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The Different Functions of Gaze

INTRODUCTION

Gaze has been said to have a number of different functions in social interaction. In this experiment an attempt was made to separate out these different functions, in order to study each one separately.

1. *Information Seeking*

Looking while talking (L_T) may be used to obtain immediate feedback on the reactions of listeners; looking while listening (L_L) may be used to supplement auditory information, by observing eye-movements and changes of facial expression. This function of gaze can be isolated in the situation where a subject interacts across a one-way screen, so that he can see and not be seen; he is unable to send any signals, so must look to collect information. Part of this information is about the other's timing of utterances and is used for synchronizing. This can be eliminated if the S delivers a monologue to his partner.

Hypothesis 1. Ss who can see through a one-way screen will look more than Ss who cannot see.

2. *Signalling*

(i) Signalling interpersonal attitudes. It has been found that people look more at those they like (Exline and Winters, 1965) and that Ss high in

dominance look more in a competitive situation, Ss high in affiliative needs look more in a cooperative situation (Exline, Gray, and Schuette, 1965). Couples who scored high on a questionnaire measuring being in love spent somewhat more time in mutual gaze and a higher proportion of their gaze was mutual than for other couples during a discussion in the laboratory (Rubin, 1970). Mehrabian (1966) found that if an experimenter interviewed two Ss, the one whom he looked at more thought that the experimenter liked him. One function of gaze appears to be the communication of interpersonal attitudes. The signal that is sent also depends on the facial expression accompanying the gaze; it may be suggested that the intensity of the attitude communicated is a joint product of the length of gaze and the intensity of the expression. Interpersonal attitudes can also be signalled by looking AWAY, i.e., negative attitudes. However, this is a very uncertain form of communication, since the sender will not know if it has been received unless he looks himself.

(ii) Prosodic accompaniments of speech. Speech is accompanied by small movements of the hands, head, and eyes, which supplement the verbal contents by giving emphasis, comment, illustration, and displaying the structure of what is said (Kendon, 1970). These signals can modify or complete the meaning of what is being said, by providing emphasis, providing nonverbal comments, giving illustrations, etc. (Argyle, 1971; Crystal, 1969).

If gaze is used for signalling, it follows that a S who is on the wrong side of a one-way screen, and who can see nothing, will still gaze in the direction of the other some of the time. Again the use of gaze for synchronizing can be eliminated by using monologues. Goldberg and Mettee (1969) carried out an experiment in which Ss delivered monologues to another person who was invisible, but who could see the S through a slit. When the other person was there, Ss looked at the slit 8% of the time and in a normal and deliberate manner; when the other person was NOT there they looked at the slit only 1% of the time, and in an accidental manner.

Hypothesis 2: Ss who can see nothing will still look deliberately in the direction of the other for part of the time.

3. *Controlling the Synchronizing of Speech*

This depends on the sending of signals by gaze-shifts, and the perception of these signals by looking at the other. Kendon (1967) found that shifts

of gaze are systematically coordinated with the timing of speech, and help with synchronizing. If one S does not look up at the end of an utterance there is a longer pause before the other replies. Argyle, Lalljee and Cook (1968) found that synchronizing was less good if eyes were concealed by dark glasses.

Hypothesis 3: Ss will gaze less during monologues than during conversations.

4. *Mutual Gaze and Intimacy*

Previous experiments suggest that gaze is used as a cue for intimacy, and that both gaze and mutual gaze decline with proximity, which is another cue for intimacy (Argyle and Dean, 1965; Argyle and Ingham, 1971). However it is not clear what are the precise conditions for affiliative satisfaction. If the decline of gaze with distance is taken as an index of affiliative effects, this should reveal what these conditions are: if there is no distance effect with the one-way screen, then EC is needed; if there is a distance effect, then sheer gaze will suffice. On the other hand gaze used for information-seeking may also increase with distance.

Hypothesis 4: If affiliation needs EC, there should be no effect of distance in this experiment. If some other feature of gaze is related to affiliation, this should be subject to the distance effect.

5. *Inhibition of Gaze — Avoiding Undue Intimacy*

Argyle and Dean (1965) proposed that gaze is affected both by approach and avoidance affiliative forces; the avoidance component would be expected to fall off more steeply with distance, as in other approach-avoidance conflicts, so that there is less gaze at closer distances, as was found both in that experiment and by Argyle and Ingham (1971). In the one-way screen condition it seems likely that the avoidance component will be eliminated, so that there should be more gaze than under normal conditions of vision. On the other hand it is also possible that the approach component is reduced — since we do not know whether this depends on simply seeing the other or on experiencing mutual gaze.

