

THE RECOGNITION OF FACIALLY EXPRESSED
EMOTION:
WITH PARTICULAR REFERENCE TO
MENTALLY ABNORMAL OFFENDERS

James Barrie Ashcroft
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ERRATA

The following references were inadvertently omitted:

Abelson RB 1983 Whatever became of consistency theory?
Personality and Social Psychology Bulletin 9 37-54

Abelson RB and Sermat V 1962 Multidimensional scaling of
facial expressions. Journal of Experimental Psychology 63
546-664

Avery-Clarke CA 1983 Sexual offenders: special programmatic
needs. Correction Today October 68-71

Boucher JD 1969 Facial displays of fear, sadness and pain.
Perceptual and Motor Skills 28 239-242

Bower GH and Cohen PR 1982 Emotional influences in memory and
thinking: data and theory. In: Clark MS and Fiske ST (eds.)
Affect and cognition. Hillsdale Erlbaum

Engen T, Levy N and Schlosberg H 1958 The dimensional analysis
of a new series of facial expressions. Journal of Experimental
Psychology 55 454-458

Exline RV 1972 Visual interaction: the glances of power and

preference. In: Cole J (ed.) Nebraska Symposium on Motivation
University of Nebraska Press

Frijda NH 1968 Emotion and recognition of emotion. In: Ekman
PW, Friesen WV and Ellsworth P (eds.) 1972 Emotion in the
human face: Guidelines for research and an integration of the
findings. New York Pergamon

Frijda NH 1969 Recognition of emotion. Advances in
Experimental Social Psychology 4 167-223

Frijda NH 1986 Action tendencies in emotions. Report
Psychology 5.2.86.98. Department of Psychology University of
Amsterdam

Frois-Whitmann J 1930 The judgement of facial expression.
Journal of Experimental Social Psychology 13 113-151

Gladstones WH 1962 A multi-dimensional study of facial
expression of emotion. Australian Journal of Psychology 14
95-100

Hastorf AH, Osgood E and Ono H 1966 The semantics of facial
expressions and the prediction of the meanings of
stereoscopically fused facial expressions. Scandinavian Journal
of Psychology 7 179-188

- Jackson HF and Moffat NJ 1987 Impaired emotional recognition following severe head injury. *Cortex* 23 293-300
- Kauranne U 1964 Qualitative factors of facial expression. *Scandinavian Journal of Psychology* 5 136-142
- Kirritz SA and Ekman P 1971 The deviant judge of affect in facial expression: Affect specific errors. In: Ekman P, Friesen WV and Ellsworth P 1972 *Emotion in the human face: Guidelines for research and an integration of the findings*. New York Pergamon
- Nummenmaa T 1964 The language of the face. In: Ekman P, Friesen WV and Ellsworth P 1972 *Emotion in the human face: Guidelines for research and an integration of the findings*. New York Pergamon
- Nummenmaa T and Kauranne U 1958 Dimensions of facial expression. In: Ekman P, Friesen WV and Ellsworth P 1972 *Emotion in the human face: Guidelines for research and an integration of the findings*. New York Pergamon
- Osgood CE 1955 Fidelity and reliability. In: Quastler H (ed.) *Information theory in psychology: problems and methods*. Glencoe, Illinois Free Press 374-390
- Osgood CE 1966 Dimensionality of the semantic space for

communication via facial expressions Scandinavian Journal of
Psychology 7 1-30

Pfeifer R and Nicholas DW 1981 Towards computational models of
emotion Proceedings of the 7th International Joint Conference
on Artificial Intelligence 2369-71

Rutter DR 1976 Visual interaction in recently admitted and
chronic long-stay schizophrenic patients. British Journal of
Social and Clinical Psychology 15 298-303

Sloman A and Croucher M 1981 Why robots will have emotions.
Proceedings of the 7th International Joint Conference on
Artificial Intelligence 197-202

Thompson DF and Meltzer L 1964 Communication of emotional
intent by facial expression. Journal of Abnormal and Social
Psychology 68 129-135

Toda M 1982 Man, robot and society. The Hague Nijhoff

Triandis HC and Lambert WW 1958 A restatement and test of
Schlosberg's theory of emotion with two kinds of subjects from
Greece. Journal of Abnormal and Social Psychology 56 321-328

Toner HL and Gates GR 1985 Emotional traits and recognition of
facial expression of emotion. Journal of Nonverbal Behaviour

Spring 48-66

Wegman C 1985 Psychoanalysis and cognitive psychology. London
Academic Press

Woodworth RS 1938 Experimental Psychology New York Henry
Holt

Yesavage H, Benezech M, Cessaldi P, Bourgois M and Addad M 1983
Arson in mentally ill and criminal populations. Journal of
Clinical Psychology 44 128-130

