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Hemispheric Brain Laterality of Perception of Tachistoscopically Presented Erotic Stimuli by Male and Female College Students

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Western Michigan University

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HEMISPHERIC BRAIN LATERALITY OF PERCEPTION OF TACHISTOSCOPICALLY PRESENTED EROTIC STIMULI BY MALE AND FEMALE COLLEGE STUDENTS

by

Randall Warne Stewart

A Thesis Submitted to the Faculty of The Graduate College in partial fulfillment of the requirements for the Degree of Master of Arts Department of Psychology

Western Michigan University Kalamazoo, Michigan December 1987
HEMISPHERIC BRAIN LATERALITY OF PERCEPTION OF 
TACHISTOSCOPIALLY PRESENTED EROTIC STIMULI 
BY MALE AND FEMALE COLLEGE STUDENTS

Randall Warne Stewart, M.A. 
Western Michigan University, 1987

The effects of hemispheric asymmetry on the perception of erotic stimuli presented in either of the two visual fields was investigated. Freshmen and Sophomore college students, 20 males and 27 females, were used as subjects in the study. Subjects were bilaterally presented with combinations of erotic, neutral, and blank visual field stimuli using a "split visual field" procedure for a total of 96 200 msec. presentations. Subjects were asked to rate the presentations on a scale of 1 to 5; 1 was equal to neutral and 5 was equal to very erotic. Males and females rated erotic stimuli presented in either visual field without hemispheric asymmetry. It was concluded that there were no significant hemispheric differences between the male and female subjects. Some other interesting results were found, however, as a result of the present experiment. A main effect due to neutral stimuli paired with erotic stimuli was highly significant; the gender by blank or neutral paired with erotic stimuli interaction approached significance; and both males and females rated erotic stimuli presented alone in either visual field at approximately the same levels as presentations of erotic stimuli in both visual fields.
ACKNOWLEDGEMENTS

I would like to offer my deep felt gratitude to Dr. Frederick Gault, whose expertise in neuropsychology made this study possible and Dr. Jack Michael for his invaluable help in the very difficult task of analyzing the data of the present study and his expertise in behavior analysis. I would also like to extend my appreciation to Dr. Alan Poling and Dr. Paul Mountjoy for their assistance and as committee members.

Randall Warne Stewart
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CHAPTER I

INTRODUCTION

Since the observations of Geshwind and Kaplin (1962) concerning the disconnection syndrome resulting from destruction of the corpus callosum following an infarct of the anterior cerebral artery and the careful analyses of human split brain patients by Gazzaniga (1970), considerable speculation has been generated concerning now the role which each cerebral hemisphere might play in the causation of behavior. The right hemisphere has been described as the more analytical, more musical, more emotional etc. while the left hemisphere has been considered to be the locus of language ability and fine motor control.

The present study is concerned with the function of the two hemispheres in processing emotionally laden stimuli. Graves, Landis and Goodglass (1981) reported that the right hemisphere was more influential in evaluating emotional word stimuli based upon a split visual field presentation of emotionally laden words. They reported that the "imageability" of the word was the critical factor in right hemisphere dominance in emotional evaluation.

Unaware of the Graves et al. study, Wierenga (1986) set out to study "perceptual defense" using split visual field presentations of emotionally laden stimuli (photographs from an atlas of emergency room surgery) and "neutral" stimuli (travel posters). With the subject concentrating on a punctate fixation light, paired stimuli were presented simultaneously to both the right and the left visual fields. The subjects were then asked to rate the presentation as negative or positive using a five point scale. She found that there was a startlingly large effect: the stimuli presented to the
left visual field and hence projected to the right hemisphere governed the evaluation of
the emotional content. Thus, while she found no evidence of a lateralized perceptual
defense effect, she gave strong confirmation to the results of Graves et al. (1981).

