

# YÜZ İFADELERİNİN TEFSİRİNE AİT TECRÜBE VE TEORİLERİN YENİDEN GÖZDEN GEÇİRİLMESİ

## RECONSIDERATIONS OF THEORIES AND EXPERIMENTS ON THE INTERPRETATION OF FACIAL EXPRESSIONS

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*Bu yazının ilk kısmında yüz ifadelerinin tefsirine dair yapılan araştırmalarda kullanılan tecrübe düzeninin problemin mahiyetine uygun düşmediği, incelenmek istenen hâdiseyi temsil etmediği gösterilmeğe çalışılmaktadır. Gerçekten hâdiseye uygun bir tecrübe nizamında tenbihin, ait olduğu situasyondan tecrid edilerek verilmemesi icap eder. Zira normal hayatta biz, bir şahsın yüz ifadelerine, veya yaşadığı teessürî ruh haline ve maruz kaldığı tenbih situasyonundan birine dair bir suale, ancak bu üç unsurdan ikisini bildiğimiz takdirde cevap verebiliriz. Halbuki, şimdiye kadar bütün tecrübeciler bizi yalnız tek bir unsurla karşılaştırıp cevap istemekte idirler.*

Contradictory results obtained from experiments in the interpretation of facial expressions, and the continuous conflicts arising from their evaluations may be accepted as an indication that research has now reached a new phase. But, this new phase indicates that a point of «dead-end» has been attained in this problem rather than a development. According to my opinion, the problem could only be saved by a new formulation from the theoretical point of view rather than through the repetitions of experiments along the old lines. This paper will be dealing both with theoretical aspects of the problem as well as exposing some of our experiments.

The legitimacy of research in this field so far has been dependent on the hypothesis which accepted a one-to-one correspondence between facial expressions and the mental states reflected by these expressions. Whether it be overtly admitted or not, such a theory exists at the basis

of every research in this field. (We are, at this moment, leaving aside the question of whether this attachment is innate or acquired.) Otherwise, all the experiments conducted in this field so far, would be meaningless because of the reasons to be given. Yet, the theory that lies at the basis of all these experiments has not been verified. In fact, in the experiments on facial expressions, these expressions were exposed to the subjects in an isolated way, and the subjects could not satisfactorily succeed in recognizing the feelings and emotions carried by these expressions. This result which was not accepted for a long time, has now been agreed upon by most workers, in the field. Under these circumstances, Woodworth, in an effort to give these unsatisfactory results a positive direction, attempted a reevaluation of the data. In this new interpretation, if the subject used any term concerned with the situations, for instance of laughing, happiness, mirth or joy, he received a correct score. Schlosberg and Osgood also agreed and developed the view along these lines. Hence, instead of a one-to-one-correspondence between feelings and emotions and their expressions, certain groups of emotions are accepted as applying to certain groups of expressions. Through this fashionable new interpretation, the basic hypothesis about the specificity of facial expressions underlying research in this field is thus abandoned.

Against this view is another one that has been encountered with a great deal of resistance so far, but, is fastly gaining ground, which accounts for the reasons underlying unsuccessful results in this field, to the isolation of facial expressions from the stimulus situations to which they belong. Fernberger, as one of the leaders in this field, has designed his experiments as all his predecessors, but having observed the enormous influence of suggestion on the interpretations of facial expressions has changed his view about this matter and has reached the following conclusion:

«Little can be determined of an emotional state in another individual from the perception of an abstracted facial expression completely divorced from a general, total stimulus situation. If a stimulus situation is indicated, the emotional state is judged in accordance with that situation rather than in accordance with the facial expression.»

Even though it may not be very clear how Fernberger found these results within the design of his experiments, more systematic research in this field has also verified his judgments. (M. Turhan).

Thus, there are now two opposing views that cannot be reconciled in this problem field. Before going into the comparison and the evaluation of results reached by these opposing groups, it should be useful

to mention some points that needs clarification. For one thing, there is the problem of methodology and how much of the event to be studied is being really represented within the design of these experiments.

For this reason the state of the observer who becomes a subject in the experimental situation, and the nature of the stimulus situation confronted by him will be studied.

### The Observer

Generally, in normal life an observer meets with one of the following situations: He is either included within the stimulus situation, or is a spectator to it without participating. In the first instance, he is either able to observe the actions or the responses of the object within the stimulus situation or is able to observe both and through his own emotional states he himself also reacts. If the object is a human being, he will be observing and interpreting the responses (facial expressions) that the person makes as a consequence of the stimulus situation and will himself be responding, this interaction continuing until the situation is dissolved. If in the participated situation by the observer, the thing that brings about the first emotional response is an object, and this stimulus has been directed to someone other than the observer as in an accident or with a wild animal, in that case, the observer will be perceiving both the object and the responses of the subject and by interpreting the response (facial expression) of the subject will make a judgment about his mental state.

In the second instance, the difference in the observer's situation depends upon the degree of his knowledge about the stimulus situation. Because, in the first instance, the observer receives his information about the interpersonal relations and the relationships between the stimuli and responses within the context of the situation. And, for this reason, he is in a position to follow the changes that take place in the situation, whereas, the observer who is excluded from the same situation is informed about the relations and elements that bring about the situation only through his own visual perceptions. Therefore, because of the reasons to be dealt with further on, an observer in this situation has a greater probability of committing errors. Generally, a subject used in experimental situation is similar to this second kind of observer. But, is not even aware of the stimulus - response relationships visually. This point which has been observed in our experiments is also important from the theoretical point of view.

