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The effect of different vertical camera-angles on faceperception.

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Abstract: The purpose of the study was to take a closer look on different camera-angles and the effects on the perceived credibility and attractiveness of pictured people. Participants of an online survey were asked to judge a face on the dimension of overall Impression, credibility and physical attractiveness. Subjects were randomly assigned to one of the five conditions in which they saw a picture of a face from a different perspective (high-angle-condition, short-high-angle-condition, eye-level-condition, short-low-angle-condition and low-angle-condition). Results revealed that participants in the low-angle-condition judged the face significant higher on the overall impression-dimension and the credibility-dimension. Significant differences were also found between the conditions that used a combination of vertical camera-perspectives and the one-shot-only-perspectives. No effect was found for the physical attractiveness scale.

Keywords: Camera-angle; Overall Impression; Credibility; Physical Attractiveness

1. Introduction

"The camera never lies" is a common proverb, implicating that a picture displays the universally valid truth. Certainly a camera does not change the pictured facts of a situation, but research showed that how items on a picture are judged, is among other things dependent on the visual perspective of the observer (e.g., Kappas, Hess, Barr, & Kleck, 1994; Kraft, 1987; Lassiter, Diamond, Schmidt, & Elek, 2007; Meyers-Levy, 1992). By manipulating the camera angle, lighting or perspective, the picture-maker affects the viewers understanding of the pictured scene (Kraft, 1987).

Several studies were conducted about judging people and judging objects from a different vertical camera angle. Meyers-Levy and Peracchio (1992) showed in their experiments that products are judged more favorable, when they are shown from a low perspective than when they are pictured from eye-level or a high camera-angle. With higher camera position the attitude towards the product became more negative (Meyers-Levy & Peracchio, 1992).

A lot of research was done on the perception of people in combination with camera-angle effects. Tiemens (1970) compared the perception of three different communicators in combination with three different camera-angles. The results revealed only for one of the three speakers significant effects and thus just a suggestion that the camera perspective can influence the perceived credibility. Participants who saw the second speaker from a high camerahim angle judged as less authoritative, communicative and knowledgeable than participants who saw him from a low perspective (Tiemens, 1970). These findings were supported by a study made by Mandell and Shaw (1973). The results of this study revealed that participants rated a newscaster significantly higher on the dimensions

of activity and potency when he was shot from a low camera-perspective than when he was pictured from a high perspective (Mandell & Shaw, 1973).

One of the most important visual stimuli in daily-life is the perception of faces (Anderson, 2005). Research by Kappas et al. (1994) adjusted the results of other studies on face perception. The results showed that faces are perceived more positive from a low camera angle (ca. -40 degree from eye-level) than from higher perspective (ca. +40 degree from eyelevel). Additionally the study results revealed that for emotional face-perception the upper half of the face may have a more crucial role for the perception, than the lower side of the face (Kappas, Hess, Barr, & Kleck, 1994).

Many studies investigated the effect of camera angle in combination with characters of a story (e.g., Kraft, 1987; Sevenants & d'Ydewalle, 2006). Kraft (1987) found that different vertical camera perspectives can have significant and predictable effects on the judgments made by the participants about physical and personal characteristics of picture-story-characters. He showed that the camera perspective acts as a visual adjective, which can give connotative meaning to a character of a story and which additionally can manipulate the physical, personal and emotional characteristics of the character. Kraft also predicted higher camera-angle effects in the absence of a narrative context (Kraft, 1987). However, a study by Sevenants and d'Ydewalle (2006) found no significant results for stronger camera-position effects without a narrative structure, but confirmed as well as further studies that camera perspective influences the perception of the pictured people.

The studies from Tiemens (1970), Mandell and Shaw (1973), Kraft (1987), Kappas (1994) and Sevenants & d'Ydewalle (2006) are in contrast to the research of McCain, Chilberg and Wakshlag (1977). Their study was about the effects of manipulated camera angles in television newscasts on source credibility. The results revealed that shots from higher camera perspectives increase credibility and attraction more than lower camera angles do. In a second study the researchers combined the eye-level perspective with either short fragments of high camera perspective or short fragments of low camera perspective. The results showed that a low camera perspective can increase the perceived credibility and attraction, but only when used in moderation (McCain, Chilberg, & Wakshlag, 1977). We found no further study which investigated these effects of sparingly used lowcamera-perspectives.

The purpose of the following study was to take a closer look on different camera-angles and the effects on the perceived overall impressions, credibility and attractiveness of pictured people. The current study measures the positive perception of the face with these three factors.