Yarnell H 1940 Firesetting in children. American Journal of
Orthopsychiatry 10 282-286

The subsequent references should be presented in the following
order:

Scherer K R 1974 Acoustic concomitants of emotional
dimensions: judging affect from synthesised tone sequences. In:
Weitz S (ed) Nonverbal communication. New York Oxford
University Press

Schlosberg H 1954 Three dimensions of emotion. Psychological
Review 61 81-88

Segal ZV and Marshall WL 1986 Discrepancies between self-efficacy predictions and actual performance in a population of rapists and child molesters. *Cognitive Therapy and Research* 10(3) 363-376

Shannon C E 1948 A mathematical theory of communication *Bell System Technical Journal* 27 379-423, 623-656

Shannon C E and Weaver W 1949 *The mathematical theory of communication*. Urbana University of Illinois Press

TO JEN

It was true that as one watched life in its curious crucible of pain and pleasure, one could not wear over one's face a mask of glass, nor keep the sulphurous fumes from troubling the brain, and making the imagination turbid with monstrous fancies and misshapen dreams.

Oscar Wilde
"The Picture of Dorian Gray"

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THE RECOGNITION OF FACIALLY EXPRESSED EMOTION
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The aim of this research was to investigate whether certain groups of mentally abnormal offenders demonstrated identifiable differences in their ability to recognize facially expressed emotion.

In particular, it might be supposed that part of the difficulty that those people with histories of extreme interpersonal violence have, whether including abnormal sexual interactions or not, may be understood more clearly by a reference to their ability to detect accurately the expression of emotion in their victims.

Early results from the study suggested that sex-offenders may demonstrate difficulty in the accurate recognition of facially expressed fear. Comparisons were made with samples from the United States of America and with a British population.

Further studies showed that the relationship between emotions as perceived by mentally abnormal offenders may help to clarify the nature of the differences between the groups studied.

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CHAPTER ONE

Emotion and Emotional Expression

The literature of Psychology is replete with references to "Emotion" or "Affect" and indeed the whole subject has been a major area of controversy for more than a century. In modern usage, "emotion" has multidimensional references that include: verbally expressible subjective experiences; concomitant internal physiological changes; and observable motor behaviour (for example, facial expression, gesture and posture). These fundamental aspects are richly documented in the literature and art of the world.

While emotion may have subjective dimensions, not every inner experience can be called an emotion. Emotions may often be characterised by visceral change; yet not every alteration in blood pressure or perspiration is held to be emotional. These manifestations may be the result, for example, of temperature changes in the environment. People often weep when they say they are sad, yet such responses can occur when there is local irritation of the eye, or even when the person weeping reports

happiness. Any definition of emotion, therefore would have to qualify the relevant phenomena, to note the conditions that bring them about and possibly to take account of the consequences. Such a definition would have to rest on well defined mechanisms of emotion that could be empirically established. Whilst during this century, many objective indicators of emotion have been discovered, we cannot yet be said to have attained a fully comprehensive understanding of the phenomenon.

Many approaches have been made to the study of emotion from the early descriptions of religious ecstasy to the overt dismissal of the concept completely (e.g. Duffy (1938, 1941). Wundt (1832-1920), who is often called the "father of experimental psychology" based his theories of emotion on the study of feelings generated by sensory stimuli. He concluded that there were three dimensions of emotion.

Lust- Unlust which recurs in more modern work as pleasant- unpleasant or positive- negative.

Spannung- Losung or tension release

Erregung- Beruhigung or excitement- relaxation

Whilst it can be argued perhaps that only the first of these has stood the test of time, the other two do seem to relate to factors which seem to emerge from modern empirical research.

Charles Darwin's "Expressions of the Emotions of Man and Animals" (1872) had a profound influence on the systematisation of emotion research. In his principle of "serviceable" association of habits, he suggested that emotional expressions are evolutionary remnants of previous adaptive behaviour persisting (even uselessly) in a mild form (e.g. snarling as a sign of aggression). In his principle of "antithesis", concerning the multiplicity of emotional expression, he put forward the theory that "habitual actions" serviceable to "certain states of the mind" were replaced by contrary ("antithetical") movement patterns that automatically tend to appear during the "opposite state of mind" even if they appear to have no adaptive function. Darwin was suggesting that even "useless" emotional expression (and consequently its subjective correlates) derives from adaptive functions. Darwin's influence

can clearly be seen in a later trend that dealt with emotions as a group of behaviour controlling processes rather than as "mental" entities.