### The Nature of the Stimulus Situation

In experiments on facial expressions the stimulus that is given to the subject to be interpreted by him is solely a response. But, it usually is such a response that the subject has neither a notion of the stimulus situation nor the emotional state that has occurred as a consequence of this situation. This is unlike a normal life situation. In normal life, when one is met with a similar situation, where the cause (the stimulus situation) is unknown to the observer, the person whose facial expression can not be interpreted is immediately asked the question: «What happened?»

In fact, in normal life facial expressions can not easily be recognized if two of the three conditions are unknown to the observer: One, the stimulus situation, two, which brings about the emotional mental state, and three, the facial expression that is evoked by it. (Their sequence, that is, whether the response or the facial expression should follow the stimulus is not relevant to our problem). Therefore, as in mathematics if two of the three conditions are unknown, it is impossible to solve the third one. Either the stimulus situation and the facial expression is to be known (perceived) in order to imagine or infer the emotional state, or, the stimulus situation and the emotional state (according to the person's statement) has to be known in order to be able to interpret the facial expression. Or, it is necessary, to be able to perceive the facial expression and the corresponding emotional state, and thus try to imagine the stimulus situation, or ask for additional information from the person concerned.

In normal life, as long as the chain of events follow in a series of related stimuli and responses within a certain context no definite difficulties are encountered. Only those people who join a situation at a later stage, as, for instance, late comers to a party or a cinema find it difficult to understand the interpersonal relationships through responses and facial expressions.

From this point of view, experiments designed to investigate the problem of the interpretation of facial expressions can not be claimed as reflecting real life situations.

Because, when a facial expression is exposed to the subject to be interpreted by him, the subject has no notion of either the mental sta-

te, or the stimulus situation which has caused that mental state. Under these circumstances, the subject does nothing but guesswork. This may be the main reason for unsatisfactory results so far obtained from experiments in this field.

### The Specificity of Expressions

No doubt one of the most fundamental and difficult questions in the field of facial expressions is the specificity of the expressions, that is, whether a specific expression exists for every emotional state. Starting from the very early experimenters that were interested on the problem of the physiological-anatomical mechanisms of facial expressions, some later systematic research in this field especially by C. Landis did not yield any substantial results.

In spite of this, all research work on this problem accepted the existence of the specificity of facial expressions. Otherwise, because of the reasons so far cited by us the experiments would have lost their meaning. But, excepting a few exceptional cases, experiments so far has not proved this hypothesis. In the same way, the most fashionable view nowadays which limits the relationships between emotional states and their expressions to a few dimensions, through their assumption logically abandons the hypothesis of the specificity of expressions.

Therefore, it is now necessary to accept that the results of the experiments so far has only proven the absence of such clear correspondence between the emotional states and facial expressions.

In spite of these conclusions drawn by experimental results, research workers in the field are still hesitant about this matter. There are, of course, some important points that have not yet been solved and cleared that is the real cause of these hesitations:

1. In the first place, as is indicated by Asch, smile and laughter in happiness and mirth, crying and sighing in unhappiness and sorrow, growing pale and trembling in fear states etc., are all common and diffuse. For this reason, the expressions that are fundamental to the perception and interpretation of feelings and the emotional states certainly carry some important cues. An experienced and sharp observer makes great use of their presence as much as of their absence in his judgments. In a certain situation if the expression expected to happen in that situation, is not given by the person concerned, then, it is accepted as an evidence for the concealment of an emotional state by him.

2. Besides this, it has also been observed that the same expres-

sion can be used in contrasting emotional situations. For instance, smiling which is a natural expression for happiness and mirth, can also be used for sorrow (bitter smile) and even for fear. The author has himself observed during an air raid in London how in a group of young girls some looked fearful and panicky and were crying and some were only simply smiling as a result of the same emotion, while, they were all running for a shelter.

3. Even though emotional states are expressed by single words or terms, it is often forgotten that these mental states vary both in their intensity and kind in accordance with the stimulus situations. For instance, fear varies between a mild worry and a panicky state. And, even though there is a probability for the presence of different expressions for different kinds of fears, they are indicated by single or very few words or statements in the literature. In one of his lectures when the author asked his students to enumerate in which situations they felt fear the number of responses varied between 6 to 13 and described different cases, such as, fear from failure in examinations, fear from mice or snakes, fear from death etc.

4. In contrast to the situation in Item no. 2, sometimes the same emotional mental state may be represented by varying expressions both in intensity and in kind.

5. Again, in accordance with everyday observations, the expressions vary somewhat within a certain range between different individuals and societies; yet they are still recognizable and can be interpreted.

6. Another important point in experiments on the interpretation of facial expressions is the extremely isolated way in which the stimulus material is presented to the Ss. This isolated relationship between stimulus and the response is a habit acquired from the days when psychophysics was overemphasized and which was taken over by the Behaviourists and which generally still persists in psychology.

Besides the simplicity of such a relationship; the attraction supplied by the belief of quantitative exactitude becomes very difficult to abandon, but, its price is also very high.

