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**Oral Reporting of Affective Pictures Related to the Viewing
Distance: Gender Differences**

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The goal of the experiment was to expose different strategies of women and men in adjusting the distance while viewing and reporting 48 affective (IAPS) pictures. The experiment consisted of 25 women and 19 men students. Pictures appeared on a screen for 20 secs in random order, and were analyzed in two 10 sec. sequences. After SAM (Self-Assessment Manikin) reporting, the participants orally reported on the pictures and the phase was analyzed in four 10 sec. sequences. The differences of viewing strategies between women and men are discussed, and implications for future studies are suggested.

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1. Introduction

Emotions are often connected with gestures, like gaze direction (Adams, et al., 2005) and viewing distance (Laukka, et al., 2010), and thereby we may express ourselves. These kinds of expression have been analyzed in approach-withdrawal behavior (Markman, et al., 2005), which is adapted in order to promote defense mechanisms and survival skills, and is related to gender (Elliot, et al., 2007). It has been shown that young women are more reactive to unpleasant pictures (withdrawal) than young men, and they are also more reactive to pleasant pictures (approach) (McManis, et al., 2001). The results have suggested that affective pictures differentially activate the defensive system for men and women. This has also been found in postural response studies. Women tend to increase withdrawal postural movements, and the men increase approaches postural movements during viewing unpleasant pictures (Hillman, et al., 2004, Stins et al., 2007). It has also reported that threat or fear perception of unpleasant pictures could cause bodily freezing, known as fear bradycardia (Sanchez-Navarro, et al., 2006, Marks, 1987).

The aim of the present study was to expose the changes over time in viewing distances of women and men while viewing and reporting affective pictures. In addition, the changes of viewing distances during picture viewing with relation to the corresponding changes of distances during reporting, and the relationship between the duration of reporting and picture content was studied.

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2. Methods

2.1. Participants

Forty- four (25 women and 19 men) right-handed, Finnish speaking (native fluency in Finnish and no reported history of speech disorder), undergraduate students from the University of Oulu participated in the experiment. The students participated voluntarily in the experiment during their psychology studies. Eyesight was tested using the Snellen card, and anxiety was measured using the State Trait Anxiety Inventory (STAI) (Spielberger, et al., 1970). In addition, possible alexithymia was tested with TAS-20 (Bagby, et al., 1994), the validity of which has also been tested in Finland (Joukamaa, et al., 2001). All subjects had normal or corrected eyesight (≥ 1.0), and no anxiety (STAI score < 35) nor alexithymia (TAS-20 score < 51) was found. After the explanation of the experimental protocol, the subjects gave written consent.

2.2. Apparatus

The IAPS pictures (Lang, et al., 2005) were presented on the screen (17") of a computer with an Intel Pentium 4 processor which was connected to a Tobii 1750 eye tracking system (Tobii Technologies AB, Sweden). The sample rate was 50 Hz, and the spatial resolution was 0.25 degrees. The eye tracking system located every fixation point and measured the duration of fixation, the pupil size variation and the distance of the eye from the computer screen. Heart rate variations were measured using beat-to-beat RR-intervals with a Polar S810i heart rate monitoring system (Polar Oy, Finland). The facial expressions were recorded with an IEEE 1394 Firewire camera (Sony DFW-VL500, Japan). In addition, the subject's speech was recorded using a wireless microphone system (Sennheiser HSP2, Denmark).

2.3. Materials

A total number of 48 International Affective Pictures (Lang, et al., 2005) were used in the experiment¹. The pictures were divided into three different groups; 16 pleasant, 16 neutral and 16 unpleasant pictures (Nummenmaa, et al., 2006). The overall luminance levels of the pictures were adjusted with Adobe Photoshop 6.0 software. The mean luminance values of pleasant, neutral, and unpleasant pictures did not differ significantly from each other.