Carlson (1986) explains in his book that visual stimuli entering the brain does
so via the optic nerves from the eyes which join together at the base of the brain
forming the optic chiasm. At this point axons from ganglion cells that are connected
to the inner portions of the retina cross through the chiasm and connect to the dorsal
lateral geniculate nucleus of the opposite side of the brain. The lens inverts images
projected on the retina which is also reversed left and right. Axons from the nasal
portions of the retinas cross to the opposite side of the brain each hemisphere receives
input from the opposite side of the visual area. In other words the right visual field is
processed by the left hemisphere and the left visual field is processed by the right
hemisphere. The dorsal lateral geniculate nucleus on each side projects to the same
side of the visual cortex. The dorsal lateral geniculate nucleus is connected to the ip-
silateral visual cortex. There is considerable overlap in the visual fields of the two
eyes, thus many cortical regions receive input from approximately the same area in the
visual field from both eyes (Physiology of Behavior, p. 181).

An electroencephalographic study involving correlation of penile tumescence
with temporal and occipital EEG amplitude integrated over 5 second epochs was done
by Cohen, Rosen, and Goldstein (1985). Using both auditory and visual erotic stim-
ulation they found a pattern of right temporal lobe activation in association with
maximum penile tumescence in normal men. Sexually dysfunctional men appeared to
show the right temporal activation to auditory stimuli but to a lesser degree with visual
stimuli. They interpret their results as being consistent with the body of literature on
cerebral asymmetry.
Galin and Ornstein (1972) reported electroencephalographic (EEG) asymmetry in the band from 1-35 Hz EEG evoked potential. Continuous recordings were made from the right and left temporal and parietal areas and ratios of average evoked potentials were compared. Four different cognitive tasks were used in the study, 2 verbal and 2 spatial. The verbal tasks were writing a letter of the alphabet and mentally writing a letter of the alphabet (by covertly picturing oneself writing the letter by hand with a writing instrument) with eyes fixated on a central focal point. Spatial tasks involved recreating geometric patterns from memory with patterned three-dimensional blocks after having viewed the two-dimensional designs on paper. Normal right handed male and female subjects showed higher right hemisphere EEG evoked potential than left hemisphere EEG evoked potential for verbal tasks than they did on spacial tasks.

Hirshkowitz, Karacan, Thornby, and Ware (1984) found temporal lobe electroencephalograph (EEG) asymmetries during sleep related penile erections in right handed young adult males. Greater right than left hemispheric wide-band integrated EEG amplitude attenuations were found with maximum tumescence during REM sleep, but were not found in parietal lobe recordings. This suggested higher right hemispheric temporal lobe activation during nocturnal penile tumescence, and that central nervous system electrophysiological changes occur predictably in relation to nocturnal penile tumescence activity.

Safer (1981) investigated the processing of emotional facial expressions by males and females while using different perceptual strategies. Subjects were presented with a slide that pictured a face with an emotional expression for 8 seconds. Half of the subjects (12 male and 12 female) were then asked to identify a second facial emotion presented to them for 30 msec and the other half were presented a second slide of a face for 50 msec. They were then asked to identify whether the second face
was the same as the first. Subjects were given 3 examples of the emotional expressions prior to the trials indicating same or different. They were also given 4 practice trials prior to their session. All subjects answered "same" more frequently for faces presented to the left visual field (right hemisphere) than to the right visual field (left hemisphere). Males and females did not differ in their overall accuracy for the recognition of faces. He concluded "that sex, hemisphere, and perceptual-strategy differences exist in access to verbal and imagery codes for decoding emotional expressions. Females have privileged access to left hemispheric, verbal codes for emotion, and this access underlies the sex difference in hemisphere specialization in recognizing emotional expressions" (p. 86). Both hemispheres play a part in processing emotional stimuli, but they do it in different ways. It was also concluded that access to imagery and verbal codes, rather than sex and hemisphere differences, accounts for these results. This indicates that the different methods used by males and females to process emotional visual stimuli (females have a left hemispheric specialization) could account for the gender/hemisphere differences and in the accuracy of processing such stimuli.

Left visual field (right hemisphere) superiority by men and women for matching low detail faces was demonstrated by Freeman and Ellis (1984). They also found that high information faces were better handled than low information faces when falling in the right visual field (left hemisphere) and that dissimilar pairs of faces were more accurately judged than similar pairs.

When comparing perception of faces with words Moscovitch and Klein (1980) found that males and females were able to identify correctly faces presented in the left visual field (right hemisphere) more often than the right visual field (left hemisphere). They also found that the right visual field (left hemisphere) had an advantage for the correct identification of words and that faces were identified correctly more
often when they were paired with words. Also, small changes in the magnitude but not in the direction, i.e., right or left, of perceptual asymmetries were observed with changes in the main variable. The changes were usually opposite to those predicted by attentional models of perceptual asymmetries.