Let us now turn to experimental results to find out how much of these theoretical points have been verified.

### EXPERIMENT I.

The first part of the experiments which have been carried out will be described briefly since they are, in principle, similar to those of the workers already known. When these experiments were made, the only

works in English with which I was familiar were, with the exception of Charles Bell's and Darwin's works and literature in German and French, those of Feleky, and Landis' first paper mentioned in the 1929 edition of Woodworth's «Psychology».

The materials used for these experiments were obtained from the photographs in the third volume of Dumas' Textbook and from Kruckenberg's «Der Gesichtsausdruck des Menschen. (1920)» To obtain the necessary photographs and films for the experiment, the following conditions had to be satisfied:

1. Photographs or films had to be taken in a natural social situation, along with the stimulus, recording the introspection of the subject without his knowledge of the process.

2. If the stimulus situation, which is expected to evoke the desired emotion, is to be recorded in the laboratory artificially, then, it would be necessary to record the expression of only one emotion at each session, and if the photographing had to continue throughout the same day it would then be advisable to use a different subject for each type of emotion. When it is desired to obtain a pure expression (not necessarily a specific one) connected with a certain mental state, before starting the experiment, it would be necessary for the subject to be in a normal, natural state, i. e. free from the effects of an earlier emotional state. Since it was difficult for us to fulfill these requirements, it was thought the existing material would be better to use. In any case the aim of these experiments were to repeat the previous ones made in this field by different workers.

The photographs taken from Kruckenberg included practically every emotion imaginable. All these photographs, over 100 in number, were shown to 10 subjects with the following instructions; «After carefully observing the emotions and feelings expressed in the pictures to be shown to you now, express your judgement right away».

When the judgements obtained in this manner were examined, I found that none of the conclusions arrived by the subjects agreed with the expressions which the pictures were meant to convey with the exception of the ones showing «joy», (and even these were described by similar feelings such as «laughter», «happiness», «gladness», «merriness», etc.) In only two of the pictures the correct judgements exceeded 50 %.

When the judgements from a picture sometimes exceeded 50 %, this was, with the exception of two photographs, either an opposite emotion to that expressed in the picture, or, belonged to a different emotion altogether. For instance, a picture which showed surprise

was judged to the extent of 70 % as «fear» (including «horror») while only 15 % judged it as «surprise», or else, its complete opposite. In this way only two of the pictures scored more than 50 % correct judgements.

Of the 55 photographs taken from Kruckenberg only 4 are mentioned here. The first photograph, is a picture taken by Kruckenberg himself. A 12 year old girl is being frightened by a bicycle pump bursting behind her; the photograph having been taken just at this moment.

Although the picture was meant to express «fear», of the 16 judgements given by the ten subjects, 4 were «gladness», 3 «laughter», 4 «pleasure», 3 «joyfulness», and 2 were either «laughing», or «crying».

Of the second picture although it represented a meaningless grimace, the 12 judgements included the following: 3 of them «boredom», «making faces», «vainness», saying, «what shall I do now?», «the spoken word has left a negative impression», «he has come in contact with something he dislikes», «he is not pleased», saying, «has it really happened?». The third picture represents a purely mechanical facial expression (due to the itching of the nose); the judgements of this were as follows: twice; «he is thinking», twice; «attention», three times, «he is looking at something in front of him», «he is busy with something which gives him pleasure», «he is remembering things that he has done», «he is playing a musical instrument by hand and singing», «he is annoyed», «he is angry», «he is listening to something», The expression assumed by a stutterer when speaking was represented in the fourth picture, on which the following judgements were given; twice, «boredom», three times, «bodily pain», twice, «attention», twice «he has misunderstood something», «anger», «fear», «surprise», «he has seen something».

Summarizing the results of the experiments of the first part, the following points may be brought out:

1. Any facial expression when shown separately in itself cannot be definitely and clearly interpreted. A photograph representing any particular emotion is mistaken for other similar emotions: (for instance, «joy», «gladness», «happiness», «laughter», «merriness», enjoyment etc, cannot be distinguished). In fact, sometimes emotions which were the opposite or far removed from the original were mistaken one for the other; in this way, «laughter» is taken for «crying»; and «anger», «fear» and «surprise» for each other.

2. The facial expressions described in this manner have several meanings, namely, a certain facial expression is amenable to various interpretations at once; it is not confined to a single interpretation.



3. Most of the subjects, when judging an expression, always had in mind a situation.

How is the failure to interpret facial expressions from single photographs to be explained? What is the reason for this incorrect and incomplete judgement?

Darwin, who was the first to carry out an experiment of the type described above, was the first to give an answer to this question: according to him these photographs could not be correctly interpreted because they do not really show the emotion which they are desired to show. Following Darwin, Feleky repeated the experiments by taking the photographs himself, so that no doubt could be placed on their correctness, and this led him to find the cause in the subjects: «It must be kept in mind that a part in the variation in the judgements of the same photograph is due to ignorance of the meaning of real facial expressions and to the ignorance of the accepted terms used».

Other workers either laid the blame, like Darwin, on the badness of the pictures, or, like Feleky, considered the cause to be the lack of ability and the ignorance of the subjects. It is also pointed out that expression shown on a photograph is static as against the dynamic nature of facial expressions. I think the most plausible reasons have been covered by the explanations.

