.

Labroo, Dhar and Schwarz (2008) showed that increased perceptual fluency (generated by semantic priming) causes higher liking. In their experiment, semantic primes, which helped participants recognizing a product, enhanced liking for the prime-congruent products. Participants favoured prime-congruent products over prime-incongruent products.

1.4.3. Fluency and Truth

As mentioned in chapter 1.2., Reber and Schwarz (1999) showed that perceptual fluency affects judgements of truth. In their study, statements were judged as being truer when the statements were easy to read. McGlone and Tofighbakhsh (2000) also proved that rhyming aphorisms were judged to be more accurate than non-rhyming aphorisms. They suggested “that rhyme, like repetition, affords statements an enhancement in processing fluency that can be misattributed to heightened conviction about their truthfulness” (McGlone and Tofighbakhsh, 2000, p. 424).

1.4.4. Visual Processing Effects Action

Tucker and Ellis (1998) proved that visual processing and priming influences the following action. In their study, participants responded faster when a previously presented task-irrelevant stimulus was congruent with the required response. They showed that perceiving a visual stimulus could intensify a particular response. Tucker and Ellis (2000) also found that “seen objects potentiate a range of actions associated with them” (p. 451). In further studies, Tucker and Ellis investigated “that a task-irrelevant object property can potentiate a particular action” (2001, p. 792) and “that an active object representation is sufficient to generate affordance compatibility effects based on associated actions, whether or not the object is concurrently visible” (2004, p. 185).

1.4.5. Fluency and Beauty

Based on the assumptions of the “hedonic fluency model” by Winkielman et al. (2003), Reber, Schwarz and Winkielman (2004) proposed “that aesthetic pleasure is a function of the perceiver’s processing dynamics: The more fluently the perceiver can process an object, the more positive is his or her aesthetic response” (p. 377). They provided the reasons and mechanism why fluency causes aesthetic pleasure in four particular assumptions.

- 1) Variables through which fluent processing can be facilitated are similar to components who play a major role in theories of beauty (e.g., goodness of form, symmetry or figure-ground contrast).

- 2) According to Reber et al. (2004), “processing fluency is itself hedonically marked and high fluency is subjectively experienced as positive” (p. 377).
- 3) Reber et al. (2004) also proposed that “the affective response elicited by processing fluency feeds into judgments of aesthetic appreciation, unless the informational value of the experience is called into question” (p. 377).
- 4) Finally, Reber et al. (2004) claimed that “the impact of fluency is moderated by expectations and attribution. On the one hand, fluency has a particularly strong impact when its source is unknown and fluent processing comes as a surprise. On the other hand, the fluency based affective experience is discounted as a source of relevant information when the perceiver attributes the experience to an irrelevant source” (p. 377-378).

1.5. Starting Point and Aim of the Current Study

Hayes et al. (2008) investigated a field of fluency research that has not yet been focused to a great extent: the influence of visuomotor fluency on the affective responses to objects. The authors hypothesise “that perceptual-motor compatibility, or the fluency by which perception is converted into action, will influence liking: more fluent actions directed to an object will evoke positive affect that is associated with the acted upon object. An affective mechanism such as this could be beneficial both as a reward mechanism for learning efficient movements, and as an object selection mechanism: Items will be selected that have promoted efficient action in the past.” (Hayes et al., 2008, p. 462).

In their study, Hayes et al. (2008) wanted to find out if affective judgements of objects can be influenced by the fluency of executed responses to the object and if the observed fluency of another person’s action can influence the affective responses to objects. Therefore, the experiment was conducted in two different ways. Participants either had to interact with everyday household items, for example different brands of washing powder or different brands of jams. Or they had to watch a movie clip of a person interacting with the items.

In their study, participants sat at a table with two mats and moved household items from one mat to the other, either in a fluent or in a non-fluent condition (see fig. 1). In

the fluent condition, no obstacle was inserted between the two mats. In the non-fluent condition participants had to avoid an obstacle (a water-filled vase with an artificial flower). The participants were supposed to move the items as quickly as possible using their designated hand. Immediately after placing the item on the destination mat, they were asked to rate the object they had moved.

According to the author's assumption, participants gave significantly higher liking ratings for the items in the fluent action condition.

For the participants who watched movie clips of a person interacting with the items, results were as follows: Items in the fluent action condition were rated as significantly more liked than those in the non-fluent action condition, but only when the head and eye gaze of the actor was visible. Liking ratings were reduced when the actor's head could not be seen. According to Hayes et al. (2008) a "shared attention between actor and observer is a necessary requirement for actions to be simulated, and suggests the important role that the actor's attention/intention state plays for eliciting empathic feeling in the observer" (p. 471). The authors also claimed that "further work will be necessary to understand the mechanisms mediating the influence of visuomotor processes on emotion. The superior temporal sulcus (STS), a cortical region involved in the processing of biological motion such as eye gaze direction and reaching, has strong connections to both the amygdala and orbitofrontal cortex (e.g., Sander et al., 2005). Both of these latter brain structures are involved in emotional assessment of the objects we encounter. Therefore converging techniques, such as fMRI and MEG, will enable the detection of the neural networks mediating the interaction between action and emotion" (Hayes et al., 2008, p. 471).

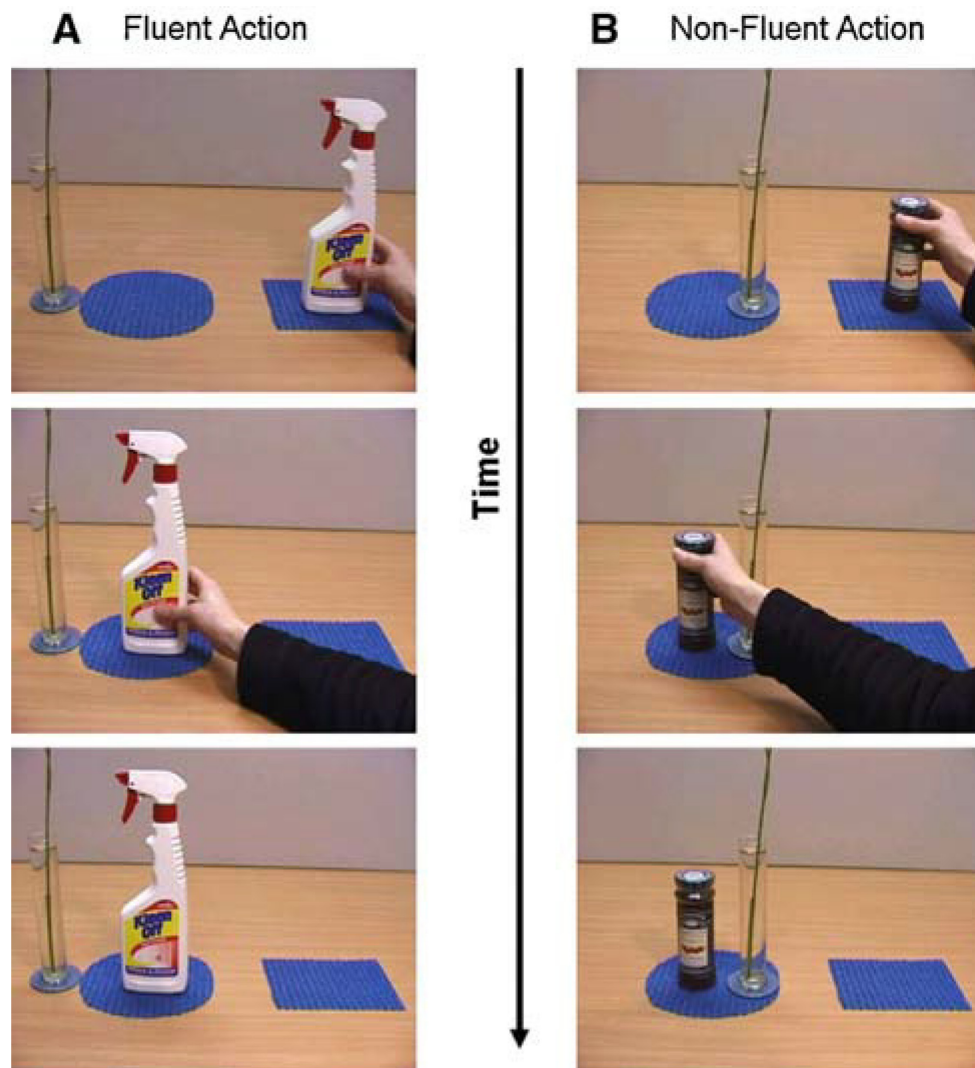


Fig.1 Example of a fluent action trial (a) and a non-fluent action trial in the experiment of Hayes et al. (2008).

On the basis of the previously described findings, the aim of this study was to find out, if the tendency to find objects more attractive when they move in a fluent way can also be demonstrated in a computer simulation.

Similar experiments, conducted in line with experimental research at the faculty of Psychology (at the University of Vienna), in which the participants had to follow moving objects on the screen (and subsequently rate the appreciated liking of the objects) by gazing at them with their eyes, could not show this effect. Consequently, it can be assumed that the motion of the eyes alone is insufficient to cause a positive affect. According to the fluent account, objects which moved fluently over the screen should have been preferred. However, no such difference in the liking ratings could be found.

Therefore a visuomotor component was added in this study by forcing simple hand-eye coordination. Participants were supposed to follow a grey coloured square on the screen (which either moved in a fluent or non-fluent way) with their index finger and then rate their liking of an appearing stimuli on the screen.

This visuomotor component was expected to amplify the influence of visuomotor processes on emotional responses. If so, fluent action may evoke positive affect and, as a consequence, objects in the fluent condition should be rated as more liked than objects in the non-fluent condition.

A pre-study was conducted with the aim to investigate whether a tendency to find objects more attractive in the fluent action could be made visible.

Furthermore, the results of the pre-study should allow conclusions that could be helpful for the conduction of the main experiment.

2. Empirical Part

2.1. Pre-Study

2.1.1. Method

2.1.1.1. Participants

A total of 31 participants (21 females and 10 males, aged between 19 and 34 with a mean age of 23.52 [$SD=3.90$]) took part in the pre-study.

27 of the participants were right-handed; the other 4 were left-handed.

(Handedness was assessed by using a German language version of the Edinburgh Handedness Inventory). All of the participants had a normal or corrected-to-normal visual acuity and with the exception of one participant (who had a red-green colour deficiency) a normal colour vision. All participants did not know the purpose of the experiment.

2.1.1.2. Stimuli

Stimuli were Mondrian-like pictures, occurring either in a rough or a smooth type, with approximately equal liking rates, based on former pilot studies (see fig. 2). 72 Mondrian-like pictures (36 in a rough and 36 in a smooth type) were presented and had to be rated in the experiment. The Mondrian-like pictures were shown in a 160x160 pixel-frame.

Presentation of stimuli and recording of participants liking rates was conducted via PC using the software Experiment Builder (see www.sr-research.com). Participants sat at an approximate distance of 50 cm from the computer screen. The screen resolution of the experiment was 1280x1024 pixels with 32 bit colour depth. The whole stimuli-set used in the pre-study can be found in Appendix A2.

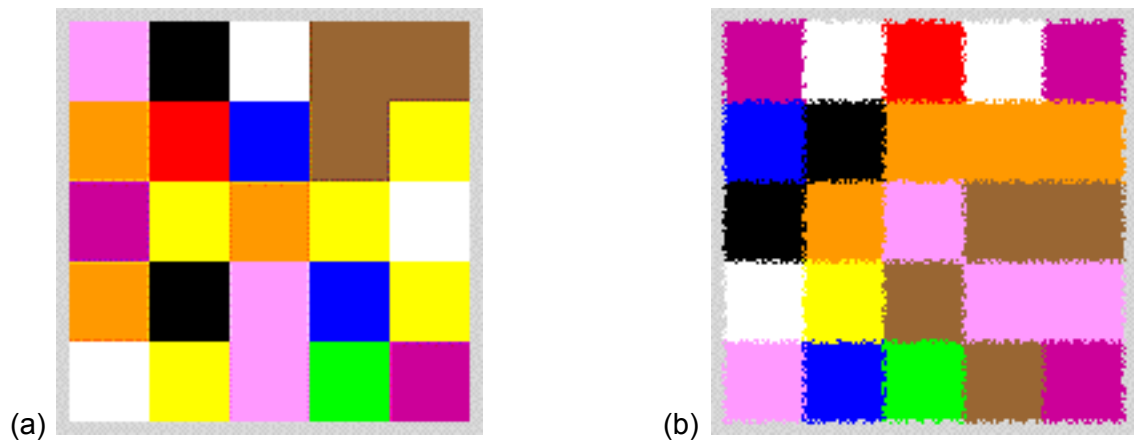


Fig. 2 Example of presented stimuli in the pre-study. Mondrian-like "smooth" (a) and Mondrian-like "rough" (b).

2.1.1.3. Design and Procedure

The pre-study was conducted in a computer testing room at the faculty of psychology (at the University of Vienna). All participants were tested individually and their visual acuity, colour vision (Ishahara Colour Visual Test) and handedness (Edinburgh Handedness Inventory) were tested. Also, a written informed consent was obtained. Instructions were presented on the computer screen and oral instructions were given additionally. The written texts used in the introductions can be found in Appendix A1.

Participants sat in front of a computer screen and had to follow a grey coloured square with their eyes moving across the screen either in a fluent or in a non-fluent way (see fig. 3). The grey coloured square moved either horizontally (from left to right or from right to left) or vertically across the screen (from bottom to top or from top to bottom).

In the fluent condition, the grey square moved in a straight line and without shift of direction from one side of the screen to the opposite side of the screen. In the non-fluent condition, the moving object changed its direction in the middle of the screen (for example: the object started from left to right and changed in the middle of the screen to the top or the bottom of the screen. When the object started at the bottom or the top of the screen, it shifted the direction in the middle of the screen to the left or the right of the screen).

The grey coloured square needed either 3000 ms (slow condition) or 2000 ms (fast condition) to move across the screen. In each trial a cue presented prior to this marked the starting position of the grey square.

Participants were supposed to move their finger to the starting position when the cue appeared. While the grey square moved across the screen, the participants followed the movement with their index finger (participants could choose the hand with which they preferably wanted to perform the task).

When the grey coloured square stopped, participants were supposed to take the finger off the screen, and a Mondrian-like picture (rough or smooth) appeared for two seconds. Participants then verbally rated their liking of the stimulus object on a scale ranging from 1 to 5, with lower numbers representing greater liking (1 = "like the most" and 5 = "like the least"). The responses were given verbally to the experimenter. Participants were instructed to respond quickly, based on their first impressions.

Six practice trials were conducted with stimulus objects that were not presented in the experiment set. Participants then completed a total of 72 recorded trials without interruption. 8 trials were used as "catch" trials to keep the participants attention focused. In the "catch" trials, the grey square did not move at all or just moved to the middle of the screen. The presentation orders of the 72 trials were completely random.

2.1.1.4. Variables and Test Conditions

Liking Ratings

Liking ratings represented the dependent variable in the experiment to determine the participant's affective responses to the stimuli objects. Participants made a verbal response to indicate their liking of the stimuli on a scale ranging from 1 to 5, with lower numbers representing greater liking. "1" indicated "like the most" and "5" indicated "like the least".

Fluency

Fluency represented the independent variable of the experiment. Objects moved either fluently or non-fluently across the screen (See Fig. 3).

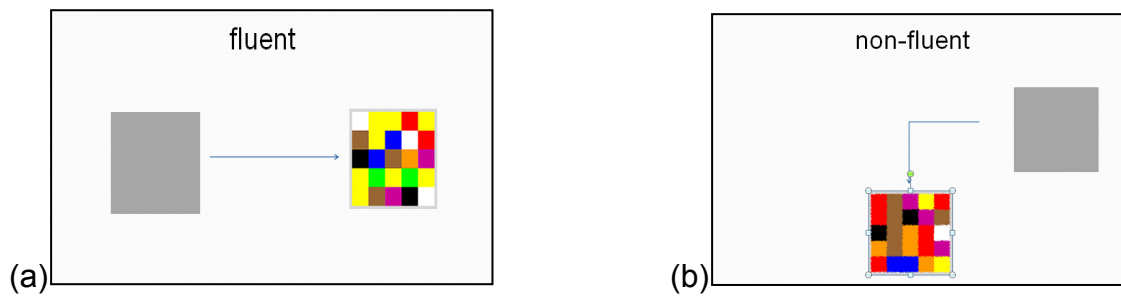


Fig. 3 The fluent (a) and non-fluent (b) conditions.

Speed

Objects moved either within 3000 ms (slow condition) or 2000 ms (fast condition) across the screen.

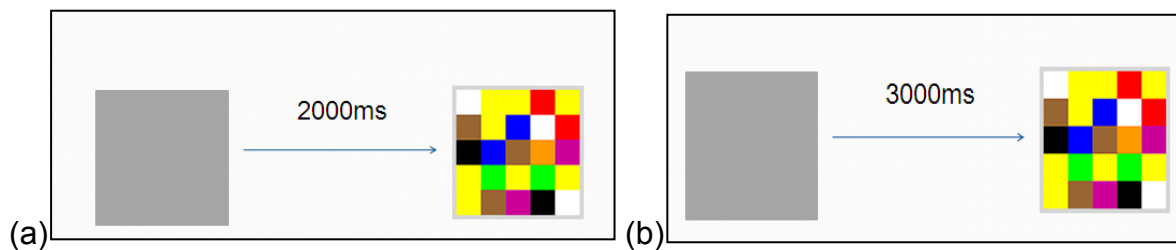


Fig. 4 Illustrating the „fast“ (a) and „slow“ (b) conditions.

Direction

Objects moved either horizontally (from left to right or from right to left), or vertically across the screen (from bottom to top or from top to bottom).

Types of stimuli

Mondrian-like pictures occurred in a rough or a smooth type (see fig. 2).

