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## Eye-Contact, Distance and Affiliation \*

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*Previous evidence suggests that eye-contact serves a number of different functions in two-person encounters, of which one of the most important is gathering feed-back on the other person's reactions. It is further postulated that eye-contact is linked to affiliative motivation, and that approach and avoidance forces produce an equilibrium level of physical proximity, eye-contact and other aspects of intimacy. If one of these is disturbed, compensatory changes may occur along the other dimensions. Experiments are reported which suggest that people move towards an equilibrium distance, and adopt a particular level of eye-contact. As predicted, there was less eye-contact and glances were shorter, the closer two subjects were placed together (where one member of each pair was a confederate who gazed continuously at the other). The effect was greatest for opposite-sex pairs. In another experiment it was found that subjects would stand closer to a second person when his eyes were shut, as predicted by the theory.*

During social interaction, people look each other in the eye, repeatedly but for short periods. If we may anticipate, people look most while they are listening, and use glances of about 3–10 seconds in length. When glances are longer than this, anxiety is aroused. Without eye-contact (EC), people do not feel that they are fully in communication. Simmel has described it as “a wholly new and unique union between two people,” and remarked that it “represents the most perfect reciprocity in the entire field of human relationship.”<sup>1</sup> A certain amount is already known about the empirical determinants of EC, and this will be reviewed below. Rather less is known about the psychological processes which produce EC, or the functions which it serves; the most important alternatives are discussed in the third section. We shall develop a set of hypotheses relating EC to the need for affiliation, and then report some experiments which test these hypotheses.

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<sup>1</sup> Georg Simmel, “Sociology of the Senses: Visual Interaction,” in R. E. Park and E. W. Burgess, editors, *Introduction to the Science of Sociology*, Chicago: University of Chicago Press, 1921.

## THE DETERMINANTS OF EC

The amount of EC which takes place in an encounter varies from zero to 100 per cent of the time available, and some of the sources of variation are known. In some of the experiments cited it is more appropriate to speak of "gaze-direction," since what was measured was whether the subject looked up, regardless of whether the other person was looking back. In other experiments, a confederate was used who gazed all the time at the subject, so that gaze-direction is the same as eye-contact.

1. *Point in the Conversation.* In all investigations where this has been studied it is found that there is more EC when the subject is listening than when he is speaking, typically with a ratio of  $2\frac{1}{2}$  or 3:1. Furthermore people look up, at the end of their speeches and of phrases within them, and look away at the start of long utterances.<sup>2</sup>

2. *Nature of topic.* There is more EC when less personal topics are discussed,<sup>3</sup> and when the material is cognitively straightforward. There is less during unfluent and hesitating passages.<sup>4</sup>

3. *Individual differences* in EC are very great. Women are found to engage in more EC, in a variety of situations.<sup>5</sup> Some patients suffer from "aversion of gaze,"<sup>6</sup> and it has been found that autistic children avoid masks of human faces too.<sup>7</sup> There are cross-cultural differences, varying from taboos on EC, to much greater amounts of intimacy than are common in Western countries.

4. *Relations between a Pair of People.* There is more gaze direction if A likes B,<sup>8</sup> and if they are cooperating rather than competing.<sup>9</sup> There is

<sup>2</sup> Adam Kendon, "The Distribution of Visual Attention in Two-Person Encounters," 1964, Report to Department of Scientific and Industrial Research; Ralph V. Exline, David Gray and Dorothy Schuette, "Visual Behavior in a Dyad as Affected by Interview Content and Sex of Respondent," *Journal of Personality and Social Psychology*, 1 (March, 1965), pp. 201-9; Gerhard Nielsen, *Studies in Self Confrontation*, Copenhagen: Monksgaard, 1962.

<sup>3</sup> Exline *et al.*, 1963, *op. cit.*

<sup>4</sup> Ralph V. Exline, "Explorations in the Process of Person Perception: Visual Interaction in Relation to Competition, Sex and the Need for Affiliation," *Journal of Personality*, 31 (March, 1963), pp. 1-20.

<sup>5</sup> Exline, 1961, *op. cit.*

<sup>6</sup> Morris D. Riemer, "Abnormalities of the Gaze—A Classification," *Psychiatric Quarterly*, 29 (December, 1955), pp. 659-672.

<sup>7</sup> Corinne Hutt and Christopher Ounsted, "The Significance of Gaze-aversion in Children," 1964, Unpublished.

<sup>8</sup> Ralph V. Exline and Lewis C. Winters, "Affective Relations and Mutual Glances in Dyads," 1964 (ronoed).