When the answers as given above pose a problem in themselves, it appears that the solution of the main question is well nigh impossible. For, when the criterion of correctness or incorrectness of an expression depends on the ability to interpret the person judging it, when we have no other standard, it is not possible to know whether to lay the blame on the photograph or on the one judging it; unless one of them is accepted without doubt as subject to no error, or established as near certainty as possible.

Thus with this in view, C. Landis, by bringing about truly objective situations, attempted to excite his subjects and photographed them.

Despite the violent swearing by the subjects in certain scenes and their throwing some of the furniture at the experimenter, even though there was little doubt of their emotions, there was still uncertainty as to their expressions. In spite of this, Landis made those subjects, whose emotions were well expressed, repeat the expressions by inducing them to remember some of the same situations, and photographed them again.

Although there was a difference between these two kinds of expressions, the latter gave better results from the point of view of interpretation.

**M. Sherman**, besides taking moving pictures of expressions, actually showed the reactions of the subjects directly to the observers. In this experiment too, there was little difference between the interpretations of photographs, films or direct observations. It was only the knowledge of the stimulus situations which had a positive influence. Sherman may be criticised for having used babies only a few days old as his subjects of observation, whose expressions are not yet differentiated.

It is not only because of the fruitless speculations to which they lead, but also from consideration of the direction which the experiments now follow that we think it not worth while to delay over these points.

In studying the possibility of improving the ability of the subjects to interpret, **F. H. Allport**, after stating that this is possible to a certain extent, mentions that besides artistic ability, interest, being a member of a large family, etc, and the situation is also a factor. In his latest papers, **C. Landis** subscribes to the same view, namely that the situation is a factor in the interpretation of expressions. (*Jour. of Gen. Psychol.*, 1929, Vol. II.)

In fact, the second of the experiments, which are to be described now, show that the situation is not only a factor but is the main factor in the interpretation of facial expressions. For this reason, we thought of producing expressions within situations, and have them judged in this context, in order to examine the role played by the situation. Since it was practically impossible to bring out and record a normal situation in the laboratory, I attempted to solve the problem in as simple a manner as possible. Since the influence of situation, and the effect observed is so evident, even these simple experiments are sufficient to demonstrate the point.

## EXPERIMENT II: A) PRELIMINARY EXPERIMENTS

With this in view, it was thought of making use of films comprising of different scenes and representing a single situation. When it was found impossible to obtain a continuous film containing clear and different situations, it was tried to get hold of film scenes depicting clear situations. It is possible to obtain photographs of such scenes from the English magazines, «Picture Show» and «Picturegoer». In these periodicals the pictures depict the scenes of situations fairly fully, and are described quite well.

In order to find out whether the photographs obtained from these periodicals, about 60 in number, did or did not depict a situation, I

showed them to various subjects and requested them to describe the situation represented in the photograph and to interpret the facial expressions of the persons in the scene. As a result of these preliminary experiments ten photographs were selected (\*): these ten photographs depicted the following ten situations :

Figure (1) A man is introducing his new wife to his old wife.

Figure (2) A father and mother pose with their child born ten hours ago.

Figure (3) A gangster who has returned home from a crime, finding his wife and his daughter with a police cadet, thinks that the latter is there to arrest him. At this moment his wife is telling him that their daughter is engaged to the cadet.

Figure (4) A man is teaching his wife billiards.

Figure (5) An actor about to go on the stage for the first time is unable to put on his tie from excitement: a fellow actress is giving him a hand.

Figure (6) A sculptor making love to his model is caught suddenly by his wife.

Figure (7) A young woman is caught in a mountain cottage with a man; she is obliged to marry him against her will.

Figure (8) A man is ill; he is about to die; his wife is nearby.

Figure (9) There is a quarrel between the man and his son, and his mother is intervening.

Figure (10) The servant of an Hungarian Lord is elected to parliament as a representative of the opposition party; the lord is sneering at this, at which his daughter (who is in love with the servant) becomes angry.

## B) THE MAIN EXPERIMENT.

These ten photographs were shown to the ten subjects in the following way: In each photograph the situation was exposed to a different degree. First, it was covered so that only the face of one person in the photograph remained visible, and, in this way it was shown to the subject who was asked to observe the emotion implied by the facial expression, and to describe it without long delay. When the facial expression of this person had been described, the expressions of the other persons in the photograph were shown similarly and described

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(\*) In selecting these photographs another point kept in mind, was that they should represent as many important emotions as possible.

in turn, until the whole situation was exposed. The point of this preliminary method was to hide the aim of the experiment from the subject and so to eliminate the influence of suggestion. We shall see the important role of this when we come to examine the attitude of the subjects. But, against these advantages there was the great disadvantage of decreasing the immediate influence of the situation, hence, we were obliged to discontinue it. Again, for this reason it has not been recorded in the tables the judgements by the subjects of the facial expressions of the other persons in the photograph. The only judgements included in the tables were those given when the situation was excluded and when the situation had been completely exposed. Despite this elimination, it is still not possible to include here an abstract of the tables of all experiments; hence only a few representative figures will have to suffice. In addition to these, I also give the verbatim report of reactions (exact protocol) to several photographs in order to give an idea of the progress of the experiments. The subjects taking part in these experiments as in the previous ones, were University students, mostly studying psychology, between the ages of 19 and 22.