Cohen (1973) studied the serial versus parallel processing aspect in experiment 3 of his study. He found that the left hemisphere was faster overall for males and females in correctly identifying letter combinations. This may be due to the possible advantage of specialization for processing verbal material, and the left hemisphere having a sensory advantage by being the faster contralateral pathway while the right hemisphere receives its input from the slower route of the ipsilateral pathway. However, these factors are generally confined to situations that competitively stimulate both visual fields (stimulate at the same time). As a function of increasing the number of letters projected to the right visual field (left hemisphere) there was an increase in reaction time as a result. When the presentation size was increased to the left visual field (right hemisphere) by adding more letters there were no increases in the reaction times i.e., four letter reaction times were the same as two letter reaction times. The conclusion was that the left hemisphere processed the set serially, while the right hemisphere processed it holistically or in parallel i.e., "this pattern of results suggests a right hemisphere superiority for judgements of difference, but is not consistent with material being transferred across the corpus callosum for analysis in the hemisphere specialized for the type of material" (Cohen, 1973, p. 355).

Birkett (1981) studied the effects of hemispheric lateralization of physical and name matching tasks with upright and 180, inverted letter pairs, which was called a "rotation effect" (the process of inverting the letters) with right and left handed males and females. "Same" or "different" stimuli were presented to the left and right visual fields tachistoscopically and subjects responded to matching stimuli by depressing a
telegraph key. He found that this "rotation effect" was larger (shorter reaction time) in the right than in the left hemisphere for males and for right handers but, larger in the left than in the right hemisphere for females and for left handers of both genders. The author's conclusions were that his findings were not consistent with the current views on hemispheric asymmetry. Also, the inclusion of inverted letters may change the entire task so it must be known precisely what the laterality tasks involve in information processing terms. Finally, findings from the cognitive psychology area should be taken into consideration when interpreting laterality experiments.

Rizzolatti, Umilta, and Berlucchi (1971) found stimulus-dependent hemispheric differences in males. The subjects had faster reaction times for discriminating letters in the right visual field (left hemisphere) than in the left visual field (right hemisphere) and a faster reaction time for recognizing "positive" or "negative" faces in the left visual field (right hemisphere) than in the right visual field (left hemisphere). The experimenters also reported that reaction times did not vary as a result of responding with either the right or left hand (responses required pressing a key) and that errors of commission and omission did not show any significance relative to the side the stimuli were presented on and the hand used to respond with.

Right-handed females showed faster reaction times to the right visual field (left hemisphere) compared to right-handed males that showed a tendency, although not significant, toward a left visual field (right hemisphere) superiority in complex semantic processing tasks (Hatta, Ohnishi, and Ogura 1982). Subjects were presented Katakana (Japanese) words that represent objects or animals in either large or small print and asked to discriminate whether the size of print was commensurate with the size of the object the word named. In other words, the authors revealed sex differences in the use of hemisphere for processing complex semantic tasks. Males tend to use the imagery code, while females use a symbolic and verbal code. Male and
female college students were involved in a study by Shearer and Tucker (1981). The students viewed color slides of sexual (individuals and heterosexual couples either posing seductively or involved in depictions of intercourse) or aversive (morgue corpses, child-abuse victims, starving children, snakes, rats, etc.) content. They were given the instructions either to facilitate ("turn on") or to inhibit ("turn off") any emotional arousal, but no specific instructions were given as to the method subjects were to use to accomplish this. By this procedure the experimenters were able to determine what methods students used to facilitate or inhibit stimuli (the so called "creative ability") and categorized these written descriptions i.e., analytical or verbal. Relative hemispheric activation was assessed using auditory attentional bias probes. Subjects were presented with a tone to either ear and asked to determine which side the presentation was on. There seemed to be a "contralateral shift in attention during relative dominance of one hemisphere and upon the contralateral/ipsalateral input competition in the auditory neural system" (p. 88). In this way the researchers also compared facilitation and inhibition strategies by subjects. The researchers found that analytic and verbal thinking were engaged in more frequently to inhibit arousal whereas "global and imaginal" cognition for the facilitation versus inhibition conditions were most often used to facilitate emotion. They also found greater arousal when subjects were asked to facilitate either sexual or aversive arousal compared to inhibiting such arousal. As a result the aversive stimuli had a greater right hemispheric activation effect for perception during the "turn on" than the "turn off," however, the sexual stimuli had no effect on hemispheric asymmetry during either response condition.