<sup>9</sup> Ralph V. Exline, 1963, *op. cit.*

less EC if there is tension in the relationship, as when a soldier is being disciplined by an officer,<sup>10</sup> or if A has recently deceived B.<sup>11</sup>

5. *The Developmental History of EC.* Observations of infants show that the smiling response to certain aspects of the human face develops in the first weeks of life. Spitz carried out experiments with masks, and found that in the second month a representation of the top of the head, including the eyes, would produce smiling.<sup>12</sup> Wolff observed that EC first appeared between the 25th and 28th day; when this occurred it stopped the baby's random activity, and was found rewarding by the mothers, who now regarded the baby as "fun to play with."<sup>13</sup> Just as the young of other species imprint the mother and follow her around, it has been suggested that the immobile human infant follows the mother's face with its eyes.<sup>14</sup>

#### FUNCTIONS OF EC

There is no one theory that can explain all of the above findings. It has been pointed out that EC can have a variety of subjective meanings—such as friendship, sexual attraction, hate and a struggle for dominance.<sup>15</sup> We shall consider here the main functions which EC may serve.

1. *Information-Seeking.* If social behavior is looked at as a kind of motor skill, we must enquire how the performer obtains the necessary feedback on the reactions of the other. Speech and paralinguistic material convey a great deal, but it is possible to get a lot more by careful inspection of the other's face, especially in the region of the eyes. Such feedback is needed most at the end of speeches, to see how these have been received. The speaker looks away at the beginning of his speeches and when he has to think about what he is saying, because the extra input from EC is distracting.

2. *Signalling That the Channel Is Open.* During EC each person knows that the other is attending primarily to him, and that further interaction can proceed. A flicker of the eye towards a third party may indicate that the channel is closed. This can be regarded as a rather special case of the

<sup>10</sup> Erving Goffman, *Behavior in Public Places*, London: Free Press of Glencoe, 1963, p. 96.

<sup>11</sup> Ralph V. Exline *et al.*, "Visual Interaction in Relation to Machiavellianism and an Unethical Act," *American Psychologist*, 16 (July, 1961) p. 396.

<sup>12</sup> René A. Spitz, "The Smiling Response: A Contribution to the Ontogenesis of Social Relations," *Genetic Psychology Monographs*, 34 (April, 1946), pp. 57–125.

<sup>13</sup> Peter H. Wolff, "Observations on the Early Development of Smiling," in B. M. Foss, editor, *Determinants of Infant Behavior II*, London: Methuen, 1963, pp. 122–3.

<sup>14</sup> Philip H. Gray, "Theory and Evidence of Imprinting in Human Infants," *Journal of Psychology*, 46 (July, 1958), pp. 155–66.

<sup>15</sup> Sandor S. Feldman, *Mannerisms of Speech and Gesture in Everyday Life*, New York: International University Press, 1959, p. 233.

first process, in that information is obtained about the other's direction of attention. EC also places a person under some obligation to interact; thus, when a chairman or waiter allows his eye to be caught he places himself under the power of the eye-catcher.<sup>16</sup>

3. *Concealment and Exhibitionism.* Some patients, according to Laing, lack adequate feelings of self-regard and ego-identity, and have a great desire to be seen, in order to be "loved and confirmed as a person."<sup>17</sup> Some people want to be seen, and EC is the proof that they are being seen. Others do not want to be seen, and feel "impaled before the glance of another,"<sup>18</sup> feel they are depersonalized or turned to stone by becoming an object for another's perception.<sup>19</sup> This fear of being seen may be due to a fear of being rejected, based on past experience, or a desire to conceal inner states—which in turn would lead to rejection. The latter is supported by the finding that subjects who had been induced to cheat gazed less.<sup>11</sup>

4. *Establishment and Recognition of Social Relationship.* If A gazes at B, this will have a different impact, depending on his facial expression. If there is EC, both may know that A's attitude to B is one of sexual attraction, friendship, hate, dominance or submission. There may be a rapid sequence of communications, in which EC plays a central part, and which serves to establish the relationship between A and B. For example, suppose A wants to dominate B: A stares at B with the appropriate expression; B may accept A's dominance by a submissive expression and looking away; or B may outstare A, or simply withdraw by looking coldly away. Hess has found that emotional arousal leads to enlargement of the pupils, and that men are more attracted by girls with enlarged pupils (hence the use of belladonna), though they are quite unaware that this is the cue to which they are responding.<sup>20</sup>

5. *The Affiliative Conflict Theory.* In this section we shall introduce some ideas which will explain some of the EC phenomena which are so far unexplained.

A. There are both approach and avoidance forces behind EC. The approach forces include the need for feedback, discussed above, and sheer affiliative needs: for example, EC can be used as a reinforcer in the operative

<sup>16</sup> E. Goffman, *op. cit.*, p. 94.