First subject: Medical student; Figure (1); Date of experiment: 5.1.1939. (The first woman on the left is shown.) His comments were as follows: «She is speaking to a man, is being invited by someone, perhaps to a dance; nevertheless indecisive, is deciding whether to accept or not, is in a somewhat - difficult position, indecisive» (the photograph is then fully exposed) and the subject says, while laughing, «Oh, it's quite the opposite» The man has been frightened, is surprised; is irresolute and does not know what to do or say»; (of the one in the middle), «the woman is proud and also surprised»; (of the one on the left, first shown) «this woman has decided to do something definite, or she is glad at the success of the thing she has done and is watching attentively».

Experimenter — «They are newly wed; he is introducing his wife»

Subject — «In that case the man is thoughtfully watching, and does not know what to say under the circumstances. His new wife is pleased and proud and is closely watching the other woman, who appears to despise her, nevertheless she is pleased too».

Experimenter — «She is his former wife».

Subject — «Yes, the man is in a difficult position. The new wife shows pride and contempt; the former wife's expression includes a little sorrow and pain although she appears pleased.»

The following points stand out in these experiments:

1. The interpretation of an isolated facial expression is altered

immediately after the situation is visually revealed. We see here a complete transformation: (where previously the expression was judged as «indecisive», it is now stated that «it is definite.») This alteration in the expressions continues throughout as the situation is being completed. In this connection verbal instruction has a similar effect to visual exposition. (We see this from the change of the judgements of the three subjects concerning the above photograph.)

2. There is a tendency on the part of the subject to fit his original judgement into the new situation, (e.g. having judged it as «glad» in the first instance, he then preserves this by saying that with «gladness there is some sorrow and pain»).

Two more protocols, again about Fig. 1 are included which contain practically the same points.

Subject: Student of Philology. Date of experiment: 13.12.1938. (of the first woman on the left) «there is a little gladness and a little surprise on her face.» (The photograph is fully exposed); «she has a somewhat reluctant appearance, shyness. I can observe surprise in the one on the right.» (of the second woman in the middle) «a certain attentiveness and some amazement.» Exp.— «This is his new wife, he is introducing her to his former wife.» Subj.— «Oh, now it is completely changed. I don't see much difference in the middle woman. The man has a hesitant and frightened aspect; and is worried. There is some pretence on the part of the woman on the left», (the former wife).

Third Protocol.

Subject: Student of Psychology. Date: 31.12.1938.

(Again of the first person from the left). «She is watching someone with amusement. Or she has seen someone she had never seen before; or else is looking at someone she is meeting for the first time. The lines on her face indicate that she has met someone or is pointing at someone.» (The photograph is exposed.) «Well, that is just it; she is at a meeting, she is holding a friend's hand and asking how she is. The man does not know the woman and is therefore asking, (What is happening?) The first woman is looking at the other woman's dress and closely watching her friend. The other (the second woman) is natural and is only looking at her face.»

Exp.— «This woman (the first woman) is the man's first wife, and he is introducing her to his new wife».

Subj.— «This woman, (the first woman) is in a mocking mood, wants to ask sarcastically, is this her? The new wife is a little proud. The man is in the position of studying the situation.»

It sometimes happens that some similar or somewhat dissimilar

expressions can fit into a certain situation. Of the various judgements given prior to the exposing of the situation, one or two which fit the situation determine the judgement when the situation is exposed.

But even here it is evident that the situation has a determining influence. As opposed to this, it sometimes happens that a single expression can fit into several situations; in this case the expression remains fixed despite the change of situation. Nevertheless, these do not constitute an exception to, but are a special case of the fundamental rule. In order to demonstrate both these and the influence of the situation, not only on the facial expressions but also on the posture of the body, and on the gestures, the protocols corresponding to two other photographs are given below.

Subject : Student of Philology; Fig. 4; Date of Expt: 7.1.1939. (The lower part of the photograph is hidden.) «They are both gay, are watching something nice and following it with interest. This may be a child, baby or a lovely animal. (The photograph is completely exposed). The subject, saying «aha» and laughing at length, says «it has altered tremendously», and continues to laugh. «Yes, the man is teaching the girl a game.»

It is clear that although the subject admits the tremendous alteration, this alteration belongs to the situation he had in mind and not to the facial expression.

The protocol by the same subject of Figure 5 is given below. (The woman's face only is to be seen.) «She is laughing about something; she is not very merry; it is not a natural laugh. There is something in front of her, in which she is interested.» (The man's face only is to be seen). «Is he ill? He may be lying down. The expression on his face is not likely to be laughter; he is thinking of something; perhaps he is not much interested in what is being said». (The photographs is completely exposed. The subject laughs again.) «It is obvious that the man is annoyed». Since the initially judged expression by the subject can fit into this situation, he sticks to his original judgement.

Subject: Student of Philosophy; Fig. (4); Date: 4.1.1939.

(Only the faces of the persons are seen in the photograph.) «They are both looking at something and laughing. A child they are fond of is standing in front of them.» (The photograph is uncovered.) «They have been playing billiards.»

Again the same subject. Figure (5).