2.4. Procedure

The subjects were interviewed and STAI (Form 2) and TAS-20 questionnaires were presented before the experiment. Subsequently, the subject was able to practice the experimental procedure from "the paper version" with the experimenter. Thereafter, the subject practiced the procedure with the computer. Before the actual experiment, the subject rested for 60 secs, while the heart rate monitoring system, audio and camera systems were combined with the eye tracking system. The subject's eye movements were also calibrated into the eye tracking system.

In the experiment, the pictures were presented on the computer screen and the distance of the subject from the screen was 65 cm. At first, the subject had to look at a letter X, which appeared in the middle of the screen, about 30 secs. Sequentially either a pleasant or neutral or unpleasant picture appeared on the screen for 20 secs in random order. Immediately after the 20 secs, the SAM scale appeared. The subject's task was to orally report the valence and arousal of the picture according to the SAM scale (1-9 categories). These categories were grouped according to

¹ The number of the IAPS pictures used in the experiment were: pleasant (2050, 2057, 2070, 2091, 2165, 2209, 2216, 2340, 2352, 2550, 4608, 4601, 4653, 4700, 8490 and 2040); neutral (2190, 2191, 2215, 2235, 2393, 2487, 2516, 2745, 2840, 2850, 2870, 7493, 7496, 7550, 8311 and 9070); unpleasant (2375, 2750, 2800, 2900, 3015, 3051, 3181, 3301, 3550, 6243, 6570, 6838, 9040, 9421, 9435 and 2095).

their valence giving new categories: “pleasant” (1-3), “neutral” (4-6), and “unpleasant” (7-9). This grouping was made to improve the comparability with IAPS pictures (pleasant, neutral and, unpleasant pictures).

After the report, the subject had to press the enter button in order to darken the screen. In this phase, the subject’s task was to oral report to the experimenter, who was sitting behind the computer screen, on what had been seen, what was happening and what was going to happen in the picture. After the report, the subject had to press the enter button for the next picture to appear. Over 48 pictures, the letter X appeared for 30 secs. Finally, the STAI (Form 1) questionnaire was presented. The experimentation was approved by the Ethics Committee of the Faculty of Education, University of Oulu. (see Laukka, et al., 2008, Laukka, et al., 2010, Rantanen, et al., 2010).

2.2. Data analysis

The duration of the phase of picture viewing (20 secs.) was divided into *two 10 secs. analyzing sequences*. The averaged viewing distances of each sequence were compared as a function of picture content. The averaged durations of oral reports in the women’s group were 32.5 secs. (range 12-55 secs.) with pleasant pictures, 34.4 sec. (range 12-54 secs.) with neutral pictures, and 38.0 secs. (range 27-63 secs.) with unpleasant pictures. Corresponding durations in the men’s group were 48.1 secs. (range 11-96 sec.) with pleasant pictures, 54.7 secs. (range 13-112 secs.) with neutral pictures, and 58.2 secs. (range 15-138 secs.) with unpleasant pictures. According to these averaged durations, the phase of oral reporting was analyzed in a 40 secs. period, which was divided into *four 10 secs. analyzing sequences*. Conventional statistical methods were employed, including ANOVA and the Student’s t-test. Fisher’s LSD-test and Bonferroni correction method were applied as a Post Hoc test.

3. Results

3.1. Valence

Valence ratings differed as a function of picture type (pleasant, neutral, and unpleasant), $F(2,45) = 432.85$, $P < 0.001$. The mean valence of pleasant pictures ($M = 1.21$, $SD = 0.097$) differs significantly from the mean valence of neutral pictures ($M = 1.18$, $SD = 0.196$), $P < 0.001$, and the mean valence of unpleasant pictures ($M = 2.77$, $SD = 0.145$), $P < 0.001$. Also the mean valences of neutral pictures differ from the mean valences of pleasant and unpleasant pictures, $P < 0.001$.