2.1.2. Results and Discussion

For each participant, the mean of liking ratings was calculated for the fluent and the non-fluent conditions, averaged across stimulus objects (see Table 1). (Note: lower numbers represent greater liking).

A *t*-test failed to reveal a statistically reliable difference between the mean number of ratings in the fluent condition ($M = 2.94$, $SD = 1.08$) and the mean number of ratings in the non-fluent condition ($M = 2.98$, $SD = 1.08$), $t(1982) = .683$, $p > .05$. (Note: an alpha level of .05 was used for all statistical tests).

A one way analysis of variance (ANOVA) also showed that no significant effect could be found for the variables “speed” $F(1,2149) = .35$, $p > .05$, “direction” $F(1,2149) = .96$, $p > .05$ and “stimuli type” $F(8,2149) = .23$, $p > .05$. Moreover, none of these factors (speed, direction and stimuli type) interacted with the factor “fluency”. They did not interact with each other as well $F(4,2149) = .88$, $p > .05$.

Contrary to the assumption, no significant difference between liking ratings in the fluent condition and the liking ratings in the non-fluent condition could be found. Stimulus objects in the fluent condition were not significantly rated better than those in the non-fluent condition. The differences of the average liking ratings between the fluent actions and the non-fluent actions were rather marginal.

Table 1 Mean liking ratings for the fluent and non-fluent condition in the pre-study

Pre-study:

	Liking rating
Fluent	2.94 (1.08)
Non-fluent	2.98 (1.08)

Table 2 Average liking ratings for the Mondrian-like stimuli type

Pre-study:	Liking rating	
	Rough	Smooth
Fluent	2.91 (1.09)	2.99 (1.08)
Non-fluent	2.93 (1.10)	3.02 (1.07)

Table 3 Average liking ratings for the two speed conditions

Pre-study:	Liking rating	
	Slow (3000ms)	Fast (2000ms)
Fluent	2.97 (1.10)	2.92 (1.07)
Non-fluent	2.99 (1.08)	2.96 (1.09)

Table 4 Average liking ratings for each direction

Pre-study:	Liking rating			
	Horizontal		Vertical	
	L-R	R-L	B-T	T-B
Fluent	3.00 (1.07)	2.96 (1.09)	2.83 (1.06)	2.98 (1.11)
Non-fluent	2.98 (1.06)	2.98 (1.10)	2.96 (1.09)	3.00 (1.09)

What then could be the reason that the tendency to find objects more attractive in the fluent action could not be observed?

Comparing and analysing the different variables of the test condition did not offer valuable clues (see Table 2, 3 and 4).

According to the results of previous studies, which demonstrated that a long-term experience of fluent stimulus-action is necessary to cause a positive affect (e.g. Van der Bergh, Vrana and Eelen, 1990), a lack of presented items was presumed.

Comparing all participants' mean of ratings for the first 36 items of the test run and all participants' mean of ratings for the remaining 36 items of the test run could indicate this (see table 5).

For further exploration, the whole data set of the pre-study was split into four parts. The 72 items of all participants were partitioned into 4 parts (each with 18 items) according to the sequential arrangement in the experiment (Items 1-18, Items 19-36, Items 37-54, Items 55-72). For all parts, the means of the liking ratings (see table 6) for all participants were calculated and the results were illustrated in a diagram (see Fig. 5).

At the beginning of the experiment, it seemed that fluent action could not promote a positive affect, but the tendency to find objects more attractive in the fluent action seemed to crystallize during further trials.

Table 5 Comparison of average liking ratings for the Items 1-36 and the Items 37-72

Pre-study:	Liking rating	
	Items 1-36	Items 37-72
Fluent	2.97 (1.11)	2.92 (1.05)
Non-fluent	2.92 (1.09)	3.03 (1.07)

Table 6 Average liking ratings for fluent and non-fluent actions in sequential arrangement

Pre-Study:	Liking rating			
	Items 1-18	Items 19-36	Items 37-54	Items 55-72
Fluent	3.00 (1.02)	2.95 (1.08)	2.89 (1.15)	2.95 (1.08)
Non-fluent	2.87 (1.08)	2.98 (1.10)	2.93 (1.10)	3.12 (1.03)

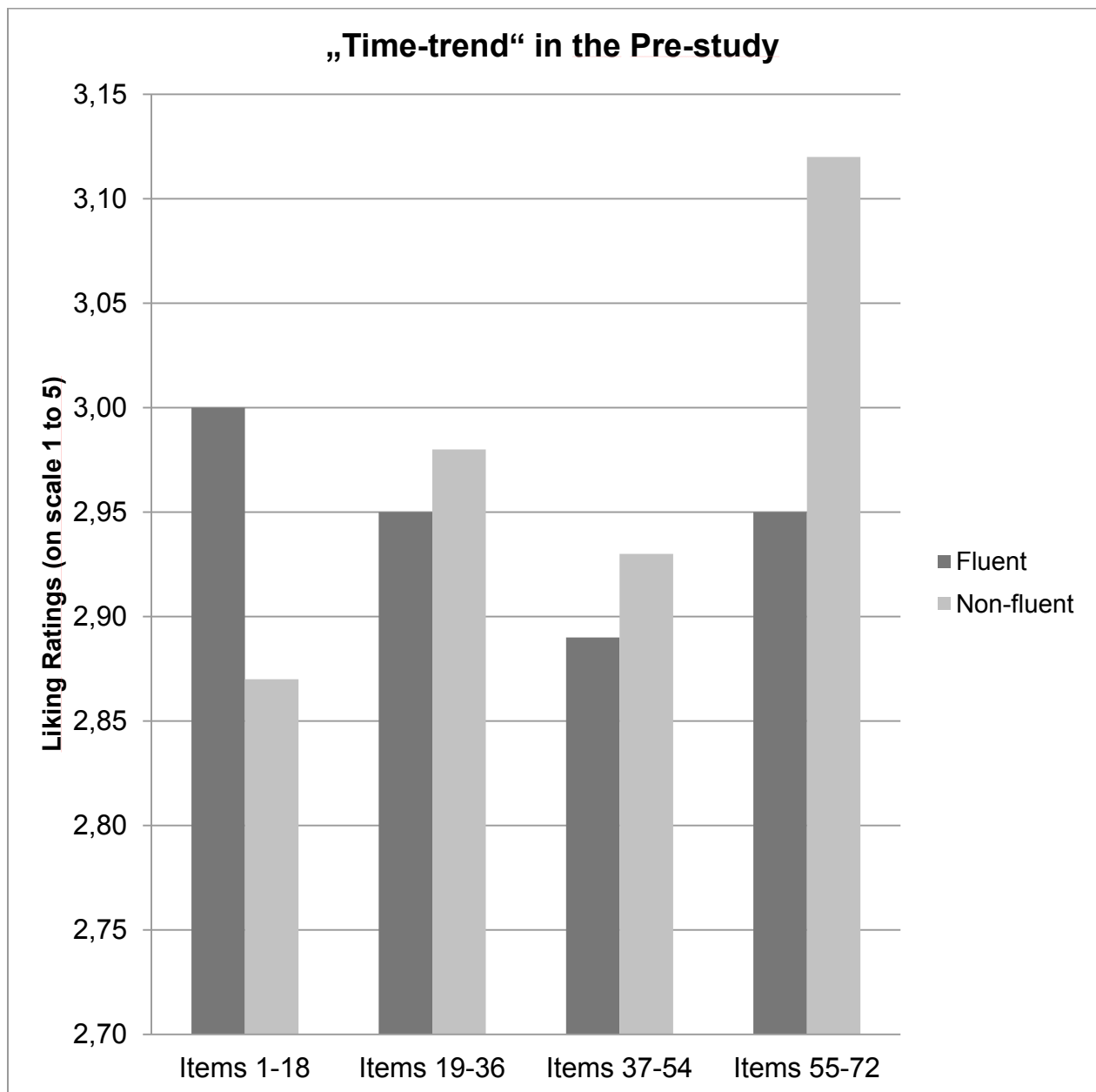


Fig. 5 "Time-trend": average liking ratings for fluent and non-fluent actions during the pre-study in sequential arrangement (per 18 Items). (Note: lower numbers represent greater liking).

These results led to the following consideration: *Can a longer testing block with more items cause a stronger effect?*

According to this consideration, the number of items in the main experiment was increased to a total of 104 Items. For this reason, “human faces” with approximately equal liking rates (based on former pilot studies) were added as stimuli. In addition, the 5 point rating scale, which was used in the pre-study, was replaced by a 7-point rating scale. A wider scale range should allow for a greater difference in the liking ratings. Concerning stimuli, design and procedure, nothing else was changed.

If these changes can cause a stronger fluency-effect the following listed hypotheses for the main study should be corroborated.

2.2. Hypotheses of the Main Study

- I. *Stimulus objects in the fluent action condition should be rated as significantly more liked than those in the non-fluent action condition.***
- II. *Each stimulus type should be rated as more attractive in the fluent condition.***
- III. *The stimuli objects in the fluent condition should be rated more attractive regardless of the speed in which the previous action was performed.***
- IV. *The stimuli objects in the fluent condition should be rated more attractive regardless of the direction in which the previous action was performed.***

2.3. Main Study

2.3.1. Method

2.3.1.1. Participants

48 participants (43 females and 5 males, aged between 18 and 33 with an average age of 21.81 [SD=3.10]) took part in the experiment.

44 of the participants were right-handed; the other 4 were left-handed.

(Handedness was assessed by using a German language version of the Edinburgh Handedness Inventory). All of the participants had a normal or corrected-to-normal visual acuity and a normal colour vision. All participants were psychology students and recruited from the University of Vienna. They received course credits for their participation. All participants did not know the purpose of the experiment.

2.3.1.2. Stimuli

Stimuli were Mondrian-like pictures (occurring either in a rough or a smooth type) and pictures of male and female faces with approximately equal liking rates, based on former pilot studies (see fig 3). 52 Mondrian-like pictures (26 in a rough and 26 in a smooth type) and 52 pictures of faces (26 male and 26 female) were presented and had to be rated in the experiment.

The Mondrian-like pictures were shown in a 160x160 pixel-frame, pictures of male and female faces were presented in a 153x200 pixel-frame.

Presentation of stimuli and recording of participants liking rates was computer-based using the software Experiment Builder (see www.sr-research.com). Participants sat at an approximate distance of 50 cm from the computer screen. The screen resolution of the experiment was 1280x1024 pixels with 32 bit colour depth. The whole stimuli-set used in this experiment can be found in Appendix B2.

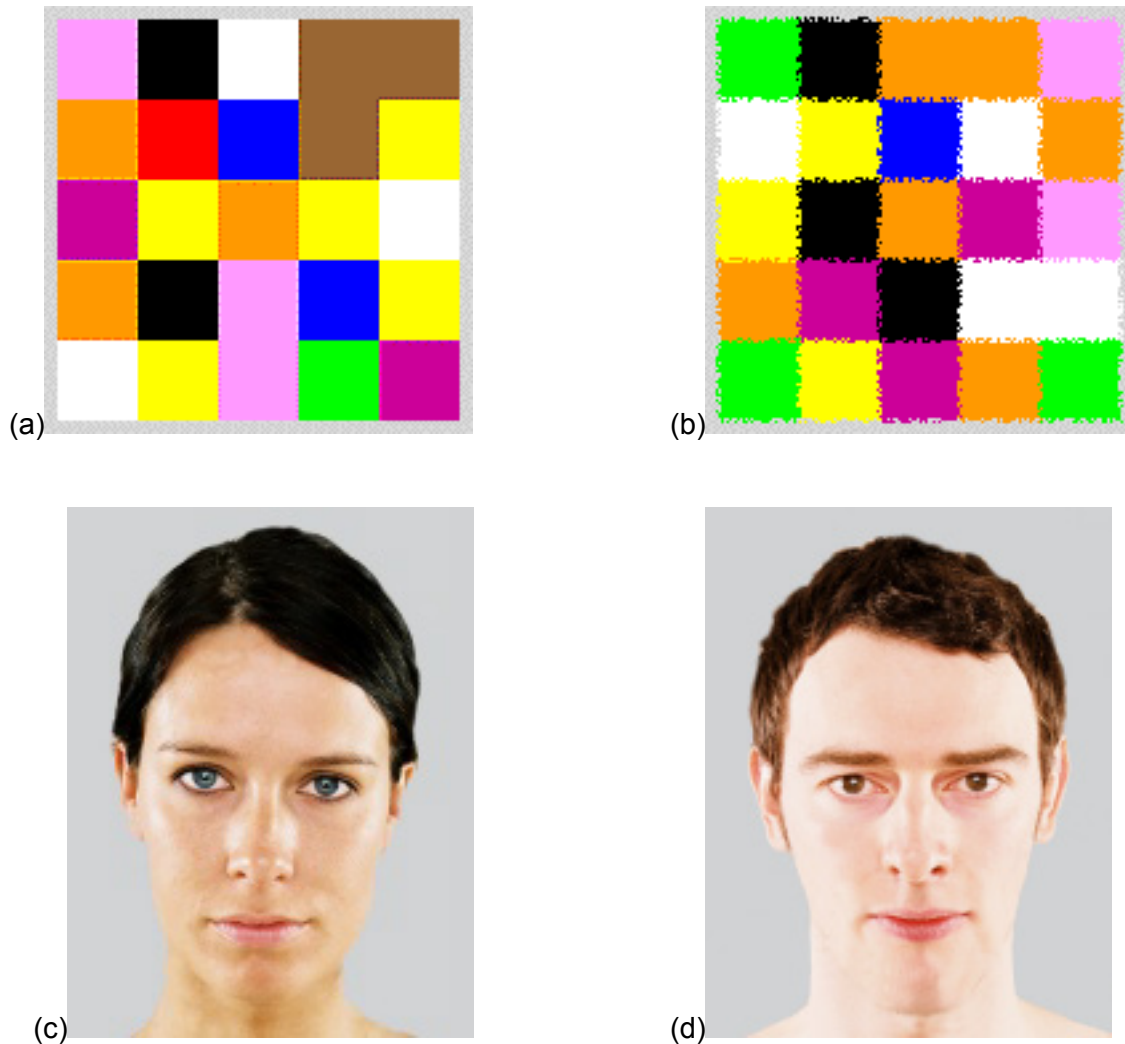


Fig. 6 Example of presented stimuli in the main study. Mondrian-like smooth (a), Mondrian-like rough (b), picture of a female (c) and male face (d).

2.3.1.3. Design and Procedure

The study was conducted in a computer testing room at the faculty of psychology (at the University of Vienna). All participants were tested individually and their visual acuity, colour vision (Ishahara Colour Visual Test) and handedness (Edinburgh Handedness Inventory) were tested. Also, a written informed consent was obtained. Instructions were presented on the computer screen and oral instructions were given additionally. The written texts used in the introductions can be found in Appendix B1.

Participants were placed in front of a computer screen and had to follow a grey coloured square moving across the screen either in a fluent or in a non-fluent way (see fig. 3). The grey coloured square moved either horizontally (from left to right or from right to left) or vertically across the screen (from bottom to top or from top to bottom).

In the fluent condition, the grey square moved in a straight line and without shift of direction from one side of the screen to the opposite side of the screen. In the non-fluent condition, the moving object changed its direction in the middle of the screen (e.g.: the object started from left to right and changed direction in the middle of the screen to the top or the bottom of the screen. When the object started at the bottom or the top of the screen, it shifted in the middle of the screen to the left or the right of the screen).

The grey coloured square needed either 3000ms (slow condition) or 2000ms (fast condition) to move across the screen. In each trial, a cue presented prior to this marked the starting position of the grey square.

Participants were supposed to move their finger to the starting position when the cue appeared. While the grey square moved across the screen, the participants followed the movement with their index finger (participants could choose the hand with which they preferred to perform the task).

When the grey coloured square stopped, participants were supposed to take the finger off the screen and a Mondrian-like picture (rough or smooth) or a picture of a face (male or female) appeared for two seconds. Participants then made a verbal response to indicate their liking of the stimulus object on a scale ranging from 1 to 7, with lower numbers representing greater liking (1 = "like the most" and 7 = "like the least"). The responses were given verbally to the experimenter. Participants were instructed to respond quickly, based on their first impressions.

Six practice trials were conducted with stimulus objects that were not presented in the experiment set. Participants then completed the 104 experiment trials without interruption. The 104 experiment trials included 8 "catch" trials and were used to keep the participants attention focused. In the "catch" trials, the grey square did not move or just moved to the middle of the screen. The presentation orders of the 104 trials were completely random.

2.3.1.4. Variables and Test Conditions

Liking Ratings

Liking ratings represented the dependent variable in the experiment to determine the participant's affective responses to the stimuli objects. Participants made a verbal response to indicate their liking of the stimuli on a scale ranging from 1 to 7, with lower numbers representing greater liking. "1" indicated "like the most" and "7" indicated "like the least".

Fluency

Fluency constituted the independent variable of the experiment. Objects moved either fluently or non-fluently across the screen (see fig. 3).

Speed

Objects moved either within 3000ms (slow condition) or 2000ms (fast condition) across the screen (see fig. 4).

Direction

Objects moved either horizontally (from left to right or from right to left) or vertically across the screen (from bottom to top or from top to bottom).

Types of Stimuli

Two different types of stimuli were used: Mondrian-like pictures and pictures of human faces. Mondrian-like pictures (either in a rough or a smooth type) and pictures of male and female faces were presented (see fig. 5).

2.3.2. Results and Discussion

For each participant, the mean of liking ratings was calculated for the fluent and the non-fluent conditions, averaged across stimulus objects (see Table 7). (Note: lower numbers represent greater liking).

A significant difference in the average liking rates between the “fluent” and the “non-fluent” condition was found $t(4606) = 2.29, p = .022$. (Note: An alpha level of .05 was used for all statistical tests).