(The woman's face only is shown.) «The woman looks at something and is laughing, is showing affection for something.» (The man's face only is shown.) «The woman has recounted something and is

laughing, the man, saying «Is that so?» and nodding his head, laughs and says, «It isn't so but let it be so.» (The photograph is completely exposed) «Aha, I should have expected this, the woman is tying his necktie, and he is pleased.»

Although it is felt desirable to give some of the data included in the tables of these experimental results, the impossibility of summarizing them here in any way makes it necessary to regard three figures as sufficient. One of these figures is the number of judgements given by the subject before the situation became known; the second is the number when the situation became known; and the third is the relation of the change of the judgements between the two position.

The number of judgements given by the ten subjects about the first person shown in each of the covered photographs was **281**. The number of judgements given by the same ten subjects about the same person in each of the completely exposed photographs was **141**, which is practically half the previous number. This ratio is high because of the inclusion of three photographs in which the number of judgements given in the two cases was very close. If these three were excluded the ratio would be nearer 30 to 40 %. The third figure is the percentage of the alteration of the judgements in the two cases, and it is 84%.

### C) CHECK EXPERIMENT (EXPERIMENTUM CRUCIS).

The main object of this experiment, which was carried out to give greater confidence in the results of experimental findings, was to investigate the influence of situation under more rigid conditions of control: I wished to find to what extent situation could alter an expression which was not a result of that situation. The result obtained in this manner from this experiment was to be used as a measure of the influence of situation. It is to be recalled that in the experiments described in the first part expressions of emotions somewhat similar to each other, or dissimilar emotions, such as «fear», «anger» or «surprise», were mistaken one for the other.

It would have been sufficient for our purpose to find whether a situation did or did not make an expression which did not belong to it, and change the expression to one which fitted that situation: for example, by putting an expression from a situation depicting «fear» into a situation representing «surprise» or «anger». If an expression which does not show much of an emotion were to be placed in one of the emotional situations named above and the positive result be obtained, a more exacting condition would no doubt be created regarding the influence of the situation.

With this in view, I obtained two different photographs of a person, one emotional, the other with a fairly normal expression. Thus, the face in the normal picture was isolated by photography and by the same means were transposed to replace the face in the emotional picture. The proportion of change was over 90%.

### EXPERIMENT III. EXPERIMENTS WITH FILMS:

This experiment was repeated under more rigid and difficult conditions with the introduction of a film. In order to have the film as close to natural and normal life as possible it was thought best to have it represent a scene from the daily life of a family. One afternoon, while the whole family are having tea happily together the butler brings in some fruit in an antique bowl that has a great ancestral value for



the family. When placing it on the table he suddenly drops and breaks it. The whole family become very angry with the butler; the master fires him immediately. Then, the eldest daughter takes a piece of the broken bowl from the floor and looks at it with great pity. The whole family undergoe a state of sorrow at what they have lost and the associated memories it evokes. In the fourth scene, the butler comes back and asks for his salary. They refuse to pay it. Then, he suddenly produces a gun from his pocket and begins to threaten the family. This short film, thus, represents four basic emotions, namely, «joy», «anger» followed by «sorrow» and «fear». The actual film was made in a film studio in Istanbul, acted by two professional and three amateur actors representing the family of five with two daughters and a son.

While the scene was being acted, every actor had to portray both the emotion connected with the particular scene along with two other different emotions. So that, in every scene there were 10 different emotions or psychological states along with the main emotion connected with that scene. When a new scene began, all the actors started to act the emotion proper to that scene first and then 20-30 seconds later only one of the members began to undergo a different emotion for a period of 10 seconds, at the end of which time while he reverted back to portraying the main emotion, the subject, next to him started a different one for the same length of 10 seconds, etc. In this way, during a period of 2 to 2½ minutes 10 different emotions along with the main one were represented. These emotions were «joy», «anger», «sorrow», «fear», «surprise», «anxiety», «hatred», «pain», «contempt», «disgust», «distain».

This film was shown to three different groups of university students. The first and second group of subjects were initially given information concerning the film and were told that they would be seeing four scenes of different emotions. At the end of the first scene, the film was stopped and they were given the following instructions: They were asked whether they had seen any other emotion represented in this scene along with the main emotion, «joy», if so, to write down what they were. After answers had been collected, the second scene was shown, followed by the same instructions to the subjects, and so on with the third and fourth scenes.

The third control group was not given any information or instructions about the film. At the end of the first scene, the subjects were asked whether the scene had been convincingly acted or not; when their answers to this question had been collected they were then asked whether they have seen any other additional different facial expressi-

ons; if so, to write down what they were. The same procedure was repeated with the rest of the scenes. The statistical results concerning these three groups of subjects are shown below:

**GROUP I**

The Mean, Standard Deviation, and Probability of the judgements for each scene.

