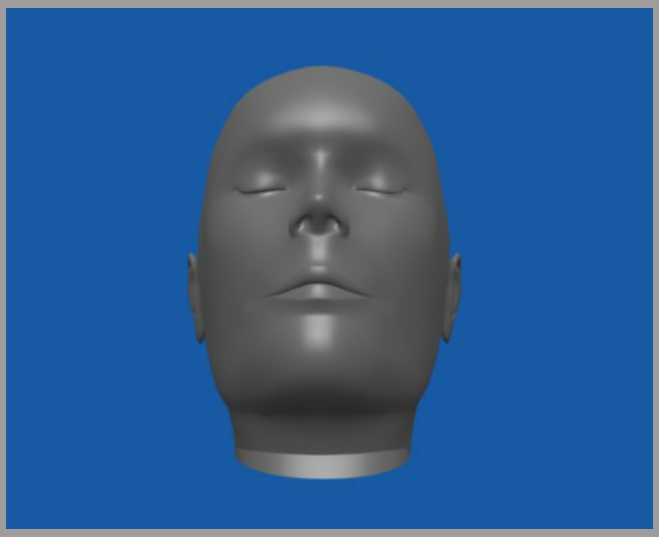
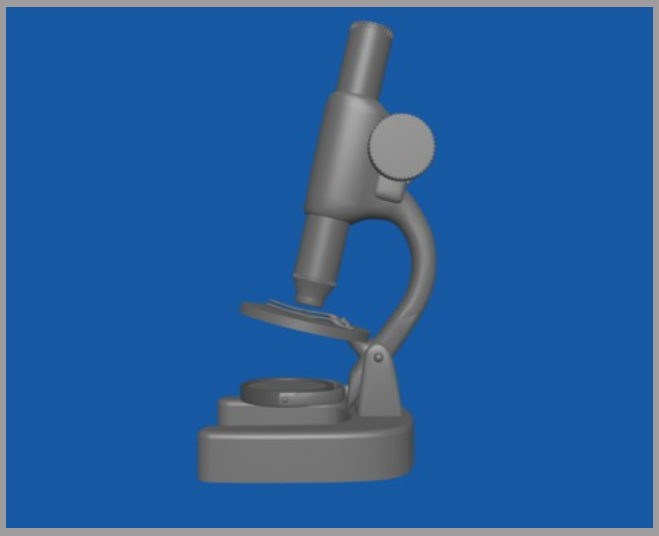


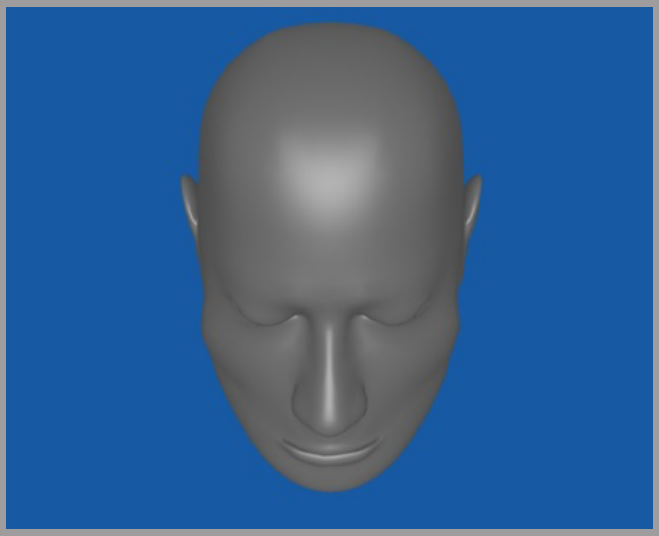
Bachelor Thesis

Exploring Camera Angle Effects on the Evaluation of Faces and Objects



Rasmus Wienemann

Faculty of Behavioral Sciences
Department of Psychology



University of Twente
Enschede - The Netherlands

Bachelor Thesis

Exploring Camera Angle Effects on the Evaluation of Faces and Objects

Rasmus Wienemann

University of Twente, Enschede, The Netherlands
Faculty of Behavioral Sciences
Department of Psychology

1st Examiner
Dr. Ard Heuvelman
University of Twente
Faculty of Behavioral Sciences
Department of Psychology

2nd Examiner
Dr. Somaya ben Allouch
University of Twente
Faculty of Behavioral Sciences
Department of Psychology

Abstract

Small differences of a photo can influence one‘s perception of the depicted. In this study the influence of the camera tilt angle on the evaluation of several scales was explored. Six faces along with six objects were rated on 13 semantic differentials. The stimuli were either presented from a low (i.e. looking up), eye-level or high (i.e. looking down) camera angle. A main effect of the camera angle as well as an interaction between the angle and the subject‘s Need for Cognition were investigated. A significant main effect of the camera angle on the evaluation of the objects was found for all faces but only one object indicating that such a camera angle effect does differ depending on the nature of the stimulus. A significant interaction between ‘Need for Cognition’ and angle was detected for only one object and no face.

Imagery becomes am increasingly important way of communication in the steadily internationalizing culture of the 21st century. Marketers (Meyers-Levy, J & Peracchio, L.A. 1992; Scott & Vargas, 2007) and designers are especially interested in the possibilities to communicate to their end users with a telling photograph or form of the product. In television or film, the portrayal of actors is constructed with great care to support the story line or create a certain effect. Inevitable in literature over film making a great deal of attention is focused on the presentation of the actors (e.g. Lievaart, R.B. & Hoetink, H., 2007).

Scott & Vargas (2007) argue that pictures in contemporary marketing are starting to function analogous to writing systems. This view of pictorial stimuli as analogous to writing implies that the interpretation of pictures is dependent on cognition as well as learning. A similar assumption of media as an analog to writing systems is opted by Meyrowitz (1998) as one type of media literacy. In his essay, Meyrowitz compares different types of media with different languages with each media type having its own set of *grammar* in forms of different aesthetic properties that influence the content elements. This grammar is specifically used by media creators to compensate shortcomings of a certain medium. Bold lettering can be used to emphasize the virtue with which an argument is made. Punctuation can help the readability of print media, but can even change the meaning of sentences completely. Film also makes great use of manipulating certain variables in order to create a desired effect. Directors and editors use a variety of techniques like length of shots, point of view, and cuts. Some of the films media grammar can also be applied to still photography, in such instances as point of view and the camera angle argues Meyrowitz.

The angle from which a scene is portrayed greatly influences the viewer's perception of the actor/actress, scene, individual or object. That said much speculation and applied folk psychology has dominated the subject. Cameramen, movie directors, photographers, marketers and many other professionals have manipulated the camera angle and have hypothesized about the created effect. (e.g. Kepplinger, 1987; Meyers-Levy, 1992) Many effects are argued from a point of common sense. Politicians photographed from a low angle looking up at them seem dominant and powerful. Looking down on the scene let the actor be perceived inferior and small. One explanation states that one‘s experience with looking up at parents whilst growing up and looking down on younger - inferior - siblings effects the perception of individuals and faces.

Kepplinger showed that an effect of the camera angle is dependent on the attributes that are measured. So one angle can be flattering for one characteristic but at the same time lessen one‘s evaluation of another characteristic. Mignualt & Chaudhuri (2003) have analyzed the effect of the camera angle has on the perception of human faces on the scales of dominance and contraction of the mouth‘s corners. They found that the angle can in fact influence the actors perceived mood and dominance. The authors argued that the apparent change in contraction of the corners of the mouth when the face was depicted at an angle would influence the perceived mood. A face seen from above makes the corners of the mouth seem pulled upwards and thus perceived happier even though a bowed head is commonly associated with sadness. The authors' hypothesis was supported by their results.

An explanation based on one‘s experiences when growing up offers only limited explanation for a similar effect on the perception and evaluation of objects found by Kraft (1987)

and Meyers-Levy & Peracchio (1992) While Kraft only found that the perceived size of boxes was influenced in photographic depiction of serial events Meyer-Levy & Peracchio found that the camera angle alone was enough to change the subjects evaluation of a fake advertisement and the depicted product. Furthermore, the researchers found that the level as to which the subject was motivated to analyze the depicted advertisement was of great influence to the size of the camera angle effect. The researchers primed the subjects to different levels of motivation to analyze the advertisement. Additionally the subject‘s Need for Cognition, “[…] an individual‘s tendency to engage in and enjoy effortful cognitive endeavors“ (Cacioppo, J.T., Petty, R.E. & Kao, C.F., 1984, p.306), was measured. The two measures were combined as a motivation to process factors that were found to affect the size of the camera angle effect. A high motivation to process caused the camera angle effect to disappear that was found in lower levels of motivation. The authors argue that the reason for this effect lies in the heuristic processing hypothesis. This hypothesis states that one relates what he or she sees in a picture to themselves by placing themselves in the camera. Therefore a high camera angle depicting someone from above interpreted as looking down on someone. In that way the hypothesis is similar to an evolutionary approach as it also is based on previous experience of the viewer influencing the perception of the present stimulus. The role of motivation to process and Need for Cognition on the heuristic processing hypothesis is that when motivation is at moderate or low levels one falls back on heuristics to analyze pictures and therefore become receptive for the effect of the camera angle. The in depth analysis of the stimulus should not be affected by such an effect, however.

Based on the different, and sometimes contradicting, findings of earlier research (Kepplinger, 1987; Kraft, 1987) the present study aimed to shed more light on the specifics of where camera angle effects occur; namely the present study aimed to investigate the fundamentals of camera angle effects when applied to faces and objects. The first mater that was investigated in this study was if a camera angle on the ratings of the scales occurs on faces and objects identically. Thus exploring the degree to which such an effect is dependent of the stimulus. The following null hypothesis was tested.

H1: An effect of the camera angle is indiscriminate to the nature of the stimulus (i.e. face or object).

The influence of the subjects‘ need for cognition as found by Meyer-Levy & Peracchio (1992) will also be examined in the proposed research. Unlike that study the present study does not present the stimuli in context. As the influence of the ‘Need for Cognition’ might also have influenced the subjects’ perception of the context the present study aimed to reproduce the effect of the ‘Need for Cognition’ in a study without context. The following hypothesis to be tested was formulated.