The study of emotion as an aspect of Physiological Psychology was and, to some extent, still is a major pre-occupation of Academic Psychology. The work of William James (1842-1910) had a shock wave effect on the way emotion was construed.

According to James

"An object falls on a sense organ and is apperceived by the appropriate cortical centre; or else the latter, excited in some way, gives rise to an idea of the same object. Quick as a flash, the reflex currents pass down through their pre-ordained channels, alter the condition of muscle, skin and viscus; and these alterations, apperceived like the original object, in as many specific portions of the cortex, combine with it in consciousness and transform it from an object-simply- apprehended into an object- emotionally- felt"

In its classic popularisation, this meant that one does not run from an unexpected encounter with a bear out of fear; one is frightened because of running away. The Danish physician Carl Georg Lange (1834-1900) stressed changes in the circulatory system in his own version of the theory. It seemed to both James and Lange that emotional qualities were the result of perceived changes in bodily activity that followed sensory impressions and an enduring line of research has emerged from this theory.

The American physiologist Walter B. Cannon (1871-1945) drew attention to the close relationship between emotional activity and the sympathetic function of the autonomic nervous system. While the evidence is that Cannon's focus on sympathetic activity was too narrow, much research was stimulated which investigated the function of the physiology of emotion. The subsequent literature on the physiology of emotion is enormous as is that on the relationship between motivation and emotion.

It is not the intention to detail the enormous literature on emotion in general. Certainly, as a central issue of psychology, the history of thought on the subject reflects the

development of the academic discipline. Theories of emotion and motivation abound from the basic categorical work of Allport (1924) to the more recent functionalist process approach of Frijda (1986), incorporating the information processing ideas of Abelson (1983), Toda (1982), Sloman and Croucher (1981), Pfeifer and Nicolas (1981), Wegman (1985) and Bower and Cohen (1981).

It is, however, the communication of emotion which has begun to produce interesting and fruitful avenues of research and it is this which concerns the current studies.

The classification and systematisation of emotional expression has been and still is, a major component of psychological research. Schlosberg (1954) produced a theory of emotion which has perhaps survived better than some. His theory was that emotions, as we describe them exist as dimensions rather than discrete entities. For him there were three main dimensions.

- 1 Sleep- Tension (Intensity)
- 2 Pleasant- Unpleasant
- 3 Attention- Rejection

Intensity refers to the degree of overall activation of the

organism and Pleasant- Unpleasant to the evaluation of the stimulus occasioning the emotion. For Gray et al.(1983) Attention- Rejection is similar to Piaget's (1953) Accommodation and Assimilation. Attention corresponds to Accommodation and implies being affected by the stimulus either willingly as in happiness or interest, or forcibly, as in fear, while rejection corresponds to assimilation and implies imposing one's self on the situation, either by rejecting the stimulus, as in disgust or destroying it as in anger. Although the dimensions are characterised as being orthogonal, the emotions are not distributed evenly in the space described by them. As can be seen there are no emotions in the quarter characterised by Rejection and Pleasure.

Joy (Happiness) is described as Pleasant, Low intensity and Accepting (PLA).

Sadness is described as Unpleasant, Low intensity and Accepting (ULA).

Fear is described as Unpleasant, High Intensity and Accepting (UHA).

Anger is described as Unpleasant, High intensity and Rejecting (UHR).

Disgust is described as Unpleasant, Low intensity and Rejecting (ULR).

Surprise is described as Pleasant, High intensity and Accepting (PHA).

The Face and the Expression of Emotion

Despite a significant degree of pessimism about the usefulness of studying facial expression as a key to understanding emotion, a pessimism which led Hebb (1946) to conclude "These studies have led to the conclusion that an emotion cannot be accurately identified by another observer", this avenue of approach is now considered to be one of the most important areas of non-verbal communication.

Duchenne (1862) produced an atlas of the anatomy of the expression of emotion. In it he listed the muscles of the face which act together to produce the facial expressions associated with emotions. As long ago as 1872, Darwin pointed out certain similarities in the expressive behaviour of men with different cultural backgrounds. He saw these as being due to characteristics inborn in all men but this opinion has been repeatedly challenged. Birdwhistell (1963,1967), for example has advanced the hypothesis that no expressive movement has a universal meaning and that all movements are a product of culture and not biologically inherited. However, Eibl-Eibesfeldt (1972) has shown that expressive movements between cultures lie not only in such basic expressions as smiling, laughing, crying and the facial expressions of anger, but in whole syndromes of social behaviour. Furthermore, these syndromes can even be observed in those born deaf and blind. In anger, for example, across cultures can be seen opening of the corners of the mouth in a particular way and by frowning, clenching of fists, stamping on the ground or even hitting objects. In happiness or social approach, smiling and nodding appears to occur across cultures. There may, however be slight variations of this which have different meanings. The eye-brow flash, for example in Japan may be considered indecent and