<sup>17</sup> Ronald D. Laing, *The Self and Others*, London: Tavistock, 1960, Chap. 8.

<sup>18</sup> Alfred Schütz, "Sartre's Theory of the Alter Ego," *Philosophy and Phenomenological Research*, 9 (December, 1948), pp. 181-99.

<sup>19</sup> Ronald D. Laing, *The Divided Self*, London: Tavistock, 1960, pp. 48 f. 78 f.

<sup>20</sup> Eckhard H. Hess, "Attitude and Pupil Size," *Scientific American*, 212 (April, 1965), pp. 46-54.

conditioning of verbal behavior.<sup>21</sup> It may be innately satisfying as suggested above. The avoidance components include the fear of being seen, the fear of revealing inner states, and the fear of seeing the rejecting responses of others, which were discussed above.

B. If there are both approach and avoidance drives behind EC, Miller's conflict analysis is applicable,<sup>22</sup> and it would be expected that there should be an equilibrium level of EC for a person coming into social contact with some second person, and that if EC rises above that amount it will be anxiety-arousing. (Of course the equilibrium amount of EC, and the equilibrium distance may not be the same for the two people; they will then work out some compromise solution, more or less satisfactory to both. In the experiments to be reported here, however, we shall hold the behavior of one person constant.)

C. It is supposed that similar considerations apply to other types of behavior which are linked with affiliative motivation. Thus there will be an equilibrium point of physical closeness, of intimacy of conversation, and of amount of smiling. The more these behaviors occur, the more affiliative motivation is satisfied, but if they go too far, anxiety is created.

D. It is suggested that an equilibrium develops for "Intimacy," where this is a joint function of eye-contact, physical proximity, intimacy of topic, smiling, etc. This equilibrium would be at a certain degree of intimacy for any pair of people. We deduce that if one of the components of intimacy is changed, one or more of the others will shift in the reverse direction in order to maintain the equilibrium. Thus,

$$\text{Intimacy} = f \left\{ \begin{array}{l} \text{eye-contact} \\ \text{physical proximity} \\ \text{intimacy of topic} \\ \text{amount of smiling} \\ \text{etc.} \end{array} \right.$$

E. Twelve empirical deductions follow from this formulation. For example if amount of smiling is reduced, and intimacy of topic and physical proximity are held constant, EC should be increased to restore the equilibrium level of intimacy.

F. If equilibrium for intimacy is disturbed along one of its dimensions, attempts will first be made to restore it by adjusting the others. If this is not possible because all are held constant, or because the deviation is too

<sup>21</sup> Leonard Krasner, "Studies on the Conditioning of Verbal Behavior," *Psychological Bulletin*, 55 (May, 1958) pp. 148-70.

<sup>22</sup> Neal E. Miller, "Experimental Studies in Conflict," in J. McV. Hunt, editor, *Personality and the Behavior Disorders*, Vol. I, New York: Ronald, 1944, pp. 431-65.

extreme, the subject will feel uncomfortable in one of two ways. If the disturbance is in the direction of too much intimacy, the avoidance forces will predominate, and the subject will feel anxiety about rejection or revealing inner states; if in the direction of less intimacy, he will simply feel deprived of affiliative satisfactions.

An experiment has already been reported that confirms one of these 12 deductions. Exline<sup>3</sup> found that there was more EC when the topic of conversation was less intimate. We shall report two experiments testing two more of these deductions. Another experiment by Exline confirms the postulated connection between EC and "intimacy": those who were caused to like a confederate engaged in more EC with him.<sup>8</sup>

#### AN EXPERIMENT ON EC AND EQUILIBRIUM FOR DISTANCE

There is some evidence for an equilibrium level of physical proximity. For the purposes of any particular form of interaction, people take up a position a certain distance from one another. Hall reports that Americans will not stand nearer than 18–20" when talking to a stranger of the same sex. If they have to stand closer than this preferred distance, they will turn and face each other at right-angles, or stand side-to-side.<sup>23</sup> Steinzor found that subjects in groups of ten were least likely to speak to those nearest to them, and most likely to address those two or three places away.<sup>24</sup> As well as minimum distances for EC and social interaction, there are also maximum ones. Sommer found that people did not like sitting more than 5½' apart when conversing in a rather large hall, and would move to another position if further apart. The preferred position for conversation at a table was at two corner seats, so that the participants were physically close, but not directly facing one another.<sup>25</sup>

Americans may stand at 18–20", but people from Latin America and the Middle East will stand much closer. Hall reports how conversations at international gatherings result in Americans retreating backwards or gyrating round in circles.<sup>23</sup> Members of some primitive societies in Africa and Indonesia come closer still and maintain bodily contact during conversation.<sup>26</sup> Every animal species has its characteristic individual distance, closer than which they will not go, as well as a maximum social distance between

<sup>23</sup> Edward T. Hall, "The Anthropology of Manners," *Scientific American*, 192 (April, 1955), pp. 84–90.