H2: The subject‘s need for cognition interacts with the camera angle effect.

The effect of the camera angle was tested on 13 semantic differentials (Osgood, C.E, Suci, G.J., & Tannenbaum, P.H., 1957) that are applicable for faces as well as objects. These semantic

differentials are expected to measure different aesthetic and emotional properties of each item. The scales used in the study had to suffice a number of criteria. As mentioned they had to be applicable to faces as well as objects. Osgood et al. have determined three main factors in their studies of the semantic differential: *Evaluation*, *Potency* and *Activation*. These factors were found in all of the studies conducted by Osgood and his colleges. All scales used in the present study were scales used in one of those studies and all except *maturity* were found to load on one of the three main factors. These main factors offer a reliable set of scales to examine the difference in camera effect between faces and objects as they were found across a number of different concepts not limited to humanoid or lifeless stimuli. Osgood et al.(1957) sorted the tested concepts in five concept groups: “person concept“ (*me*), “physical objects“ (*knife*), “abstract concepts“ (*modern art*), “event concepts“ (*birth*) and “institutions“ (*united nations*) with each providing one example of the concept used given in parenthesis (p.49). According to the findings of Kepplinger (1987) and Mignualt & Chaudhuri (2003) the scales from the factor *Potency* as dominance, bravery and strength can be influenced by the camera angle in research of faces. Kraft (1987) has also found evidence for a camera angle effect on the perception of the *evaluation* scale “good - bad“ evidently that such an effect is not solely limited to *potency* scales.

All scales had been used in earlier research to rate objects or faces with reliable effect between items or are expected to be applicable for faces as well as objects. Table 1 presents an overview of the scales that were used and the factors they were expected to load on based on the findings of Osgood et al.. The scales for beauty, size and roundness were expected to be applicable for faces and objects without validation from previous research. Maturity, although loading on one of the less describing factors in the research by Osgood et al., will be used due to the insight in the role of the heuristic processing hypothesis as an explanation of the camera effect. Implying that looking up would make an object seem more mature (i.e. grown up) and looking down childish.

Osgood‘s factors were further used to investigate a possible interaction of the factors and the sort of the item (i.e. face or object). An interaction could indicate that the item‘s evaluation is dependent on the kind of scale and underling factor and not simple features of a certain camera angle. This would support the findings of Kepplinger (1987) and Meyer-Levy & Peracchio (1992) in that such a camera effect is not universal and dependent on other factors as the attribute that is measured. The investigation of an interaction can be summarized in the following research question:

RQ1: Will the underlying factors of the semantic differentials influence the camera angle effect?

Table 1.

Semantic differentials with underlying measure per item and respective factor from Osgood et al.

Scale	Measure	Factor
good - bad	goodness[a b i]	evaluation
pleasant - unpleasant	pleasantness[c a]	evaluation
beautiful - ugly	beauty	evaluation
sad - happy	mood[d]	evaluation
soft - hard	hardness[e f]	potency
unemotional - emotional	emotionality[f]	potency
tall - short	height[i]	potency
big - small	size	potency
feminine - masculine	masculinity[b]	potency
active - passive	activeness/efficacy[g]	activity
round - sharp	roundness	tautness/activity
interesting - boring	interest[g]	receptivness/activity
childish - mature	maturity[f]	novelty

Note. [a]McCain, T.A., Chilberg, J. & Wakshlag(1977), [b]Petiot, J.-F., Yannou, B.(2004), [c]Desmet, P. (2003), [d]Mignault, A. & Chaudhuri, A.(2003), [e]Bloch, P.H.(1995), [f] Hsu, S.H., Chuang, M.C. & Chang, C.C. (2000), [g]Kepplinger (1987), [i]Kraft, R.N. (1987)

Method

Subjects

Subjects were approached via different means to participate in the study. Most subjects were approached via internet and some via personal communication. Via the internet subjects were approached via emails, personal messages in social networks, guest books and *mood messages* in social networks and the researcher‘s chat application. Subjects were also encouraged to forward the link to the survey further throughout their friends. Three general subject populations that were approached can be defined as fellow students at the University of Twente and, from the background of the researcher subjects from the area of Hanover, Germany and Ottawa, Canada.

Every subject participated at free will and was not rewarded financially or in the form of credits for their participation. The survey was conducted in English as an in-browser online survey all subjects were asked to wear correctional lenses if they usually wore them. screen captures of the survey can be found in Appendix A) The subjects were identified by their IP address and time of participation, 98 completely answered surveys were accumulated within one week, six incomplete data sets had to be eliminated. Of the 98 subjects 43 were male and 55 were female. The mean age was 32,2 years with a standard deviation of 14,5 years. (minimum 17, maximum 72). Of the sample 49 subjects were German, 37 Dutch, 5 Canadian and 7 had another nationality. The demographics of the sample are summarized in Table 2.

Tabel 2.
Demographics of the sample

	N		Age *M*(*SD*)	
Nationality	Male	Female	Male	Female
Dutch	21	16	25,6(9,7)	26,3(10,0)
German	18	31	36,1(16,2)	36,6(15,8)
Canadian	2	3	22,5(2,1)	24,0(0,0)
Other	2	5	54,0(18,4)	37,6(15,8)
Total	43	55	31,1(14,6)	33,0(15,4)

Stimuli

The stimuli used were computer renderings of faces and objects. Six faces (three male, three female) and six objects were used. Samples of these stimuli are presented in *Figure 1* (for a complete overview of the stimuli see Appendix B) The faces were generated using Poser Pro and exported to 3D Studio format (i.e. .3ds). The faces were generated with their eyes closed to prevent a possible effect of the stimuli ‘staring’ at the subject when depicted at eye-level.

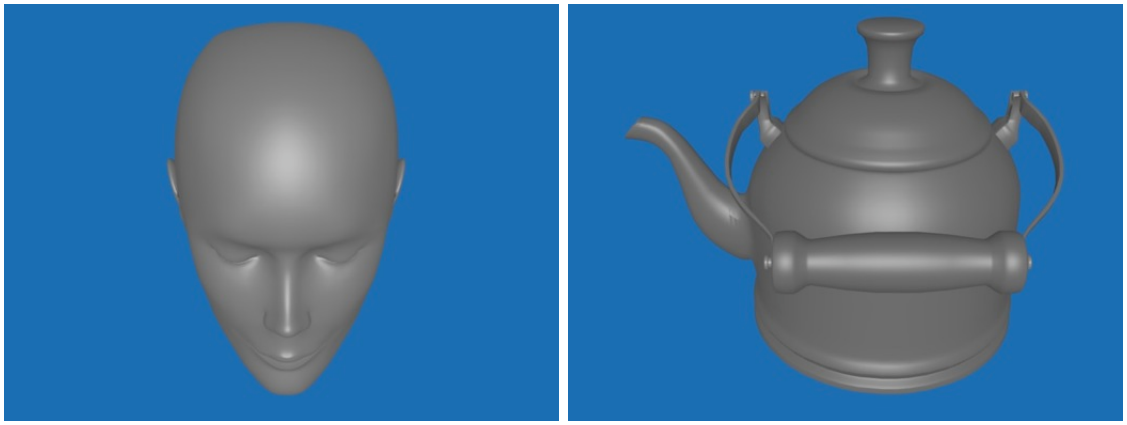


Figure 1. Female face 1 and kettle from high camera angle.

The objects were free ware files from internet portals in "3ds" format. The objects were chosen to be similar to faces in size, positive height to width ratio (i.e. higher than wide), number of features, three-dimensionality, availability (common vs. rare) and not cultural specific. Due to the limited extend of the present research it was not possible to match stimuli or pretest different objects, therefore a careful selection was critical. Although to test the hypotheses no direct comparison between stimuli is necessary. it was assumed that such a selection would provide more valid results. Although the faces were presented from a frontal point of view to minimize interference with potential lateral angle effects, the objects were presented in an informative point of view to counteract ambiguity of object recognition but were not rotated between renderings. This was also achieved by using more common objects as opposed to rare objects subjects might not recognize or know. To assure intercultural recognition of the objects no highly cultural specific objects were used. It should be noted that the results are expected to only be applicable to a western culture. The main function of the criteria "number of features", "positive height to width ratio" and "three-dimensionality" was to choose objects whose representation does change by altering the camera tilt. A volleyball, for example, will not differ much depending on camera angle. The same is assumed of mainly "flat" single feature objects as simple vases for example. Object in the study shall therefore be selected on the basis of these criteria and the assumption of therefore yielding valid results.

All files were rendered in *Blender* using a frontal *hemi* light source at approximately +30° from eye-height and a low amount of ambient light to counteract completely black shadows. The Camera of the scene was tilted 30°, keeping it at the same distance to the face or object, between renderings for the three versions of each stimuli. This way a version of each face and object with a camera tilt of -30°, 0° and +30° respectively was produced. Earlier studies recorded camera angle effects with these angles (Kepplinger, 1987; Mignault, 1992). The objects and faces were scaled to the same height and were rendered at 520 pixels width and 390 pixels height. Each object and face got a gray surface color (hexadecimal value #CCCCCC) and the same amount of reflection. The background of the rendered scene was blue (hexadecimal value #1759A2).