Eibl-Eibesfeldt suggests this may be one reason for the use of eye-make-up in some cultures. The fact that the raising of the eye-brow also may occur in the expression of surprise, has also been suggested as evidence of a ritualisation of some aspects of the display of "attention" signals. Some researchers (e.g. Hunt 1949, La Barre, 1947) have claimed that facial expression is a unique set of culturally bound conventions that have little relevance to spontaneous facial expression. Ekman (1968), Ekman and Friesen (1970), Ekman, Sorenson and Friesen (1969) and Izard (1968, 1970) have however produced evidence that seems to refute strongly this contention. The Ekman et al. studies in particular looked at eleven literate and one pre-literate cultures and found many common features of emotional expression. There is also strong evidence that that very young infants show very similar emotional expressions and reactions (Tomkins 1962,1963; Izard, 1971). Dittman (1972), proposing a theory of emotional interaction based on a mathematical theory of communication (Shannon, 1948; Shannon and Weaver, 1949) considered individual and cultural differences in choice of channel for emotional messages; so some people and cultures may favour voice rather than face.

Tomkins (1962) and Tomkins and McCarter (1964) reintroduced the James- Lange theory of emotion into contemporary research. They argued that each emotion had a particular pattern of neural firings and associated facial muscle movements. This produced proprioceptive feedback which was the basis of the emotion itself. The implication of this is that when we study facial expression we are studying emotion itself. To some extent this is supported by the work of Exline et al. (1968), who purported to show that facial movements correlate with verbal descriptions of the emotional content of a story when reported. As it happens, this not only revives the James- Lange theory of emotion but also the ideas of Piderit (1886) who was effectively a contemporary of Darwin. Piderit suggested that to think of an object brings about the same facial expression as does the actual presence of the object. Thus the thought of a bitter tasting unpleasant food would cause the mouth to behave as if reacting to a bitter taste; the recollection of an unpleasant scene would affect the eye region as if an unpleasant sight were being avoided. Also, he suggested that a pleasant thought gives open eyes and that pleasant emotions are expressed by receptive movements, while unpleasant emotions result in movements to impede the reception of stimuli. There is also evidence that facial expression can also intensify or even generate emotional

feelings (Lanzetta et al., 1981) and Plutchik (1980) has argued that personality differences are largely differences in habitual tendencies to feel or show particular emotions in response to environmental events.

Harrison (1973) categorised research on the face into that which is "primarily interested in emotion" and that which is "interested in other factors e.g. the face as a regulator (Vine 1970)". There is also the division between those interested in a "dimensional approach" to the study of emotion (e.g. Frijda 1969) and those who take a "category approach" (e.g. Ekman, Friesen and Ellsworth 1972).

The Dimensional Approach

As indicated above, Schlosberg (1954), based on the ideas of Woodworth (1938), proposed the dimensional nature of emotion. Frijda (1969) pointed out:

"Recognition of emotion can be conceived of as a process of multi-dimensional placement rather than as placement in one of a number of categories. Moreover, the multitude of emotions as distinguished in the language appears to be

reducible to combinations of a far smaller number of dimensions."

Some advantages accrued from this approach:

1 Ordered or interval data analysis procedures could be used

2 Dimensions could be employed that represented connotative meaning which may be more relevant to facial expressions than the denotative emotion categories. (Osgood 1966)

The essential element of this approach is that the emotions would be reduced to as few dimensions as possible. In his research Schlosberg showed good agreement among observers for his three-dimensional scheme (Engen, Levy and Schlosberg, 1958) as did Triandis and Lambert (1958), using Greek subjects.

However, Thompson and Meltzer (1964), employing live subjects instead of still photographs of trained actors, failed to demonstrate the circularity of the scale. Additionally, they were unable to identify all six emotion poles claimed by

Schlosberg. Similarly, Abelson and Sermat (1962) only found agreement with the Pleasant- Unpleasant dimension and could not find either of the other two dimensions. Gladstones (1962) obtained three dimensions, only two of which were clearly identifiable. Nummenmaa and Kauranne (1958) and Kauranne (1964) employed a similarities and differential technique respectively and obtained support for only two of Schlosberg's dimensions (Pleasant- Unpleasant and Attention- Rejection). The story is a general one, that other researchers have found some confirmation of the dimensions but significant differences as well. Osgood (1955,1966) found Pleasant- Unpleasant, Quiet- Intense, Quiet- Active (or "Control") and Interest dimensions from a factor analysis of ratings of live subjects. Hastorf, Osgood and Ono (1966) used still photographs of one person and a factor analysis of twelve rating scales and came up with four factors whereas Frijda (1968,1969) reported the discovery of six and seven factors respectively. Ekman, Friesen and Ellsworth (1972) noted a number of methodological problems as they saw it in most of the studies to that date. In summarising the research on a dimensional approach they state:

"It seems doubtful that consistent findings about dimensions of emotion will be found until investigators

utilize stimuli which have been shown by other means to represent a number of different emotion categories until they sample the behaviour of many different persons, and until they select scales which systematically represent all or, at least, many of the aspects of emotion which might be judged from the face- appearance, feeling, action, consequences, etc." (Ekman, Friesen and Ellsworth, 1972.