Hypothesis 5: There will be more gaze for Ss who can see but not be seen than under normal conditions.

6. *Distraction through Avoiding Excess Input of Information*

L_L is usually about twice as great as L_T, and this is thought to be mainly because a speaker does not want to be distracted. He particularly looks away at the beginning of an utterance, while he is planning it (Kendon, 1967).

It follows that a subject who can see but not be seen will not look all the time when talking, even though he could obtain more immediate feedback by doing so, and incur no mutual gaze.

Hypothesis 6: Ss who can see but not be seen will not gaze all of the time, especially while talking.

METHOD

Subjects talked to each other across a one-way screen, using throat microphones and loudspeakers, as shown in Fig. 1.

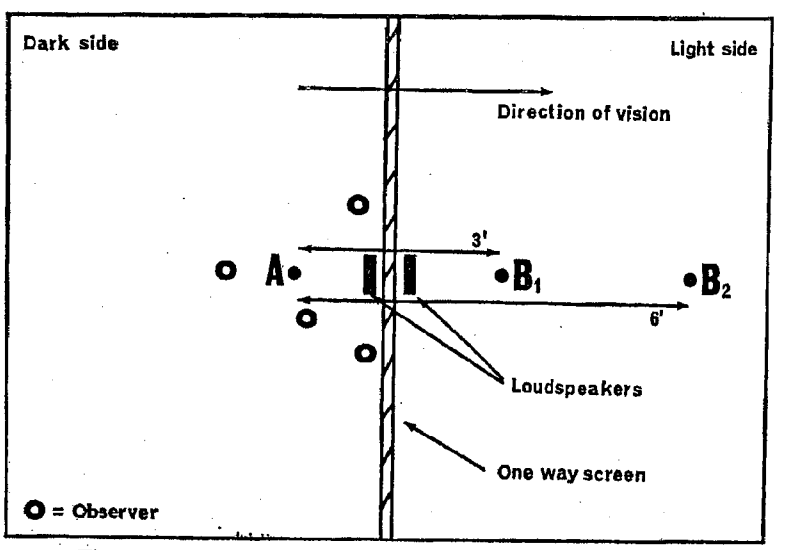

Fig. 1. Laboratory arrangements for the one-way screen experiment.

A was able to see, B was not. The lights on A's side were switched on temporarily so that B could see where A was, before each condition. A circle was drawn on B's side of the screen indicating where A was. Each pair of subjects went through 4 conditions, 2 each side of the screen,

one at 3′ the other at 6′ separation. In each of these positions there was a monologue from A, a monologue from B and a conversation, in a counterbalanced design. There were 4 observers, all on A's side: (1) to observe B's looking at A — whenever B looked straight through the circle on the glass in the direction of A this was scored as looking, (2) to observe A's looking at B, (3) to record B's speech, and (4) to record A's speech. All were recorded on a 4-track Rustrak event recorder.

Each pair of Ss sat in 4 positions, i.e., each side of the one-way screen and at 3′ and 6′ for each, and had 2 monologues and a conversation in each position. For each position there was a single topic, chosen in random order from the following: Oxford, another town, travel and holidays, books and films. For the monologues notes were provided suggesting possible content areas, which Ss looked at before they started and could consult if they ran out of ideas. In fact very few Ss needed to consult the notes. They were asked to base their conversation on the preceding monologues. Eight MF pairs were used, 16 Ss in all. Ss were students, not of psychology, drawn from a panel of volunteers. The results were compared to those of a very similar experiment, conducted in the same laboratory, but with normal vision, and using different though similar subjects (Argyle and Ingham, 1971).

RESULTS

The average amounts of looking under different conditions are shown in Table I together with data from the previous experiment using normal conditions of vision for comparison purposes.

The analyses of variance are shown in Table II.

1. *Seeing vs. Not Seeing*

As Table II shows there was more L_L and L_T when S could see, both in the conversations ($P < .001$) and the monologues ($p < .01$), though the effect was greater for the conversations (67% vs. 23%). The difference was also greater when Ss were listening than when talking ($p < .01$) — differences of 52% (L_L), 35% (L_T) between see and cannot see for the conversations.