<sup>24</sup> Bernard Steinzor, "The Spatial Factor in Face to Face Discussion Groups," *Journal of Abnormal and Social Psychology*, 45 (October, 1950), pp. 552–55.

<sup>25</sup> Robert Sommer, "The Distance for Comfortable Conversations: A Further Study," *Sociometry*, 25 (March, 1962), pp. 111–6.

<sup>26</sup> E. Ardener, Personal communication.

members of the group. For some the minimum distance is zero, as for some kinds of monkeys; for the flamingo it is 2', and so on.<sup>27</sup>

In order to carry out the later experiment it was necessary to know where the equilibrium point was for local subjects and conditions. And it was predicted from the affiliative conflict theory that the equilibrium point for approach would be closer if the other person's eyes were shut.

*Method.* Subjects were invited to take part in a perceptual experiment, and asked to stand "as close as is comfortable to see well" two physical objects, both the same size as a human head (a book, and a plaster head of William McDougall). Then followed three other displays in different orders for different subjects: (1) a cut-out life-sized photograph of the face of the first author, (2) the first author with eyes shut and (3) with eyes open. In (1) and (3) the object was looking straight at the subject with a pleasant-to-neutral expression; in (2) and (3) the object was seated in a chair. Displays 1-3 were given in all six orders. The subjects were 6 adult acquaintances (3 male, 3 female), and 6 child acquaintances (3M, 3F, aged 5-12). Distances eye-to-eye were measured by a long ruler. It was hoped that the disguise of the experiment as a study of vision would prevent such measurements being disturbing.

*Results and Discussion.* As is shown in Table 1, subjects stand eleven inches closer to the photograph than to the person, and six inches closer to a person whose eyes are shut than to a person whose eyes are open. The second effect is more marked for adults than for children, and children stand closer in all three conditions.

TABLE 1  
*Position in Inches of Nearest Approach under Different Conditions*

Subjects	n	Photo	Eyes Shut	Eyes Open
Adults	6	35.7	34.0	42.7
Children	6	16.9	27.6	31.4
Total	12	26.3	30.8	37.1

There were no reversals for the 6 adults, and only one for the 6 children. Applying a binomial test, both the photo/eyes-open differences and the eyes-open/eyes-shut differences are significant at  $p < .003$ . Other tests of significance give a rather lower value in view of the large individual differences, but for adults only on a Mann-Whitney test the eyes-open/eyes-shut difference is significant at  $p < .05$ .

<sup>27</sup> Heini Hediger, *Studies of the Psychology and Behaviour of Captive Animals in Zoos and Circuses*, London: Butterworth, 1955, pp. 66, 83.



The main effect of order is that it makes a difference whether the "eyes-shut" condition follows or precedes the "eyes-open" condition. The finding is that when "eyes-shut" comes first, both distances are less ( $p < .05$ ). This suggests a persistence of the social system which is first established.

#### AN EXPERIMENT TO DETERMINE THE EFFECTS OF DISTANCE ON EYE-CONTACT

There is some evidence that EC is reduced when proximity is greater. When proximity is very great, as in lifts and buses, interaction and EC often cease entirely. Goffman reports that EC is common when approaching a stranger on a pavement, while it is decided on which side to pass, but that "civil inattention" is given when the stranger gets to a distance of eight feet.<sup>28</sup>

The present experiment was designed to test one of the 12 deductions from our affiliative theory of EC, viz. that if spatial proximity is increased, EC will be reduced. If it is assumed that intimacy is a function of length of glance as well as of total EC, it follows that with greater proximity glances will become shorter.

*Method.* The method first employed by Exline was used, in which two people take part in a conversation, one of whom is a confederate who gazes continually at the other, a genuine subject.

Subjects were asked to come and take part in an "experiment on conversations." They were introduced to a person who appeared to be another subject but who was actually a confederate of the experimenter. The two were asked to discuss a T.A.T. card and make up a story about it in three minutes. Three conversations were held, and the chairs were placed so that the distance between them was 2', 6' and 10', eye-to-eye, in different orders for different pairs. In two preliminary experiments, the pairs were placed facing one another. In the final version of the experiment to be reported here, they were placed at 90°, behind tables; this has the advantage that EC is more "voluntary," and the gazing of the confederate is less apparent.

The independent variable was the distance between subjects. Each pair held three conversations, at distances of 2', 6', and 10'. The chairs and tables were placed so that subjects could not deviate very far from these distances by learning backwards or forwards. Subject and confederate were asked to move their chairs between conditions to positions marked by chalk. The experimenter said "And for the next conversation I'd like you to move your chairs and sit . . . here . . . and . . . here."