The Category Approach

In contrast, one can simply make the assumption that there is a set of basic emotions and that these categories cannot be reduced any further. Woodworth (1938) on the basis of the results of empirical studies proposed the categories of:

Love, mirth, happiness

Surprise

Fear

Suffering

Anger

Determination

Disgust

Contempt

Other researchers have identified categories as follows

Plutchick (1962)

Coyness, happiness, joy

Surprise, amazement, astonishment

Apprehension, fear, terror

Pensiveness, sorrow, grief

Annoyance, anger, rage

Tiresomeness, disgust, loathing

Attentiveness, expectancy, anticipation

Acceptance, incorporation

Tomkins and McCarter (1964)

Enjoyment, joy

Surprise, startle

Fear, terror

Distress, anguish

Anger, rage

Disgust, contempt

Interest, excitement

Shame, humiliation

Osgood (1966)

Complacency, quiet, pleasure, joy, glee, worried laughter

Surprise, amazement, bewilderment, awe

Fear, horror

Despair, boredom, dreamy sadness, acute sorrow

Sullen anger, rage, stubbornness, determination

Annoyance, disgust, contempt

Expectancy, interest

Pity, distrust, anxiety

Despite variations in emotion words within categories and some differences in the number of categories obtained, considerable agreement can be seen. Based on their own and previous investigations, Ekman, Friesen, and Ellsworth (1972) proposed Happiness, Sadness, Fear, Surprise, Anger, Disgust- Contempt,

and Interest as the seven major primary affect categories. In addition, they identified a number of methodological reasons why some of the findings might be inconsistent. To identify facial expression adequately, a sufficient sample of facial behaviour was considered to be necessary. They noted that few employed more than a small number of stimulus persons and most judgements were based on photographs of posed stimuli. What is more, observers were generally limited in their response to pictures to the categories of verbal description provided by the authors, which, in fact varied greatly from study to study. That this was important was demonstrated by Boucher (1969) in which Woodworth's categories of Fear and Suffering or Tomkins and McCarter's categories of Distress and Anguish could be judged as either Fear, Sadness, or Pain, or a combination of two of the terms.

Of particular importance to the current studies is the fact that "confusion" among observers in rating facial expression may also lead to discrepant findings. In particular, some emotions may be frequently confused with one another. Tomkins and McCarter (1964) described these errors as being "common confusions", where a minority of judges are consistent in their rating of facial expression (and where a majority of observers use another

emotion category). For example, Fear, Surprise and Interest appear related to each other, given that Surprise is frequently mistaken for Interest and Fear for Surprise. Similarly, Anger and Disgust- Contempt are often confused.

Another source of confusion of particular importance in the current studies is the ostensible presence of "affect blends" which may occur in facial expression. A study by Kiritz and Ekman (1971) illustrated this point. Observers who were allowed to indicate an affect blend did so for stimuli which, in other studies, had yielded approximately a 60% to 40% distribution of judgement responses (divided between the two categories making up the blend). They also found that when the proportion of judgement responses were more skewed (i.e. 80% to 20%), most observers were unable to perceive a blend and there was a consistent minority who showed "uncommon shared confusions". Ekman et al.(1972) have claimed that this may represent the identification of secondary affect categories based on blends of primary affects.

In 1976, Ekman and Friesen published the results of a series of studies which attempted to produce a set of pictures of facial affect about which most observers would agree, of a range of

people expressing Happiness, Sadness, Fear, Anger, Surprise and Disgust and of a high technical quality. Whilst this was not the first series of such photographic stimuli, (e.g. Frois-Wittman, 1930; Schlosberg, 1954) this series of 110 pictures represented a serious attempt to overcome the limitations of earlier efforts. Hundreds of photographs were studied over a period of several years and eventually produced a series which the authors claimed yielded consistent agreement among observers about the emotion being expressed. Those who posed the expressions were not specifically asked to pose an emotion, as it were, but were instructed to contract or relax certain facial muscles known to be associated with particular emotional expressions. All of the pictures in the set were judged to show the intended emotion by at least 70% of the observers. More than half of them were correctly judged by 90% of the observers. It is this series of pictures which is used in the current studies.