Objects in the fluent condition ($M = 3.75, SD = 1.50$) were rated as significantly more liked than objects in the non-fluent condition ($M = 3.85, SD = 1.50$) (see Fig. 7).

For further exploration of the results, an ANOVA was carried out.

There was a significant main effect for “stimuli type” $F(1, 4604) = 19.90, p < .001$, indicating that participants rated pictures of faces ($M = 3.71, SD = 1.47$) as significantly more attractive than Mondrian-like pictures ($M = 3.90, SD = 1.53$) (see Table 8 and Fig. 8). The interaction effect between “fluency” and “stimuli type” was not significant, $F(1, 4604) = .37, p > .05$. Fig. 8 also shows that human faces as stimuli yielded a larger difference in the liking ratings between the fluent and non-fluent conditions than the Mondrian-like pictures.

No significant effect could be found for the variables “speed” $F(1, 4604) = .54, p > .05$ and “direction” $F(1, 4604) = .76, p > .05$. There was no interaction effect between “fluency” and “speed”, $F(1, 4604) = .02, p > .05$. However, an interaction effect could be found between “fluency” and “direction” $F(1, 4604) = 4.13, p = .042$. A greater difference could be observed in the liking rates between the fluent and the non-fluent condition when the objects moved horizontally over the screen (see Table 9 and Fig. 9). Variables (fluency, stimuli, speed, direction) did not interact with each other $F(9, 4544) = .73, p > .05$.

As predicted in the hypothesis, visuomotor fluency influences the affective responses to objects. A previously performed fluent action is sufficient to evoke a positive affect. Actually, each stimulus type was rated as more attractive in the fluent condition compared to the evaluations in the non-fluent condition (see table 10 and Fig. 10). Here the results show a general preference of female faces.

According to the afore mentioned assumption, the stimuli in the fluent condition were also rated as more attractive, regardless of the speed of objects (see Table 11 and

Fig. 11) and regardless of the direction in which the objects moved with the exception of the “bottom-to-top (B-T)” direction (see Table 12 and Fig 12).

Table 7 Mean liking ratings for the fluent and non-fluent conditions in the main study

Main study:

	Liking rating
Fluent	3.75 (1.50)
Non-fluent	3.85 (1.50)

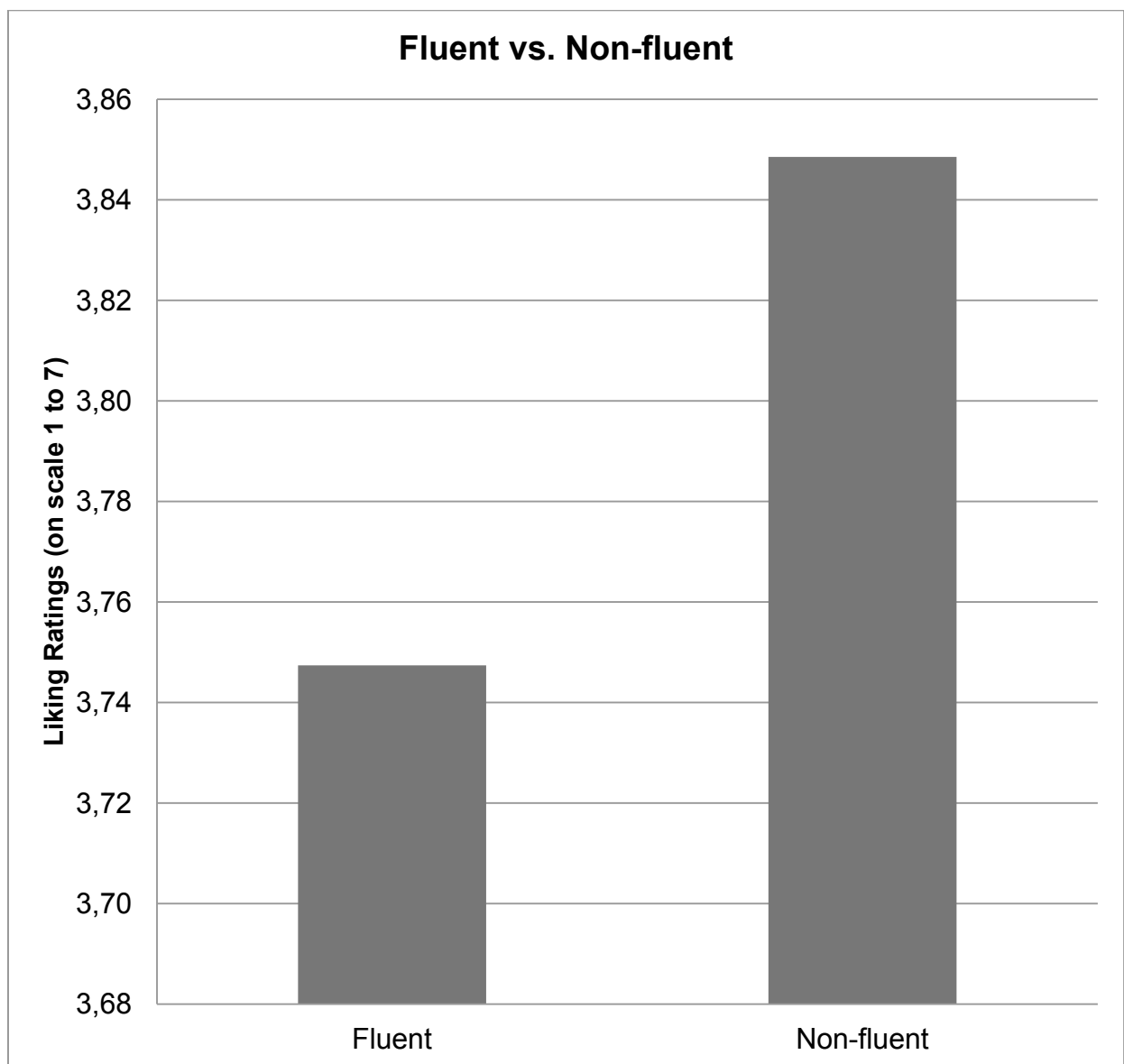


Fig. 7 Average liking ratings for the fluent and non-fluent actions in the main study. (Note: lower numbers represent greater liking).

Table 8 Average liking ratings for the stimuli “Faces” and “Mondrian-like”

Main Study:	Liking rating	
	Faces	Mondrian-like
Fluent	3.60 (1.47)	3.86 (1.53)
Non-fluent	3.76 (1.47)	3.93 (1.52)

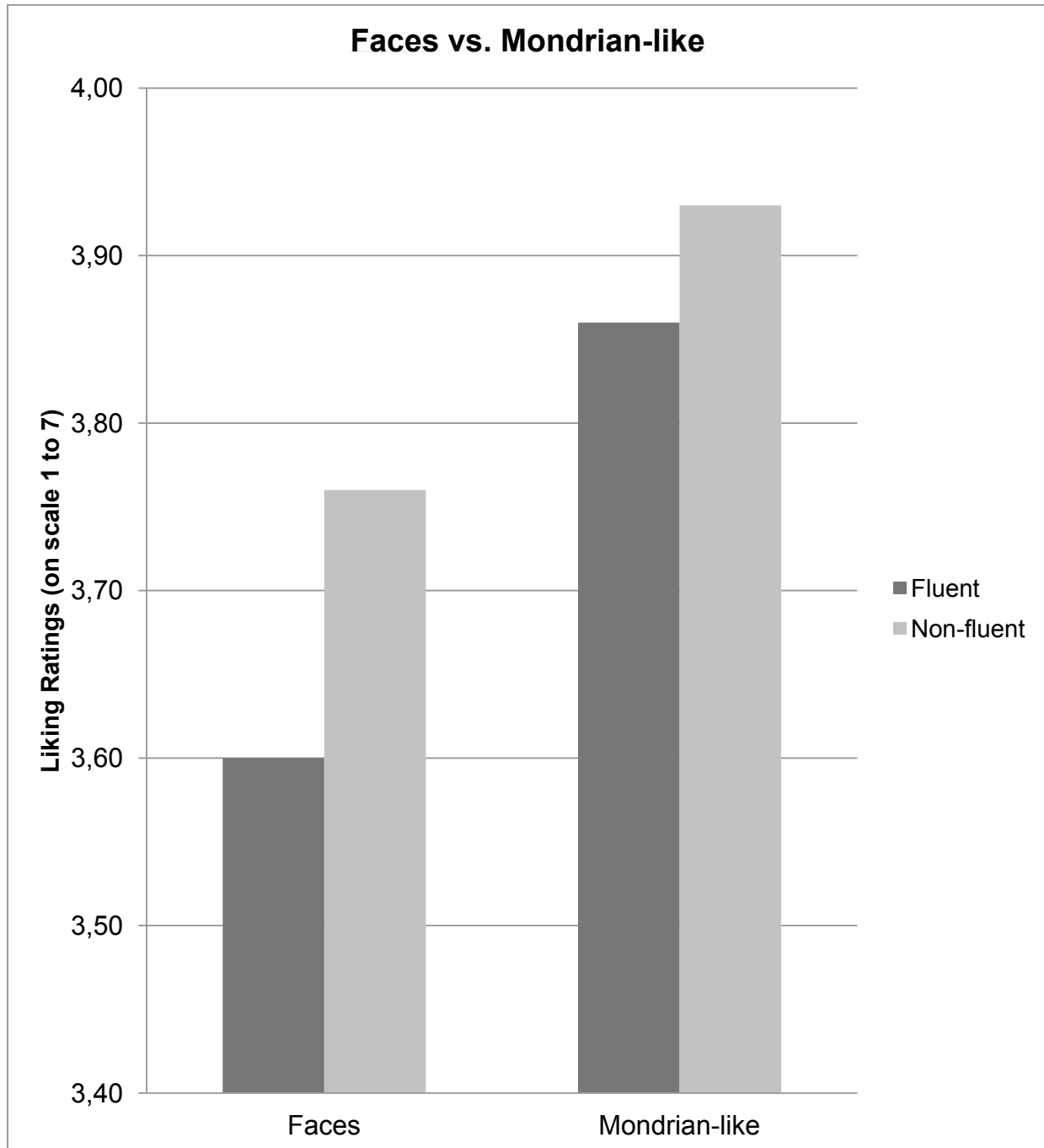


Fig. 8 Comparison of average liking ratings for the stimuli types „Faces“ and „Mondrian-like“ in the fluent and non-fluent conditions. (Note: lower numbers represent greater liking).

Table 9 Average liking ratings for the horizontal and vertical directions

Main Study:	Liking rating	
	Horizontal	Vertical
Fluent	3.68 (1.51)	3.81 (1.49)
Non-fluent	3.87 (1.50)	3.82 (1.49)

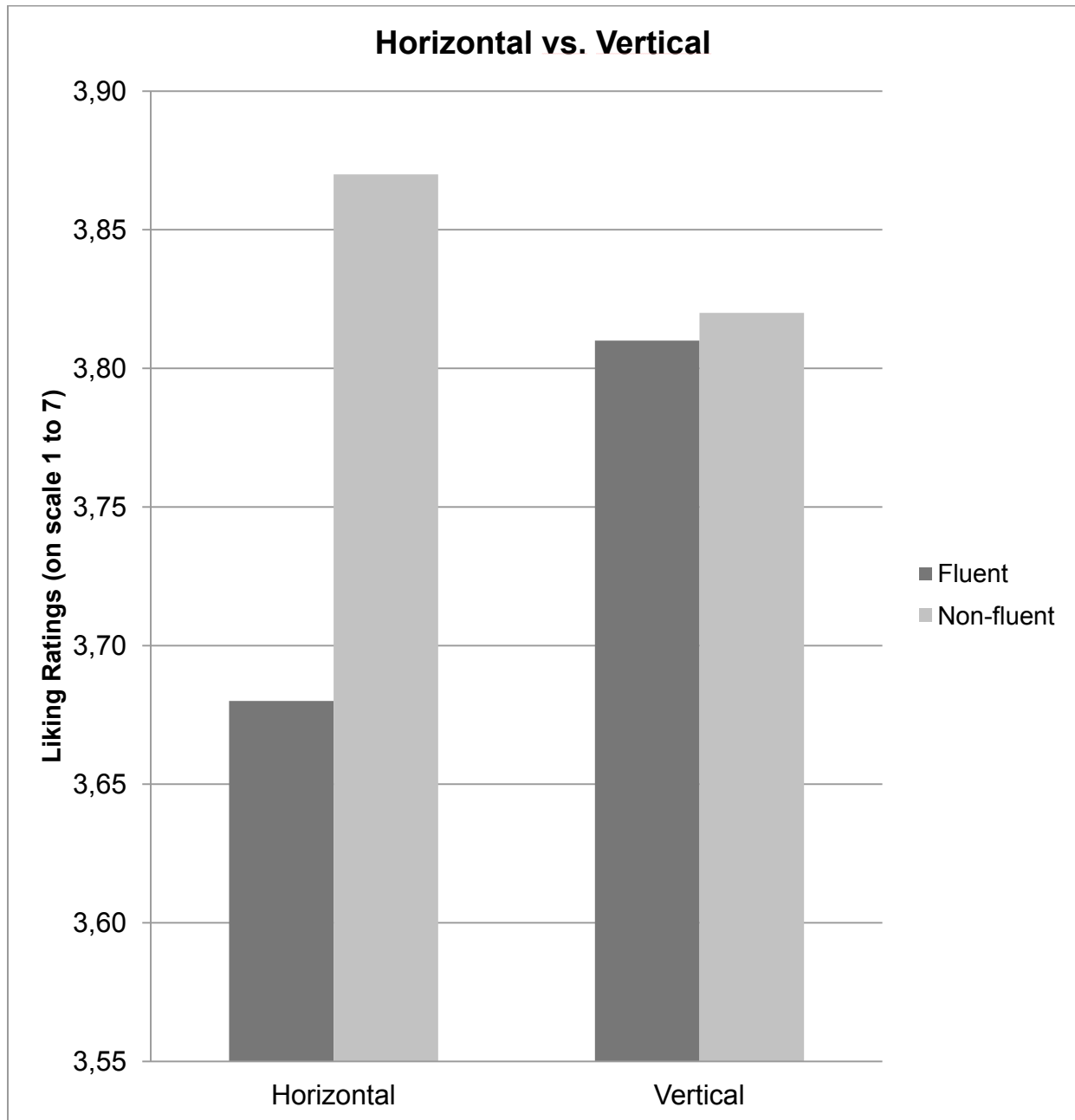

Fig. 9 Comparison of average liking ratings for the horizontal and vertical movements in the fluent and non-fluent conditions. (Note: lower numbers represent greater liking).

Table 10 Average liking ratings for each stimuli type

Main Study:	Liking rating			
	Faces		Mondrian-like	
	Female	Male	Rough	Smooth
Fluent	3.21 (1.31)	4.06 (1.49)	3.95 (1.53)	3.76 (1.51)
Non-fluent	3.32 (1.32)	4.22 (1.49)	4.05 (1.54)	3.82 (1.49)

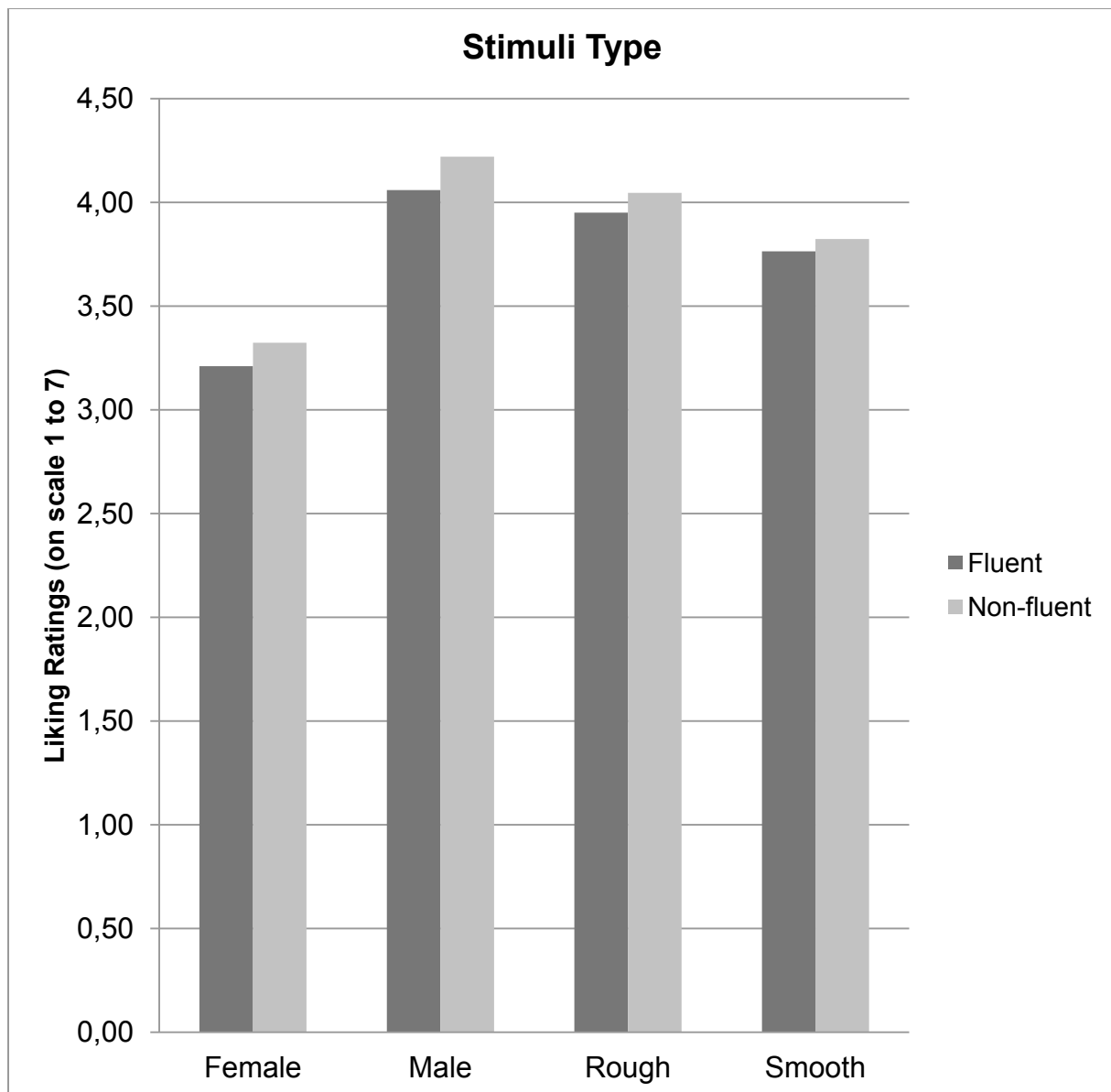

Fig. 10 Average liking ratings for each stimuli type in the fluent and non-fluent conditions. (Note: lower numbers represent greater liking).