Berrini, Sala, Spinnler, Sterzi, and Vallar (1982) explored the possibility of hemisphere asymmetries in tasks requiring verbal and spatial recognition and whether recognition depended on the receiving or input hemisphere for matching. Right- and
left-handed males and females were given the task of discriminating whether stimuli were consonant letter pairs and diagrams (vertically arranged in a column) or black five-point stars drawn inside various squares of matrices. They found that the left hemisphere was more accurate in letter recognition and in the recognition of verbal diagrams than spatial diagrams while the right hemisphere was more accurate in recognizing spatial diagrams. The authors concluded that:

...if the stimulus is conveyed to one hemisphere only (Experiment 1), as happens in the artificial conditions of a tachistoscopic test implying single hemisphere projection of the target, the entire system has a single code available and this is specific for the hemisphere receiving the input and it is nearly unintelligible to the other. The retrieval operations must, therefore, be based only on the one available representation of information without being able to draw on the two-hemisphere projection of the stimulus for matching. If, on the other hand, both hemispheres receive the target (Experiment 2), as happens in everyday life, and both code it according to their preferential strategies, recognition does not suffer from unilateral presentation of the stimulus for matching. (p. 93-94)

It appears that differences exist in the degree of involvement of the two hemispheres of the brain in processing emotionally laden stimuli. Facial recognition, extremely threatening stimuli, and sexual stimuli appear to elicit greater involvement of the right hemisphere in processing as evidenced by EEG studies and recognition tasks. The differential involvement of the right hemisphere during male sexual arousal either elicited by visual stimuli or spontaneous during dream episodes suggests that further investigation of sexual stimulus presentations with the split visual field technique holds promise.

The present study concerns hemispheric asymmetries in the perception by men and women of tachistoscopically presented erotic and neutral stimuli. From existing literature a good case can be mounted supporting the conclusion that hemispheric asymmetries exist between males and females. Following in this mode of research, the present study seeks to test for hemispheric differences between male and female
perception of erotic stimuli. Little has been done previously to identify such differ-
ences.

Existing literature indicates that males tend to process emotional and spatial
tasks as well as word recognition in the right hemisphere. Recognition tasks in-
volving letters demonstrated that males often had faster reaction times and were more
accurate than females when processing incoming information in the right hemisphere
but, that females tended to process stimuli going to the left hemisphere faster and
more accurately than did males. From previously cited literature it was expected that
males would be right hemispheric dominant in their processing of erotic stimuli while
females would be either equal in their hemispheric use for such processing or that
they would be somewhat left hemispheric dominant. Studies done specifically on the
correlation of sexual arousal of males and hemispheric brain activity showed that it
was the right hemisphere that produced higher EEG evoked potentials during sexual
arousal. This supports the notion that the processing of erotic stimuli by males is
done in the right hemisphere. To test this hypothesis erotic and neutral stimuli were
tachistoscopically viewed in various visual field combinations. The combinations
were variations of erotic/erotic, erotic/neutral, neutral/neutral, erotic/blank, and neu-
tral/blank presentations. Subjects rated the presentations on a scale of 1 to 5; 1 was
neutral (least erotic) and 5 was highly erotic. By comparing the differences in the
ratings of stimuli over the various conditions and then comparing how the various
conditions interact, the existence of differences may be determined between male and
female hemispheric perception of erotic stimuli.
CHAPTER II

METHODS

Subjects

Subjects were 20 male and 27 female volunteers between the ages of 18 and 20 years old from an introductory general psychology class at Western Michigan University. Subjects received extra credit points for participation in the study. Anonymity of subjects was protected by not associating subject's names with any of their responses during the study. Therefore, the Human Subjects Committee exempted the present study from review.