Individual differences, Non- Verbal Communication and Social Skills

As Harrison (1973) pointed out, some of the researchers on facial expression of emotion will be primarily concerned with

the phenomena as an aspect of social regulation and control. This, in general is where much of the contemporary work on facial expression is located. Ekman (1972), whilst basically supporting the innate nature of facial expressiveness has developed a "neuro- cultural theory of facial expression of emotion". This advocated both an innate basis for the connection between certain emotional states and given facial muscles (the "facial affect programme") and a cultural overlay of display rules, which can intensify, deintensify, neutralise or mask the facial display to comply with the normative demands of specific situations in a culture. Much of the general approach of social skills training sees these culturally controlled non- verbal behaviours as constant modifications of performance in the light of feedback (Argyle, 1969). Clearly part of this, and an important part (Exline, 1972; Ekman and Friesen, 1967), consists of information derived from the facial expression of others. However, as Dittman (1972) speculated when considering individual differences in performance, the channel of communication may vary, not only as a function of culture, but also as a function of age and depth of social relationship. Strangers may communicate through the most universally understood channels; i.e. words, stereotyped facial expressions and gestures. As they get to know each other

better, they use more subtle gradations of expression and rely more on subcultural variations common to both or decoded by each member. One critical problem is to discriminate between emotional and non-emotional messages. Haggard and Isaacs (1966) showed that very small changes in facial expression occurring within a fraction of a second ("micromomentary expressions") are a characteristic of some facial displays and might be detected by some but not by others.

Buck et al.(1972) claimed to have demonstrated that women were able to communicate facially expressed emotions better than men. They speculated that women were "externalisers" more than men. However in a later study (Buck, 1973), pre-school children were shown not to have these sex differences in ability, presumably indicating that socialising pressures for males tended to inhibit emotional expression or to facilitate emotional expression in females later in life.

It has been shown that variations in non-verbal communication skills are a significant aspect of study in many areas of psychopathology. Rutter (1976) claimed to show that schizophrenics demonstrated a lower level of gaze than other subjects when interacting with a psychologist in an interview

concerning personal matters, whereas when interacting with other patients or strangers about impersonal matters, their level of gaze was normal. Anxious people also tend to speak faster, more unevenly and with more speech errors. Schizophrenics appear to be less responsive to non-verbal communication (Williams, 1974) and lack stable constructs for emotions and persons (Bannister and Salmon, 1966). Mental patients may also show "leakage" beyond that expected from the cultural rules, from one modality of expression to another e.g. emotions not expressed in the face may show up in postural cues (Ekman and Friesen, 1968). Inadequate neurotics often appear not to attend much to social signals sent by others (Trower et al. 1978). Argyle (1978) has argued that social skills training based on non-verbal communication produces not only improved social behaviour, but also a marked improvement or even "cure" of socially inadequate neurotics. Goldstein (1973) pointed to the value of social skills training in improving the non-verbal behaviour of psychotics. It was claimed that improvements also occurred in feelings of self-comfort although clinical symptoms or the ability to deal with real life problems may not be so readily improved (Trower et al., 1978; Herson and Bellack, 1976). In this context, a number of studies have shown that psychiatric patients have deficits in their ability to recognise emotional

expressions (Cutting, 1981; Dougherty et al.,1974; Muzekari and Bates, 1977; Walker et al.,1980; Zabel, 1979) although Muzekari, Knudsen and Evans (1986) temper this finding with the cautionary note that the context of the emotional expression is very important and that this should be taken into account. Knudsen and Muzekari (1983) claimed that even with normal subjects, the context in which the emotion is expressed could have a significant impact on the perception of that emotion.

Mildly and severely mentally handicapped people appear to vary in their ability to recognise facially expressed emotions. Gray et al.(1983) found that when these people saw photographs showing the emotions of Happiness, Sadness, Fear, Anger, Surprise and Disgust, their overall accuracy in identifying the emotion was found to be correlated with intelligence. In addition, certain specific patterns of confusion were determined. Clinically, the most significant of these was an inability to cope with high intensity emotions (Fear, Anger and Surprise).

Borod et al. (1985) have shown that brain damaged people, especially those with right hemispheric damage used facial expression less frequently than either normals or those with

left hemisphere damage. Moreover, the emotion content of their speech was less appropriate and more descriptive than affective. Ostwald (1963) showed that patients with brain damage produced fewer high frequency speech sounds. Indeed, a number of studies have shown that brain damaged people, particularly those with right hemisphere damage show disorders of emotional expression (e.g. Borod et al.,1983; Ley and Bryden, 1981; and Tucker, 1981; Bruyer, 1981; Buck and Duffy, 1982).