The dependent variables were the amount of EC in three minutes, and

<sup>28</sup> E. Goffman, *op. cit.*, p. 95.

the average length of glances. Since the confederate gazed continuously, the amount of EC engaged in by the subject depended entirely on him, and it was only necessary to record the duration of his looking at the confederate. The observers were placed behind a one-way screen as shown in Figure 1.

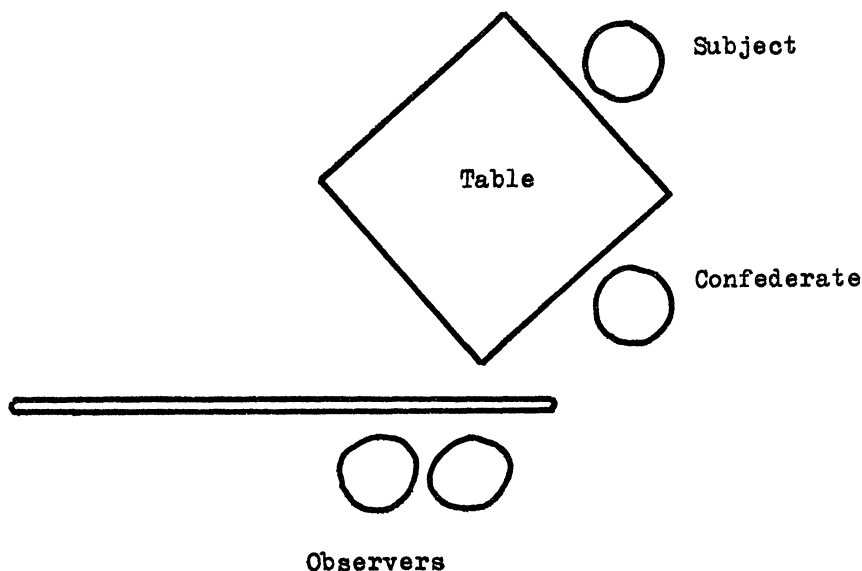


FIGURE 1

*Arrangement of subjects and observers*

The observers were looking directly into the eyes of the subject, and could tell with some accuracy when he looked at the confederate. The amount of EC in the three-minute conversations was recorded on cumulative stop watches. During the early trials two observers were used, but the agreement was so close that later we relied on one. A second observer counted the number of glances made by the subject during the three minutes. It has been suggested that at greater distance it is less clear whether the subject is really looking at the eyes of the confederate, or at other parts of his head, so that the amount of EC at greater distances may be over-estimated. However Gibson and Pick<sup>29</sup> have found that subjects can tell with considerable accuracy whether a second person is looking them in the eye: when the other was 2 metres distance, shifts of fixation of 10 cm. were clearly discriminable. Exline found that an observer agreed highly with a confederate

<sup>29</sup> James J. Gibson and Anne D. Pick, "Perception of Another Person's Looking Behavior," *American Journal of Psychology*, 76 (September, 1963), pp. 386-94.

as to whether EC was taking place,<sup>3</sup> and that there was very high agreement between observers, ( $r=.98$ ). It was our experience that for the majority of subjects there was no difficulty in telling whether EC was occurring or not; they did not spend much time fixating other parts of the head. In later studies with schizophrenics we have had greater difficulty. We also found that a subject's eyes were very stable when he was engaging in EC, rather than scanning the rest of the confederate's face. During EC there is a steady fixation, and this can generally be identified.

Instructions given to each pair were as follows: "This is an experiment to find out how two people come to an agreement during a conversation. We would like you both to look at this picture, and then you will have three minutes to make up a joint story about what you think is happening. We shall be listening to your discussion from the next room."

Eighty subjects were used, 24 of them in the main experiment, half of each sex. The subjects in the main experiment were all graduate students in subjects other than psychology. There were four confederates, two of each sex, and these young people of similar age and background to the subjects. Some deception was used to make it appear that they were genuine subjects: they were instructed to talk about half the time and to adopt a pleasant-to-neutral expression.

At the end of the experiment, subjects were interviewed, mainly to discover if they had noticed that the confederate was gazing all the time, or whether they had guessed the point of the experiment, and to explain the experiment to them.

*Results.* The experimental procedure was thought to be satisfactory, in that perfectly normal conversations took place, and only one or two persons realised that they were being gazed at, or that they were talking to a confederate; and their results were no different from those of other subjects. The main findings on total EC and length of glance are given in the analyses of variance shown in Table 2 and Figure 2.