Apparatus and Materials

Visual stimuli were presented in a split-field mode in which images were projected onto two screens [76.2 x 101.6 cm] mounted 228 cm from the subject's position, and displaced 15 degrees from the center line. Directly in front of the subject was a pin-point source of light which could be adjusted vertically to correspond to the subject's eye level. Stimuli were provided by two projectors mounted behind and to the side of the subject in an adjacent room. The experimenter could thus adjust the projectors and change stimuli without unduly disturbing the subject. In front of each projection lens was an Alphax tachistoscope shutter.

Procedure

The experiment consisted of two parts. In the first part subjects were presented with 32 paired combinations of slides either erotic or neutral in nature in a
fixed random order. The erotic slides were those associated with sexual acts e.g., sexual intercourse, fellatio, cunnilingus, etc. The neutral slides were those associated with landscapes, interactions between people other than sexual, and of water scenes involving sailboats. To determine which slides were erotic and which slides were neutral a group of 46 men and 34 women from the same class that did not participate in the actual study rated the slides as neutral or erotic on a scale of 1 (neutral) through 5 (highly erotic). This was done to avoid experimenter bias and to have similar subjects determine erotic values. Slides that were rated below 1.5 were considered neutral and those rated above 4.0 were considered erotic. The wider margin for erotic slides i.e., a margin of 1 rating point for the erotic slides compared to a margin of .5 for neutral slides, was used because neutral slides were determined with more certainty while erotic slides were subject to individual values and interpretations of erotica.

The paired slides were tachistoscopically presented for 200 msec., (a duration of sufficient time to allow subjects to perceive the stimuli being presented and used in a previous study, Wierenga, 1986) one to the right visual field and one to the left visual field. A variable interval of approximately 10 seconds elapsed between each slide presentation.

The erotic slide combinations were broken down into four categories: (1) erotic/erotic (L+/R+) in which both the left and right visual fields were presented with erotic stimuli, (2) erotic/neutral (L+/R-) in which the left visual field was presented with an erotic stimulus and the right with a neutral stimulus, (3) neutral/erotic (L-/R+) in which the left visual field was presented with a neutral stimulus and the right visual field was presented with an erotic stimulus, (4) neutral/neutral (L/R-) in which both visual fields were presented with neutral stimuli.
The categories consisted of 32 paired presentations in a fixed random order. Subjects were asked to rate verbally each paired presentation as neutral or erotic on a scale of 1 through 5; 1 is neutral and 5 is highly erotic.

In part two, one slide was presented at a time in one of the visual fields. The stimulus slides were the same as described above, half being erotic and half neutral in composition.

Slides in part two were also presented in a fixed random sequence with half presented to the left visual field (right hemisphere) and half presented to the right visual field (left hemisphere) comprising four pairings for 32 trials: (1) erotic/blank (L+/R-) in which the left visual field views an erotic slide (right hemisphere) and the right visual field (left hemisphere) is blank (no stimuli projected) (2) neutral/blank (L-/R-) in which the left visual field (right hemisphere) views a neutral slide and the right visual field (left hemisphere) is blank (no stimuli projected) (3) blank/erotic (L-/R+) in which the left visual field (right hemisphere) is blank (no stimuli projected) and the right visual field (left hemisphere) views an erotic slide, (4) blank/neutral (L-/R-) in which the left visual field (right hemisphere) is blank (no stimuli projected) and the right visual field (left hemisphere) views a neutral slide.

Before viewing the slides in part one subjects were given the following instructions:

The research you are participating in is divided into two parts. In part one a series of paired slides will be projected very briefly on two screens, one on the right visual field and one on the left visual field. You must fixate your focus on the small light dot placed...
between the screens at all times during the presentations. After each presentation you will be asked to rate whether the presentations are neutral or erotic in nature on a scale of 1 through 5:

1 2 3 4 5
neutral——erotic——very erotic

Remember, you are to give your impression of the combination of both slides briefly projected on the screen. You must fixate on the light dot at all times during the presentations and verbally give your rating by speaking loud enough for the tape recorder placed on your left to record your responses.