Jackson and Moffat (1987) showed that those with closed head injuries showed impairment also in the recognition of emotion when viewing facial expression and posture. In particular, they found most difficulty in recognising negative emotions. They suggested four possible explanations of this.

- 1 Specific neural components which deal with negative emotions, were affected. They considered this explanation to be unlikely because of the diffuse nature of this type of injury.

- 2 Head injured people encounter negative emotions more often due to their disturbed behaviour and hence the negative emotional stimuli become more salient.

3 The effect is due to the result of the coping strategy adopted by head injured people in response to highly distressing conditions ("protective mechanisms" identified by Goldstein (1952)- denial, withdrawal and lack of insight).

4 Emotional responses from others also serve as both discriminative stimuli and contingent reinforcers for appropriate social and emotional behaviour. A systematic impairment in the accurate recognition of such social cues may promote the maintenance and possible genesis of poor social skills and anti- social behaviour commonly found following severe closed head injury.

Toner and Gates (1985) have emphasised that whilst the studies on personality differences and emotional expression and recognition have thrown up little of outstanding significance, some cognizance of gender difference, the emotion being assessed and emotional state of the observer may be important. Their results indicated that females with an "inhibited, non-assertive personality style" tended to have poorer emotion recognition scores than more socially oriented females. In

contrast, for males, the relationship between personality and recognition scores was much more emotion specific: in particular with Sadness, Fear, Anger, Surprise and Disgust.

We see then that the study of emotion has been and still is a major part of psychology. The expression and recognition of emotion is mapped on our understanding of the way individuals interact in society. We can see how there is a variation between individuals in their ability to see and to respond to the expression of emotion and how the face is a major component in this social behaviour. Our task is now to see how this aspect of human behaviour may be used to help those distressed individuals who continually breach our society's codes of conduct, yet are considered to be so mentally abnormal as to require particular conditions of treatment.

CHAPTER TWO

Mentally Abnormal Offenders

2.1.INTRODUCTION

2.1.1.The Historical and Legal Context

Concerns about the control of anti- social behaviour cannot be said to be an exclusive characteristic of modern times. Indeed, it has been argued (Owens and Ashcroft, 1985) that the history of Government is to a large extent a history of society's attempt to control the excesses of some of its members. Popular fiction has it that mediaeval society's response to anti- social behaviour was characteristically brutal. This is not the case, and it is probable that what we see as more enlightened approaches to dealing with offenders is to some extent a reaction against the extremes of the late eighteenth and early nineteenth century when, for example, (in 1814) three boys, aged eight, nine and eleven could be sentenced to death for stealing a pair of shoes. The great reforms of the nineteenth and twentieth centuries generally worked to "humanise" the

application of the criminal law although the issues surrounding it continue to be in the forefront of political debate.

We can identify three types of justification for the legal response to offending (Walker, 1968). These are the Retributive, the Expressive or Denunciatory and the Reductive or Utilitarian. The Retributive justification holds that the offender "deserves" society's response. However, particularly in this country, the response is "limited" to the extent that the punishment should match the offence; hence we have the statutory "maximum" for particular sentences. The Expressive or Denunciatory approach holds that society wishes to make an important public statement about the offence and may or may not have a retributive element. For example, the use of suspended sentences can be regarded as declaring disapproval of an offence without the actual imposition of that sentence. The Reductive or Utilitarian justification views sentencing as reducing the frequency of offences in one or more of the following ways:

- 1 Deterrence of the offender, by the memory of the offender.

- 2 Deterrence of imitators, by the publication of the sentence.

3 Reformation of the offender, by education. This would include notions of habilitation and rehabilitation as well as recently popularised ideas of "community service".

4 Education of the public to take a more serious view of the offence.

5 Protection of the public by the incapacitation of the offender.

Whilst the psychologist would consider retribution and denunciatory approaches to sentencing to be beyond their normal frame of reference, the utilitarian approach certainly is not. Indeed one might argue that a central aspect of the work of a psychologist with offenders is to attempt to reduce both the probability of re-offending, whilst at the same time reducing the distress both of the offender and/or of others concerned such as victims or other members of society.