Table 11 Average liking ratings for the two speed conditions

Main Study:	Liking rating	
	Slow (3000ms)	Fast (2000ms)
Fluent	3.76 (1.49)	3.73 (1.51)
Non-fluent	3.87 (1.51)	3.83 (1.48)

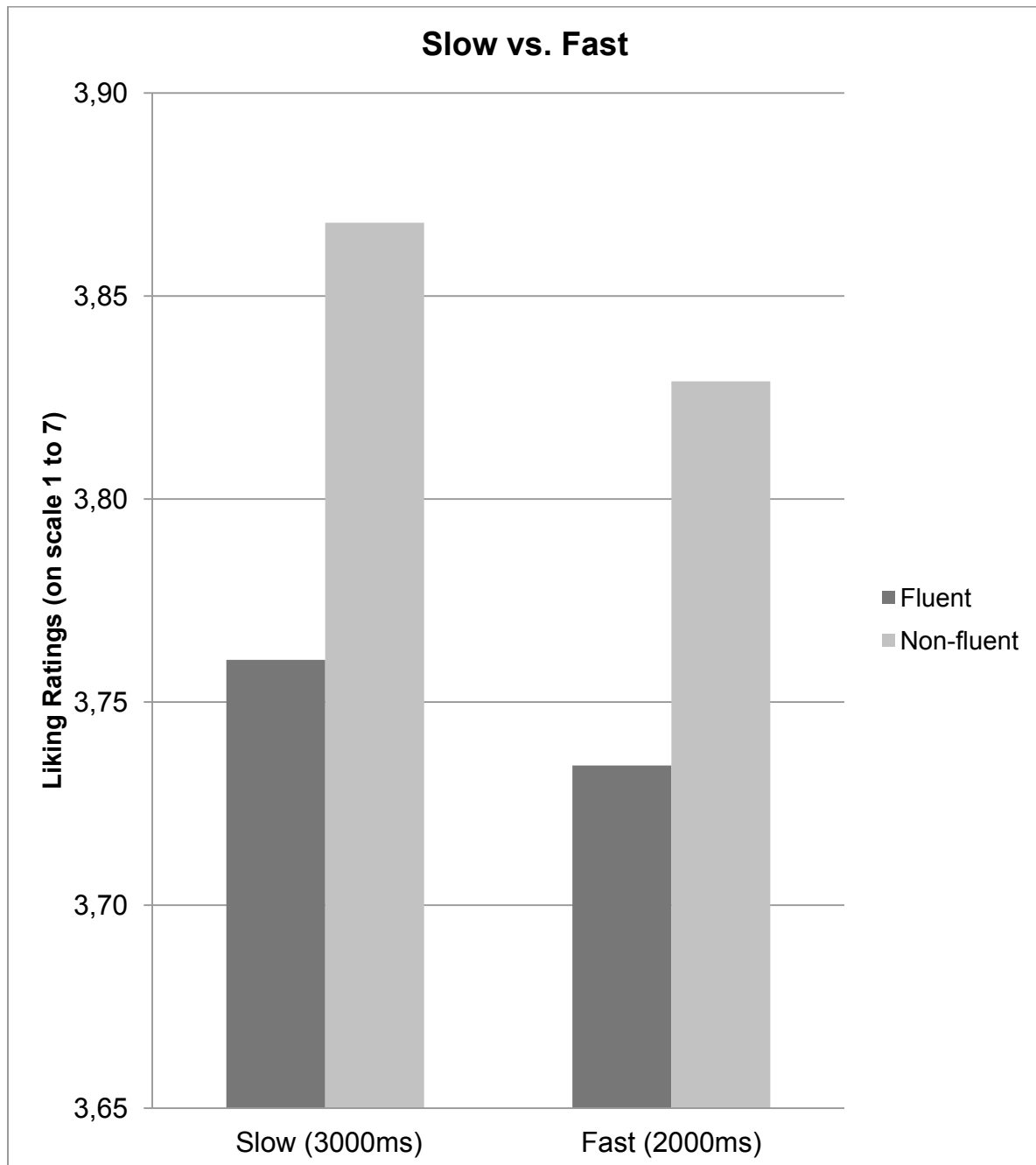
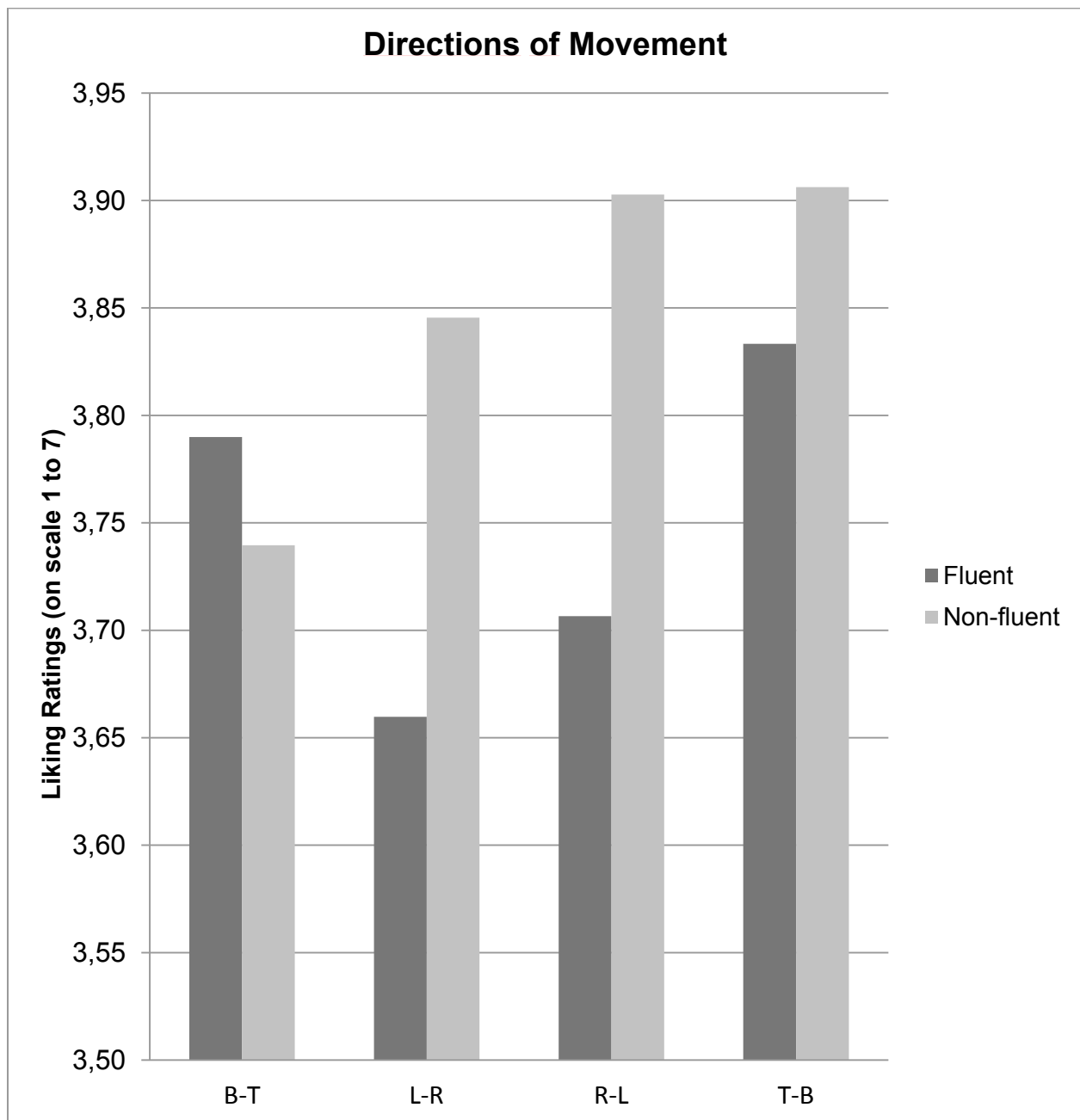

Fig. 11 „fast vs. slow“: comparison of average liking ratings for the two speed variables in the fluent and non-fluent condition. (Note: lower numbers represent greater liking).

Table 12 Average liking ratings for each direction

Main Study:	Liking rating			
	Horizontal		Vertical	
	L-R	R-L	B-T	T-B
Fluent	3.66 (1.53)	3.71 (1.48)	3.79 (1.50)	3.83 (1.49)
Non-fluent	3.85 (1.49)	3.90 (1.51)	3.74 (1.47)	3.91 (1.51)


Fig. 12 Average liking ratings for each direction in the fluent and non-fluent conditions. (Note: lower numbers represent greater liking).

3. General Discussion

As presented above, objects in the fluent action condition were rated more positively than those in the non-fluent action condition. Although the differences in the average liking ratings for the fluent and the non-fluent conditions were not huge, they can be considered quite essential. As regards the results in the conducted study, it could be shown that a previously performed fluent action is sufficient to evoke a positive affect, even when it is manipulated in a computer simulation. Non-emotive actions could provoke emotional responses.

In the conducted study, each stimulus type (male/female/rough/smooth) was rated more attractive in the fluent condition compared to the judgements in the non-fluent condition. Participants commonly rated pictures of faces as significantly more attractive than Mondrian-like pictures, regardless of which fluency condition was applied. This was due to the fact that female faces as stimuli type were generally more liked than the other stimuli.

Faces as stimuli type also caused a larger difference in the average liking ratings between the fluent and non-fluent conditions than the Mondrian-like pictures.

It can be assumed that fluency of actions causes a stronger influence on emotional responses when a human face has to be rated. This can probably be explained by the fact that we have to identify, recognize, memorize or judge an immense number of faces in everyday life and therefore rely on processing mechanisms that help us to facilitate this information. If we assume fluent processing as one of these helping mechanisms, we can also take for granted that a pretended fluency condition will have an elevated influence on emotional responses when a face has to be judged or rated.

The stimuli in the fluent condition were also rated as more attractive regardless of the speed of objects and regardless of which direction the objects moved in (with the exception of the “bottom-to-top” direction). As to the directions of movements, it is quite revealing that a greater difference in the liking rates between the fluent and the non-fluent condition could be found when the objects moved horizontally across the screen. This can probably be explained by the fact that we have to experience and perceive horizontal movements more often than vertical movements. If we think of situations in daily life, it seems that we observe horizontal movements far more often

than vertical movements, for example when we have to handle traffic situations, when we are reading a text or watching a football match. Consequently, horizontal movements probably facilitate a more intense access to fluent processing.

In the pre-study, and contrary to our assumption, stimulus objects in the fluent condition were not rated as more attractive than those in the non-fluent condition.

In line with results of previous studies, which demonstrated that a long-term experience of fluent stimulus-action is necessary to cause a positive affect (e.g. Van der Bergh et al., 1990), a lack of presented items was presumed.

Therefore, a longer experiment with more items was presented in the main study and the results of the main study seemed to prove this assumption. It can therefore be assumed that a longer testing block with more items was necessary to cause a stronger fluency effect. It seems that the tendency to find objects more attractive in the fluent action requires a certain period of time or rather a particular amount of effort.

To illustrate this hypothesis, the whole data set of the main study was split up into four parts, like in the pre-study (see chapter 2.1.2.). The 104 items of all participants were separated into 4 parts (each with 26 items), according to the sequential arrangement in the experiment (Items 1-26, Items 27-52, Items 53-78, Items 79-104). For all parts, the means of the liking ratings for all participants were calculated and the results were depicted in a diagram (see Fig. 13).

Similar to the findings of the pre-study, the tendency to find objects more attractive in the fluent condition requires some time. At the beginning of the experiment, it seemed that fluent action could not promote positive affect, but in the further trials, the diagram shows quite clearly that stimuli in the fluent condition were rated as more attractive than stimuli in the non-fluent condition. In the last 26 trials of the experiment (Items 79-104 in the diagram), the stimuli in the fluency condition again were rated as more attractive than the stimuli in the non-fluent condition. However, ratings in the last quarter of the experiment are generally a little bit higher (indicating a greater dislike), independent from the condition and probably caused by the length of the experiment and the physical effort.

It can be assumed that the increased difference between the average liking ratings in the fluent and non-fluent condition during the experiment are associated with the increase of effort during the test run.

When a higher effort is required, it is possible that the facilitated processing of a fluent action seems to be more pleasant and causes a positive affect. Presumably at the beginning of the experiment, the fluent processing did not seem to be more pleasant and therefore did not evoke positive affect.

Table 13 Average liking ratings for fluent and non-fluent actions in sequential arrangement

Main Study:	Liking rating			
	Items 1-26	Items 27-52	Items 53-78	Items 79-104
Fluent	3.88 (1.51)	3.71 (1.50)	3.60 (1.47)	3.79 (1.51)
Non-fluent	3.83 (1.45)	3.75(1.52)	3.97 (1.56)	3.85 (1.45)

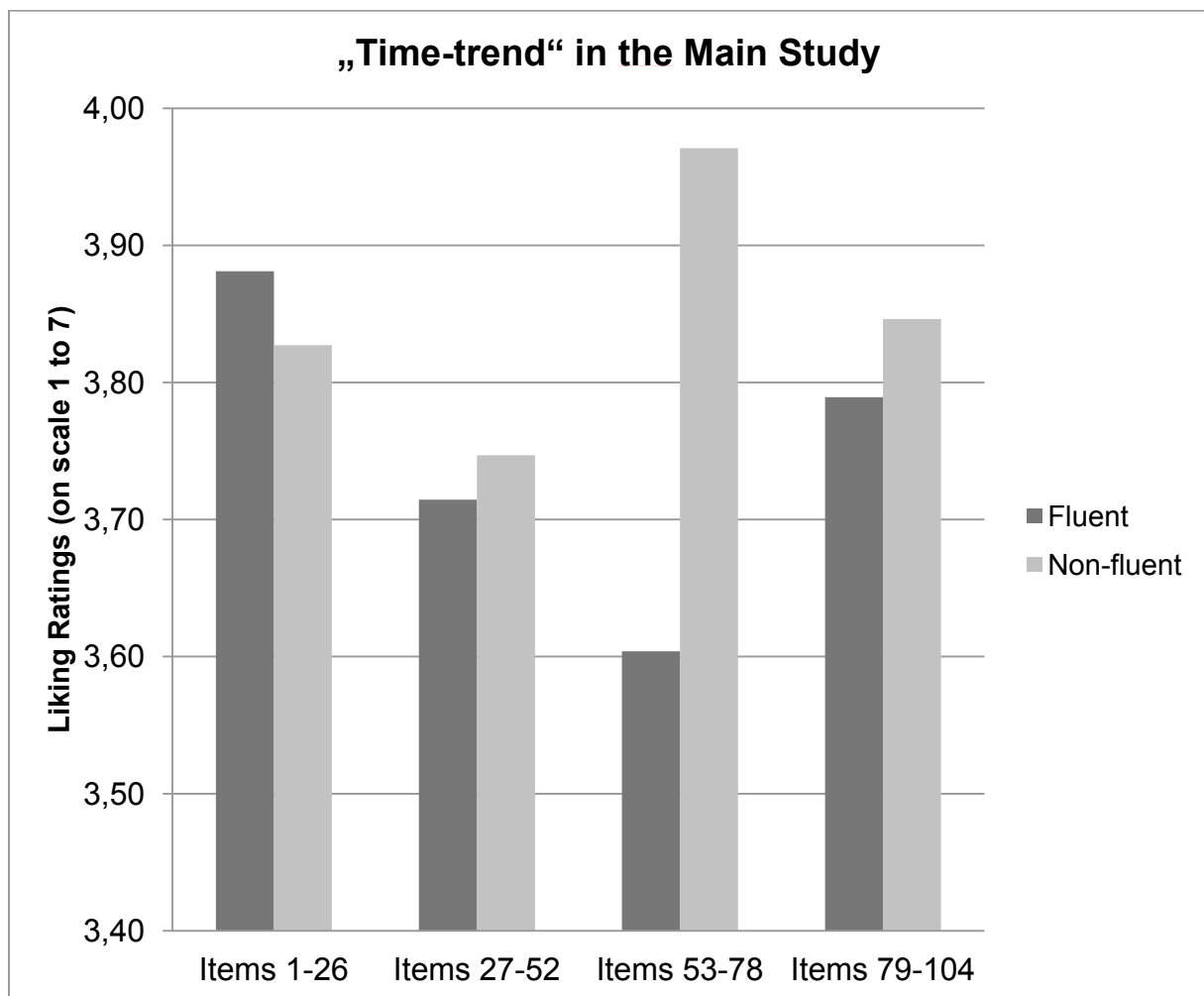


Fig. 13 "Time-trend": average liking ratings for fluent and non-fluent action during the Experiment in sequential arrangement (per 26 Item). (Note: lower numbers represent greater liking).