The research-question of this study was to clarify if people perceive faces as more positive when they are seen from certain perspectives. Additionally we tried to illuminate the effects of a short-angle-shot, found by McCain, Chilberg and Wakshlag (1977). The current study suggested, based on the earlier reviewed literature, the following hypothesis:

H1.a: Participants who view a human face from a high perspective will rate this as higher on the overall impression-dimension than those who view the same face from short-high-angle-, eye-level-, short-low-angle- or low-angle-perspective.

H1.b: Participants who view a human face from a short-low-angle perspective will rate this higher on the overall impression-dimension, than those who view the same face from short-high-angle-, eye-level- or low-angle-perspective.

H2.a: Participants who view a human face from a high perspective will rate this as more credible than those who view the same face from short-highangle-, eye-level-, short-low-angle- or low-angleperspective.

H2.b: Participants who view a human face from a short-low-angle perspective will rate this as more credible, than those who view the same face from short-high-angle-, eye-level- or low-angle-perspective.

H3.a: Participants who view a human face from a high perspective will rate this as more attractive than those who view the same face from short-highangle-, eye-level-, short-low-angle- or low-angleperspective.

H3.b: Participants who view a human face from a short-low-angle perspective will rate this higher as more attractive, than those who view the same face from short-high-angle-, eye-level- or low-angle-perspective.

2. Method

2.1. Procedure

For this study the online-survey-page www.thesistools.nl was used. Participants were asked via e-mail and social networks to participate and received a direct link to the survey-page. Subjects were randomly assigned to one of the five conditions high-angle-condition (1), short-highangle-condition (2), eye-level-condition (3), shortlow-angle-condition (4) and low-anglecondition (5). After answering demographical questions about age and gender, participants in all conditions saw the same face but pictured from a different perspective. In condition 1, 3 and 5 participants saw one picture shot from the allotted perspective for 15 seconds. In the short-lowperspective and the short high-perspective participants saw the picture mainly from eye-level perspective (10 seconds) but the last 5 seconds from the low or high camera-perspective. After seeing the picture all participants had to answer the same questionnaire.

2.2. Materials

Participants in each condition saw the same faces. We chose for digitally produced images because of several reasons. By using real-life actors, problems can occur concerning the visible emotions in facial expression and the familiarity to participants. Additionally it is much easier to control the camera-angle and the lightning-level in a digital environment.

Faces were generated by the parametric face modeling software FaceGen Modeller 3.1.2 (Singular Inversions, 2004). The program enables to generate realistic faces at any age, race and gender, and the user can control the facial expression. The face was generated as "typical male", with an age around 20 years. The racemorphing-setting was set on "mainly European". In order to create a more realistic face we used a detail texture for the skin. Additionally we kept all facial expressions on a neutral level, to ensure that participants were not influenced by the mimic of the faces. The background of the faces was set in neutral white and the light level was kept constant over the different conditions.

The camera-perspectives were manipulated by using the graphic-software Autodesk 3Ds Max 9.0 (Autodesk, 2006). The faces were shown from three perspectives in a frontal view. The high- and lowangle perspective had a difference of 18° from eyelevel. We choose for 18°, because research by Kepplinger (1987) showed for this variation the clearest results in the evaluation.



Figure 1: The face used in the study, pictured from the high-perspective (a), eye-level (b) and the low-perspective (c).

2.3. Measures

To measure the overall impressions in the perception several scales from earlier studies were combined. From Kepplinger (1987) the significant items about type A (aggressive-type) and type B (dynamic-type) were used to measure the perception of the pictured face. Additionally the "evaluation-factor"-scale from Sevenants and d'Ydewalle (2006) were included.

The Type A, Type B and Evaluation-factor Scales were grouped under the label "overall impressions" and consisted in total of 8 items of Osgood's semantic differential. Participants were asked to indicate their position on a seven-point scale between two bipolar adjectives. A sample item of the overall impression scale is "peacefulaggressive". The total score was computed by adding up all individual item scores.

Further the credibility-scales used by McCain, Chillberg and Wakshlag (1977) with the three dimensions of sociability, competence and character were included. We state in the hypothesis that the more credible the face is perceived, the more positive it appears. The format for these items was the same as for the overall impression scales, the seven-point Osgood's semantic differential scale. One typical sample item for the credibilityscale is "expert-inexpert". In total the scale consisted of 15 items. To generate the total score all individual scores were added.