The difference in the mean valence of pleasant pictures between women ($M = 1.24$, $SD = 0.121$) and men ($M = 1.18$, $SD = 0.096$) did not reach significance, $t(30) = 1.41$, $P = 0.170$. Neither the mean valence of neutral pictures (women, $M = 1.79$, $SD = 0.167$, men, $M = 1.79$, $SD = 0.252$), $t(30) = 0.017$, $P = 0.987$, nor unpleasant pictures (women, $M = 2.74$, $SD = 0.161$, men, $M = 2.79$, $SD = 0.156$), $t(30) = -1.02$, $P = 0.318$, reached significance.

3.2. Phase of picture viewing

When the viewing distances of women were averaged as a whole (20 sec.), the distances of pleasant ($M = 528.78$ mm, $SD = 4.55$), neutral ($M = 528.05$ mm, $SD = 3.50$), and unpleasant (529.83 mm, $SD = 4.21$) pictures resulted in no significant effect, $F(2,57) = 0.944$, $P = 0.395$. Nor did the averaged viewing distances in the first analyzing sequence (1-10 sec.) reach significance, $F(2,27) = 0.855$, $P = 0.437$. However, the distances in the second sequence (11 - 20 sec) was significant, $F(2,27) = 3.39$, $P < 0.05$. Post hoc comparison revealed significant difference only between pleasant and neutral pictures, $P < 0.05$.

Correspondingly, when the viewing distances of men were averaged as a whole, the distance was the greatest in neutral pictures (594.79 mm, $SD = 7.39$) then in pleasant pictures (593.48 mm, $SD = 6.66$), and the lowest in unpleasant pictures (589.51 mm, $SD = 6.94$). There were no significant differences between the viewing distances, $F(2,57) = 3.100$, $P = 0.053$. The analysis of the sequences showed significant difference only in the second sequence (11-20 Sec.), $F(2,27) = 10.46$, $P < 0.001$. Post hoc comparison revealed significant differences between pleasant and unpleasant pictures, $P < 0.05$, and between neutral and unpleasant pictures, $P < 0.001$.

Figure 1a illustrates that in the women's group, the averaged viewing distance increased from the first sequence (527.08 mm) to the second sequence (530.48 mm) with the pleasant pictures. The distance also increased from the first sequence (529.53 mm) to the second sequence (530.13 mm) with the unpleasant pictures. Only in neutral pictures did the viewing distance decrease from the first sequence (529.33 mm) to the second sequence (526.77 mm) (Fig. 1a).

The sequence analysis also revealed that the averaged viewing distance in the men's group increased significantly from the first sequence (591.16 mm) to the second sequence (598.42 mm) with the neutral pictures. $t(18) = -2.50$, $P < 0.05$ (Fig 1b). The distance also increased from the first sequence (591.46 mm) to the second sequence (595.50 mm) with pleasant pictures. Only with unpleasant pictures did the viewing distance decrease from the first sequence (590.05 mm) to the second sequence (588.97 mm) (Fig. 1b).

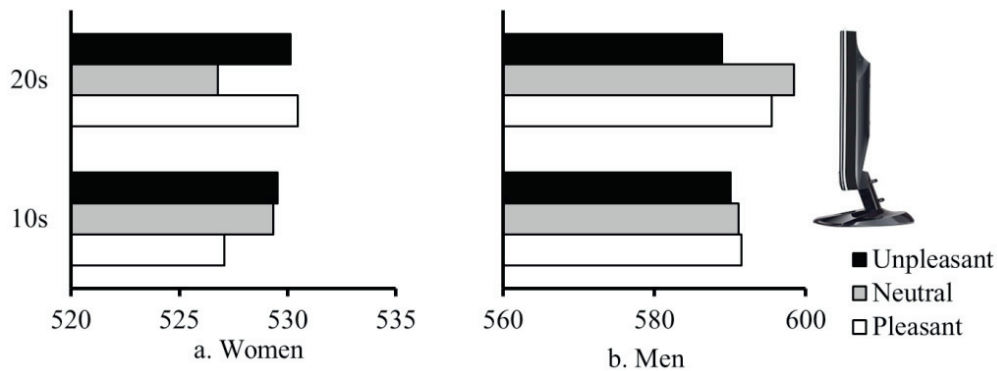


Fig. 1. The averaged viewing distances (mm) among women (a) and men (b) in the first analyzing sequence (1-10 sec.) and the second analyzing sequence (11-20 sec.) in pleasant, neutral, and unpleasant pictures in the phase of picture viewing.