4. Final Considerations

As mentioned in chapter 1.5. (“Starting point and aim of the current study”), similar experiments (conducted in line with experimental research at the faculty of psychology at the University of Vienna), in which the participants had to follow moving objects on the screen by gazing at them with their eyes, could not show this effect. Eye motions alone seem to be insufficient to cause a fluency effect.

Quite contrary to that, hand-eye coordination in this study (participants were supposed to follow a grey coloured square on the screen with their index finger) seemed to enable a more intense access into fluent processing and evoked positive affect in the fluent condition. To trace the presented movement with the finger probably implies an enhanced perception that the movement is fluent or non-fluent, although this perception processing most likely happens unconsciously. As a consequence, it seems evident that visuomotor components that require higher demands are more capable to entail fluent processing.

In situations where complex interactions of visuomotor skills are needed, facilitated processing will probably be more pleasant and therefore also regarded in a more hedonic way and eventually cause positive affect. For example, in the study of Hayes et al. (2008) participants had to grasp and move objects from one target to another and in the case of the non-fluent condition actually avoid an obstacle. If we presume that this activity requires complex interactions of visuomotor skills, it seems plausible that a facilitated processing is more pleasant. Hence, in the experiment by Hayes et al., participants actually rated objects in the fluent condition as more liked.

If fluent action is presented in activities where a lower visuomotor effort is required, this fluency effect will probably be marginal, for example in eye gazing experiments. This could be the reason why this effect has not been demonstrated in computer simulations so far.

Hayes et al. (2008) also proved that fluent action evokes positive affect even though the action was performed by others and only observed by the participants (see chapter 1.5.). It might be objected that this result is in contrast with the previously proposed assumption that the impact of fluency is marginal when the level of visuomotor activity involved in fluent actions is low.

For observed actions affective responses were found only when the head and eye gaze of the performer was visible. Hayes et al. (2008) suggested as a possible

reason “the important role that the actor’s attention/intention state plays for eliciting empathic feeling in the observer” (p. 471). According to the claim made above, it could therefore be possible that observed fluent actions with a stronger demand for visuomotor skills also intensify the empathic feelings in the observer, whereas observed fluent actions with low visuomotor involvement will probably not be adequate to stimulate strong empathic feelings in the observer.

In conclusion and according to Winkielman and Cacioppo’s (2001) hedonic fluency model, in which they claimed that “the more fluently the perceiver can process an object, the more positive is his or her aesthetic response” (p. 377), we can advance this theory and finally presume that the more fluently the perceiver can process a motor interaction, the more elevated is his or her aesthetic response.

This new approach in fluency research raises a variety of new research questions and allows some potential approaches for further research. Further research will be necessary to outline which types of non-emotive actions are qualified to produce affective responses and to investigate, if some stimuli types (e.g., faces) are more adequate to cause affective responses after a fluent motor interaction. Besides, it will be quite interesting to investigate if fluent motor interaction can also influence other kinds of decision processes, for example, judgements of truth.

Further research will also be necessary to estimate the impact of the required effort to carry out the fluent performance.

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Appendices

Appendix A

A1. Text used for screen instruction in the pre-study

Willkommen zu dem Experiment!

Sie werden eine Reihe von grauen Kästen wie diesen auf dem
Bildschirm erscheinen sehen:



Ihre Aufgabe ist es, die Bewegung der Kästen mit Ihrem Zeigefinger
am Bildschirm zu verfolgen.

Am Ende jedes Durchlaufs werden Sie ein Farbmuster sehen, entweder in „glatter“ oder „rauer“ Erscheinungsform.

GLATT



RAU



In jedem Durchlauf sehen Sie jeweils nur entweder ein „glattes“ oder ein „raues“ Farbmuster.

Des Weiteren werden Sie gebeten zu beurteilen, wie gut Ihnen das jeweilige Farbraster oder Gesicht gefällt. Dazu benutzen Sie bitte die folgende Skala:

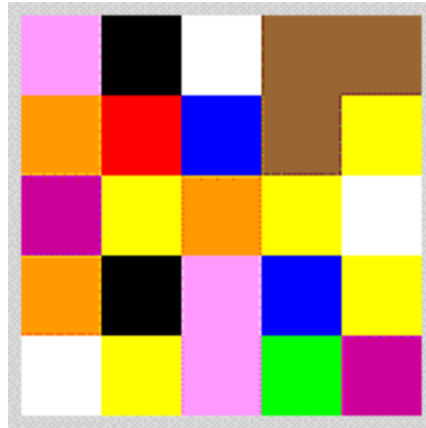
1	2	3	4	5
Gefällt mir sehr gut			Gefällt mir gar nicht	

Gefällt Ihnen das Muster oder Gesicht sehr gut, sagen Sie „1“

Gefällt Ihnen das Muster oder Gesicht gar nicht, sagen Sie „5“

Bitte nutzen Sie die gesamte Bandbreite der Skala für Ihre
Bewertungen aus!

Wenn Sie also zu Beispiel dieses Muster sehen



.....sagen Sie eine Nummer zwischen 1-5, je nachdem wie sehr Ihnen
das Muster gefällt.

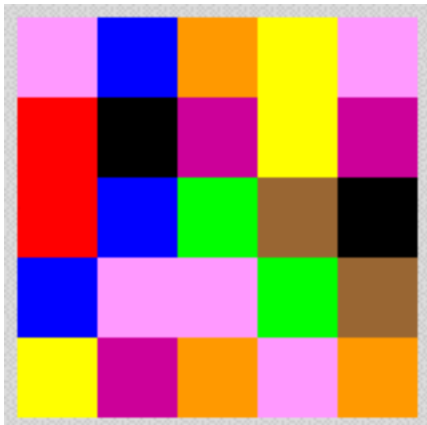
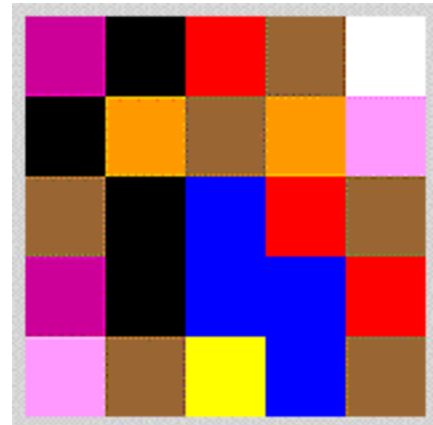
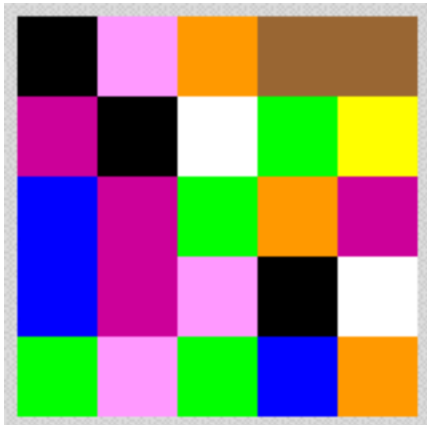
Haben Sie noch irgendwelche Fragen?

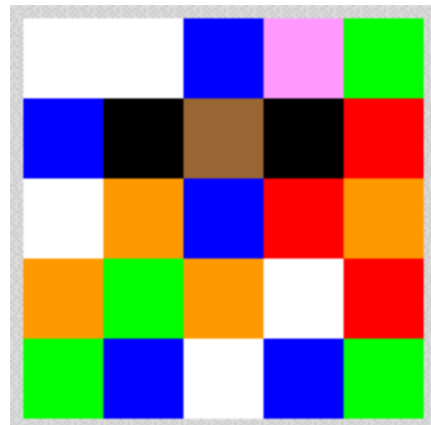
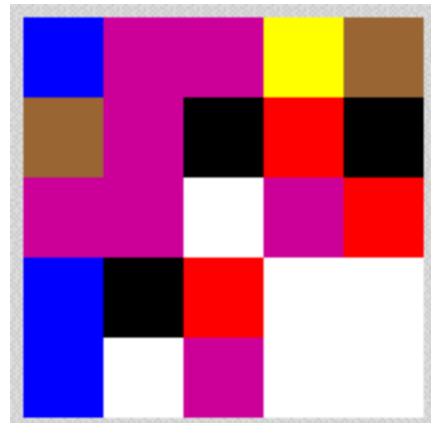
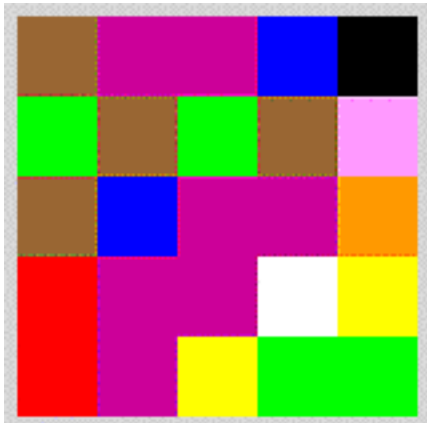
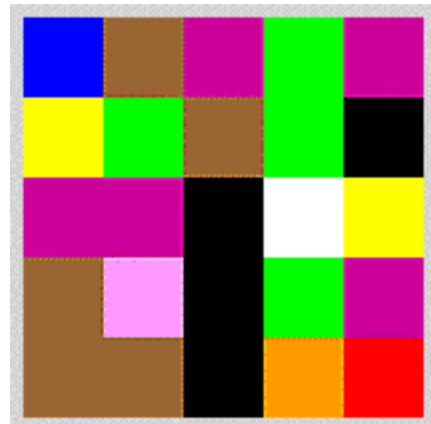
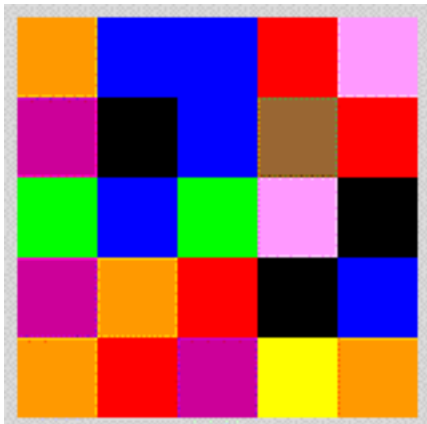
Zur Erinnerung:

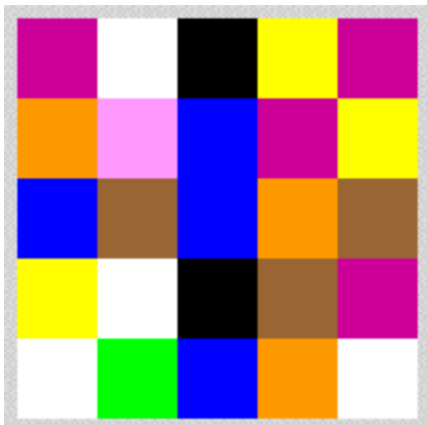
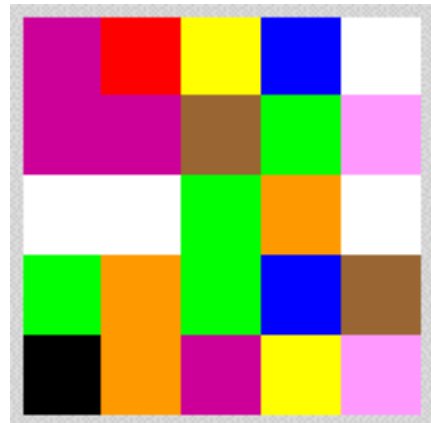
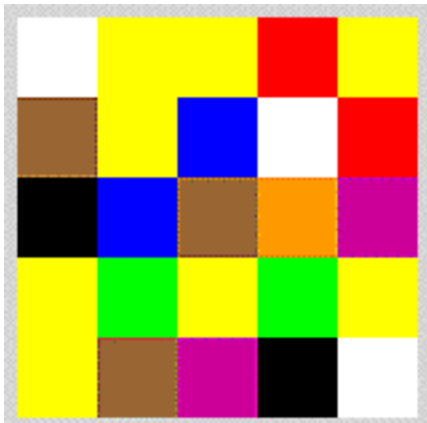
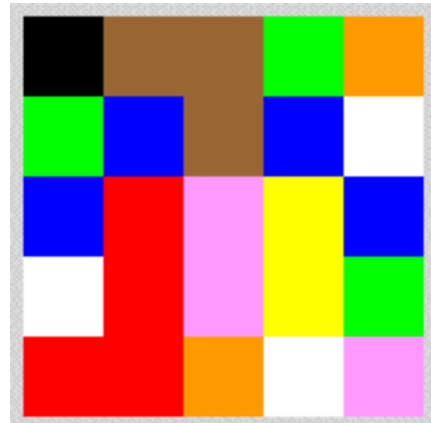
„1“ bedeutet „gefällt mir sehr gut“

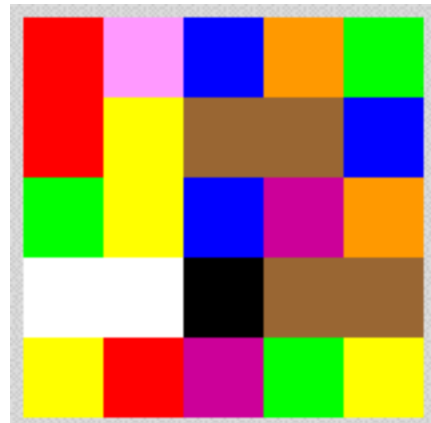
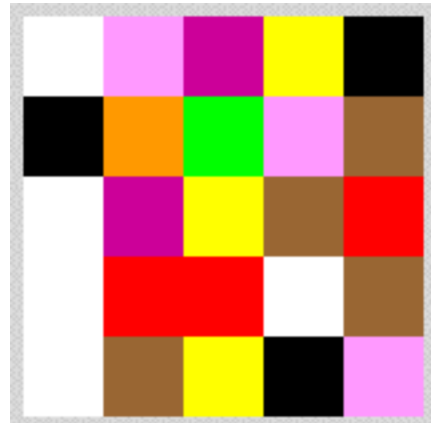
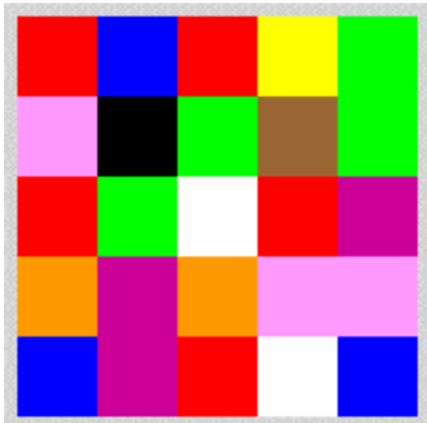
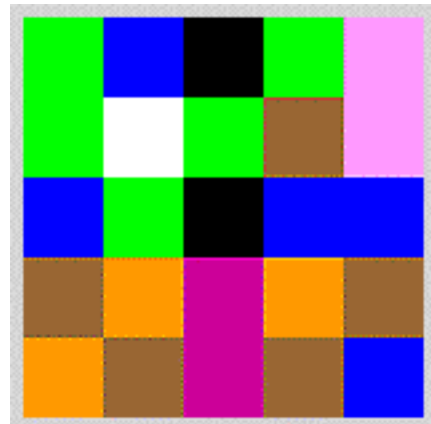
„5“ bedeutet „gefällt mir gar nicht“

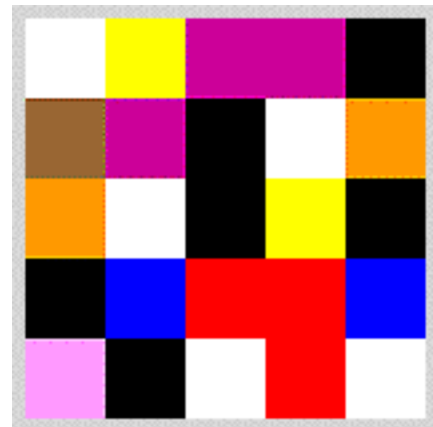
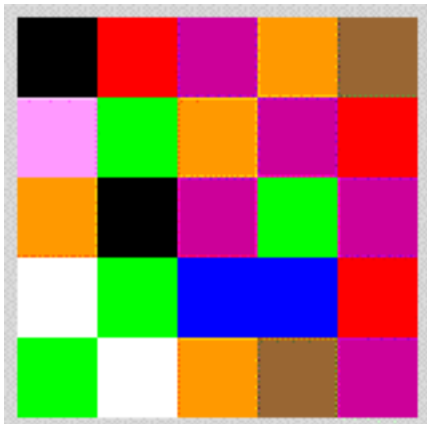
A2. Stimuli used in the pre-study