To measure attractiveness we made use of the attractiveness-scales, used in the study of McCain et al. (1977). Because of the passive characteristic of the face and the absence of a story-context we included only the physical-attraction items. The scale consisted of a five-point Likert-scale. Respondents had to specify their level of agreement to a statement about the physical attractiveness of the pictured face. A typical sample item for this scale was "I think he/she is very good looking.". The scale ranged from "strongly agree" to "strongly disagree". The total score of the physical attractiveness scale was computed by adding all individual scores of the scale.



Figure 2: Overall Impressions, Credibility and Attraction form together the Positive Perception of the face.

Participants were also asked to indicate which emotion they think the face expressed. For this they had to choose one of the basic emotions of anger, contempt, disgust, fear, happiness, sadness and surprise (Ekman, 1992) plus the options "neutral" and "other".

2.4. Participants

Participants were recruited via social networks and e-mail distribution-lists. In total 123 people participated in the study. Due to an outlier-analysis eight participants were excluded from the further analysis. From these 115 participants, 55 were male and 60 were female, 27 of the participants were students at the University of Twente, 47 participants were students at other universities and 41 participants were no students. The age of the Participants ranged from 18 to 38 (M= 24.68, SD=3.53).

3. Results

To analyze the effect of the manipulated factor camera-angle we used the statistic software PASW Statistics 18 (PASW Statistics, 2010).

For all scales taken together no significant effects of camera angles via the analysis of variance were found (F(4,110)=1.91, p=.11). For the further analysis the scales were treated separated from each other.

3.1 Overall Impression

The first two hypotheses were that participants in the high-perspective- and the short-lowperspective condition will rate the face higher on the Overall Impression-Dimension. The Overall Impression Scale consisted of eight items, a low rating meant that the overall impression of the face was positive. Reliability analysis revealed that Cronbach's Alpha would increase from .72 to .80 if two items were deleted, so the items "reservedintrusive" and "active-passive" were excluded from further analysis to ensure a high reliability.

Mean Scores of overall impression across all five conditions were highest in the high-

perspective-condition (M= 25.76, SD=5.19), followed by the short-low-perspective-condition (M=23.52, SD=5.31), the eye-level-condition (M=22.93, SD=5.60) and the short-highperspective-condition (M=22.81, SD=4.76), the means were lowest in the low-perspective-condition (M=19.62, SD=3.47).

Table 1Means for Overall Impression

	Mean	Std. Deviation
High Perspective	25.76	5.18
Short High Perspective	22.81	4.76
Eye Level	22.93	5.59
Short low perspective	23.52	5.31
Low perspective	19.61	3.47

Mean scores and standard deviations for the overall impression-scales

An analysis of variance revealed a significant effect of camera angle on the perceived Overall Impression of the face (F(4,110)=3.51, p<.05). The Bonferroni Post Hoc Test revealed that only the comparison between High-Level-Condition and Low-level- Condition revealed a significant difference (M diff= 6.14, p=.001). This means that in contradiction to the hypotheses 1a and 1b, the participants rated the face more positive in the low perspective-, short-high-perspective and eye-levelcondition than in the short-low- or highperspective-condition.

3.2 Credibility

The hypotheses about credibility predicted that people judge the person on a photo as most credible when this person is pictured from above or from a short low-angle-perspective.

Reliability Analysis revealed a satisfying Cronbach's Alpha (.82). The ANOVA found a significant effect of camera-angle and perceived credibility (F(4,110)=2.77, p<.05). The higher the scores, the lower was the perceived credibility. Mean scores were highest in the in the short-lowperspective condition (M=59.87, SD=6.48) followed by the eye-level condition (M=56.69, SD=5.99), the high-perspective Condition (M=56.48, SD=4.82), the short-high-perspective condition (M=55.67, SD=3.12) and the lowperspective condition (M=55.09, SD=4.82).

Table 2Means for Credibility

	Mean	Std. Deviation
High Perspective	56.48	4.82
Short High Perspective	55.67	3.12
Eye Level	56.69	5.99
Short low perspective	59.87	6.48
Low perspective	55.09	4.82

Mean scores and standard deviations for the credibility scales

The Bonferroni Post Hoc Test revealed that the mean difference between the scores of the five conditions was just between the short-low-perspective- and the low-perspective-condition significant (M diff=4.77, p<.05). The hypotheses 2.a. and 2.b. were not confirmed.