The experiment has been replicated four times, with variations in task and conditions, and using different subjects, confederates, observers, and experimenters. The first two experiments used a head-on position of the subjects: the effects of this are discussed later. The third experiment is the one reported here, and incorporated a number of improvements in technique, such as using tables and chairs that prevented the subjects from changing the distance between them. The fourth is an experiment by Mr. E. R. Porter using pairs of males throughout, and varying certain other conditions. The effect of distance was similar in all these rather different versions of the experiment.

(1) *Distance and Total EC.* The prediction that EC will decrease with spa-

TABLE 2  
*Analyses of Variance for Main Experiment on Total EC and Length of Glance*

Source	Total Eye-Contact				Average Length of Glances					
	s.s.	df	m.s.	F	p	s.s.	df	m.s.	F	p
Distance	20,824	2	10,412	16.12	.001	211.4	2	105.7	8.13	.01
Sex of Subject (SS)	1,271	1	1,271	1.97	n.s.	10.0	1	10.0	0.77	n.s.
Sex of Confed. (SC)	263	1	263	0.41	n.s.	13.1	1	13.1	1.01	n.s.
Sequence (Seq.)	16,230	5	3,246	5.03	.025	145.3	5	29.1	2.24	.06
Distance x SS	64	2	32	.05	n.s.	8.3	2	4.2	0.32	n.s.
Distance x SC	40	2	20	.03	n.s.	6.1	2	3.0	0.23	n.s.
Distance x Seq.	905	10	91	.14	n.s.	40.5	10	4.1	0.31	n.s.
SSS x SC	22,349	1	22,349	34.59	.001	219.6	1	219.6	16.90	.01
SSS x Seq.	14,758	5	2,952	4.57	.025	479.4	5	95.9	7.38	.01
SC x Seq.	22,779	5	4,556	7.05	.01	676.6	5	135.3	10.41	.01
Dist. x SS x SC	1,423	2	711	1.10	n.s.	16.7	2	8.4	0.64	n.s.
Dist. x SS x Seq.	2,795	10	280	0.43	n.s.	85.8	10	8.6	0.66	n.s.
Dist. x SC x Seq.	3,673	10	367	0.57	n.s.	64.5	10	6.5	0.50	n.s.
SSS x SC x Seq.	19,450	5	3,890	6.02	.01	316.7	5	63.3	4.87	.025
Residual	6,460	10	646	—	—	130.0	10	13.0	—	—
Total	133,284	71	—	—	—	2,424.1	71	—	—	—