TABLE I

Total Gaze (%) at 3′ and 6′ under Normal and One-way Screen Conditions (MF only)

			Talk				Listen				Means						
			Male		Female		Male		Female								
			3′	6′	3′	6′	3′	6′	3′	6′	Talk	Listen	3′	6′	M	F	All
Normal	n = 8 pairs		26.7	52.3	28.6	36.5	58.0	76.3	54.8	69.0	36.0	64.5	42.0	58.5	53.2	47.2	50.2
One-way screen	Conversations	See	55.5	54.4	54.7	55.8	70.5	75.3	85.9	84.0	55.1	78.9	66.7	67.4	63.9	70.1	67.0
		cannot see	15.3	14.0	25.0	24.3	18.5	22.2	25.7	40.5	19.7	26.7	21.1	25.2	17.5	28.9	23.2
n = 16	Monologues	See	21.4	24.6	34.3	21.6	60.0	73.3	62.3	76.4	25.5	68.0	44.5	48.9	44.8	48.6	46.7
		cannot see	18.1	19.4	19.8	18.1	29.2	22.9	38.0	51.3	18.8	35.4	26.3	27.9	22.4	31.8	27.1

TABLE II

Summaries of Analyses of Variance on Looking and Talking Measures

Source	SS	df	MS	F
1. Total looking				
Between Ss	140344.23	15		
Sex (A)	13776.90	1	13776.90	1.52
Ss within groups	126567.34	14	9040.52	
Within Ss	266800.75	48		
Seeing (B)	213097.64	1	213097.64	94.05[a]
A × B	365.76	1	365.76	<1.00
B × Ss within groups	31719.85	14	2265.70	
Distance (C)	236.39	1	236.39	<1.00
A × C	15.01	1	15.01	<1.00
C × Ss within groups	11324.85	14	808.92	
B × C	199.51	1	199.51	<1.00
A × B × C	268.16	1	268.16	<1.00
BC × Ss within groups	9573.58	14	683.83	
2. Looking while listening				
Between Ss	21717.98	15		
Sex (A)	2465.12	1	2465.12	1.79
Ss within groups	19252.86	14	1375.20	
Within Ss	60010.25	48		
Seeing (B)	43607.88	1	43607.88	64.23[a]
A × B	2.03	1	2.03	<1.00
B × Ss within groups	9504.86	14	678.92	
Distance (C)	455.82	1	455.82	3.22
A × C	18.50	1	18.50	<1.00
C × Ss within groups	1980.14	14	141.44	
B × C	237.93	1	237.93	<1.00
A × B × C	315.95	1	315.95	1.14
BC × Ss within groups	3887.14	14	277.65	
3. Looking while talking				
Between Ss	17576.26	15		
Sex (A)	426.42	1	426.42	<1.00
Ss within groups	17419.84	14	1224.99	
Within Ss	30424.49	48		
Seeing (B)	20064.72	1	20064.72	45.8[a]
A × B	375.39	1	375.39	<1.00
B × Ss within groups	6133.18	14	438.08	
Distance (C)	4.00	1	4.00	<1.00
A × C	7.42	1	7.42	<1.00
C × Ss within groups	2438.74	14	174.19	
B × C	3.51	1	3.51	<1.00
A × B × C	2.42	1	2.42	<1.00
BC × Ss within groups	1395.11	14	99.65	

TABLE II CONTINUED

Source	SS	df	MS	F
4. Talking				
Between Ss	61086.98	15		
Sex (A)	3094.14	1	3094.14	0.75
Ss within groups	57992.84	14	4142.35	
Within Ss	79817.25	48	1662.86	
Seeing (B)	18462.01	1	18462.01	12.35[b]
A × B	70.14	1	70.14	.047
B × Ss within groups	20928.60	14	1494.90	
Distance (C)	6.89	1	6.89	<1.00
A × C	1164.51	1	1164.51	<1.00
C × Ss within groups	26052.35	14	1860.88	
B × C	43.89	1	43.89	<1.00
A × B × C	23.78	1	23.78	<1.00
BC × Ss within groups	13065.08	14	933.22	
5. Monologues				
Between Ss	118570.97	15		
Sex (A)	5751.28	1	5751.28	<1.00
Ss within groups	112819.69	14	8058.55	
Within Ss	365410.17	112		
Seeing (B)	50880.50	1	50880.50	14.69[b]
A × B	1035.13	1	1035.13	<1.00
B × Ss within groups	48503.12	14	3464.51	
Talking (C)	114960.13	1	114960.13	32.14[a]
A × C	2112.50	1	2112.50	<1.00
C × Ss within groups	50070.62	14	3576.47	
Distance (D)	1237.53	1	1237.53	1.19
A × D	5.29	1	5.29	<1.00
D × Ss within groups	14572.93	14	1040.92	
B × C	22313.28	1	22313.28	16.63[b]
A × B × C	3549.03	1	3549.03	2.64
BC × Ss within groups	18786.94	14	1341.92	
B × D	264.50	1	264.50	<1.00
A × B × D	2080.12	1	2080.12	2.16
BD × Ss within groups	13475.13	14	962.51	
C × D	4050.00	1	4050.00	10.48[b]
A × C × D	3160.12	1	3160.12	8.18[c]
CD × Ss within groups	5411.13	14	386.51	
B × C × D	1785.03	1	1785.03	3.53
A × B × C × D	69.03	1	69.03	<1.00
BCD × Ss within groups	7088.11	14	506.29	