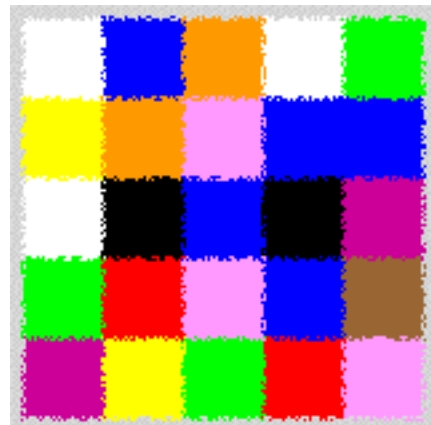
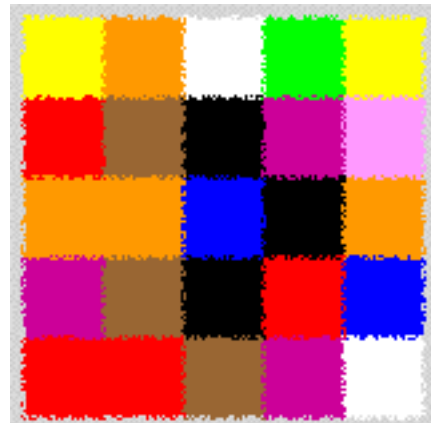
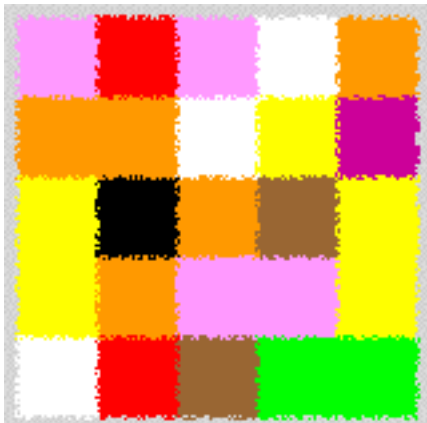
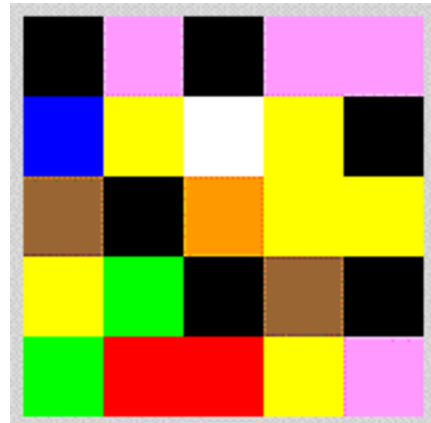
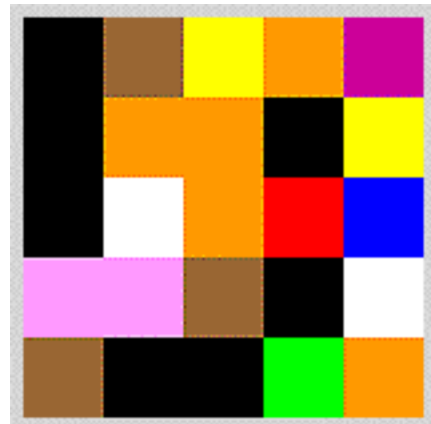
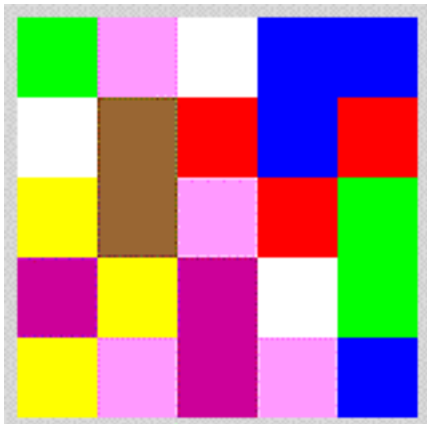


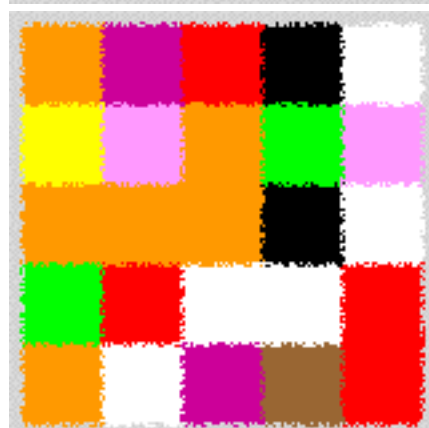
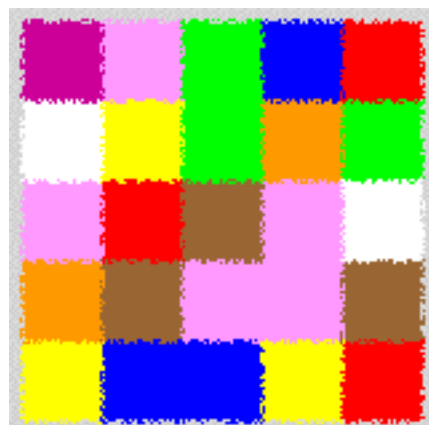
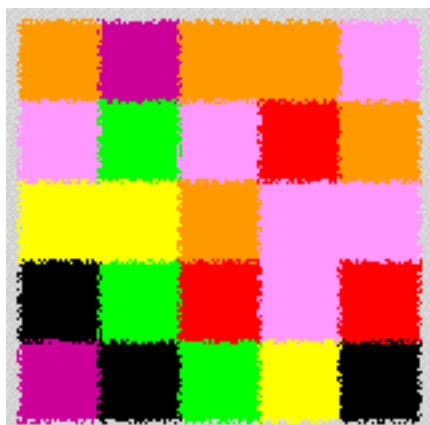


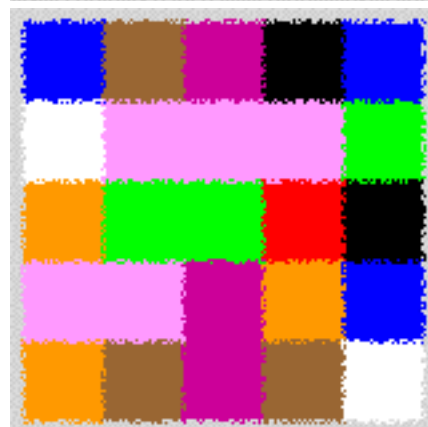
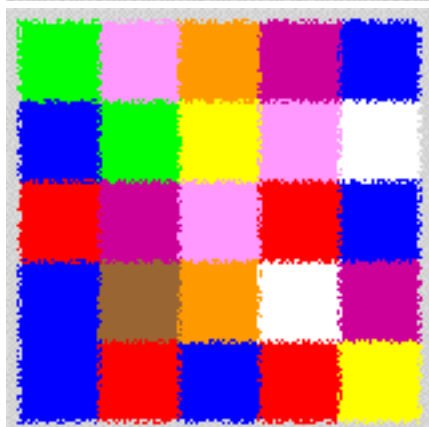
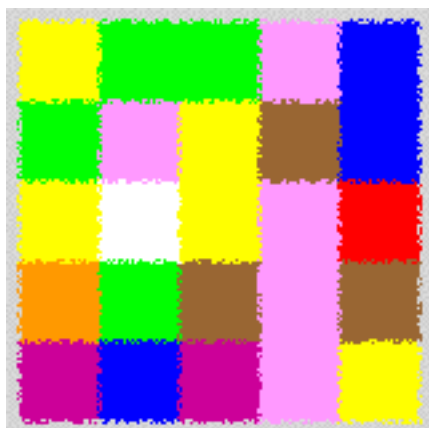


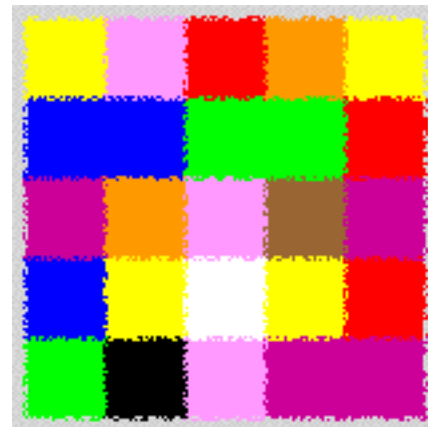
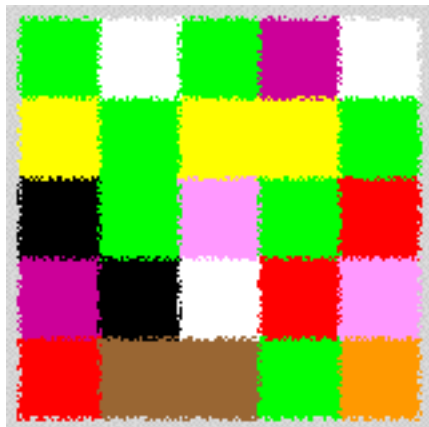
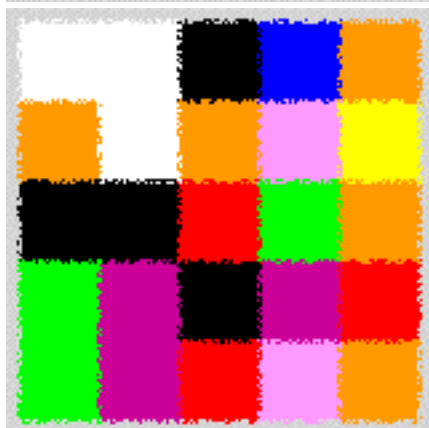
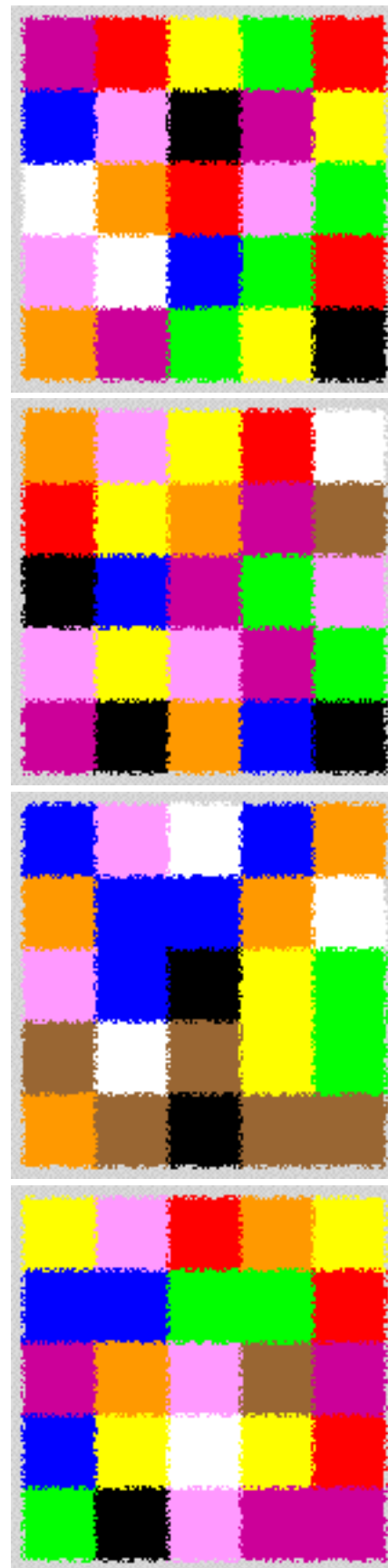
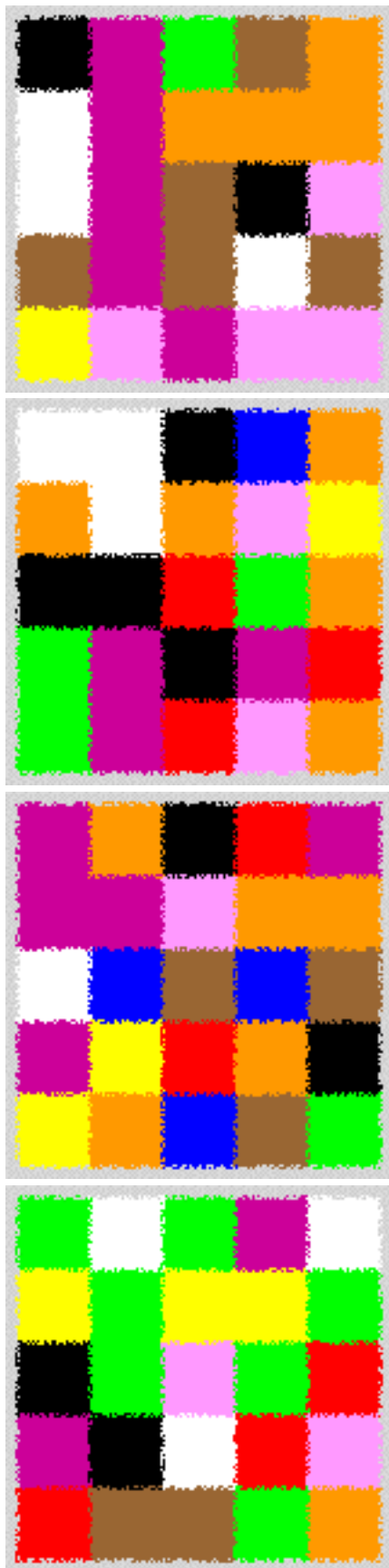


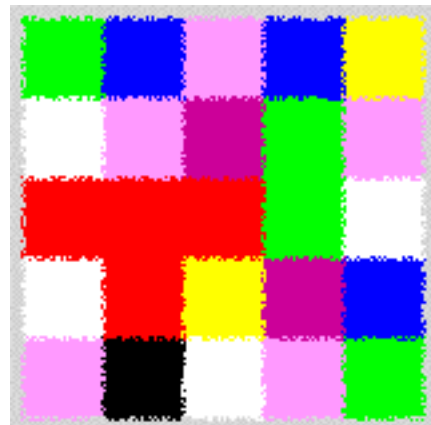
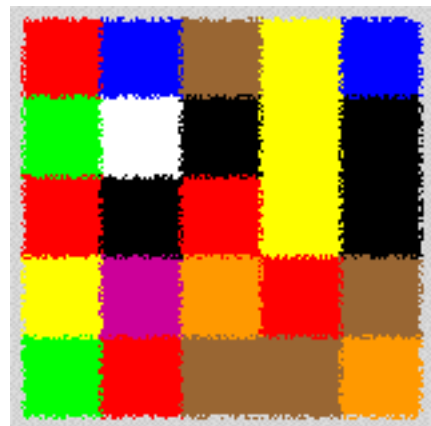












Appendix B

B1. Text used for screen instruction in the main study

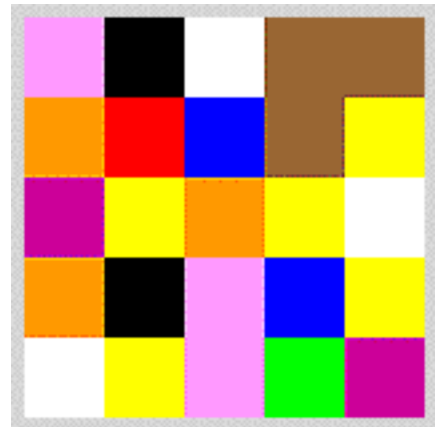
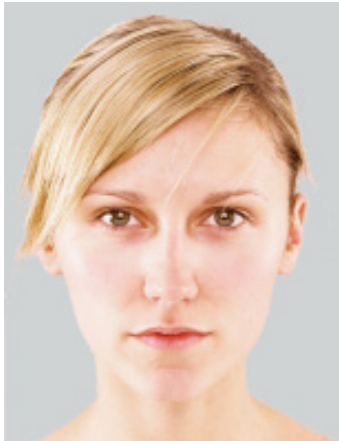
Willkommen zu dem Experiment!

Sie werden eine Reihe von grauen Kästen wie diesen auf dem
Bildschirm erscheinen sehen:



Ihre Aufgabe ist es, die Bewegung der Kästen mit Ihrem Zeigefinger
am Bildschirm zu verfolgen.

Am Ende jedes Durchlaufs werden Sie entweder ein Farbmuster oder ein Gesicht sehen.



In jedem Durchlauf sehen Sie jeweils nur entweder ein Gesicht oder ein Farbmuster.

Des Weiteren werden Sie gebeten zu beurteilen, wie gut Ihnen das jeweilige Farbraster oder Gesicht gefällt. Dazu benutzen Sie bitte die folgende Skala:

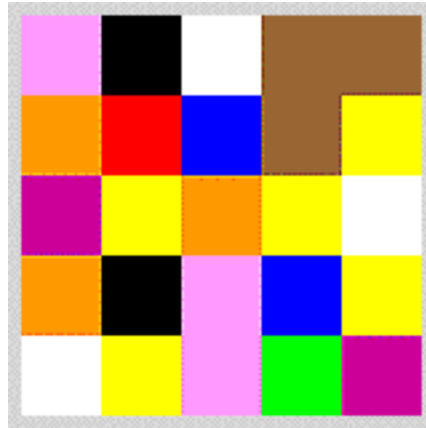
1	2	3	4	5	6	7
Gefällt mir sehr gut			Gefällt mir gar nicht			

Gefällt Ihnen das Muster oder Gesicht sehr gut, sagen Sie „1“

Gefällt Ihnen das Muster oder Gesicht gar nicht, sagen Sie „7“

Bitte nutzen Sie die gesamte Bandbreite der Skala für Ihre Bewertungen aus!

Wenn Sie also zu Beispiel dieses Muster sehen



.....sagen Sie eine Nummer zwischen 1-7, je nachdem wie sehr Ihnen
das Muster gefällt.

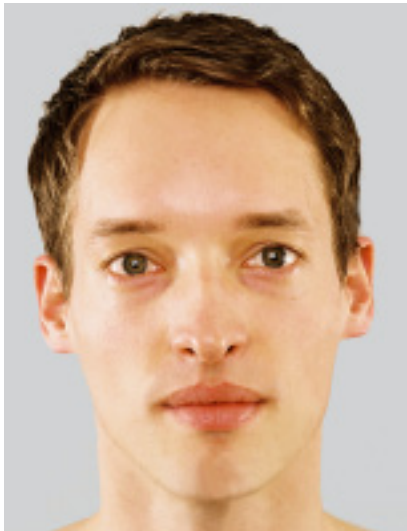
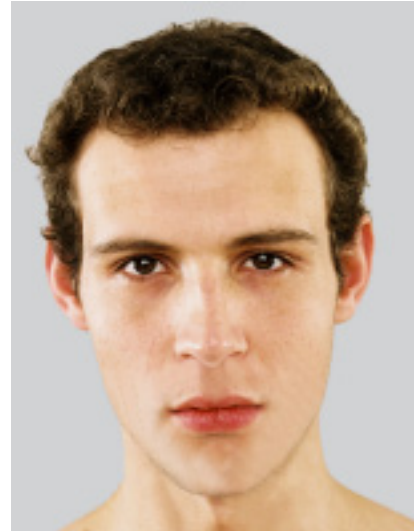
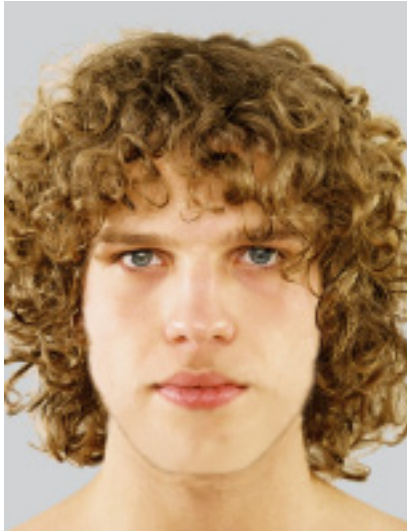
Haben Sie noch irgendwelche Fragen?