3.3. Phase of oral reporting

In the phase of oral reporting the viewing distances of women, averaged as a whole (40 secs.) revealed significant difference with picture content. The viewing distance in unpleasant ($M = 535.84$ mm, $SD = 14.18$) was the greatest, then in neutral ($M = 531.40$ mm, $SD = 15.17$), and the lowest in pleasant ($M = 522.88$ mm, $SD = 20.73$) pictures, $F(2,117) = 6.039$, $P < 0.01$. Post hoc comparison showed significant difference in distance between pleasant and unpleasant pictures, $P < 0.01$. Respectively, the viewing distance of men showed no significant difference compared with picture content. The distance in neutral pictures ($M = 598.97$ mm, $SD = 21.59$) was the greatest, then in unpleasant (594.66 mm, $SD = 23.32$) pictures, and the lowest in pleasant pictures (588.42 mm, $SD = 27.14$).

There were two analyzing sequences in which the viewing distances reached a significant difference in both groups. In the second sequence (11-20 sec.), the picture content resulted in a significant difference with women, $F(2,27) = 11.41$, $P < 0.001$, and with men, $F(2,27) = 3.61$, $P < 0.05$. In both groups, the greatest distance was with unpleasant pictures, and the shortest distance with pleasant pictures. In the fourth sequence (31-40 sec.), the greatest distance in the women's group was with unpleasant pictures, and the shortest distance with pleasant pictures, $F(2,27) = 6.25$, $P < 0.01$. Respectively, in the men's group the greatest distance was with neutral pictures, and the shortest distance with pleasant pictures, $F(2,27) = 4.98$, $P < 0.05$.

The sequence analysis showed that the averaged viewing distance in the women's group firstly decreased, then increased and finally decreased again when reporting pleasant pictures, $F(3,36) = 15.69$, $P < 0.001$ (Fig. 2a). On the other hand, in the men's group the viewing distance was shortened during reporting, $F(3,36) = 59.67$, $P < 0.001$, as shown in Fig. 2b. The distance during the reporting of neutral pictures decreased in all sequences in the women's group, $F(3,36) = 13.04$, $P < 0.001$, as well as in men's group, $F(3,36) = 23.05$, $P < 0.001$. The distance in women's

group decreased till 30 sec. and increased in the last sequence when reporting unpleasant pictures, $F(3,36) = 9.96$, $P < 0.001$, whereas the distance in the men's group decreased evenly, $F(3,36) = 23.67$, $P < 0.001$, as illustrated in Figure 2a-b.

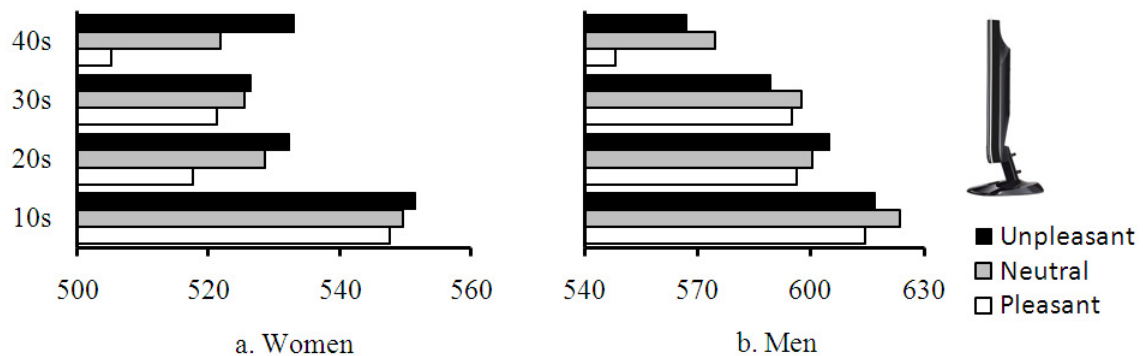


Fig. 2. The averaged viewing distances (mm) among women (a) and men (b) in four different analyzing sequences in pleasant, neutral, and unpleasant pictures in the phase of oral reporting.