You are required to give quick responses without thought. In other words you must quickly give your first impression. Again, remember to fixate on the light dot and you will be reminded of this throughout the session. You are not obligated to participate in this study and may withdraw at anytime without penalty. Are there any questions so far?
Before beginning part two the following instructions were read:

In part two you will be viewing one slide at a time in either the right or left visual field. These slides will appear in a random fashion. As in part one you must immediately rate the slide after the presentation on the same scale as in step one.

Remember you must fixate on the light dot at all times during the presentations. You will be reminded of this several times during the session. Again, you are not obligated to participate in this study and may withdraw at anytime without penalty.
CHAPTER III

RESULTS

Considering the ratings for erotic effectiveness that each subject made when the stimuli were, erotic/blank (erotic stimuli in the left visual field processed by the right hemisphere, and a blank with no stimuli projected in the right visual field processed by the left hemisphere), blank/erotic (left visual field blank with no stimuli projected, processed by the right hemisphere, and erotic stimuli in the right visual field processed by the left hemisphere), erotic/neutral (erotic stimuli in the left visual field processed by the right hemisphere, and neutral stimuli in the right field processed by the left hemisphere), and neutral/erotic (neutral stimuli in the left visual field processed by the right hemisphere, and erotic stimuli in the right visual field processed by the left hemisphere), it is possible to identify two independent sources of variation. One is the location of erotic stimuli either in the left or in the right visual field (which is perceived by the hemisphere opposite of the visual field). The other is the content of the other visual field which was neutral stimuli or no stimuli (blank). The first factor will be referred to as "left/right" and the second as "blank/neutral." Since both males and females provided the ratings, it is further possible to analyze the data with respect to this third factor, the gender of the rater. Thus a two by two by two analysis of variance was performed to evaluate the statistical significance of any differences due to these three factors and to their interactions with each other. The gender factor was based on observations made by different subjects (males versus females), whereas the first two factors were based on the four sets of observations made by the
same subjects. The results of the analysis of variance are shown in Table 1. The means for the various conditions are shown in Table 2.

The F value for the between-subjects factor (males vs. females), 3.73 (with 1 and 45 degrees of freedom) was such that a value that large or larger would be expected by chance if the population means were equal with a probability between 0.05 and 0.10. Although it is not significant, it shows that males rate the erotic stimuli, irrespective of their location or what was in the other visual field, somewhat higher than do the females. This conclusion must be modified somewhat when one of the significant interactions is taken into consideration, as will be discussed below.

The main effect due to the location of the erotic stimulus (the left/right factor) was not close to significance. The F based on 1 and 135 degrees of freedom was close to zero (F=.373 p>.10).

The main effect due to the visual field containing neutral stimuli, was highly significant. The F, based on 1 and 135 degrees of freedom would occur by chance with a probability less than .0001. The significance consisted in the fact that the presence of neutral stimuli in one visual field greatly reduced the effectiveness of erotic stimuli (as contrasted with erotic stimuli with no stimuli in the other visual field).

Of the two-way interactions, the gender by blank/neural was close to significance the F based on 1 and 135 degrees of freedom would occur with a probability less than 3.85 between the .05 and .10 levels. This interaction consisted in the fact that males were somewhat more affected by neutral stimuli in the nonerotic visual field than the females, i.e., males gave higher erotic ratings than females, when erotic stimuli were paired with blank visual fields, but when it contained neutral stimuli had ratings that were close to those of the females.
The gender by left/right interaction, assessment of which was the main purpose of the present study, was not even close to significance. The blank/neutral by left/right interaction, however was between the .10 and .05 level. This interaction consisted in the fact that with neutral stimuli in one of the two visual fields, left was rated higher than right, whereas the reverse was true with blank visual fields in the neutral visual field.

The two-way interaction can best be appreciated from a table of means which has been corrected for the main effects. The relevant table is shown as Table 3.

The three-way interaction was not close to significance.