Apparatus

For the evaluation of the stimuli seven point Likert scales with an opposing term at either end of the scale. The survey was conducted via a website and could be filled in within the subject‘s browser window. To prevent a priming or answer pattern effect to occur each subject was presented with stimuli with different camera angles as opposed to making a survey only with stimuli with the same angle in each version. For the sake of the study‘s reliability the only alteration between each page of the survey was the camera angle of the stimulus. To further prevent answer patterns several measures were taken. The scale‘s orientations within one page of the survey were altered between scales, i.e. the left end of the scale scoring high as opposed to the right end. Between stimuli the order of the scales was differed. Four different configurations were produced. This was done in such a manner that each scale was located in every quarter of the list once within the four versions and so that the underlining factors were spread out. The four configurations were then assigned to stimuli in such a manner that each configuration appeared once in every third of the pages. Between versions of the survey the angle per stimulus differed. This was also done so that every angle appeared four times during the survey. Per angle one stimulus was a female face, one a male face and two were objects. Finally these three versions‘ ordered was inverted from back to front to form a total of six different versions. This was done in order to counteract learning or boredom effects. (The exact order of stimuli and scales can be found in Appendix C)

Randomization across the six versions was achieved by an adaptive link on the welcome page. The link sent the first subject to click on the *START* link to version one, the second to version two and so forth upon having sent a subject to version six it would automatically send the subject to the first version once again and start the cycle anew. This achieved a decent amount of randomization and a similar amount of versions filled in (n_1=38, n_2=29, n_3=31, versions that differ in camera angle).

Data was aggregated in an *Excel* file on the server. The scores were recorded automatically in a manner that their direction was identically to Osgood‘s (1957) thesaurus study. The direction of each scale is summarized in Table 3.

Tabel 3.
Direction of the scales

Low	High
good	bad
unpleasant	pleasant
beautiful	ugly
happy	sad
soft	hard
emotional	unemotional
short	tall
small	big
feminine	masculine
passive	active
round	sharp
boring	interesting
childish	mature

Procedure

Upon following the link to the Survey the subjects were shown a welcome screen which stated that the study was conducted as part of a bachelor thesis at the University of Twente, the semantic differentials were explained and they were asked to wear glasses or contact lenses if they needed to. Nothing was mentioned about the goal of the study as to achieve reliable results.

After clicking start the first stimulus appeared centered at the top of the window with the semantic differentials underneath. Beneath the scales was a button labeled Reset, which reset all scales, and a button labeled Next, which send the information to the server and redirected the subject to the next stimulus. Upon opening none of the scales were filled in to prevent subjects clicking through the survey. All scales had to be filled in in order to proceed or an error massage would show upon clicking Next.

Following the twelve stimuli the subjects were asked to fill out the condensed ‘Need for Cognition’ scale by Cacioppo et al. (1984). In order to keep the survey consistent the answer possibilities were limited to a seven point Likert scale instead of the nine point scale used by Cacioppo et al. (1984) (for an example of the questionnaire see Appendix E)

Finally the subjects were asked for some demographics. (i.e. sex, age and nationality) and upon closing were thanked and given the possibility to contact the researcher for further questions and remarks.

Results

Need for Cognition

The 'Need for Cognition' (NfC) questionnaire's reliability was tested by computing Cronbach's Alpha. The reliability coefficient was +0.78 that allows the assumption that the questionnaire did indeed measure one underlying factor. The mean scores of the 'Need for Cognition' (NfC) scales were computed for each subject as a variable *meannfc*. The mean score of this variable of the sample was 4,9 (*SD*= 0,7) on a scale from 1 through 7. In fact only nine subjects had a *meannfc* of four or lower. To categorize the sample in low and high NfC two groups were formed using the same method as was used as in the study of Meyer-Levy and Peracchio(1992). The sum of all NfC items' scores was computed and the sample's median of 90 determined. Subjects were then categorized to either low or high NfC according to their score in relation to the median. The *meannfc* of the *low-nfc*(n=51, M=4,41, SD=0,47) and *high-nfc* (n=47, M=5,51, SD=0,38) group differed significantly, $t(96)=12{,}35$, $p < 0{,}001$ (two-tailed).

Hypotheses

To test the hypotheses three (camera angle, i.e. high, eye-level, low) by two (NfC, i.e. high, low) Multivariate Analyses of variance (MANOVA) were performed per stimulus. Dependent variables were the scores on the scales of that stimulus and the independent variables the camera angle and the subject's NfC category. The results are presented in Tabel 4.

In order to test the first hypothesis that the camera angle effect was indiscriminate to the nature of the stimulus, i.e. face or object, the main effect of the camera angle was examined. On all face stimuli a significant main effect of the camera angle effect was found on the objects, however, only the blender showed a significant effect. To test this difference Analyses of Variance (ANOVA) were performed per scale per stimulus with the camera angle as independent factor. The complete recollections of these ANOVAs can be found in Appendix D. The scale maturity was the only scale that produced no significant effects of the camera angle on any stimulus and was excluded from further analyses. The results were aggregated in a table in such a way that per stimulus per scale could be indicated if the respective ANOVA was significant. This table was then analyzed by means of a nonparametric test. A χ^2 square test was performed to test for an interaction between the nature of the stimuli (face or object) and the significance of the ANOVA on a the scales. The test supported that more scales were significant when the stimulus was a face (34 of 72) rather than an object (10 of 72), $\chi^2(1, N = 144) = 18{,}85$, $p < 0{,}001$.

The second hypothesis was tested by examining the interaction of NfC category and camera angle. Solely the the Kettle showed a significant interaction between NfC category and camera angle, $F(26{,}160)=2{,}07$, $p < 0{,}01$.

Table 4.
MANOVAs of camera angle and NfC category per stimulus

Source	*F*[a]	*p*
female face 1		
angle	2,68***	0,00
angle*NfC category	0,65	0,90
female face 2		
angle	2,50***	0,00
angle*NfC category	1,40	0,11
female face 3		
angle	4,70***	0,00
angle*NfC category	0,76	0,79
male face 1		
angle	1,76*	0,02
angle*NfC category	0,43	0,99
male face 2		
angle	2,86***	0,00
angle*NfC category	0,92	0,59
male face 3		
angle	2,26**	0,00
angle*NfC category	0,90	0,61
kettle		
angle	1,46	0,08
angle*NfC category	2,07**	0,00
blender		
angle	1,95**	0,01
angle*NfC category	0,72	0,84
microscope		
angle	0,77	0,79
angle*NfC category	0,79	0,75
coffee maker		
angle	1,26	0,19
angle*NfC category	0,53	0,97
hourglass		
angle	1,32	0,16
angle*NfC category	0,67	0,89
hammer		
angle	1,02	0,45
angle*NfC category	0,77	0,78

Note. [a]*df*=(26,160).
*$p < 0,05$, **$p < 0,01$, ***$p < 0,001$.

Research Question

To answer the research question first the reliability of the scales was measured. Cronbach‘s Alpa was +0,81 for the scales of the evaluation factor, +0,69 for the scales of the activity factor and +0,53 for the potency scales. For the factor potency reliability could not be lifted higher than +0,63 by deleting items and the scales were not further analyzed. The maturity scale was not used here

either. Only the difference between the factors evaluation and activity can be analyzed while there can be assumed that those do measure the underlying factor. The same data from the ANOVAs performed to test the first hypothesis excluding the scales of the potency factor and the maturity scale were used to perform a χ^2 square test to determine an interaction between the factors and the significance of the respective ANOVA. The test showed that ANOVA‘s were more often significant when the scale was of the evaluation factor (18 of 48) than when the scales were from the activity(5 of 36) factor, $\chi^2(1,N = 84) = 5,77, p = 0,02$.

Discussion and Limitations

Discussion

The first Hypothesis can be discarded as the results of the MANOVAs in Table 4 show that the camera angle has an effect on all faces but only on one object. The additional χ^2 square test further supports this conclusion. This indicates that there is in fact a difference in camera angle effect between faces and objects in this study. The reason for this difference cannot be completely be clarified by this study neither was it the intention of the research to do so. The scales used might more commonly be used by laity to describe faces rather than objects, although they had been used for both in previous studies as discussed above. Also, from personal communication to the researcher from subjects after they had filled in the survey a little confusion was created by the uni-color objects. This of course is necessary to eliminate color effects but might have caused some evaluation bias that might be stronger with objects that are more often multi-colored rather than generally uni-colored faces.

These results support the heuristic processing hypothesis in that it is much more common that the subjects see faces from different angles with a certain meaning intended than objects. As argued by Mignault and Chaudhuri (2003) the face is often used by humans, but also other life forms to communicate basic emotions and dominance with their environment. Objects, on the other hand, are more commonly seen in only one position as for example on the counter, thus from above, for most kitchen appliances.

In photography and film the camera angle is often used in the same way to produce similar effect. Powerful politicians and royalty are often depicted from a low angle; this might be the result of the way leaders are often positioned on a stage when they talk to a group. The fact the one is used to seeing leaders or powerful individuals on stages and the pictures of those events from a low angle might cause one to develop a heuristic when evaluating low angle shots. If this is true the heuristic processing hypothesis is likely to be a self-fulfilling prophecy in that people are used to a certain depiction and this depiction will than be used by cameramen and photographers to communicate that which in turn further strengthens the heuristic.

The second hypothesis can only be accepted for one stimulus, namely the blender. For all other stimuli no interaction between the camera angle and the level of the NfC could be found. It can be assumed that the subject‘s level of NfC does not interact with the camera angle in the sort of depiction of the stimuli chosen for this study. Te stimuli were presented without context as opposed to the study of Meyers-Levy and Peracchio(1992) where an advertisement with text and picture was used. It might be that in their study the high NfC category simply studied the text more thoroughly, which was identical in both advertisements.

Another problem with the interpretation of the NfC‘s influence in this study is that although two significantly different level of NfC between groups was produced that is merely of statistical value. The sample in fact scored very high on the NfC questionnaire (M = 4,9 on a scale from 1 to 7). This results in a comparison of high (M = 4,41) and very high(M = 5,51) categories in this

sample. The study of Meyers-Levy and Peracchio also had an above average mean score in their sample but it was still lower that in the present study. The mean of their study was at 60% of the highest possible score where as in this study the mean was at 70% of the highest score. This minimizes the validity of the analysis and therefore makes a definite conclusion over the influence of the NfC for this study impossible. The reasons for the high mean of the sample are believed to be manifold. For one in the researchers environment most people are taking part in a higher educational program or have a university or collage degree. As indicated by earlier research the level of NfC does correlate with educational success (Elias, S.M. & Loomis, R.J., 2002). Also the way the subject was approached, online and semi personally relies on a certain level of curiosity of the potential subject to help by filling in the survey. A person‘s curiosity has been found to positively correlate to that individual‘s NfC. (Olson, K., Camp, C. & Fuller, D.,1984).