1. Scene: Joy N (number of subjects) : 59.

1. Scene Joy N (number of subjects) : 59.

$\Sigma fx = 104$	$M = 1.76$	$\sigma = .953$
R 0-4.	$\sigma M = .122$	
	$t = 14.19$	
	$p < .001$	

2. Scene : Anger. N = 60

$\Sigma fx = 84$	$M = 1.40$	$\sigma = .916$
R 0-4	$\sigma M = .118$	
	$t = 11.86$	
	$p < .001$	

3. Scene . Sorrow. N = 58

$\Sigma fx = 113$	$M = 1.95$	$\sigma = 1.204$
R 0-4.	$\sigma M = .158$	
	$t = 12.34$	
	$p < .001$	

4. Scene . Fear N = 59

$\Sigma fx = 94$	$M = 1.59$	$\sigma = 1.149$
R 0-4.	$\sigma M = .149$	
	$t = 10.67$	
	$p < .001$	

**GROUP II**

1. Scene : Joy N = 43

$\Sigma fx = 40$	$M = .93$	$\sigma = .975$
R 0-4.	$\sigma M = .148$	
	$t = 6.28$	
	$p < .001$	

2. Scene : Anger. N = 43

$\Sigma fx = 34$	$M = .79$	$\sigma = .764$
R 0-2	$\sigma M = .116$	
	$t = 6.81$	
	$p < .001$	

3. Scene : Sorrow. N = 42.  
 $\Sigma fx = 44$  M = 1.05  $\sigma = 1.170$   
 R o-4  $\sigma M = .180$   
 t = 5.83  
 p < .001

4. Scene : Fear. N = 41.  
 $\Sigma fx = 26$  M = .63  $\sigma = .852$   
 R o-3  $\sigma M = .133$   
 t = 4.73  
 p < .001

### GROUP III.

1. Scene : Joy. N = 26  
 $\Sigma fx = 27$  M = 1.04  $\sigma = .847$   
 R o-3  $\sigma M = .153$   
 t = 7.38  
 p < .001

2. Scene : Anger. N = 30.  
 $\Sigma fx = 34$  M = 1.13  $\sigma = .850$   
 R o-3  $\sigma M = .153$   
 t = 7.38  
 p < .001

3. Scene : Sorrow. N = 29.  
 $\Sigma fx = 28$  M = .96  $\sigma = .967$   
 R o-3  $\sigma M = .179$   
 t = 5.36  
 p < .001

4. Scene : Fear. N = 29.  
 $\Sigma fx = 44$  M = 1.52  $\sigma = 1.122$   
 R o-4  $\sigma M = .208$   
 t = 7.30  
 p < .001

From these results it can be seen that the mean in every group could not even reach two (it was 1.995 with the first group in the «sorrow» scene). This means that, in every scene, out of the different emotional expressions, on the average, only about two could be perceived. The rest of eight expressions were either absorbed with the emotion proper to that scene or were interpreted with a subtle change which fitted that scene.

We believe that this experiment dispels any doubt concerning the influence of situation on the interpretation of facial expressions.

### Results

When the results obtained from these experiments were collected the following points became established:

1. Facial expressions which are separated from the situation and shown in an isolated form can not be clearly and definitely interpreted. There is either a confusion of similar or even dissimilar expressions occur. But, by making such an expression fit itself through selection and differentiation to the situation continues until it is definitely completed.

2. The situation influences the interpretation not only of facial expressions but also bodily posture and gesture.

3. In judging facial expressions most of the subjects have in mind one or more situations. If one of their judgements accords with the exposed situation it remains unchanged. But even here the situation plays a selective and determining part by distinguishing one or two from out of the numerous judgements.

It can thus be concluded that in the interpretation of facial expressions the principle part is played by the situation and not by the facial expressions. Therefore, an expression which has been isolated from its situation can not be correctly interpreted. It seems that the most suitable design reflecting a natural situation should employ two of these three items, and that the situation should be included in both cases.

Besides these experimentally proved and established results, several others present themselves which can only be pointed out here. During these experiments, and also in experiments which have not been described here, some observations were made. Some of the subjects were puzzled after having described the facial expression of some person, and when they were asked the reason for this, or even before they were asked, they stated that they had seen the person in some film or

other, and that the face appeared familiar to them; and when the situation had been exposed they exclaimed, «Yes, I remember now I saw it in a certain film.»

This is a situation which no doubt often happens in almost everyone's daily life. When we meet in the street, or elsewhere, a person who works in a shop, cafe or restaurant where we have only been at once or twice by chance, we fail to recognize the person until we meet him again by chance where he works or if we remember in which the place he works. I give another example of this case concerning a different field altogether. I take my example from the experiment carried out for a different purpose, by two English phoneticians. While these two phoneticians were travelling in London the following idea occurred to them: Using the correct stress and intonation, what are the minimum clues necessary for an English man to understand a sentence? A little later one of them is asked something, and he says, «to ko ro» his questioner understands him, and says, «thank you». The second phonetician in his turn asks someone working at a place they happen to be «to' 'mo' kre» and get the reply, «Yes, sir». It would be interesting to know how many readers have understood these sentences, it is unlikely that many can do so. The first was said in a bus in reply to the conductor for the fare, the complete sentence being, «Tottenham Court Road». The second sentence was asked of the guard in an underground station when going to Notting Hill, and when completed should read, «Are you stopping at Mornington Crescent?». It is certain that the situation greatly influenced the comprehension of these sentences. We do not wish to say anything very dogmatic about recognition here, but it seems to us, in order to be able to recognize things or persons with whom we are not well acquainted in various situations, it is necessary to see them again in the position or situation in which we first perceived them» (\*).