[a] $p < .001$
[b] $p < .01$
[c] $p < .05$

2. *Gaze by Ss Who Cannot See*

As Table I shows Ss who cannot see look on average 23% in the conversations, 27% in the monologues. The observers in this experiment found that Ss looked quite definitely, deliberately and normally at the circle on the one-way screen, which showed where the other person was.

3. *Gaze When Seeing vs. Gaze under Normal Conditions*

Ss in the conversations who could see looked 67% of the time, compared with 50% in the normal conversations studied by Argyle and Ingham (1971). The difference was greater at 3′ (24%) than at 6′ (9%) and for females (23%) than males (10%). The relation between these scores and distance is shown in Fig. 2.

4. *Comparison of Monologues and Conversations*

It can be seen from Table I that there is more gaze in conversations, but only for SEE (67% vs. 46%), and not for CANNOT SEE. The effect is more marked for L_T (55% vs. 26% in SEE), than for L_L.

5. *Effects of Distance*

There is a significant interaction of distance with talking in the monologues; there is more L_L at 6′ than 3′ ($p. < .01$). In the conversations there was a nonsignificant trend in the same direction. In the monologues there was also a triple interaction: there was more looking at 6′ while listening, by females ($p. < .05$); this was not found in the conversations.

DISCUSSION

We can learn something from this experiment about the different functions of gaze.

1. *Obtaining Information*

Hypothesis 1 is confirmed: Ss who can see look more than Ss who cannot see — 67% vs. 23% in the conversations. The effect of being able to see affected both L_L (79% vs. 26%) and L_T (55% vs. 20%), showing that information is sought both while talking and while listening.

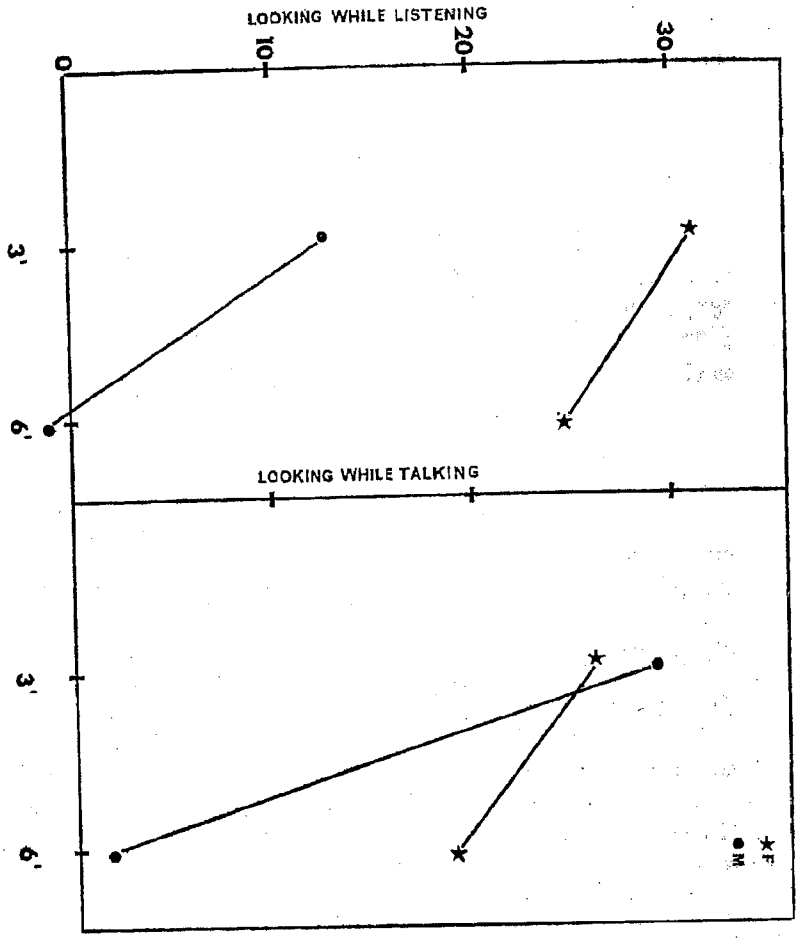

Fig. 2. Looking for one-way screen SEE minus looking under normal conditions, as a function of distance.