The research question could only be tested between two factors as the potency factor was not measured reliably. Also the reliability of the activity factor was rather low but allowed for a general exploration of an effect the underlying factor has on the occurrence of a camera angle effect. The analysis showed that the scales of the evaluation factor were more often significantly influenced by the camera angle than the ones from the activity factor. The factors do differ in amount of times a camera angle effect occurs. The reason for this cannot be determined definitely by the present study. One explanation might be that the evaluation factor correlates to one‘s emotional response to the stimulus that is virtually immediate and that for other factors a longer evaluation period is needed. But to thoroughly study and be able to formulate conclusions over the specifics of such an interaction further research is needed with scales with a higher Cronbach‘s Alpha that measure all three basic factors reliably.

Limitations

In order to allow the present study a more in depth analysis of the effects of the camera angle some alternations would have to be done. A big problem was produced by the nature of the survey concerning the analysis of the gathered data when the decision was made to vary camera angles within versions. This was done to counteract priming and or fatigue effects but caused great difficulties in analyzing the effects of the camera angle. The alternation that each version was equal to one angle would have made an analysis of the camera angle per scale across stimuli possible and therefore a much more detailed and valid testing of the differences between objects and faces. The problem was not foreseen by the researcher.

The used statistical measures to analyze the difference between occurrence of camera angle effect and nature of the stimulus do not necessarily provide the most valid approach of measuring such an effect. These were used because other analyses were made impossible as described above. The perceived differences when testing hypothesis one could also be a result of a higher likeness between faces than between objects, therefore, resulting in a higher correlation between scales with faces as stimuli rather than objects.

Furthermore some limitations are inevitable with the present approach of research. The semi personal approaching of subjects results in a population of a certain milieu. This might compromise the validity of the study. Also the online setting of the survey is not ideal. It is not possible to

control the subject‘s experimental setting. Also the size of the subjects screen might influence the effect in that the size of the stimulus is not completely controllable within internet browsers. The size of an image has been positively correlated to perceived arousal by earlier studies (Detenber, B. H.& Reeves, B.A., 1996). This might have an influence and if so it cannot be controlled in the present setup, although the stimulus size was constant in pixels limiting such an effect. Also Exposure times of the stimuli cannot be controlled within this setup.

The present study aimed to isolate the camera angle effect from context. This decision could possibly have biased the result towards the more commonly utilized effect of the camera angle on the evaluation of faces compared to objects. Namely that faces can be portrayed without much context whereas objects are bound to have a context in form of their environ meant that they rest on. The effect of the context on an angle effect is something that should be analyzed in future studies. All studies that generated angle effect with depictions of objects did so with context. in the study of Kraft (1987) the stimulus was part of a story and in the study of Meyers-Levy and Peracchio (1992) of an advertisement.

Future Research

For a more in depth study of the camera effects without context the present study could be repeated with thorough pre-testing of the stimuli to ensure comparability. The survey should further be conducted in such a manner that allows comparison between stimuli across scales as discussed above. The effect of the factors found by Osgood et al. (1987) could also be tested in a study with extensive pre-testing of the stimuli and scales. The role of context should be studied with identical stimuli and a differing context a simple title of each stimulus might suffice to influence the evaluation of the same stimulus on the same scale. Kepplinger (1987) proposed that the camera angle interacts with each scale of evaluation but it could be that the context of a stimulus might interact with a scale as well. A low angle shot of a face with either “The Hero“ or “The Villain“ as a title might invert the camera effect on a scale as good - bad whilst the size of the effect stays constant. Thus the size of the effect is influenced by the angle and the direction by the context and or the scale.

The present study offers a first insight in the complexity of the camera angle effect and a first step towards an empirical investigation of the fundamentals of the effect but more research is needed to fully understand the workings of the effect.

References

Blender (version 2.48a) [Computer software]. (2008). Amsterdam: Stichting Blender Foundation.

Bloch, P. H. (1995). Seeking the ideal form: Product design and consumer response. *Journal of Marketing, 59*(3), 16-29.

Cacioppo, J. T., Petty, R.E. & Kao, C.F. (1984). The Efficient Assessment of Need for Cognition. *Journal of Personality Assessment, 48*(3), 306-307.

Desmet, P. (2003). Measuring Emotion: Development and Application of an Instrument to measure emotional responses to Products. In M. A. Blythe, A. F. Monk, K. Overbeeke & P. C. Wright (Eds.), *Funology: From Usability to Enjoyment* (pp. 111-123). Norwell, MA: Kluwer Academic Publishers.

Detenber, B. H. & Reeves, B. A. (1996). Bio-informational Theory of Emotion: Motion and Image Size Effects on Viewers. *Journal of Communication, 46*(3), 66-84.

Elias, S. M. &Loomis, R. J. (2002). Utilizing Need for Cognition and Perceived Self-Efficacy to Predict Academic Performance. *Journal of Applied Social Psychology*, *32*(8), 1687-1702.

Hsu, S. H., Chuang, M. C. & Chang, C. C. (2000). A semantic differential study of designers' and users‘ product form perception. *International Journal of Industrial Ergonomics, 25*, 375-391.

Kepplinger, H. M. (1987). *Darstellungseffekte: Experimentelle Untersuchungen zur Wirkung von Pressefotos und Fernsehfilmen* [Depiction effects: Experimental Studies of the Effect of Press Photos and Television Movies]. Freiburg(im Breisgau): Karl Alber

Kraft, R. N. (1987). The influence of camera angle on comprehension and retention of pictorial events. *Memory & Cognition, 15*(4)*,* 291-307.

Lievaart, R. B. & Hoetink, H. (2007). *Films Maken: alles over film maken op video - een handboek van scenario tot montage (6th ed.).* Amsterdam: QQleQ Dramaprodukties

McCain, T. A., Chilberg, J. & Wakshlag, J. (1977). The Effect of Camera Angle to Communicator Credibility. *Journal of Broadcasting, 21*(1), 35-46.

Meyers-Levy, J. & Peracchio, L. A. (1992). Getting an Angle on Advertising: The Effect of Camera Angle on Product Evaluations. *Journal of Marketing Research*, *39*, 454-461.

Meyrowitz, J. (1998). Multiple Media Literacies. *Journal of Communication*, *48*(1), 96-108.

Mignault, A. & Chaudhuri, A. (2003). The Many Faces of a Neutral Face: Head Tilt and Perception of Dominance and emotion. *Journal of Nonverbal Behavior, 27*(2)*,* 111-132.

Olson, K., Camp, C. & Fuller, D. (1984). Curiosity And Need For Cognition. *Psychological Reports, 54*(1), 71-74.

Osgood, C. E., Suci, G. J., Tannenbaum, P. H. (1957). *The Measurement of Meaning.* Urbana, Chicago and London: University of Illinois Press

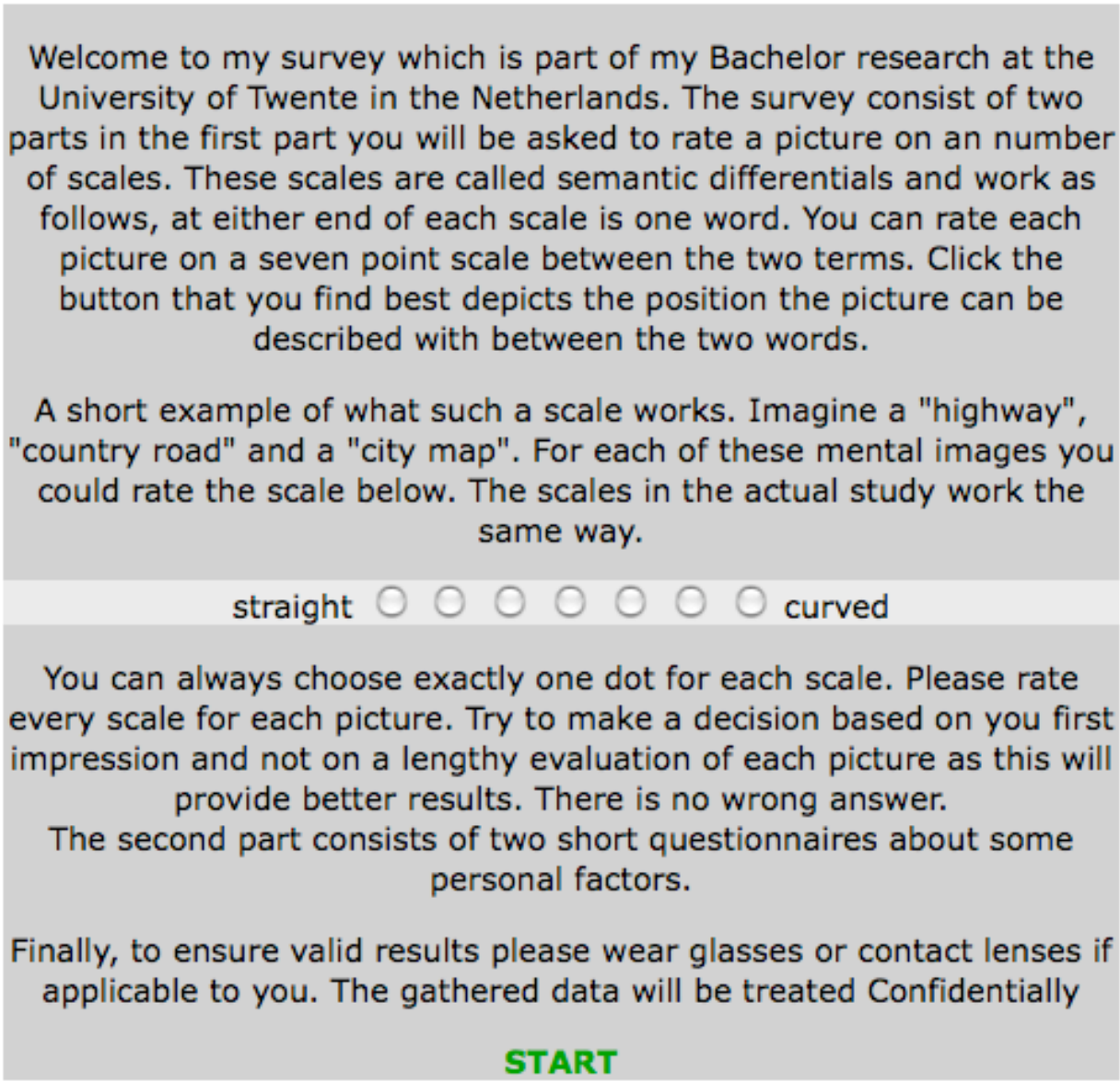
Petiot, J.-F., Yannou, B. (2004). Measuring consumer perceptions for a better comprehension, specification and assessment of product semantics. *International Journal of Industrial Ergonomics, 33, 507-525.*

Poser Pro [Computer software]. (2008) Aliso Viejo, CA: Smith Micro Software, Inc..