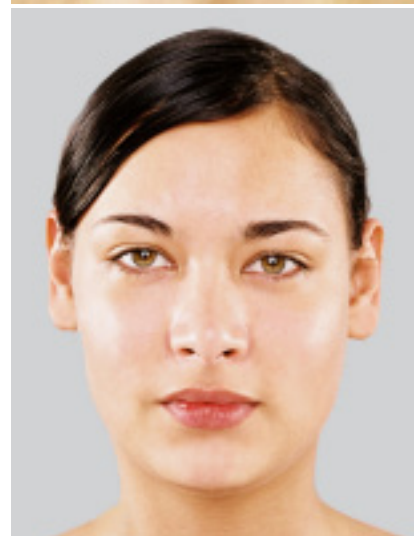
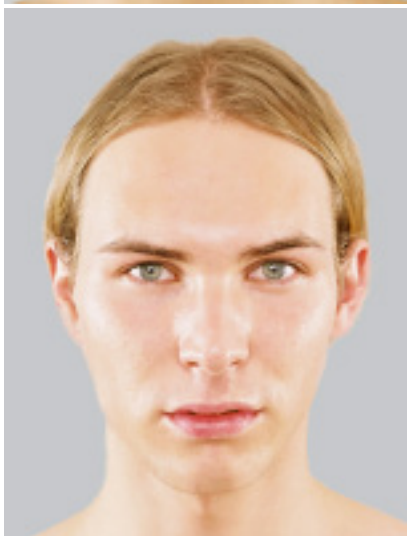
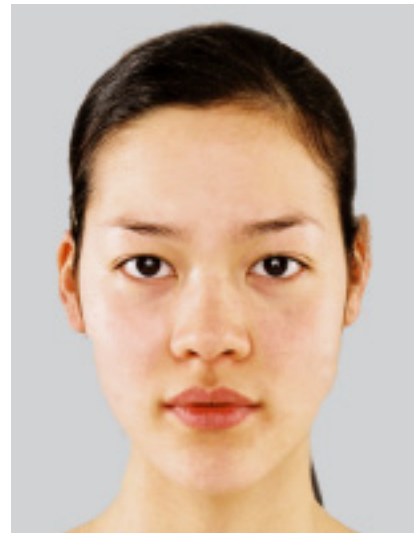
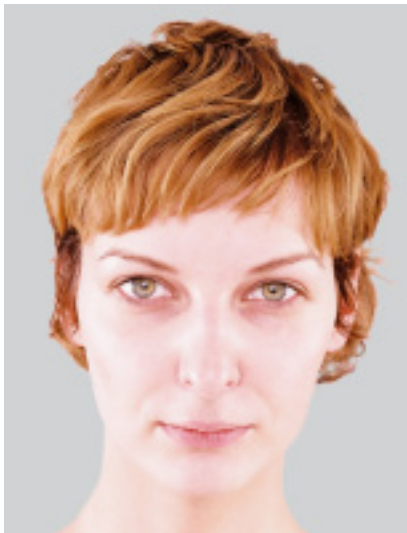
Zur Erinnerung:

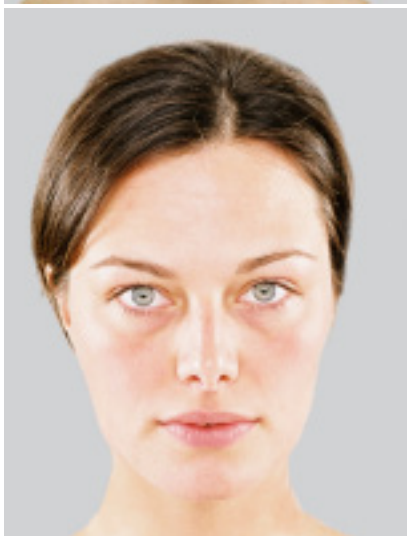
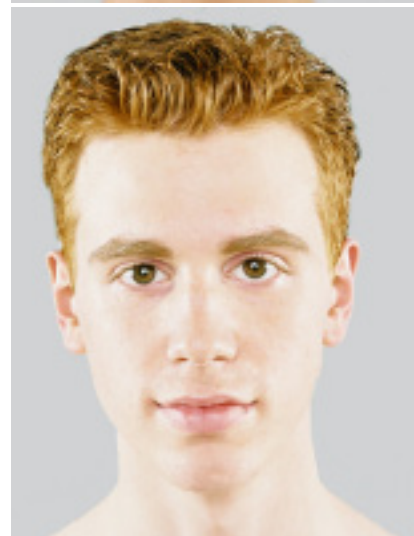
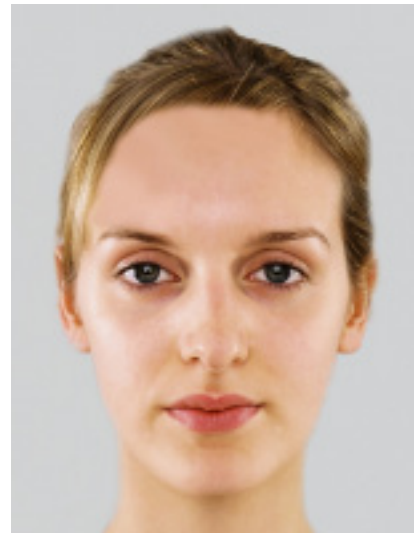
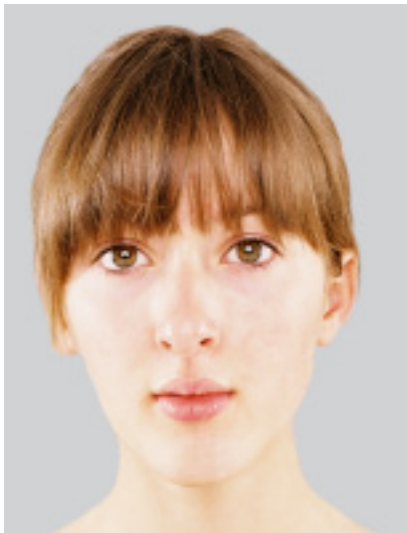
„1“ bedeutet „gefällt mir sehr gut“

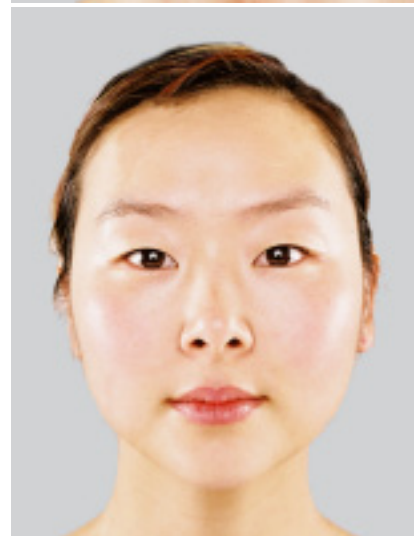
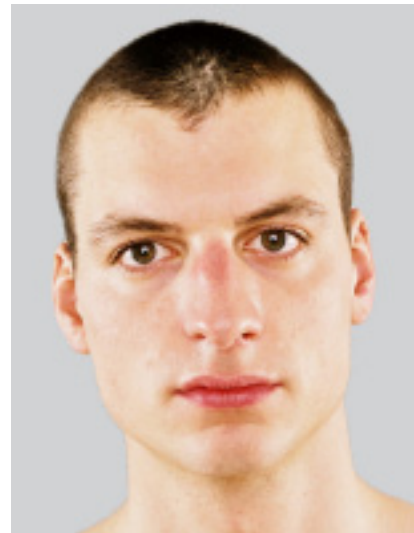
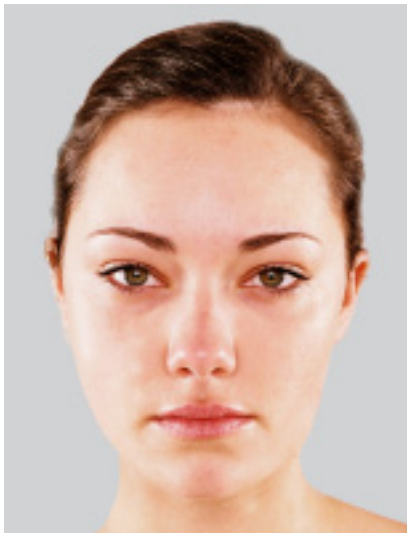
„7“ bedeutet „gefällt mir gar nicht“

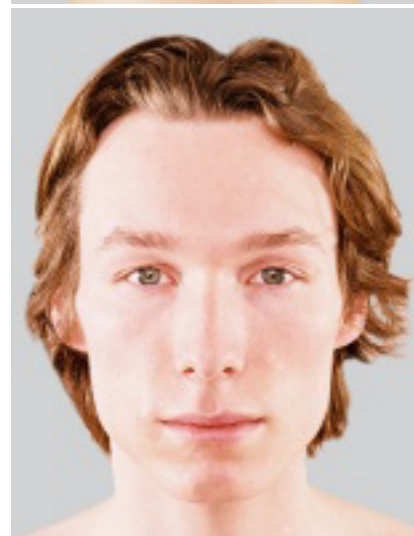
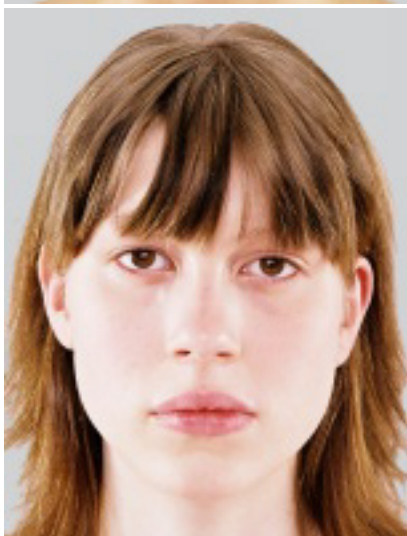
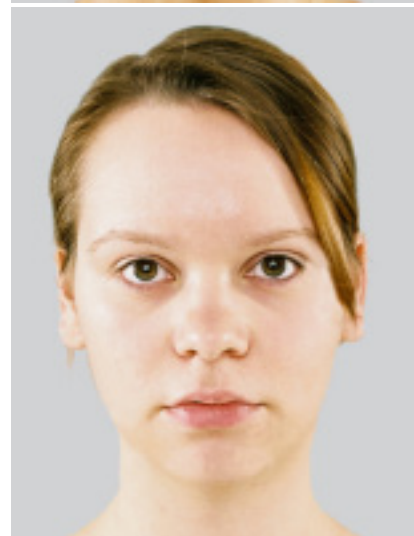
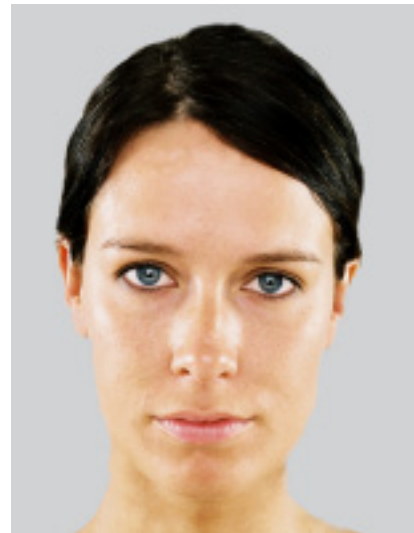
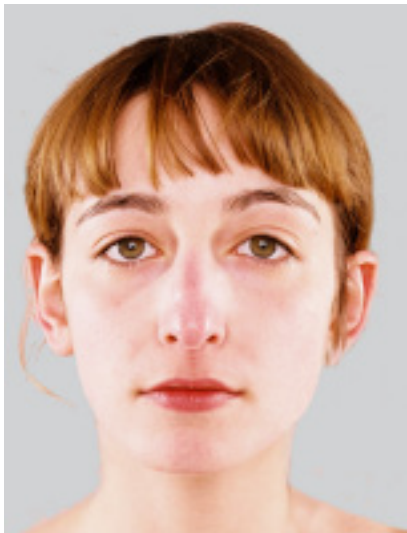
B2. Stimuli used in the main study

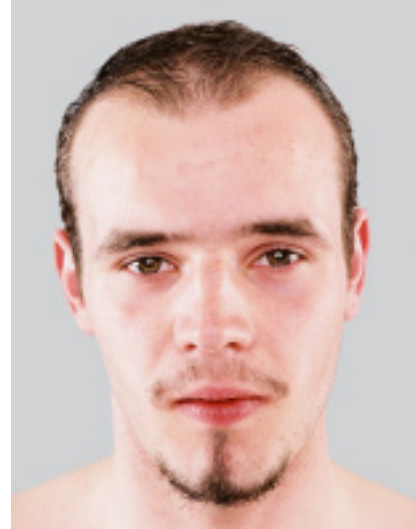
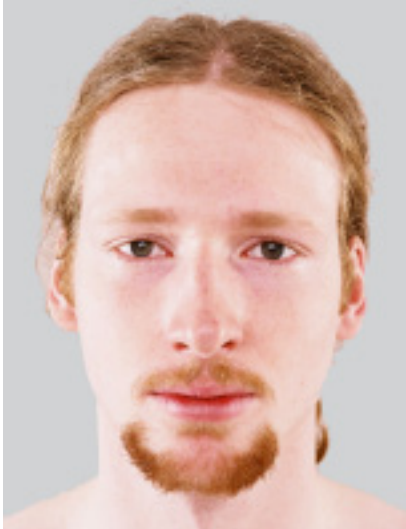
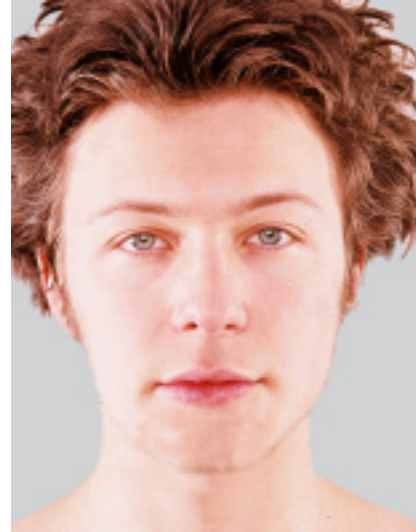
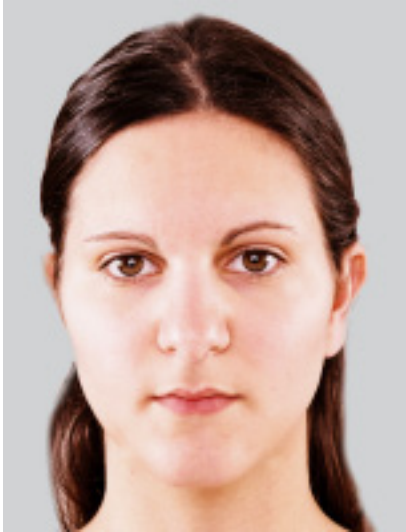
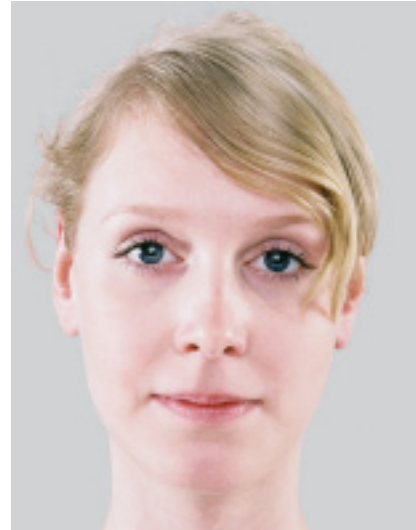
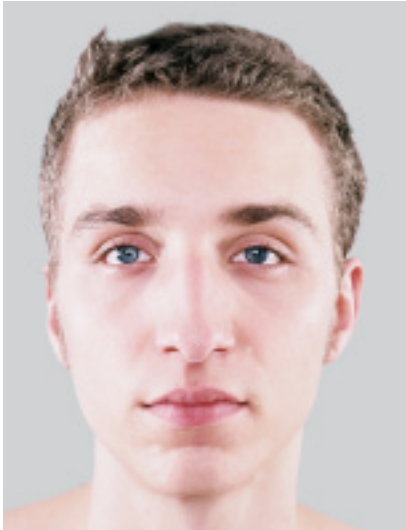