There are several other comparisons available from data that were not included in the significance tests described above. In general these comparisons can be understood from the table of means, Table 2. The means for the erotic/erotic condition (erotic stimuli in both visual fields) were quite high, although interestingly not much higher than the means for the condition with erotic stimuli and blank visual fields. For the erotic/erotic condition the males gave considerably higher ratings than the females. Ratings for the several conditions involving no erotic stimuli are quite low, as would be expected (Figure 1).
Table 1

Erotic Discrimination: The Results of the Various Analysis of Variance and Two- and Three-Way Interactions

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Subjects</td>
<td>46</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A=Gender</td>
<td>2.138</td>
<td>1</td>
<td>2.138</td>
<td>3.73</td>
</tr>
<tr>
<td>Subjects w. groups</td>
<td>25.780</td>
<td>45</td>
<td>.573</td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
<td>141</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B=Erotic paired with neutral or blank</td>
<td>36.768</td>
<td>1</td>
<td>36.768</td>
<td>226.40</td>
</tr>
<tr>
<td>AxB</td>
<td>.62</td>
<td>1</td>
<td>.626</td>
<td>3.85</td>
</tr>
<tr>
<td>BxSubjects within groups</td>
<td>7.310</td>
<td>45</td>
<td>.1624</td>
<td></td>
</tr>
<tr>
<td>C=Right/Left</td>
<td>.0367</td>
<td>1</td>
<td>.0367</td>
<td>.373</td>
</tr>
<tr>
<td>AxC</td>
<td>.0084</td>
<td>1</td>
<td>.0084</td>
<td>.085</td>
</tr>
<tr>
<td>CxSubjects within groups</td>
<td>4.43</td>
<td>45</td>
<td>.09844</td>
<td></td>
</tr>
<tr>
<td>BxC</td>
<td>.410</td>
<td>1</td>
<td>.410</td>
<td>.80</td>
</tr>
<tr>
<td>AxBxC</td>
<td>.130</td>
<td>1</td>
<td>.130</td>
<td>.25</td>
</tr>
<tr>
<td>BxCxSubjects within groups</td>
<td>22.93</td>
<td>45</td>
<td>.510</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2

Uncorrected Means for the Four Erotic Conditions

<table>
<thead>
<tr>
<th>MEANS</th>
<th>LVF/RVF Erotic/Neutral</th>
<th>LVF/RVF Neutral/Erotic</th>
<th>LVF/RVF Erotic/Blank</th>
<th>LVF/RVF Blank/Erotic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MALES</strong></td>
<td>3.18</td>
<td>2.92</td>
<td>4.42</td>
<td>4.54</td>
</tr>
<tr>
<td><strong>FEMALES</strong></td>
<td>2.90</td>
<td>2.93</td>
<td>3.92</td>
<td>4.11</td>
</tr>
</tbody>
</table>

Note: Table II represents uncorrected means over the four conditions of erotic/neutral (erotic stimuli presented to the left visual field and neutral stimuli presented to the right) neutral/erotic (neutral stimuli presented to the left visual field and erotic presented to the right) erotic/bland (erotic stimuli presented to the left visual and a blank presented to the right) and blank/erotic (a blank presented to the left visual field and erotic to the right visual field).

### Table 3

Uncorrected Means for the Blank/Erotic Conditions

<table>
<thead>
<tr>
<th>UNCORRECTED MEANS</th>
<th>LVF/RVF Erotic/Blank</th>
<th>LVF/RVF Blank/Erotic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td>4.42</td>
<td>4.54</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td>3.92</td>
<td>4.11</td>
</tr>
<tr>
<td></td>
<td>4.17</td>
<td>4.33</td>
</tr>
</tbody>
</table>

Note: The means of the two experimental conditions of greatest interest in that these conditions best represent the measure of hemispheric asymmetry.
Table 4

Twice Corrected Means for the Erotic/Blank Conditions

<table>
<thead>
<tr>
<th></th>
<th>Erotic/Blank</th>
<th>Blank/Erotic</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALES</td>
<td>4.26</td>
<td>4.22</td>
</tr>
<tr>
<td>FEMALES</td>
<td>4.24</td>
<td>4.27</td>
</tr>
</tbody>
</table>

Note: The twice corrected means of the two conditions erotic/blank (erotic stimuli in the left visual field, right hemisphere, and a blank in the right visual field, left hemisphere) and blank/erotic (blank in the left visual field, right hemisphere, and erotic stimuli in the right visual field, left hemisphere).

