Influence of Interpersonal Affect on Visual Interaction

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Abstract

This study is a replication with modification of Yajima & Takagi's questionnaire method on the influence of interpersonal affect on visual interaction. Four hundred and twenty-four female college students filled out the questionnaire. We found the sequences of affects and reactions were affected by the respective interpersonal affects of the two members of a dyad. As a result of structural equation modeling analysis, a like vs. dislike pattern and a control intent pattern were found. We interpreted the like vs. dislike pattern as follows: one's perception of intent of another's gaze influences one's affect toward another's gaze in that positive evaluations can serve as positive affects to behave in positive ways, like smiling and greeting. In turn, another's positive perception of your reaction results in another's positive emotional experience toward your reaction, which serves to behave in positive ways, like smiling and greeting.

Key words: interpersonal affect, visual interaction, like vs. dislike pattern, control intent.

I. Introduction

Person perception has long been a major topic in social psychology, but the focus has usually been on the cognitive inference processes, with little explicit or sophisticated attention to the specific nonverbal cues involved. However, much is known about the role gaze, or eye contact between a gazing pair, plays in forming an observer's impressions. A gaze influences valuations of like and attraction,\(^1\)\(^-\)\(^7\), credibility,\(^8\)-\(^10\) and dominance. One recurring result of these studies is the positive rating of persons displaying a high degree of eye contact. In the above studies, mostly a single independent variable is manipulated and the consequences are observed for a single dependent variable.

But there are still questions that remain unanswered by these studies. One is

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why people with a high degree of eye contact have this positive rating. Another
is do they have this positive rating with everyone or only with certain people. In
order to answer these questions and others like them we need to see the sequence
of reactions. This sequence starts with me looking at you and proceeds through
you responding by looking at me. It continues on to include my feelings about
how you are looking at me and then to your feelings about how I continue to look
at you. It finally ends with our reactions to each other’s gazes. Studying the
sequence of reactions like this is a more realistic way of understanding the role
eye contact between a gazing pair plays in forming an observer’s impressions.

Much of one’s life is spent in what appears to be fairly well coordinated
interaction with other people. The relative smoothness of operation in day-to-
day living reflects that one person is in some degree aware of what another
person does, feels, wants, and is about to do.\(^1\) It is very difficult to study this
by experiment alone. Because of this, it is worthwhile to conduct a questionnaire
study. Through a questionnaire we can walk a person through a variety of
hypothetical situations and then evaluate their responses in order to arrive at
some concrete conclusions.

Kendon suggested that gaze serves three main functions in social interaction: an
expressive function, a monitoring function, and a regulatory function.\(^2\) Based on
Kendon’s three functions, Yajima and Yajima & Takagi comprised their inventory
including these functions. They found that the differences of interpersonal
relationships (friendly, cooperative, neutral, competitive, and unfriendly rela-
tions) affected the perception of the intent of the gaze and the following affective
reactions.\(^3–4\) But their questionnaire did not include the important function of
gaze. There has been little in the way of organized and integrated discussion of
the social control function in nonverbal research. But there is a considerable
amount of empirical research that can be interpreted within a social control
framework.\(^5\)

Thus our items were based on “A study of visual interaction and its determinants”\(^6\),
adapted and slightly modified with classroom setting and control items. Our
investigation, which used a questionnaire method, had the following aim. We
wanted to know how sequences of affects and reactions were affected by the
respective interpersonal affects of the two members of a dyad. The questionnaire
approach was used, since this makes it possible to sample a number of situations
that are difficult to conduct in an experiment, and also to make use of a fairly
large number of participants, as needed for correlational purposes. We would
enter this reservation, however. All participants were female from a women’s
college. A full exploration of this area would of course require investigations
using both male and female subjects. On the other hand, women are more
suitable participants for this study due to the fact that for women, visual orienta-
tion towards others may be more strongly determined by their affective relation-
ship to that person than for men. A possible implication of this sex difference is
that eye contact will constitute a more salient communicative cue for judging
others when women are the judges than when men are. Females may be more aware of their nonverbal expressions than males.

II. Method

1. Participants
Participants were 424 female junior college students. Participation in the study partially fulfilled a course requirement. The questionnaires were completed both in class and as take-home work.

2. Procedure
The rating scales were administered to the participants. The task of a participant was, for each of the 54 scales presented in the hypothetical situation with the imaginary other (same sex), to check the appropriate spot on the rating scale. Each of the following four kinds of questionnaires were filled out by 106 of the participants.