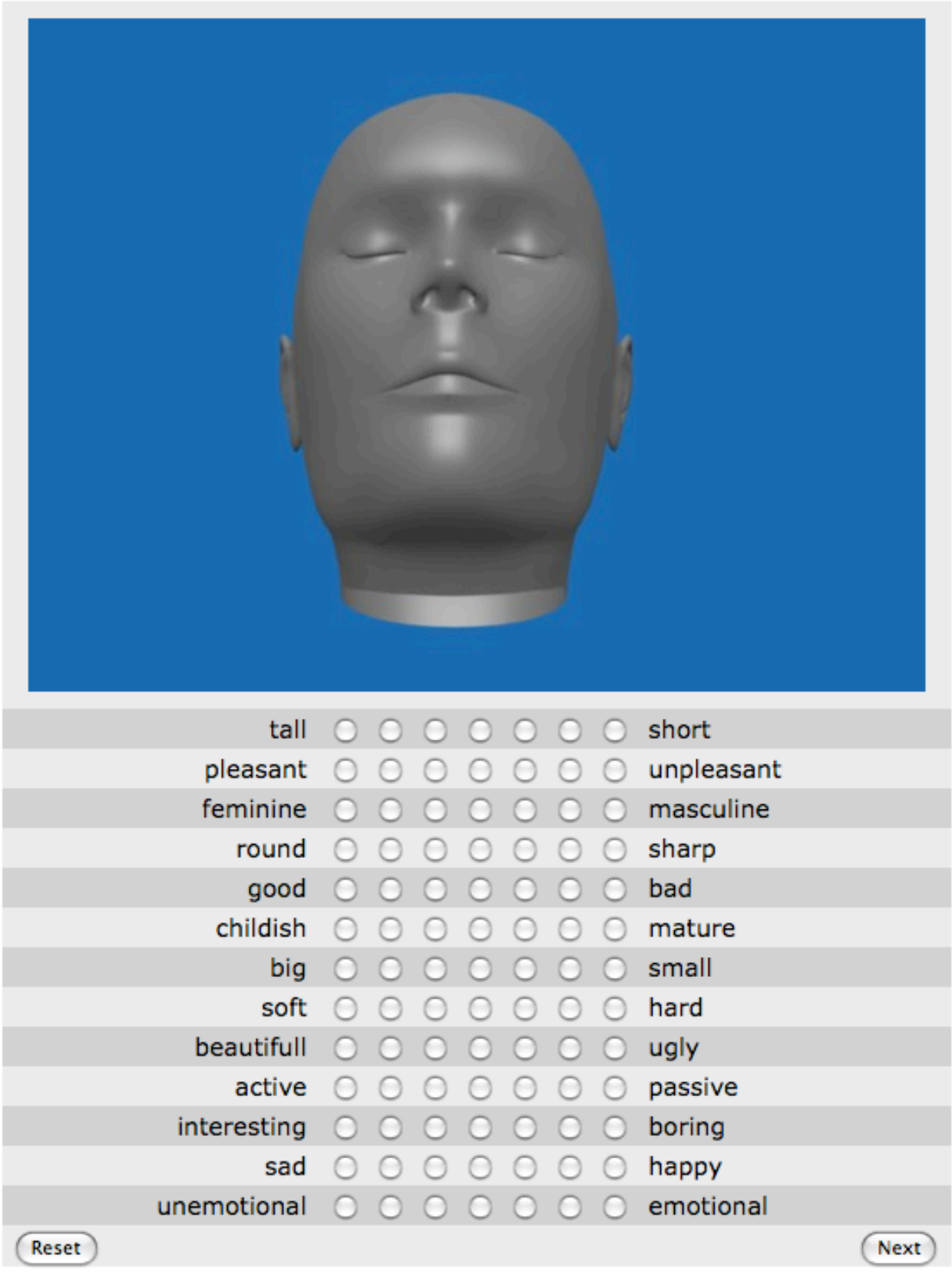
Scott, L. M. & Vargas, P. (2007). Writing with Pictures: Toward a Unifying Theory of Consumer Response to Images. *Journal of Consumer Research*, *34*, 341-356.

Appendixes

Appendix A



Welcome screen.



Sample of an item: Female face 1 from version 1.

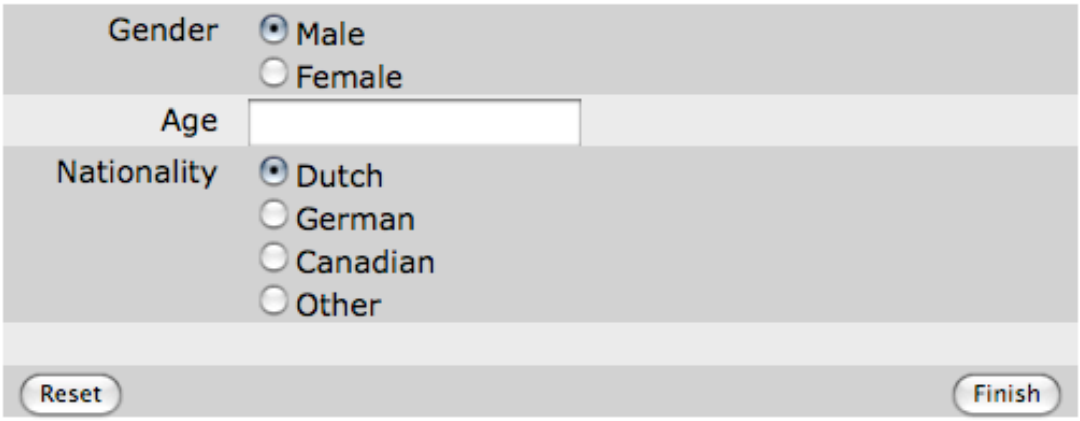
The last two questionnaires aim to asses some personal factors and demographics. Please give a as precise answer as possible. Again all data will be treated confidentially.

On the scales below rate the degree to which you agree with each statement, from "strongly disagree" (left) to "strongly agree" (right). There are no right or wrong answers.

	disagree						agree
I would prefer complex to simple problems.	○	○	○	○	○	○	○
I like to have responsibility of handling a situation that requires a lot of thinking.	○	○	○	○	○	○	○
Thinking is not my idea of fun.	○	○	○	○	○	○	○
I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.	○	○	○	○	○	○	○
I try to anticipate and avoid situations where there is likely chance I will have to think in depth about something.	○	○	○	○	○	○	○
I find satisfaction in deliberating hard and long hours.	○	○	○	○	○	○	○
I only think as hard as I have to.	○	○	○	○	○	○	○
I prefer to think about small, daily projects to long-term ones.	○	○	○	○	○	○	○
I like tasks that require little thought once I have learned them.	○	○	○	○	○	○	○
The idea of relying on thought to make my way to the top appeals to me.	○	○	○	○	○	○	○
I really enjoy a task that involves coming up with new solutions to problems.	○	○	○	○	○	○	○
Learning new ways to think doesn't excite me very much.	○	○	○	○	○	○	○
I prefer my life to be filled with puzzles that I must solve.	○	○	○	○	○	○	○
The notion of thinking abstractly is appealing to me.	○	○	○	○	○	○	○
I would prefer a task that is intellectual, difficult and important to one that is somewhat important but does not require much thought.	○	○	○	○	○	○	○
I feel relief rather than satisfaction after completing a task that required a lot of mental effort.	○	○	○	○	○	○	○
It's enough for me that something gets the job done; I don't care how or why it works.	○	○	○	○	○	○	○
I usually end up deliberating about issues even when they do not affect me personally.	○	○	○	○	○	○	○

Reset Next

NfC questoinnaire.