Figure I. The uncorrected means of all the experimental conditions. "+" represents erotic visual field, "-" represents neutral visual field, and "b" represents blank visual field. The visual field pairings are labeled at the top of each column and gender is listed at the bottom of the columns.
CHAPTER IV

DISCUSSION

The hypothesis of the present study, that males were more right hemispheric dominant in processing visual erotic stimuli than females, was not demonstrated. In fact, one could fairly say that this notion was refuted by the present results, to the degree that approximately equal sample means ever refutes the belief that the population means could be different. However clearly significant differences existed in the results between erotic stimuli paired with blank visual fields versus erotic stimuli paired with neutral stimuli, and the male/female interaction of erotic stimuli paired with neutral stimuli or presented alone in one or the other of the visual fields approached significance. The male/female hemispheric interaction, the result of most initial interest to the present investigator, did not approach significance. The overall difference between male/female ratings of erotic stimuli, however, approached significance at the .05 level.

There are a good deal of data from other research to support the notion that males tend to process emotional stimuli, including erotic stimuli, in the right hemisphere of the brain. Research measuring the degree of brain activity compared to the level of sexual arousal clearly demonstrated a marked right hemispheric activation in males compared to the left/hemisphere (Cohen, Rosen & Goldstein, 1985; Galin & Ornstein 1972). Other studies demonstrated that males tended to perceive emotional facial expressions more accurately than females and showed a specialization in the left visual field (right hemisphere) while females tended to show no hemispheric specialization (Freeman & Ellis, 1984; Safer, 1981).
Correct identification of words and letters or identifying like or unlike samples by males and females clearly indicated a left hemispheric advantage for both male and female identification accuracy (Berrini, Sala, Spinnler, Sterzi, and Vallar, 1982; Birkett, 1981; Cohen, 1973; Hatta, Ohnishi & Ogura, 1982; Moscovitch & Klein, 1980; Rizzolatti, Umilta & Berlucchi 1971;). Cohen also demonstrated that serial processing tended to be located in the left hemisphere while holistic and parallel processing generally took place in the right hemisphere.

Shearer and Tucker (1981) found aversive stimuli had a greater right hemispheric activation effect for perception when subjects were asked to "facilitate" rather than "inhibit," but also found that during the presentations of sexual stimuli there was no hemispheric asymmetry. Perceptual dominance by the right hemisphere for aversive (emotional) stimuli presentations was also demonstrated by Wierenga, 1985. Emotional word perception by the right hemisphere was demonstrated by Graves, Landis, and Goodglass, 1981. All of these studies demonstrated a right hemispheric dominance in the perception of emotion stimuli.

Most of the previously cited studies indicated that emotional, sexual, or any recognition tasks involve the right hemisphere except for one which found no asymmetries when identifying sexual stimuli, i.e., right and left hemispheres were equally active in perception of such stimuli.

The present experiment did not demonstrate hemispheric asymmetry as did most of the previously cited studies, but did reveal some other possibly interesting results. Males rated erotic stimuli higher than females. Not only were the ratings higher in the erotic/erotic condition, but also regardless of the visual field. This may simply reflect differences in the way our culture raises males and females with regard to explicitly erotic stimuli. What is more interesting is that there were no gender differences when the erotic stimuli were paired with neutral stimuli, although the differ-
ences seemed quite large when paired with a blank visual field. Such findings may indicate that the presence of neutral stimuli paired with the erotic stimuli reduces the erotic perception of the presentation drastically for males, while females were not affected by such conditions compared to conditions that paired erotic stimuli with blank visual fields.

The left/right interaction was not significant, nor was the the three way interaction involving this factor. Confining an analysis to the data where one of the fields was blank, however, a condition that now seems the most appropriate one for this type of investigation, this two-way interaction is also close to zero, as can be seen in the table showing these means corrected for main effects, Table 4.

Future research could focus on the interesting "detracting" ability of neutral stimuli when paired with erotic stimuli and the "reversing effect" it seems to have on males.

The present study did not take into account any handedness differences of the subjects. Future studies should consider hemispheric dominance according to handedness. This may indicate a hemispheric dominance opposite to the dominant hand i.e., stimulus input on a given side of the body is processed by the opposite brain hemisphere. In this way right and left handers could be compared to their own gender as well as compare males to females.
BIBLIOGRAPHY


Moscovitch, M., & Klein, D. (1980). Material-specific perceptual interference for visual words and faces: Implications for models of capacity limitations, attention,