3. Instruments
The scales consisted of the following:
The sequences of questions are shown in the following chain: B looks at A → A infers B’s attention → A’s feeling to B’s gaze → A’s reaction to B’s gaze → B infers A’s reaction → B’s feeling to A’s reaction → B’s reaction to A’s reaction.
Thus any one respondent would provide six chain ratings for each of the following four hypothetical situations. Each item was scored on 4-point scales that ranged from 1 (never) to 4 (very much so).
1) When you (A) were studying in a classroom, you felt like someone was observing you. When you looked at her (B), she was looking at you. You like her and she also likes you (you have a positive feeling toward her and she also has a positive feeling toward you).
2) When you (A) were studying in a classroom, you felt like someone was observing you. When you looked at her (B), she was looking at you. You like her but B doesn’t like you (you have a positive feeling toward her while B feels negatively toward you).
3) When you (A) were studying in a classroom, you felt like someone was observing you. When you looked at her (B), she was looking at you. You dislike her but B likes you (you have a negative feeling toward her while B feels positively toward you).
4) When you (A) were studying in a classroom, you felt like someone was observing you. When you looked at her (B), she was looking at you. You dislike her and B also dislikes you (you have a negative feeling toward her and B also feels negatively toward you).
Q1. What do you think B’s intention of looking at you is? (Your perception of the intent of the other’s gaze.) Four 4-point scales were employed. The scales employed were liked attitude, disliked attitude, have an interest, and intention of
control.
Q2. What are your feelings in regards to B’s gaze? (Your emotional response toward the other’s gaze.) The following set of fifteen affect names was utilized in question 2. The scales employed were happiness, submission, shyness, strength, pleasure, courage, embarrassment, tension, humiliation, irritation, anger, surprise, strangeness, and doubt.
Q3. What is your reaction in response to B’s gaze? (Your reaction toward the other’s gaze.) Eight 4-point scales were employed. The scales employed were smiling, greeting, nodding, opening the eyes, staring, averting the eyes, tilting the head, and raising the eyebrows.
Q4. What does B think of your reaction? (Other’s perception of your reaction.) The same scales as in Q1 were employed.
Q5. What are B’s feelings toward your reaction? (Other’s emotional experience toward your reaction.) The same scales as in Q2 were employed.
Q6. What is B’s reaction in return to your reaction? (Other’s reaction toward your reaction.) The same scales as in Q3 were employed.
For total samples, reliability coefficient (Cronbach’s alpha) was .88 (N of items = 54, N of cases = 424

III. Results and Discussion

The results were presented in two sections. First, we compared the groups’ differences to determine whether the two factors (A’s affect toward B and B’s affect toward A) resulted in differences in mean anticipated affects and reactions. Second, structural equation modeling analysis was conducted to identify and assess the direct and indirect predictive relationships among the hypothesized series of anticipated affects and reactions followed by gazing behavior.

1. Groups Analysis Comparison

First, for each question the responses to the ratings were combined over four situations. Scales were subjected to principal component factor analysis. This was followed by a Varimax (orthogonal) rotation.

In question 1, two factors were obtained. Factor 1 can be labeled as “Like vs. dislike attitude”, in view of the high loading of the like scale (.83) and dislike scale (−. 84). Factor 2 is defined by a high loading on the control scale (.52) and interest scale (.52). It can be labeled as “Control intent”. These two factors accounted for 54.4% of the variance.

In question 2, three scales had high loadings on Factor 1: angry scale (.86), irritation scale (.84) and humiliation scale (.69). We labeled this as “Dislike”. Two scales had high loadings on Factor 2: courage scale (.67) and strength scale (.58). We labeled this as “Courage”. Three scales had high loadings on Factor 3: strange scale (.87), doubt scale (.72) and surprise scale (.48). We labeled this as “Strangeness”. Three scales had high loadings on Factor 4: tension scale (.89), shyness scale (.51) and embarrassment scale (.41). We labeled this as "Tension".
These four factors accounted for 55.6% of the variance.

In question 3, two factors were obtained. Factor 1 can be labeled as "positive reaction", in view of the high loading of the smile scale (.83), greet scale (.60) and nod scale (.68). Factor 2 is defined by a high loading on the tilt the head scale (.66) and raises the eyebrows scale (.64). It can be labeled as "Embarrassed reaction". These two factors accounted for 44.3% of the variance.