4. Conclusion

In our previous study (Laukka, et al., 2010), we measured the changes of viewing distance with widely used affective pictures (IAPS) where the subject's task was to evaluate the valence and arousal of the affective picture utilizing the SAM (Self-Assessment Manikin) scale. In addition, we attached the third phase to the experimental set-up, in which the subject's task was to orally report on what had been seen, what was happening, and what was going to happen in the picture to the experimenter, who was of the opposite sex and was sitting behind the computer screen. We concluded that a strategic plan develops during the subject's performance in the experiment, and it could be interpreted as an organization of action which occurs when the picture is recognized and evaluated. The aim of the present study was to expose the possible time sequences when the strategic plan was developed, and establish if, in this respect, there was a gender difference.

According to the results, generally the viewing strategies varied depending on the valences, and gender. Women viewed pleasant pictures at the shortest distance during the first 10 seconds, and then withdrew to view the pictures at the greatest distance. On the other hand, men viewed pleasant pictures at the greatest distance during the first 10 seconds, and approached to view the pictures at the averaged distance when compared with the distances of neutral and unpleasant pictures. We may presume that women firstly pay more attention to the details of the pleasant picture and afterwards have a more comprehensive perception of the pictures, whereas men behaved in the reverse order. We could also presume that despite different viewing strategies, the evaluation of pleasant pictures was more or less effortless for both groups. Characteristic for the strategy is the primary approach and an ultimate withdrawal behavior, which could indicate the mastering of the task. This is supported by the results from the analysis of the phase of oral reporting. The both groups reported the pleasant pictures in the shortest time, and they viewed the pictures at the lowest distance.

The greatest discrepancy between the groups appeared while viewing neutral pictures. At the beginning, both groups viewed neutral pictures from the average distance. Women approached the pictures and viewed them at the lowest distance at the end of the viewing phase, whereas men withdrew significantly and viewed the pictures at the greatest distance. The difficulty and confusion in the assessment of neutral pictures are reflected in both groups. Women viewed the pictures more analytically than men, in a similar manner as with pleasant pictures, and after approaching behaviour they almost remained stationary while reporting the pictures at the average distance. Women spoke more briefly than men, and the overall duration of the speech was similar to the duration of the reporting of pleasant pictures. On the other hand, men withdrew quickly to view the pictures comprehensively at the greatest

distance, and then approached the screen when finishing the reporting of neutral pictures. The overall duration of the reporting of neutral pictures was similar to the reporting of unpleasant pictures, although the distance during the reporting of neutral pictures was the greatest.

The changes in viewing distances were comparatively slight in both groups, but the changes were diverse between the groups when unpleasant pictures were viewed. Women viewed pictures at the greatest distance in the beginning and withdrew slightly afterwards, but still the viewing distance remained the greatest; meanwhile men viewed pictures at the shortest distance and then approached slightly, but still comparatively viewed the pictures at the shortest distance. Women remain in the greatest viewing distance during reporting unpleasant pictures, whereas men viewed pictures at the average distance compared to neutral and pleasant pictures. It can be concluded that unpleasant pictures were thought-provoking and immobilized both women and men (Stins et al., 2007, Sanchez-Navarro, et al., 2006, Marks, 1987). This was manifested in the overall durations of the reports of unpleasant pictures, which were the longest in both groups, and especially men were verbose compared to women.

In conclusion, the viewing strategies were different depending on the picture content and gender. The critical period in the phase of picture viewing where difference emerged with regard to picture contents and gender was the last ten seconds. The same period differentiates picture contents from one another while reporting pictures, but there were no gender differences.

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