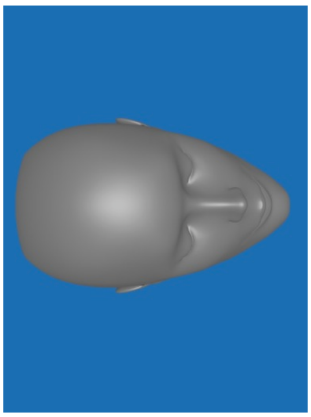
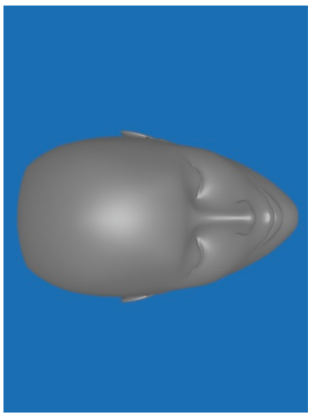
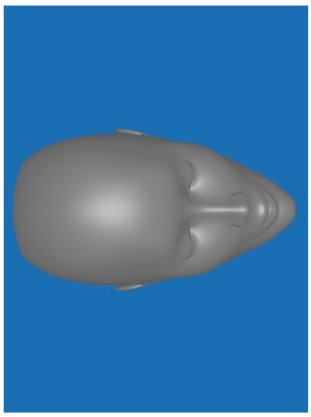
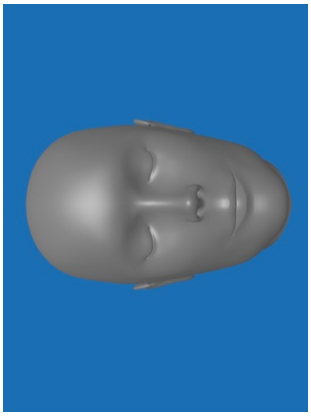
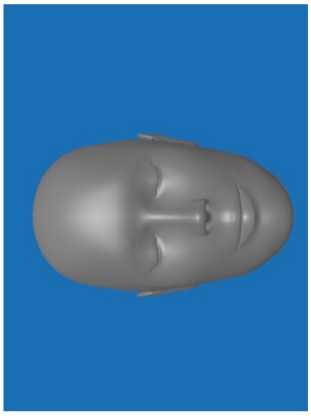
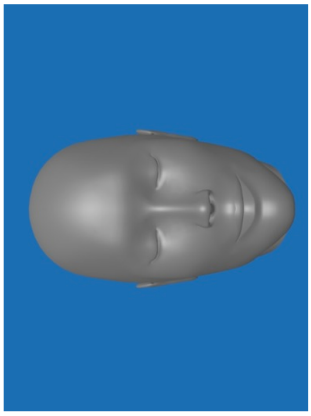
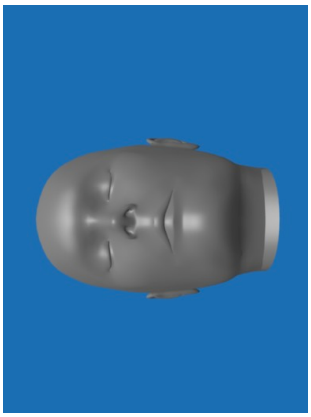
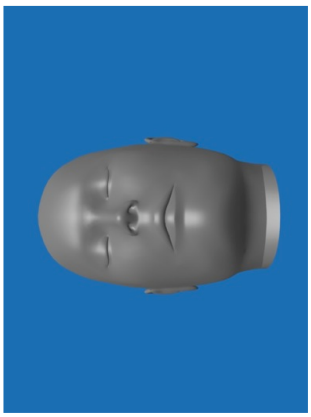
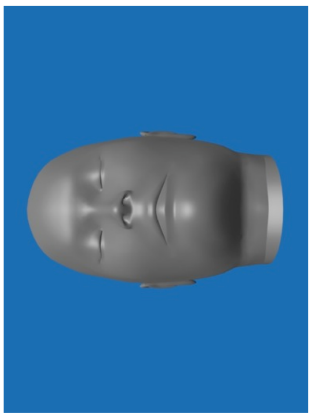
Demographics.

Thank you very much for helping me with my study by participating. If you would like to comment, have further questions regarding the study or want to be informed about my results email me. Otherwise you can simply close the window.

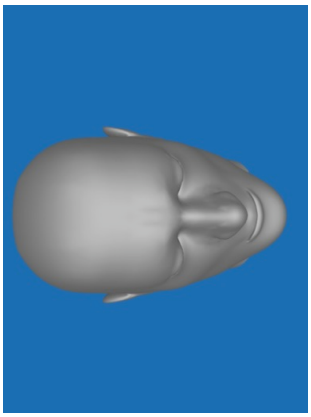
Gratefully,
Rasmus Wienemann
University of Twente
Faculty of Behavioral Sciences, Enschede, NL

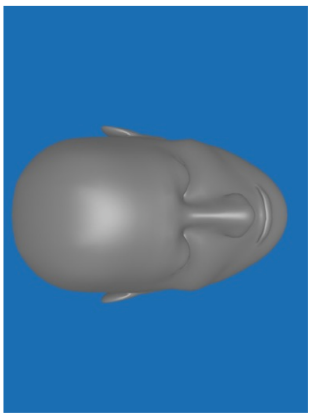
Thank you sccreen.

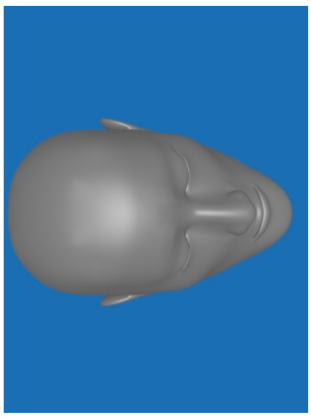
Appendix B

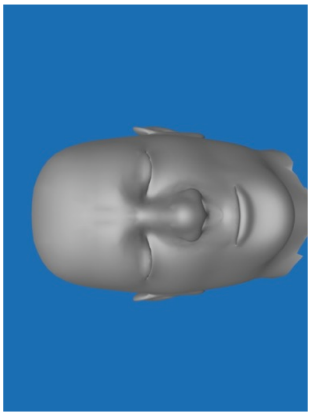










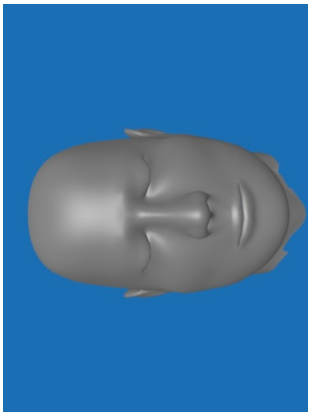
Female face 1 Female face 2 Female face 3