In question 4, two factors were obtained. Factor 1 can be labeled as "Like vs. dislike attitude", in view of the high loading of the like scale (.76) and dislike scale (−.77). Factor 2 is defined by a high loading on the control scale (.74) and interest scale (.73). It can be labeled as "Control intent". These two factors accounted for 62.2% of the variance.

In question 5, three scales had high loadings on Factor 1: irritation scale (.87), anger scale (.85) and humiliation scale (.81). We labeled this as "Dislike". Three scales had high loadings on Factor 2, strange scale (.83), doubtful scale (.78) and surprise scale (.74). We labeled this as "Strangeness". Four scales had high loadings on Factor 3, pleasant scale (.73), strength scale (.68), satisfaction scale (.68) and courage scale (.66). We labeled this as "Courage". These three factors accounted for 56.7% of the variance.

In question 6, two factors were obtained. Factor 1 can be labeled as "Positive reaction", in view of the high loading of the smile scale (.89), nod scale (.79) and greet scale (.73). Factor 2 is defined by a high loading on the raise the eyebrows scale (.69) and the tilt the head scale (.58). It can be labeled as "Embarrassed reaction". These two factors accounted for 48.4% of the variance.

Factor scores were then calculated for each participant across the set of the rotated factors and were subjected to a $2 \times 2$ analysis of variance to determine whether the interpersonal affect had an effect on the anticipated affects and reactions.

1) Intent of gaze perception

In Factor 1, there were significant main effects for A, $F (1, 420) = 28.93, p < .001$, and B, $F (1, 420) = 314.38, p < .001$. Regardless of the feeling of the other person (B), A would find the other's visual attention more favorable when A likes B than when A dislikes B. Regardless of A's feeling to B, A would find the other's visual attention more favorable when B likes A than when B dislikes A. In Factor 2, there was a significant main effect for B, $F (1, 420) = 12.07, p < .001$. The main effect of A was not significant. Regardless of A's feeling to B, A would find the other's visual attention more control-oriented when B likes A than when B dislikes A.

2) Emotional experience toward other’s gaze

In Factor 1, there was a significant main effect for A, $F (1, 420) = 145.90, p < .001$ and B, $F (1, 420) = 75.58, p < .001$. There was significant interaction, $F (1, 420) = 10.84, p < .001$. Regardless of the feeling of B, A would find the other's visual attention more irritated and angry when A dislikes B than when
A likes B. In Factor 2, there was a significant main effect for A, $F (1, 420) = 5.65, p < .01$. The main effect of B was not significant. There was significant interaction, $F (1, 420) = 15.83, p < .001$. Regardless of the feeling of B, A would find the other's visual attention more strong and courageous when A likes B than when A dislikes B. In Factor 3, there was a significant main effect for B, $F (1, 420) = 7.08, p < .008$. The main effect of B and interaction were not significant. Regardless of A's feeling to B, A would find the other's visual attention stranger when B dislikes A than when B likes A.

3) Your reactions toward other's gaze

In Factor 1, there were significant main effects for A, $F (1, 420) = 63.45, p < .001$, and B, $F (1, 420) = 55.53, p < .001$. A × B interaction was also significant, $F (1, 420) = 11.84, p < .001$. Regardless of the feeling of B, A would smile, greet and nod more to the other's visual attention when A likes B than when A dislikes B. Regardless of A's feeling to B, A would smile, greet and nod more to the other's visual attention when B likes A than when B dislikes A. Thus there is a greater positive reaction when B likes A than when B dislikes A.

4) Other's perception of your reaction

In Factor 1, there were significant main effects for A, $F (1, 420) = 87.38, p < .001$, and B, $F (1, 420) = 45.17, p < .001$. A × B interaction was also significant, $F (1, 420) = 14.90, p < .001$. Regardless of the feeling of B, B would find my reaction more favorable when A likes B than when A dislikes B. Regardless of A's feeling to B, B would find my reaction more favorable when B likes A than when B dislikes A. In Factor 2, A × B interaction was significant, $F (1, 420) = 4.19, p < .04$. Control intent, which is perceived when B likes A, can have an effect when B dislikes A.