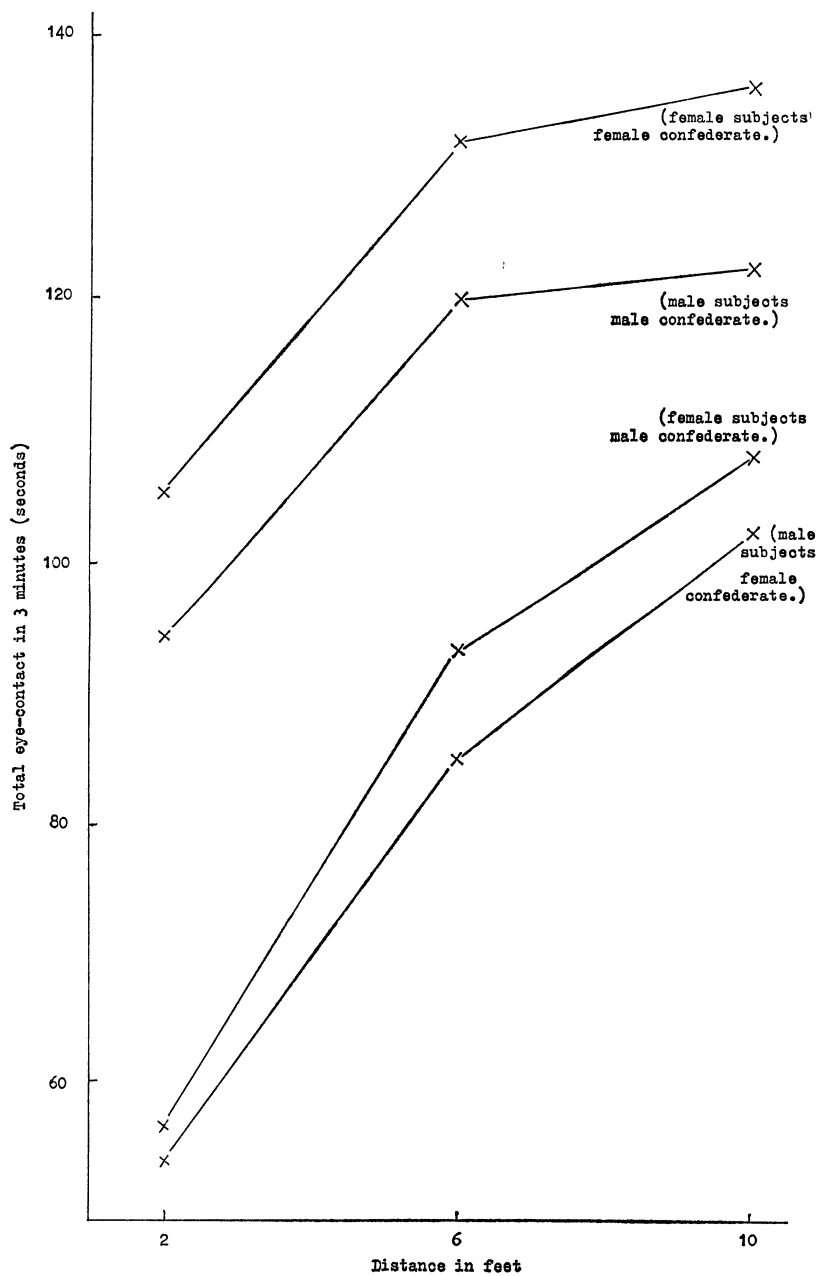


FIGURE 2  
*Relation between EC and distances for different combinations  
 of confederates and subjects*

tial proximity is confirmed for all four combinations of sexes ( $p < .001$ ). It is somewhat more marked for opposite-sex pairs. These results are shown in Figure 2. It can be seen that EC varies from about 30 per cent to 75 per cent of the time in the different conditions, i.e., we are dealing with major sources of variance. These results were replicated in the preliminary experiments, using a different angle between subjects. The effects of distance were more marked at  $90^\circ$  than  $180^\circ$  between the subjects ( $p < .05$ , females only).

It was found that the effect of distance is greatest for subjects with short EC (averaged for all three distances):  $\rho = -.38$  ( $p < .05$ ). Is this due to the greater shift and lower EC for opposite-sex pairs? If separate correlations are calculated, it is found that the shift/EC correlation is  $-.30$  (n.s.) for opposite-sex pairs, and  $.00$  for same-sex pairs. It appears that the more fundamental relation is between sensitivity to distance and low EC, which in turn could explain the greater effect for opposite-sex pairs.

(2) *Distance and Length of Glances.* Length of glance increased with distance from 5.5 seconds at  $2'$  to 8.8 at  $6'$  and 9.6 at  $10'$  ( $p < .01$ ). Thus the main difference occurred between  $2'$  and  $6'$ . These averages are rather unsatisfactory indices for certain subjects who had one or two very long glances, perhaps trying to outstare the confederate.

(3) *Sex Differences.* It was expected that female subjects would show more EC than males. This was found (see Figure 2), but the differences although consistent were small and non-significant. The same is true of length of glances. Sex of confederate as a variable was a negligible source of variance. However sex of subject and sex of confederate interact strongly ( $p < .001$ ): there is much less EC with mixed-sex pairs. This is most marked at  $2'$ . Length of glances is less for opposite-sex pairs: 3.7 seconds as opposed to 7.2 seconds for same-sex pairs at  $2'$ .

(4) *Sequence of Conditions.* It was found in the experiment on distance equilibrium, and in the first two versions of the present experiment, that the social relationship established in the first condition persisted in the later ones. Thus if  $2'$  was the first condition there would be less EC throughout all three conditions. This was *not* found in the experiment we are reporting here. Although sequence (2-6-10, 2-10-6, etc.), and order (1st, 2nd or 3rd condition), are both significant sources of variance, we conclude that this must be due to non-random sampling of subjects, as no meaningful pattern could be discovered. There were only 4 subjects for each of the six sequences compared.

(5) *Observational Results Concerning Equilibrium Tendencies.* It was expected that at very close distances efforts would first be made to reduce intimacy by reducing EC etc., but that anxiety would be shown if such steps were not enough. In the  $2'$  condition, EC never quite fell to zero, but signs of tension were observed in all subjects, especially when facing each other di-

rectly. They tried to increase the distance—by leaning backwards—which was prevented by chairs in the main experiment. They engaged in various gestures apparently to reduce EC or to distract attention: looking down, shading the eyes with the hand, narrowing the eyes, scratching the head, smoking (prevented in final version), blowing the nose, etc. At the 10' position, on the other hand, subjects were inclined to lean forwards, as would be expected from the equilibrium theory. This was prevented by tables in the main experiment.

We should consider how far the conditions of the experiment may have distorted the results. The situation was odd in at least one respect; namely the confederate stared continuously. This would probably be interpreted by the subject as seeking greater intimacy; had the confederate adopted a more hostile expression, it might have been seen as an attempt to dominate. Thus the amount of intimacy in the situation was entirely under the control of the subject. However, many subjects were not aware that the confederate *was* gazing continuously; and this was particularly true of subjects with short EC, for whom the effect of distance was most marked.