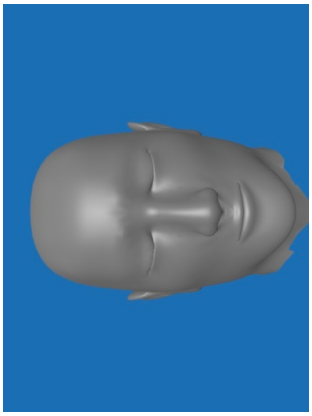


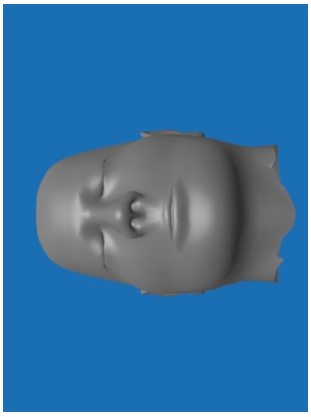








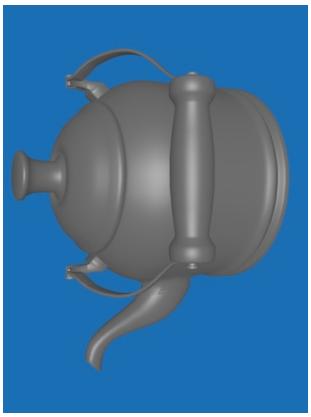


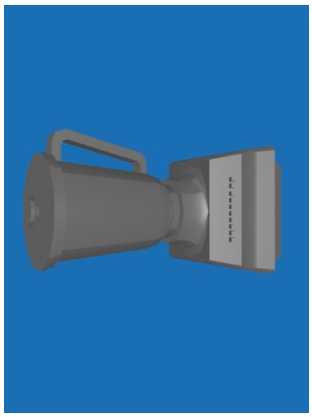


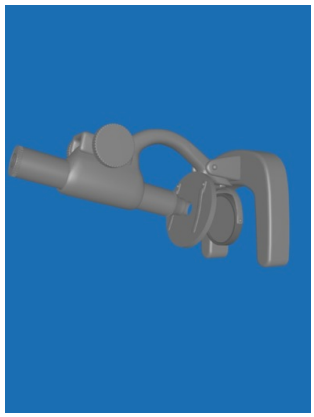
Male face 1

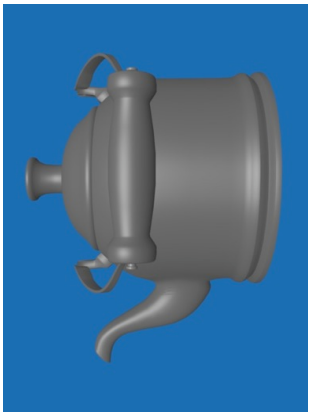
Male face 2

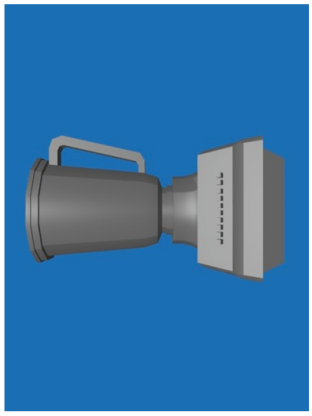
Male face 3

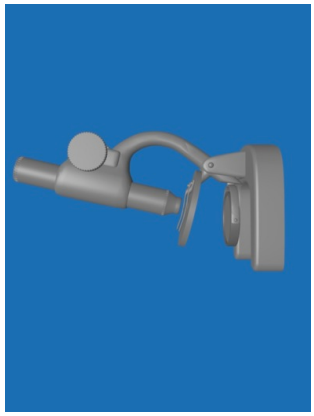


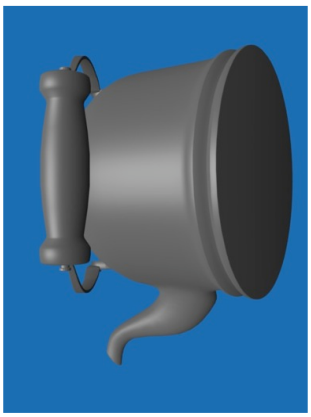




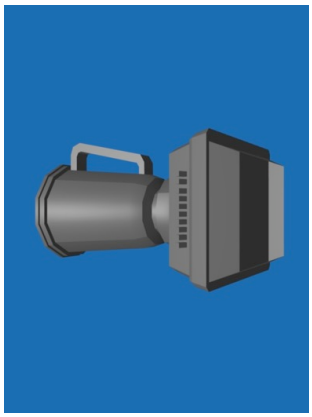




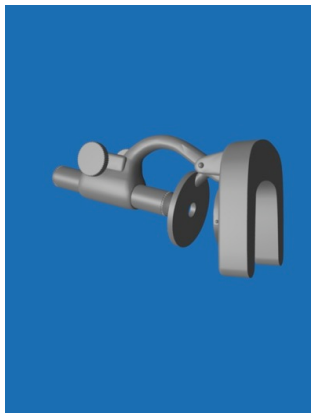




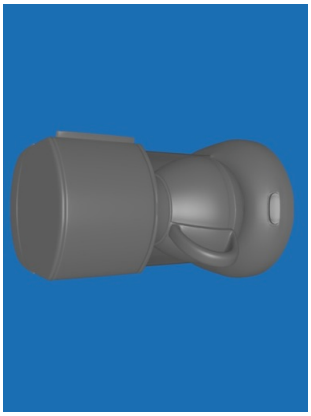
Kettle

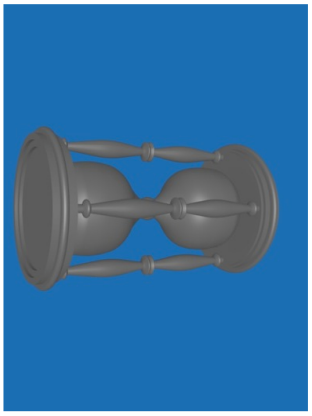


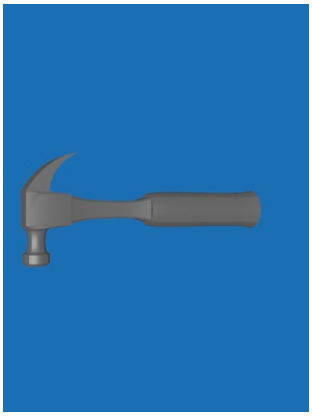
Blender

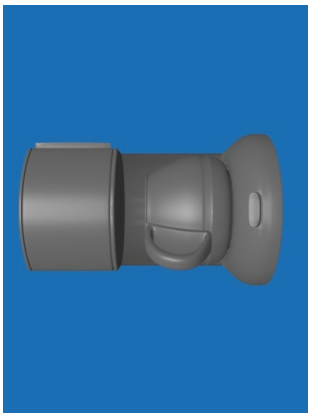


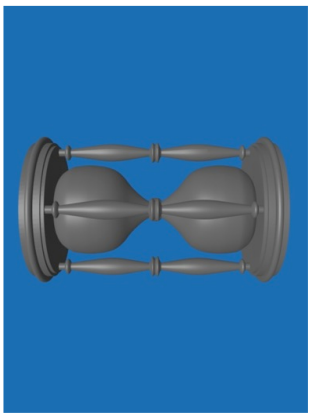
Microscope

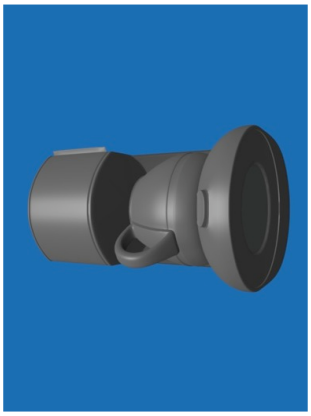


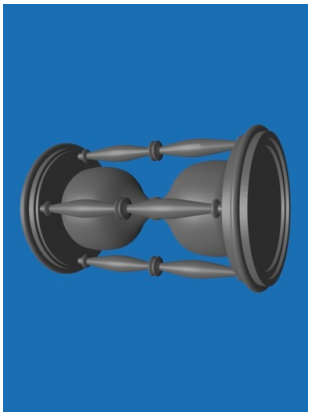












Coffee Maker

Hourglass

Hammer

Appendix C

Table A1
Configurations of scales

configuration 1	configuration 2	configuration 3	configuration 4
hardness	interest	height	goodness
beauty	mood	pleasantness	maturety
activeness	emotionality	masculiniy	size
height	hardness	roundness	interest
pleasantness	beauty	goodness	mood
masculiniy	activeness	maturety	emotionality
roundness	goodness	size	height
interest	maturety	hardness	pleasantness
mood	size	beauty	masculiniy
emotionality	height	activeness	roundness
goodness	pleasantness	interest	hardness
maturety	masculiniy	mood	beauty
size	roundness	emotionality	activeness

Table A2
Order Stimuli with respective configuration of scales

item	order	configuration	order inverted	configuration
female face1	female face1	3	hammer	3
female face2	kettle	1	male face3	1
female face3	male face1	4	hourglass	4
male face1	blender	2	female face3	2
male face2	microscope	4	male face2	1
male face3	female face2	3	coffee maker	2
Kettle	coffee maker	2	face2	3
Blender	male face2	1	microscope	4
Microscope	female face3	2	blender	2
Coffee Maker	hourglass	4	male face1	4
Hourglass	male face3	1	kettle	1
Hammer	hammer	3	female face1	3

Appendix D. *Mean scores per scale per angle and ANOVA of the angles effect.*

	M(SD)			ANOVA of angle	
stimulus	low	eye-level	high	df	F-score
female face 1					
active	3,55(1,408)	3(1,317)	3,31(1,628)	2,95	1,241
beauty	3,66(1,192)	3,71(1,189)	3,48(1,617)	2,95	0,24
emotion	4,32(1,646)	3,39(1,022)	4,17(1,649)	2,95	3,718*
gender	4,05(1,676)	3,26(1,505)	2,79(1,424)	2,95	5,696**
good	3,26(1,223)	3,23(0,717)	3,55(1,242)	2,95	0,803
hard	3,76(1,55)	2,87(0,991)	3,59(1,783)	2,95	3,347*
height	4,42(1,718)	5,13(1,024)	4,97(1,18)	2,95	2,538
interest	4,39(1,285)	4,29(0,902)	4,28(1,556)	2,95	0,09
maturity	4,42(1,734)	5,29(1,16)	4,9(1,472)	2,95	2,919
mood	3,76(1,101)	3,23(1,055)	4,28(1,222)	2,95	6,543**
pleasant	3,39(1,424)	3,58(1,205)	3,97(1,658)	2,95	1,321
round	3,66(1,381)	3,35(1,082)	4,07(1,602)	2,95	2,056
size	4,08(1,363)	4,16(1,416)	3,79(1,449)	2,95	0,568
female face 2					
active	3,38(1,449)	3,82(1,642)	3,71(1,395)	2,95	0,718
beauty	3,76(1,215)	2,89(1,247)	3,19(1,078)	2,95	4,402*
emotion	3,86(1,529)	3,29(1,45)	3(1,065)	2,95	3,085
gender	4,1(1,448)	3,16(1,669)	2,19(1,046)	2,95	13,352**
good	3,76(1,154)	2,68(1,297)	2,94(0,964)	2,95	7,441**
hard	3,52(1,573)	2,63(1,149)	3(1,238)	2,95	3,736*
height	4,38(1,237)	4,66(1,341)	4,61(1,145)	2,95	0,446
interest	4,24(1,55)	4,47(1,33)	4,68(1,194)	2,95	0,771
maturity	4,72(1,667)	4,74(1,571)	4,68(1,351)	2,95	0,014
mood	3,79(1,177)	2,89(1,429)	3,19(1,302)	2,95	3,867*
pleasant	4,07(1,387)	2,66(1,341)	3,26(1,154)	2,95	9,702**
round	3,17(1,227)	2,66(1,236)	2,81(1,223)	2,95	1,48
size	4,45(1,429)	3,97(1,241)	3,74(0,999)	2,95	2,557
female face 3					
active	3,61(1,476)	3,97(1,295)	3,95(1,374)	2,95	0,649
beauty	4,42(1,119)	3,31(1,168)	3,39(1,285)	2,95	8,325**
emotion	3,61(1,334)	2,55(0,985)	3,24(1,618)	2,95	4,635*
gender	4,58(1,587)	2,45(1,27)	1,76(0,852)	2,95	45,833**
good	4,06(1,153)	3,14(0,875)	3,03(1,15)	2,95	9,032**
hard	4,26(1,365)	2,76(1,185)	2,84(1,285)	2,95	13,616**
height	4,77(1,23)	4,83(1,002)	4,55(1,589)	2,95	0,417
interest	4,61(1,308)	4,69(1,339)	4,68(1,435)	2,95	0,031
maturity	4,9(1,35)	4,69(1,312)	4,39(1,569)	2,95	1,103
mood	4,32(0,702)	2,79(1,264)	2,92(1,363)	2,95	16,755**
pleasant	4,26(1,316)	3,17(1,071)	3,21(1,417)	2,95	7,203**
round	3,74(1,46)	3,34(1,344)	3,37(1,384)	2,95	0,802
size	4,71(1,189)	4,03(0,944)	3,34(1,4)	2,95	10,883**