3.3 Attractiveness

The last two hypotheses were about the effect of camera angle on the perceived attractiveness of the pictured person. The used physical attractiveness scale had a high reliability (.83) but the ANOVA revealed no significant effect of camera angle on perceived attractiveness (F(4,110)=1.227, p=.304).. In order to access the reasons for these results we conducted separate ANOVAs for both sexes. Both, the only-male group (F(4,55)=1.12, p=.36) and

only-female group (F(4,58)=.85, p=.50) did not reach a significant effect.

Based on these data it can be concluded that the camera-angle did not affect the perceived attractiveness of the pictured face in this study

3.4 Additional Analysis

Participants were asked to declare which emotion they thought the face expressed. In all conditions most participants thought that the face expression was neutral. Especially in the lowperspective-group (90% of the participants) and in the short-low-perspective-condition (60%) people rated the face as neutral. In the high-perspective condition remarkable many participants rated the face with negative emotions.

Table 3

Emotions					
	Negative	Positive	Neutral/ Other		
High	57.1	9.5	33.3		
Short High	31.6	5.3	63.2		
Eye Level	37.9	6.9	55.2		
Short low	26.1	4.3	69.6		
Low	0.0	0.0	100		

Percentages of distribution of perceived emotions.

Emotions were grouped into three dimensions by negative (anger, contempt, disgust, fear, sadness), positive (happiness, surprise) and other emotions (neutral, other). Pearson's Chi-Square-test revealed that the percentage of attributed negative, positive or neutral/other emotions differs significant by conditions ($\chi^2(8, N=113)=21.63, p<.05$).

4. Discussion

4.1. General Conclusion and Discussion

This exploratory study revealed significant effects of the camera angle on face-perception. The hypotheses were mainly based on the research made by McCain, Chilberg and Wakshlag (1977), however results of the present work could not support their findings, that a higher camera-position evokes a more positive attitude towards the communicator. Furthermore the results of this study support the findings from research made by Tiemens (1970), Mandell and Shaw (1973), Kraft (1987), Kappas (1994) and Sevenants & d'Ydewalle (2006) who found that a lower camera angle influences the perception of people in a positive way. This study reveals that a low camera angel influences the perception of a human-face on an overall-impression dimension in a positive way. Additionally the findings support the position that faces who are pictured from a low camera perspective appear to others as more credible.

Following Patzer (1989) there is a well established correlation between physical atttractiveness and perceived personal and nonpersonal characteristics. Surprisingly in this study no evidence was found for a greater perceived attractiveness between the conditions, but for other personal characteristics like greater overall impressions and credibility.

Attractiveness is a complex concept, influenced by many other factors, like an "averaged" composition or symmetry of the proportions of facial features (Brehem, Kassin, & Fein, 2005). A possible explanation for the absence of cameraeffects on physical attractiveness is that other factors were too influential or the influence of camera effects on physical attractiveness was too weak. It is also possible that, as a matter of facts, camera-perspective-related effects on physical attractiveness were not existent. An inhibition of the camera effects through other factors would provide a clarification for the fact that credibilityand overall impression scales revealed significant differences in the conditions, because it is conceivable that the factors inhibit the perceived physical attraction but not the perceived credibility

or overall impression. Additionally the used scale measures the physical attractiveness level quite obviously. Male respondents had probably problems to rate the physical attractiveness via the used scales of a face of the same sex. However effects for the physical attractiveness scale reached not a significant level when split into gendergroups.

A third possible explanation for the not significant camera effect for the physical attractiveness scale may be that, although a nearly realistic face was generated, it was obviously that the face was not a realistic photography of an existing human-being. This explanation is unlikely because research by Krach et al. (2008) revealed that the same brain areas are activated if people judge robot-faces or human-faces, what suggests that there is no difference in the interpretation of artificial or realistic faces. On the one hand people may have difficulties to judge computer generated items on a physical dimension, on the other hand a realistic photography brings further limitations as discussed in the method-section.

While the short-high-perspective- compared to the high-perspective-condition and the short-lowperspective- compared to the low-perspectivecondition revealed nearly no differences for the overall impressions-dimension, the groups differed significantly on the results for the credibility scales. Especially the difference between the short-lowangle- and the low-angle-condition was highly significant. In the short-low-condition faces appeared much less credible than in the low-levelcondition. A possible explanation for the different perception is that the most of the time, participants in the short-low-condition saw the face from eyelevel-perspective. Only during the last five seconds participants viewed the face from the low-cameraperspective. So it is possible that the eye-level appeared to the participants in contrast to the lowperspective as much higher. As concluded before, a higher camera-angle means a more negative appearance, though people judged the face as less credible.