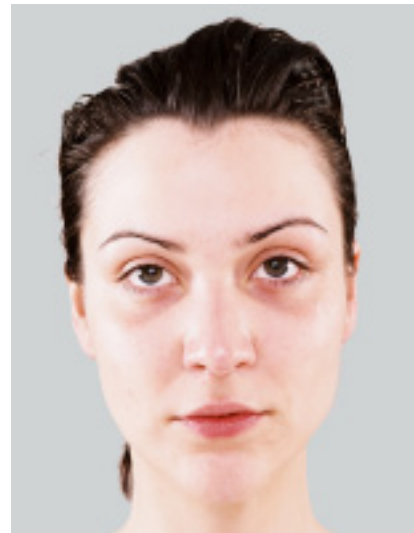


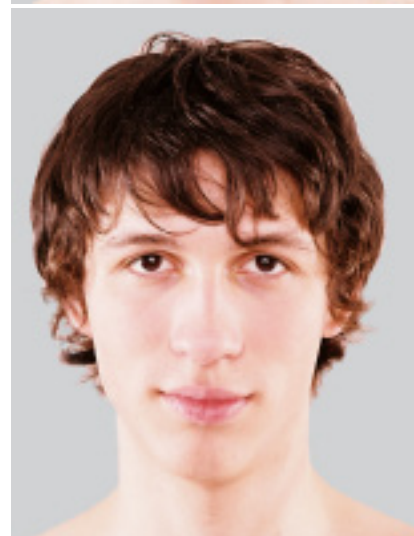
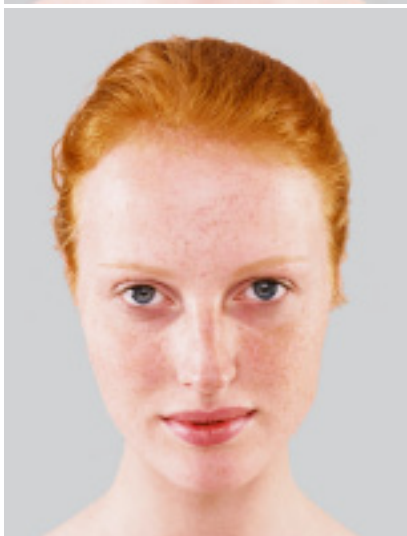
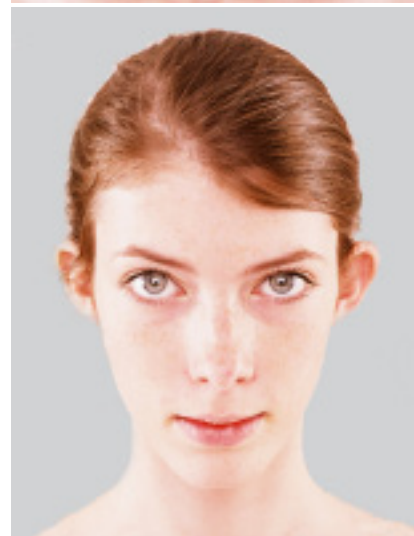
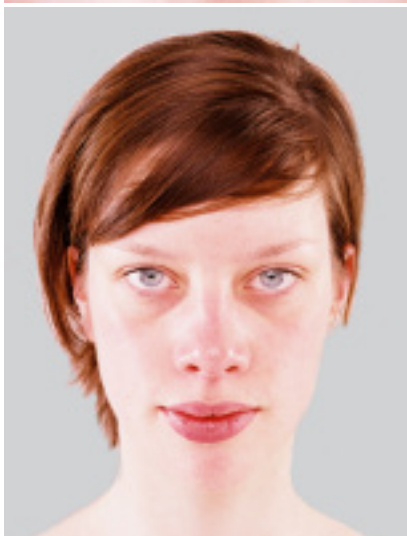


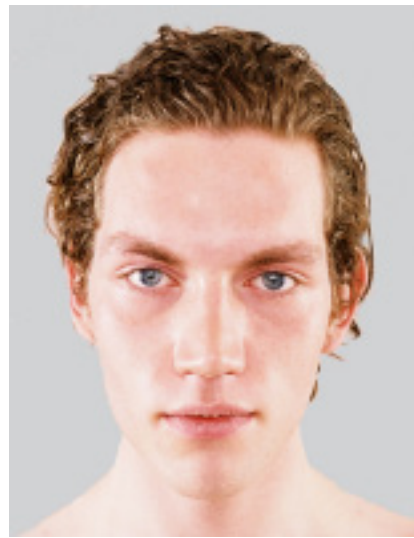
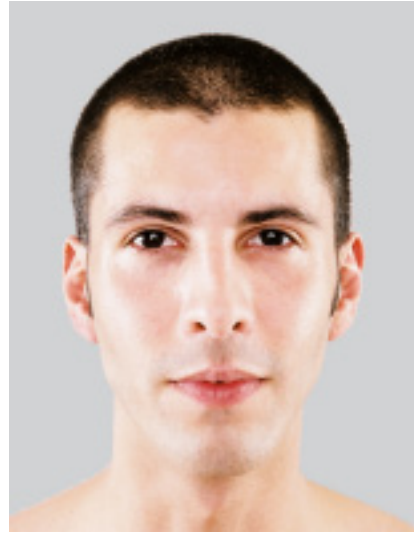




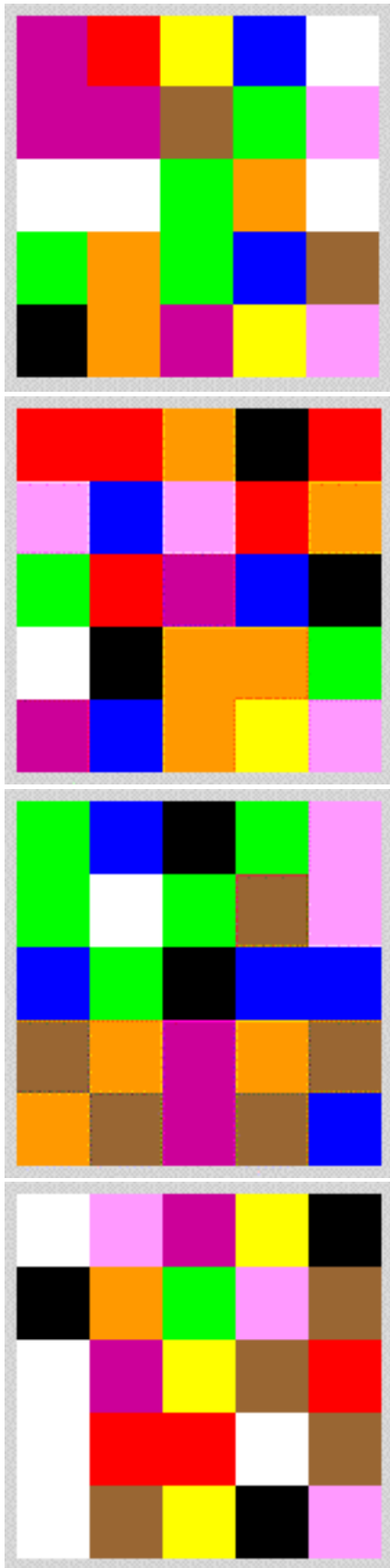




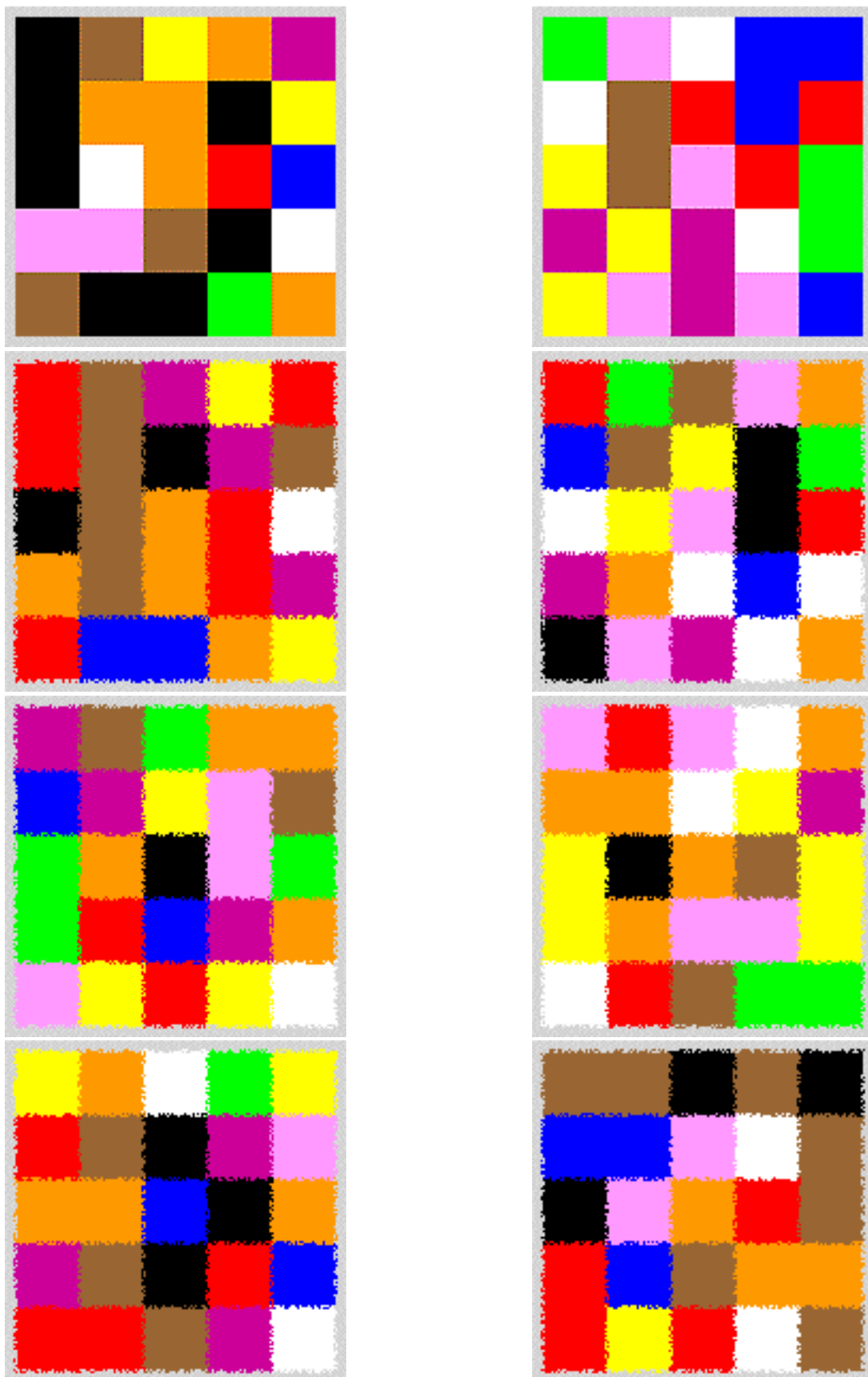


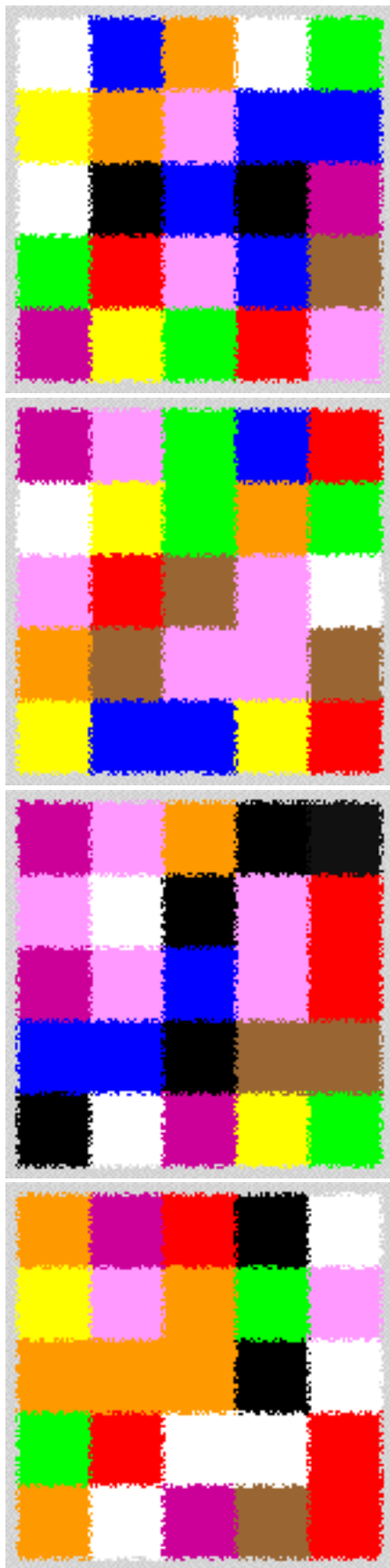


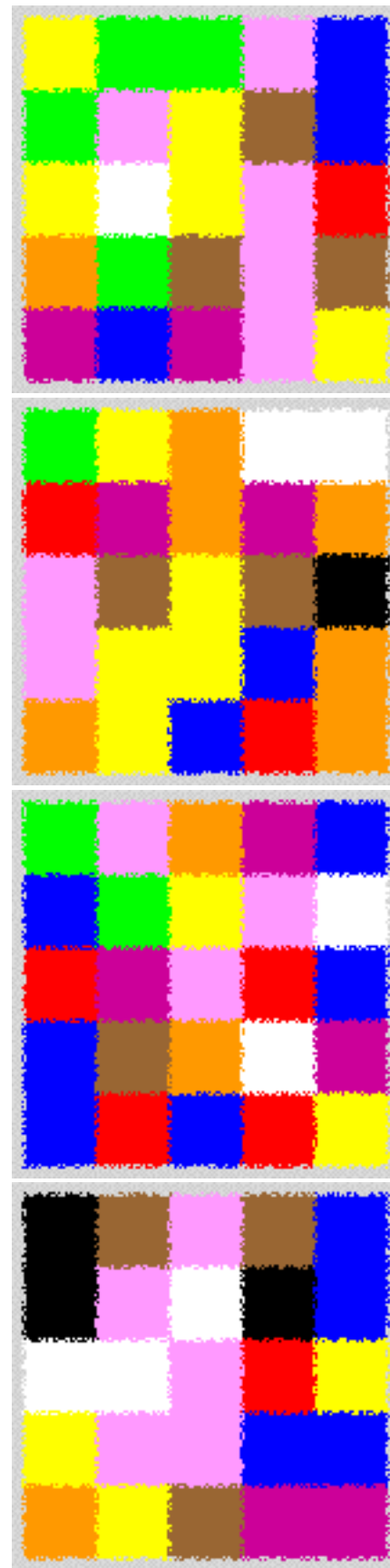
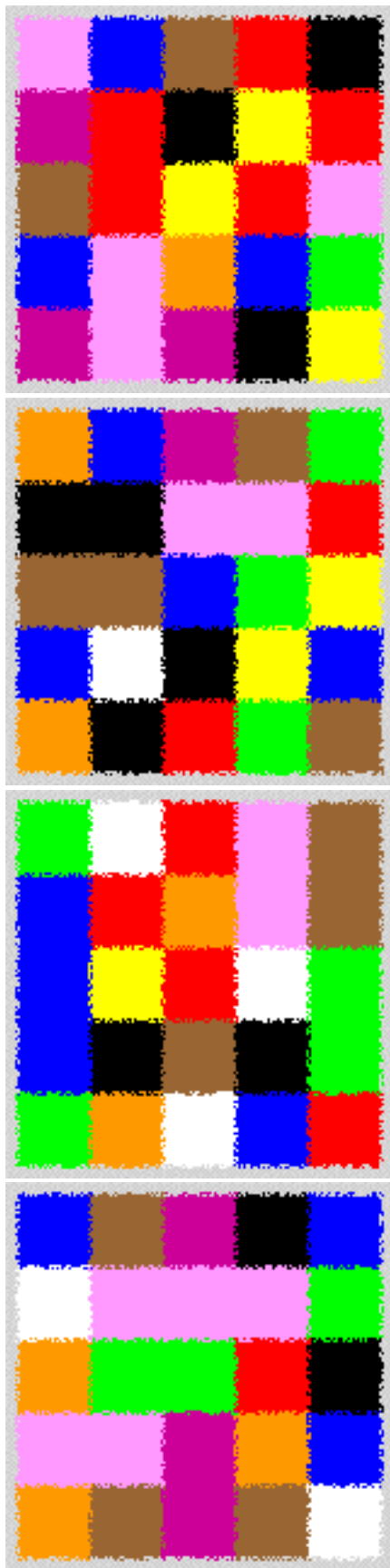


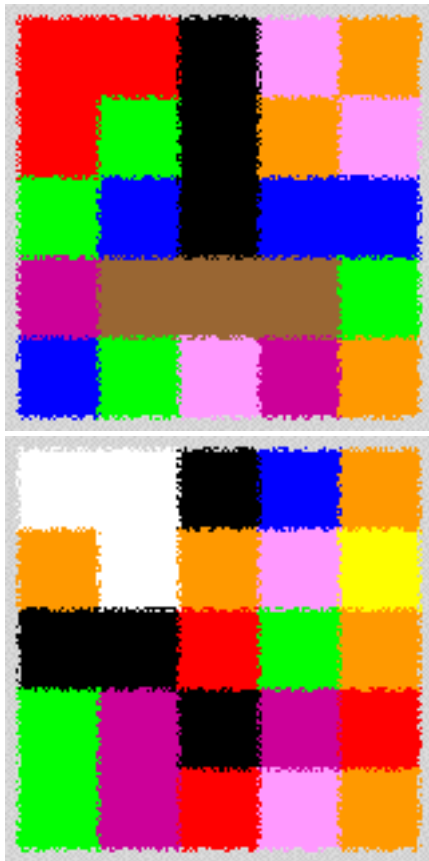












Curriculum Vitae

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Organisatorische Unterstützung
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Druck- und Kopiergeräte

- administrative Agenden
- Marktanalyse und Neukundenakquisition
- Datenbankverwaltung
- Planung, Organisation und Evaluation von Projekten und Marketingaktionen
- Vertriebsunterstützung

08/2008-12/2009

Qualitätsmanagement

- Qualitätskontrolle und Qualitätssicherung
- Mystery-Shopping
- Interviewer Einschulungen und Nachschulungen

06/2008-07/2008

Praktikum als Assistent des Projektleiters in der Marktforschungsabteilung

- Verschiedenste organisatorische Tätigkeiten zur Projektvorbereitung, während der Durchführungsphase sowie in der Bearbeitungs- und Auswertungsphase
- Teamleitung und Teambetreuung
- Datenkontrolle und Aufbereitung
- Datenauswertung und Erstellung von Auswertungsreports

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Sprachen

Deutsch - Muttersprache

Englisch - fließend

Sonstige Fähigkeiten und
Kompetenzen

- Klavier, Orgel, Gitarre und Bass