	M(SD)			ANOVA of angle	
stimulus	low	eye-level	high	df	F-score
male face 1					
active	3,81(1,558)	4,16(1,685)	4,1(1,589)	2,95	0,445
beauty	5,39(0,989)	5,37(1,076)	4,86(1,093)	2,95	2,435
emotion	3,19(1,327)	3,18(1,658)	3,66(1,542)	2,95	0,956
gender	6,39(0,882)	6,63(0,589)	6,31(0,806)	2,95	1,688
good	4,9(1,165)	4,92(1,124)	4,97(1,239)	2,95	0,022
hard	4,23(1,23)	4,84(1,386)	4,72(1,162)	2,95	2,155
height	5,16(1,214)	4,89(1,673)	5(1,195)	2,95	0,308
interest	3,9(1,35)	4,39(1,346)	4,72(1,131)	2,95	3,107*
maturity	5,81(1,25)	5,74(1,446)	6,31(0,604)	2,95	2,151
mood	5,03(1,016)	5(0,838)	5,03(1,149)	2,95	0,013
pleasant	5,32(0,979)	4,95(1,374)	5,03(1,21)	2,95	0,864
round	2,94(1,365)	3,13(1,563)	4,21(1,497)	2,95	6,431**
size	5,68(1,137)	5,76(0,998)	4,76(1,38)	2,95	7,065**
male face 2					
active	3,87(1,51)	3,03(1,401)	2,81(1,108)	2,95	5,893**
beauty	5,68(1,042)	5(1,195)	4,26(1,264)	2,95	12,885**
emotion	3,89(1,624)	4,41(1,476)	3,84(1,463)	2,95	1,301
gender	6,37(0,852)	5,79(1,207)	5,68(1,166)	2,95	4,201*
good	4,71(1,113)	3,9(1,012)	3,97(1,08)	2,95	6,13**
hard	4,92(1,73)	3,79(1,634)	4,42(1,361)	2,95	4,124*
height	4,97(1,404)	4(1,389)	4,03(1,426)	2,95	5,389**
interest	4,08(1,217)	3,72(1,306)	3,77(1,543)	2,95	0,698
maturity	5,61(1,264)	5,38(1,208)	5,42(1,285)	2,95	0,319
mood	5,16(1,079)	4,59(1,119)	5,03(1,048)	2,95	2,434
pleasant	5,29(1,011)	4,48(1,353)	4,42(1,148)	2,95	6,078**
round	3,21(1,545)	2,79(1,346)	3,23(1,407)	2,95	0,881
size	5,71(1,206)	5,28(1,131)	4,48(1,092)	2,95	9,839**
male face 3					
active	3,14(1,706)	2,68(1,222)	3,37(1,422)	2,95	1,957
beauty	5,52(1,379)	4,45(1,261)	4,16(1,305)	2,95	9,337**
emotion	3,72(1,83)	4,03(1,354)	4,08(1,634)	2,95	0,444
gender	6,07(0,923)	5,97(0,912)	5,58(1,177)	2,95	2,188
good	4,52(1,243)	3,74(1,182)	3,37(1,149)	2,95	7,809**
hard	4,07(1,944)	4,06(1,209)	4,05(1,77)	2,95	0,001
height	4,76(1,405)	4,71(1,101)	4,37(1,46)	2,95	0,873
interest	3,83(1,284)	3,77(1,454)	4,58(1,308)	2,95	3,892*
maturity	5,55(1,152)	5,68(1,045)	5,42(1,056)	2,95	0,481
mood	5,21(0,978)	4,1(0,978)	4,53(1,428)	2,95	6,795**
pleasant	5,21(1,346)	4,19(1,327)	4,13(1,51)	2,95	5,679**
round	2,72(1,222)	3,03(1,329)	2,89(1,41)	2,95	0,402
size	5,72(1,192)	4,9(1,165)	4,32(1,21)	2,95	11,507**

	M(SD)			ANOVA of angle	
stimulus	low	eye-level	high	df	F-score
object 1					
active	3,26(1,653)	2,79(1,373)	3(1,375)	2,95	0,758
beauty	4,26(1,064)	4,31(1,137)	3,58(1,5)	2,95	3,587*
emotion	4,61(1,202)	5,31(1,775)	4,53(1,672)	2,95	2,317
gender	3,45(1,06)	3,41(1,24)	2,95(1,207)	2,95	2,006
good	3,58(0,958)	3,31(1,312)	2,79(1,166)	2,95	4,237*
hard	5,06(1,569)	5,38(1,59)	4,32(2,028)	2,95	3,258*
height	4,19(1,515)	3,79(1,398)	3,37(1,567)	2,95	2,588
interest	3,48(1,546)	3,38(1,449)	3,97(1,442)	2,95	1,592
maturity	4,81(1,046)	4,55(1,055)	4,79(1,143)	2,95	0,522
mood	3,9(0,746)	3,69(0,93)	3,71(0,984)	2,95	0,538
pleasant	3,87(1,284)	3,66(1,344)	2,89(1,034)	2,95	6,255**
round	2,9(1,274)	2,79(0,902)	2,53(1,502)	2,95	0,803
size	4,87(1,31)	4,41(1,427)	3,97(1,365)	2,95	3,686*
object 2					
active	3,31(1,892)	4,37(1,731)	4,19(1,682)	2,95	3,229*
beauty	4,48(1,326)	4,95(1,451)	4,42(1,025)	2,95	1,741
emotion	5,72(1,162)	5(1,507)	4,84(1,393)	2,95	3,537*
gender	4,83(1,071)	4,63(1,46)	4,13(0,922)	2,95	2,765
good	3,9(0,9)	3,61(1,22)	3,39(1,116)	2,95	1,612
hard	6,03(0,981)	5,45(1,537)	5,16(1,344)	2,95	3,341*
height	4,62(1,347)	4,66(1,097)	4,32(1,107)	2,95	0,784
interest	4,52(1,703)	3,58(1,671)	3,71(1,575)	2,95	2,952
maturity	5,17(1,071)	4,76(1,125)	4,74(1,032)	2,95	1,537
mood	4,03(1,117)	3,76(0,82)	3,9(1,136)	2,95	0,589
pleasant	4,17(1,227)	3,79(1,298)	3,65(1,17)	2,95	1,452
round	4,97(1,322)	5,08(1,65)	4,87(1,36)	2,95	0,173
size	4,38(1,522)	4,26(1,288)	4,29(1,039)	2,95	0,07
object 3					
active	4,26(1,537)	4,07(1,387)	3,65(1,664)	2,95	1,411
beauty	3,79(0,991)	3,9(0,9)	3,97(1,169)	2,95	0,265
emotion	5,03(1,533)	5,52(1,353)	4,77(1,334)	2,95	2,117
gender	4,45(1,058)	4,21(0,94)	4,26(1,094)	2,95	0,514
good	2,92(1,302)	3,45(1,088)	3,26(1,341)	2,95	1,529
hard	5,18(1,373)	4,76(1,596)	5,03(1,472)	2,95	0,692
height	3,71(1,113)	3,52(1,379)	3,71(1,189)	2,95	0,255
interest	5,37(1,239)	4,9(1,423)	5,1(1,399)	2,95	1,037
maturity	5,47(1,224)	5,14(1,274)	5,32(1,194)	2,95	0,613
mood	3,92(0,273)	3,97(0,981)	3,94(0,629)	2,95	0,038
pleasant	3,55(1,408)	3,86(1,156)	3,58(1,148)	2,95	0,573
round	4,21(1,527)	3,86(1,407)	3,9(1,64)	2,95	0,537
size	3,05(1,469)	3,21(1,292)	3,58(1,177)	2,95	1,384

	M(SD)			ANOVA of angle	
stimulus	low	eye-level	high	df	F-score
object 4					
active	4,14(1,807)	4,13(1,668)	3,79(1,891)	2,95	0,425
beauty	3,79(0,94)	3,81(1,014)	4,11(1,226)	2,95	0,927
emotion	5,34(1,565)	4,84(1,44)	4,5(1,607)	2,95	2,468
gender	4,07(1,193)	3,87(1,056)	4,03(1,284)	2,95	0,237
good	3,03(1,017)	3,35(0,915)	3,05(1,374)	2,95	0,783
hard	4,9(1,566)	3,87(1,284)	4,16(1,717)	2,95	3,506*
height	4,1(1,012)	3,68(1,107)	3,68(0,904)	2,95	1,808
interest	3,45(1,804)	3,87(1,648)	3,61(1,764)	2,95	0,456
maturity	5(0,964)	4,97(1,08)	4,95(1,251)	2,95	0,018
mood	3,76(0,786)	3,65(1,142)	3,79(1,069)	2,95	0,182
pleasant	3,45(1,213)	3,16(1,157)	3,21(1,359)	2,95	0,451
round	3,41(1,15)	3,13(1,335)	2,89(1,247)	2,95	1,422
size	4,21(0,978)	3,97(1,048)	3,66(1,192)	2,95	2,144
object 5					
active	4,18(1,753)	4,45(1,609)	3,66(1,587)	2,95	1,782
beauty	3,66(1,341)	3,23(1,087)	3,93(1,252)	2,95	2,49
emotion	4,95(1,469)	4,9(1,3)	5,72(1,533)	2,95	3,142*
gender	4,08(1,124)	3,65(1,082)	3,97(1,18)	2,95	1,316
good	3,34(1,258)	3,26(0,815)	3,55(1,152)	2,95	0,563
hard	4,53(1,606)	4,06(1,632)	3,9(1,423)	2,95	1,491
height	4,18(1,574)	4,13(1,384)	4,24(1,354)	2,95	0,045
interest	4,21(1,417)	4,39(1,476)	3,48(1,639)	2,95	3,057
maturity	5(1,162)	5,16(1,098)	4,69(1,168)	2,95	1,312
mood	4,26(1,131)	4(0,73)	3,79(0,902)	2,95	2,046
pleasant	3,74(1,501)	3,61(1,022)	4,1(1,205)	2,95	1,193
round	2,53(1,084)	2,94(1,289)	2,69(1,039)	2,95	1,102
size	4,16(1,763)	4,32(1,376)	4,17(1,49)	2,95	0,109
object 6					
active	4,71(1,716)	5,16(1,534)	4,72(1,98)	2,95	0,755
beauty	4,68(1,166)	4,29(1,037)	4,14(1,432)	2,95	1,63
emotion	5,23(1,257)	4,58(1,654)	5,21(1,521)	2,95	2,107
gender	5,74(1,39)	5,66(1,146)	5,66(1,173)	2,95	0,05
good	4,03(1,11)	3,34(1,564)	3,55(1,454)	2,95	2,121
hard	6,39(0,919)	6,21(1,212)	6,55(0,632)	2,95	1,01
height	4,26(1,612)	4,39(1,669)	4,24(1,48)	2,95	0,096
interest	3,48(1,313)	4,18(1,411)	4(1,581)	2,95	2,119
maturity	5,42(1,089)	5,24(1,324)	5,48(1,09)	2,95	0,397
mood	4,13(0,718)	4,26(0,76)	3,93(0,842)	2,95	1,521
pleasant	4,84(1,319)	4,29(1,412)	4,34(1,542)	2,95	1,455
round	4,94(1,413)	5,18(1,54)	5,69(1,168)	2,95	2,259
size	4,29(1,616)	3,97(1,404)	4,1(1,145)	2,95	0,433

The Author wants to thank,

Dr. Heuvelman
Dr. ben Allouch
Mr. Jonker
Graeme
Loes
Bart

for their help and support.