### Conclusions

Under these circumstances, there does not seem to be much meaning in the study of facial expressions when isolated from the situation either through photographs or through films. In reality, in order to study facial expressions in an appropriate way, we must present them with the stimulus, and interpret them according to the situation within which they have occurred. To accomplish this it is

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(\*) This has been meanwhile experimentally proved by one of my co-workers in the recognition of faces: S. Özbaydar, «The role of situation in recognition of faces.» Unpublished Ph. D. Thesis, 1957. University of Istanbul.

necessary to photograph the face of the person, whose facial expression it is desired to record, with the stimulus situation, and without the knowledge of the person concerned. Even then it is not possible to tell that the inner experience and the facial expression are in accordance or adequate. To record inner experience would not give us a criterion. In cases of definite failure ( i.e.in cases where, in spite of all the fulfilled requirements, facial expressions are not correctly interpreted,) there is no way out than to accept the discordance between facial expressions and emotions as Darwin did, or to conclude the subjects as ignorant and unintelligent as Feleky did.

This dilemma is due to the erroneous and prejudiced assumptions of the experimenters and to their depriving themselves of such a unique and important criterion as situation. A facial expression, and generally any psychic reaction, is made as a result of a stimulus occurring in a situation and within that situation. Therefore, the facial expression that is to be interpreted forms the part of a whole, in most complicated cases, between one or more human beings and the sociopsychological relationships that they form, or by some other stimulus, or from objects within the environment and especially from knowledge about the situation.

That is, expression is not independent of a stimulus-situation in spite of having been provoked by it. So, isolating expression from the situation and presenting it to the observer make him to attach a meaning to the absent situation by filling the gap of the situation, and things happening within this situation through this single clue.

Thus, the experiments conducted under these conditions about facial expressions become nothing but guess-work. In reality, we, in daily life, try to guess the reasons for a man's emotional changes, when we have no clue as to their reasons, by trying to find the possible situations that may arouse such facial expressions. When we are aware of the situation, we are so certain of the emotional content of a person that we only start to observe his facial expressions when he attempt to hide them. Thus, facial expressions are a clue to and a natural manifestation of situations. What is important for us is not the look of the facial expressions but the adequateness of the reactions of the person to that situation.

The following scene that has been observed in London during the Second World War is worth mentioning because it illustrates our points. The author of this paper came to the gate of Kensington Park opening on the Bayswater Road, at the subway station of Queensway, opposite this gate a group of 40-50 people were coming out. Just at that

moment an urgent air raid alarm was given. A great majority of the people all of a sudden started to run towards the park, paying no attention either to the traffic lights or to the cars whose drivers were as panicky as they were. They were all acting as dangerously as they possibly could. The most reasonable step would have been to go quickly in to the shelter of the underground station. But the sudden impact of the alarm as soon as they came out of the station caused them to panic. What were their facial expressions? Youngsters were giggling, some of the elderly people were shouting, but they all had the expression of a normal person trying to catch a train.

It would be impossible to force a subject to believe that there was an expression of fear on their faces of a photograph without a clue to that situation. Similarly, it is also necessary to have information about the situation in order to interpret the real meaning behind a smile; whether it means, not a sign of happiness, but of anger, or shyness, or embarrassment, and (in some cultures) sorrow.

Lastly, we could ask the question whether knowledge about the situation would always inevitably lead to the right interpretation?

As in every perceptual, understanding and learning processes, so also in this case, it is connected with the amount of knowledge about the situation the ability to understand and conceive. For this reason, erroneous understanding or knowledge of situation ends in wrong interpretations of expressions. Such experiences are common in daily life. Marcel Proust gives a very good example of this while interpreting the look in the eyes of a young girl in his novel «*Albertine Disparue*», how it changes from one situation into the other, or to be more correct, how it changes when he learns about the real situation.

All the experiments, and observations, force us to accept a new theory and method, where situation is essential for the interpretation of facial expressions. Not only expressions but the investigation of all behaviour will depend on such an approach.

### Summary

Ten pictures representing a definite and clear scene were selected from normal films to be used in the investigation of the factors contributing to the interpretation of facial expressions, and the role of the situation in this process. In these pictures, the main character was first presented to the subjects isolated from the situation, and then within the situation, with additional information to ten subjects, and they were asked to interpret their facial expressions in both cases. In

these experiments, it was found that an expression isolated from the situation was interpreted differently from the same expression within the situation. According to the results of this experiment, it was found that the situation halved the number of judgements about an expression compared with the number of judgements given in isolated situations. It also concentrated the responses, among many possibilities, on the one that fitted the situation most, and in many cases changed it. The influence of situation was also important on gestures and postures. In the check experiment a normal face was interchanged with an angry one in an «anger» situation in the pictures and this face was interpreted by the majority as showing anger or some related emotions.

This experiment was repeated under more rigid conditions with a film. A group of five acted scenes of «joy», «anger», «sorrow» and «fear» and each actor for ten seconds acted two other emotions in each scene. Thus in every emotional scene, ten other emotions were represented. This film was shown to three groups of university students, and they were asked whether they observed other emotions besides the main one, and if so, their names and numbers. As a result it was seen not more than two emotions could be perceived in each scene on the average.

This indicates the distinctness of the influence of situation, and it implies the necessity of a new approach and method where situation is taken as a basis in the investigations of facial expressions.



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