#### DISCUSSION

How far do our results support the existence of equilibrium positions for distance or EC? The first experiment found that subjects would only approach to a certain degree of physical proximity; the second experiment found that those at 2' tried to increase the distance, and those at 10' to reduce it, by leaning backwards and forwards respectively. Subjects at 2' were in a state of discomfort and tension. There are no comparable data to demonstrate an equilibrium for EC, but in our second experiment, where EC was entirely under the subject's control, we found a consistent level of EC for each subject, and that this was a function of our experimental conditions, varying from 30–75 per cent of the time. There were very great individual differences, from 0 to 100 per cent of the time.

How far have our tests of hypotheses, derived from the theory, confirmed that theory? In the first experiment it was found (for adults) that A would stand 8.7" nearer B when B's eyes were shut—a difference of about 23 per cent of the mean distance. In the second experiment, it was found that EC was reduced at closer distances. The effect was greatest between 2' and 6', for subjects who were low in EC, and for opposite-sex pairs, this being possibly a special case of the former. EC changed from 30 per cent to 58 per cent of the time for opposite-sex pairs, from 55 per cent to 72 per cent for same-sex pairs. Clearly this hypothesis is also confirmed, though there are further complications not envisaged by the theory.

There is an apparent difficulty over the finding that EC did not fall to

zero in the 2' condition. Placing two people 2' apart is a major disturbance of equilibrium, and considerable reduction of EC, smiling, etc., would be needed in compensation. The fact that subjects were very uncomfortable at 2' shows that equilibrium was not satisfactorily restored. There seem to be two possibilities: (1) There is a separate equilibrium for EC, distance etc., and they cannot *fully* compensate for one another, as our theory supposed; or (2) there are such strong positive forces behind EC that it is difficult to reduce it to zero. These forces are the need for *some* feedback, to ensure that the channel is still open, and to avoid sheer rudeness in view of the conventional social pressures to engage in some EC. In the preliminary experiments, in which subjects sat directly facing each other, there was nearly as much EC at 2' as at 6'. We thought that this might be due to the difficulty of avoiding EC without rudeness at 2', and we used a 90° position in the main experiment to make EC more voluntary. In fact there was a much greater drop in EC between 6' and 2' with this arrangement, which supports the interpretation above. In subsequent studies with schizophrenics, to be reported elsewhere, some subjects *did* reduce their EC to zero at 2'.

The finding that opposite-sex pairs show *less* EC and use shorter glances is contradictory to the general expectations of the theory, since it may be presumed that the approach drives are stronger with opposite-sex pairs. In fact, there was rather more arousal in the opposite-sex pairs, and conversation was more lively. Of course, opposite-sex pairs in other contexts *do* engage in a lot of EC, but this may be only when intimacy really has developed. In our situation the subjects were initially strangers. Another aspect of EC may need to be postulated to account for our result. EC between opposite-sex pairs of this age, in this culture, probably carries the additional implication of sexual attraction, and this may be especially true of long glances. In order to keep this attraction within bounds in the laboratory setting, EC may have been reduced.

Since the information and feedback-seeking aspects of EC are reasonably well established, it is worth enquiring whether our results could be explained in these terms. The greater EC at greater distances could perhaps be due to the increased difficulty of perception. It may also be more necessary to keep signalling to the other that one is still attending, i.e. that the channel is still open. We found that EC invariably fell off in the second half of each three-minute conversation. This could be because the necessary feedback had by then been obtained; in addition, subjects were at this stage thinking hard for more ideas, and EC would have constituted a distraction. On the other hand, this theory offers no explanation for the existence of an equilibrium position, or for the emotional aspects of EC, and it is believed that the affiliative-conflict theory is required in addition to the information-seeking analysis.



## SUMMARY

Previous evidence on the determinants of eye-contact was reviewed, and it was concluded that EC serves a number of functions. One of the most important of these is the quest for feedback during social interaction, together with that of signalling that the channel is open.

A second theory was proposed, that EC is a component of intimacy and is equivalent to physical proximity. These, and other aspects of intimacy are governed by both approach and avoidance forces, and are kept in a condition of equilibrium for any two people. Experiments were reported which provide evidence of such an equilibrium for physical proximity and for eye-contact.

It is postulated that if this equilibrium is disturbed along one of its constituent dimensions, e.g., by increasing physical proximity, there will be compensatory changes along the other dimensions. It has already been shown that greater intimacy of topic leads to less eye-contact. We have now shown that reducing eye-contact makes greater proximity possible, and that greater proximity reduces eye-contact.