It is possible that some of the looking in SEE is for purely affiliative reasons — enjoying the sight of the other, but the absence of any consistent effect of distance on gaze here makes this unlikely.

2. *Signalling Interpersonal Attitudes and Prosodic Accompaniments*

It is not possible to separate these two kinds of signalling with this experiment, but their joint effects can be found. Hypothesis 2 is confirmed

in CANNOT SEE Ss still looked 23% of the time in the conversations, 27% in the monologues. This is more than was found by Goldberg and Mettee (1969), whose Ss looked only 8% of the time. However their Ss just gave monologues whereas our Ss gave monologues as a prelude to a conversation on the same topic, which presumably generated rather more involvement with the other person. However Goldberg and Mettee's Ss looked 1% of the time when there was no-one behind the slit; we do not have the comparable figure for our situation, but presumably there would be some accidental looking or looking at the one-way screen itself so that 23% is an overestimate. This kind of looking may be partly out of habit, but it seems likely that it represents the signalling by means of gaze that is used under normal conditions. Gaze that is used to signal synchronizing can be eliminated by taking the figure for the monologues, where no synchronizing is needed. The amount of gaze in CANNOT SEE was greater while listening (35%) than talking (19%) and presumably consisted mainly of feedback signals commenting on the other's utterances.

3. *Synchronizing Speech*

The amount of gaze used for this purpose can be found by comparing the conversations and monologues. There was more gaze on average in the conversations, but only for the SEE condition (67% vs. 47%). Previous studies show that synchronizing depends partly on the sending of information by shifts of gaze (Kendon, 1967). There was no difference between our conversations and monologues in CANNOT SEE, perhaps because Ss do not realise that they send this kind of signal. The effect was greater in SEE for L_T (55% vs. 26%) than L_L. Ss look to obtain information to help with synchronizing — and part of the information they seek is obtained from the other's gaze behaviour; they obtain this information mainly by looking when talking.

4. *Gaze, Mutual Gaze, and Intimacy*

It was predicted that there should be no effect of distance on gaze in this experiment, on the assumption that distance affects only MUTUAL gaze, which was excluded here. There was however a small distance effect, for the monologues, for L_L only ($p < .01$), and especially for females ($p < .05$); there was a nonsignificant trend for the conversations, no effect for L_T, and little effect for males. The difference is in any case considerably less than under normal vision.

	3′	6′	Difference
L_L (normal)	56.4	72.6	16.2
L_L (OWS, all conditions)	48.8	55.8	7.0

This shows that there is a much reduced distance effect under one-way screen conditions, affecting L_L only (and females more than males). It may be a residue or carry-over from normal looking behaviour. However the results on the whole support the hypothesis, in that there is no effect of distance on L_T, and the effect on L_L is less than half of the effect under normal vision. This confirms that the distance effect is primarily due to MUTUAL gaze.

5. *Inhibition to Avoid Intimacy*

This hypothesis was confirmed: there was more gaze for OWS SEE than under normal conditions, 67% vs. 50%. The extent of this inhibition can be measured by subtracting the amounts of gaze under normal conditions from the OWS SEE scores for the conversations (though different Ss were involved). The effect falls off rapidly with distance, as shown in Fig. 2, and is greater for females than males.

These results confirm the existence of an avoidance component for gaze, which operates under normal vision, is eliminated by the one-way screen, and falls off rapidly with distance.

6. *Inhibition by Avoidance of Distraction*

This hypothesis was confirmed: in the conversations for Ss who could see L_L was 79%, L_T 55%: there was a greater difference in the monologues, where L_L was 68%, L_T 26%. Ss who could see without being seen looked more than under normal vision, but the amount of their looking did not become 100%. The highest percentage gaze found was for females in the conversations while listening — 85%. In the experiments by Argyle and Ingham (1971) gaze increased with distance, but at 10′ was no more than 65%, and the curve for gaze against distance was approaching an asymptote at this level.

Summation of the different factors

We conclude that amount of gaze is a joint product of a number of approach and avoidance forces. However the different components do

not appear to add up in any simple way, and it seems likely that two or more can operate simultaneously. For example A might look at B primarily for affiliative reasons, but he would also receive information. Or A might look up at the end of an utterance to collect immediate feedback, but this look will act as a synchronizing signal to B. And A cannot look at B to collect information without sending signals about his attitude to B.

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