The research-question for this study was if the camera-perspective let people perceive faces as more positive when they are viewed from certain perspectives. Indeed, the results of the credibilityand the overall impression-scales suggest that people are perceived as more positive from a low perspective.

Data gathered by the emotion-choice-option supported the position, that a low camera perspective would lead participants to choose a more positive emotion. While participants in the high-perspective condition preferred to choose negative emotions, all participants in the low condition picked either the "neutral"- or the "other"-option, no one picked a negative emotion. It is remarkable that also no one in the lowperspective condition choose a positive emotion but it has to be noticed that the face was generated with the intention to show a neutral facial expression.

4.2. Limitations and further research

A shortcoming of the recent study is that the change of the camera-perspective was quite obvious to the participants in the short-low- and the shorthigh-condition. Especially participants with a background of psychological education may be influenced by knowledge about camera-angleeffects.

The recent study revealed significant effect between the combined-camera-angle-conditions and the one-angle-shot-conditions. The influence of the stimulation-time was further not explored. For further research it might be interesting to evaluate what influence the viewing-time of a certain perspective in the combination-conditions has on the identified effects.

4.3. Practical Implications

In daily life the results of this study can have practical implications on every field where visual pictures of people are used and credibility and a certain overall impressions are proposed to be created. Especially in the marketing-context the credibility of the communicator is important. Not only marketers can profit from these results, nearly every visually-based communication can profit from sensible chosen camera-perspectives.

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Appendix:

- A. Demographical Questions
 - 1. Are you male or female? _____
 - 2. How old are you?_____
 - 3. Are you a student?
 - Yes at the University Twente
 - Yet at another University
 - No, I'm not a student

B. Overall Impression Scale

The following questions are about how you perceived the face you just saw. You see a list of opposite adjectives, please select one of the fields between the adjectives to indicate how you perceived the face.

peaceful	 aggressive
nonviolent	 violent
reserved	 intrusive
relaxed	 strained
active	 passive
friendly	 unfriendly
happy	 sad
good	 bad
irritable	 good nature
nice	 awful
cheerful	 gloomy

C. Emotion Choice

Please choose the emotion that you think was represented on the face in the video. If the expressed emotion is not available please choose "other", if you think that the face showed no emotion please choose "neutral".

anger	fear	surprise surprise
	happiness	neutral
disgust	sadness	other

D. Credibility Scale

The following questions are about how you perceived the face you just saw. You see a list of opposite adjectives, please select one of the fields between the adjectives to indicate how you perceived the face. irritable - - - - - good nature

unfriendly	 friendly
good	 bad
nice	 awful
cheerful	 gloomy
expert	 inexpert
valuable	 worthless
intelligent	 unintelligent
undependable	 responsible
trained	 untrained
qualified	 unqualified
sympathetic	 unsympathetic
kind	 cruel
virtuous	 sinful

E. Physical Attractiveness Scale

Please use the following scales to indicate how strong you agree or disagree to the statements about the pictured person:

I think he or she is quite handsome.							
strongly agree	agree	neutral	disagree	strongly disagree			
He is not very good looking.							
strongly agree	agree	neutral	disagree	strongly disagree			
I don't like the way he lo	oks.						
strongly agree	agree	neutral	disagree	strongly disagree			
He is somewhat ugly.							
strongly agree	agree	neutral	disagree	strongly disagree			
I find him physically attra	active.						
strongly agree	agree	neutral	disagree	strongly disagree			
He is very sexy looking.							
strongly agree	agree	neutral	disagree	strongly disagree			

F. Table of percentages of distribution of perceived emotions in detail

	Emotion								
	anger	contempt	disgust	fear	happiness	sadness	surprise	neutral	other
High Perspective	14.3	14.3	19.0	0.0	0.0	9.5	9.5	23.8	9.5
Short High Perspective	14.3	4.8	0.0	0.0	4.8	19.0	0.0	47.6	9.5
Eye Level	6.9	10.3	3.4	0.0	3.4	17.2	3.4	51.7	3.4
Short low perspective	13.0	0.0	0.0	8.7	4.3	4.3	0.0	60.9	8.7
Low perspective	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.5	9.5

Participants had to choose between one of Ekman's basic emotions and the added options "neutral" and "other". The Table shows percental distribution of the chosen emotions within the different conditions

G. Table of Analysis of Variance for Overall Impression, Credibility and Physical Attractiveness

	df	F	η	р	
Overall Impression	4	3.51*	.34	.01	
Credibility	4	2.77*	.30	.03	
Physical Attractiveness	4	1.23	.21	.30	

*p<.05