5) Other's emotional responses toward your reactions

In Factor 1, there were significant main effects for A, $F (1, 420) = 56.06, p < .001$, and B, $F (1, 420) = 70.25, p < .001$. Regardless of the feeling of B, B would feel more irritated and angry to my reaction when A dislikes B than when A likes B. Regardless of A's feeling to B, B would feel more irritated and angry to my reaction when B dislikes A than when B likes A. In Factor 3, there were significant main effects for A, $F (1, 420) = 12.95, p < .001$, and B, $F (1, 420) = 8.91, p < .003$. A × B interaction was also significant, $F (1, 420) = 4.07, p < .04$. Regardless of the feeling of B, B would feel more pleasant and satisfactory to my reaction when A likes B than when A dislikes B. Regardless of A's feeling to B, B would feel more irritated and angry to my reaction when B likes A than when B dislikes A.

6) Other's reaction toward your reaction

In Factor 1, there were significant main effects for A, $F (1, 420) = 41.35, p < .001$, and B, $F (1, 420) = 98.41, p < .001$ and A × B interaction was also significant, $F (1, 420) = 5.54, p < .02$. Regardless of the feeling of B, B would smile, greet and nod more to my reaction when A likes B than when A dislikes
B. Regardless of A’s feeling to B, B would smile, greet and nod more to my reaction when B likes A than when B dislikes A. In Factor 2, there was a significant main effect for B, \( F(1, 420) = 10.68, p < .001 \). Regardless of A’s feeling to B, B would tilt her head and raise her eyebrows more to my reaction when B dislikes A than when B likes A.

As the above results show, our responses to gaze depend on the situation and on who is gazing. Our study of reactions to gaze can be understood by defining gaze as a behavior that intensifies whatever feelings are being shared between two persons. It seems that we can expect positive responses to gaze in friendly relationships and negative responses to gaze in unfriendly relationships.

2. Predictive Relationships Among Anticipated Affects and Reactions

We used the linear-structuring equation modeling (using AMOS 4.0 program) to investigate the sequence of anticipated affects and reactions (Figure 1). 13 For this model, root mean square of approximation (RMSEA) = .09, goodness of fit (GFT) = .73, adjusted goodness of fit (GFT) = .68, Akaike information criterion (AIC) = 2269.36. A convenient representation of the relationships among a number of variables is the path diagram. Figure 1 shows the path diagrams. A straight, one-headed arrow represents a causal relationship between two variables. Like-dislike attitude paths lead to 1dislike, 1positive reaction, 2like-dislike, 2dislike and 2positive reaction, whereas control intent paths lead to 1tension, 1embarrassed reaction, 2control, 2tension and 2embarrassed reaction. When you (A) perceive (s) (the) other’s (B’s) gaze as positive in attitude, A feels a positive affect and not a negative affect. And A behaves in positive ways like smiling, greeting and nodding and not in negative ways like averting one’s gaze or staring. In turn, B perceives your reaction as favorable in attitude and experiences a positive affect not a negative affect, which leads to behavior in positive ways, like smiling, greeting and nodding and not in negative ways like averting one’s eyes or staring.

When you (A) perceive (s) (the) other’s (B’s) gaze as intended to control, A feels tense. And A behaves in embarrassing ways like tilting the head and raising the eyebrows. In turn, B perceives your reaction as intended to control and experiences a tense affect that leads to behavior in embarrassing ways like tilting the head and raising the eyebrows.

Thus, by adding a social control item to Yajima & Takagi’s questionnaire, we could show a contrast in two basic motive systems that relate to interpersonal behavior: intimacy function and social control function. As the study was limited to female to female encounters, male to female encounters not dealt with in this study should also be investigated. Same-sex dyads and opposite-sex dyads gaze differs.
Figure 1. Structural model for relation of anticipated affects to reactions. For indicators, favr = favorable, unfa = unfavorable, irrit = irritation, inter = interest, cont = control, humi = humiliation, emba = embarrassment, tens = tension, headt = tilt the head, eyers = raise the eyebrows, eyeo = open the eyes.
Circled values at the top are error variances. All coefficients are standardized values.
IV. Conclusion

Taken together, we found two contrasting patterns: like – dislike attitude and control intent. Although the abstract distinction between like – dislike attitude and control intent can easily be made, classifying everyday exchanges may be more difficult. Many interactions may reflect a mixture of intimacy and social control motives.\(^1\) No men participated in this study. We have shown that for at least one sample of a college aged female population the positive or negative affect for the other is matched by systematic changes in the feelings and reactions.

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References


8, 136–144.
16) Yajima, S. 1994 Influence of interpersonal relation on visual interaction (1). Ningen Kagaku (Graduate School of Kansai University), 41, 89–110. (In Japanese)