2.1.2. The Special Hospitals and the Mentally Abnormal Offender

A more enlightened approach to the treatment of mentally abnormal people from the mid- nineteenth century onwards also paralleled the development of humane treatment for prisoners. The Bethlem Hospital and subsequently Broadmoor Hospital reflected the acknowledgement that mental abnormality may lead certain people to extremes of anti- social behaviour and that care for these people may have to pre-empt any notions of society exacting its penalty on them. However, the work of Clinical Psychologists in this field, as Howells (1987) has pointed out, is not strictly defined by the term "criminological" which encompasses a range of topics which usually fall outside their area of interest. Nevertheless, Clinical Psychologists find themselves working with people whose asocial or anti- social behaviour is an important aspect of their difficulties and many of these find themselves in conflict with the law. The Special Hospitals represent one aspect of provision in England for the care, treatment and control of some mentally abnormal offenders. Since the publication of The Report of the Committee on Abnormal Offenders (1975), further provision for the treatment of mentally abnormal offenders has

Figure 2.1.
All Special Hospitals

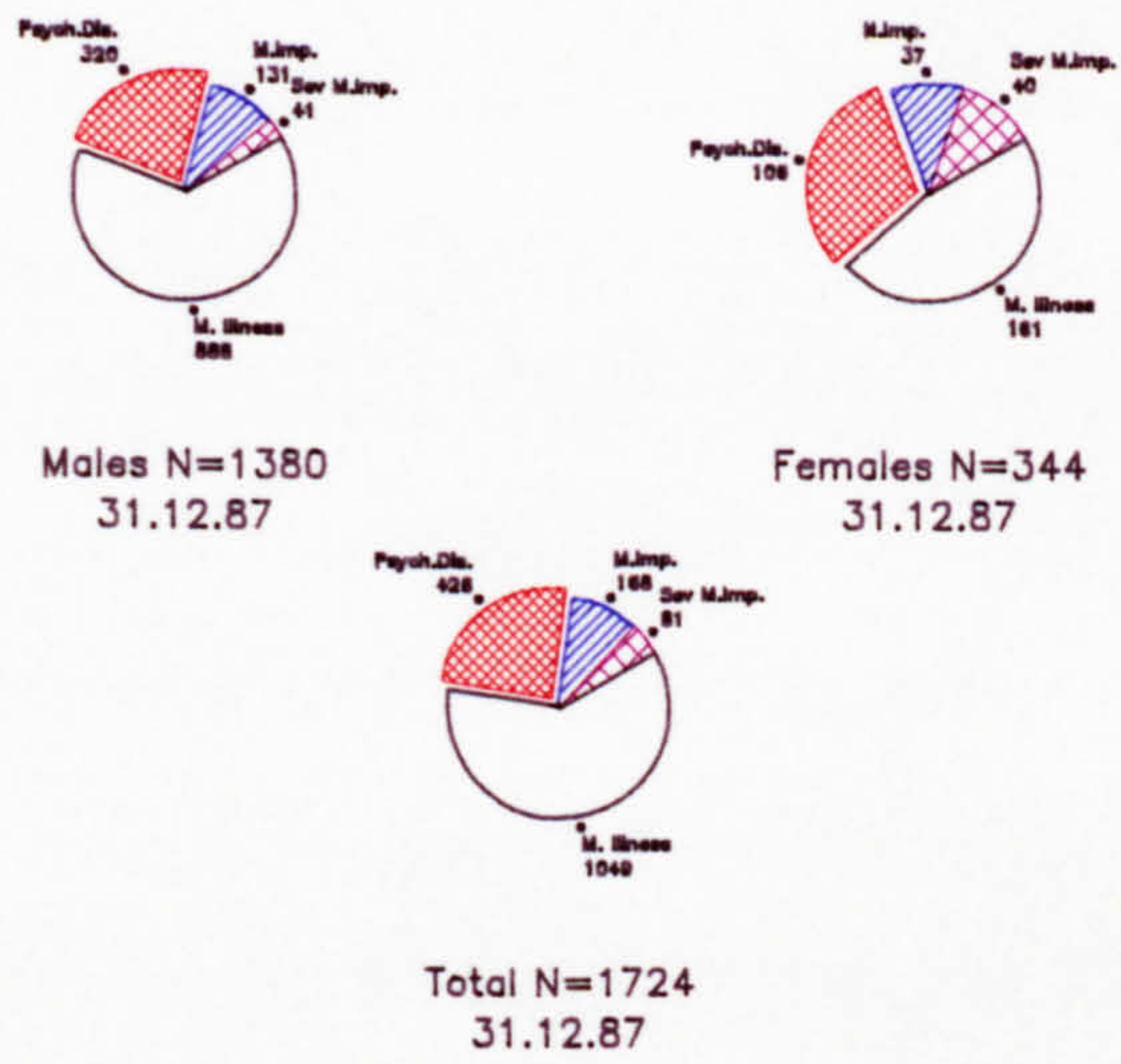


Figure 2.2.
Distribution Across Hospitals:31.12.87

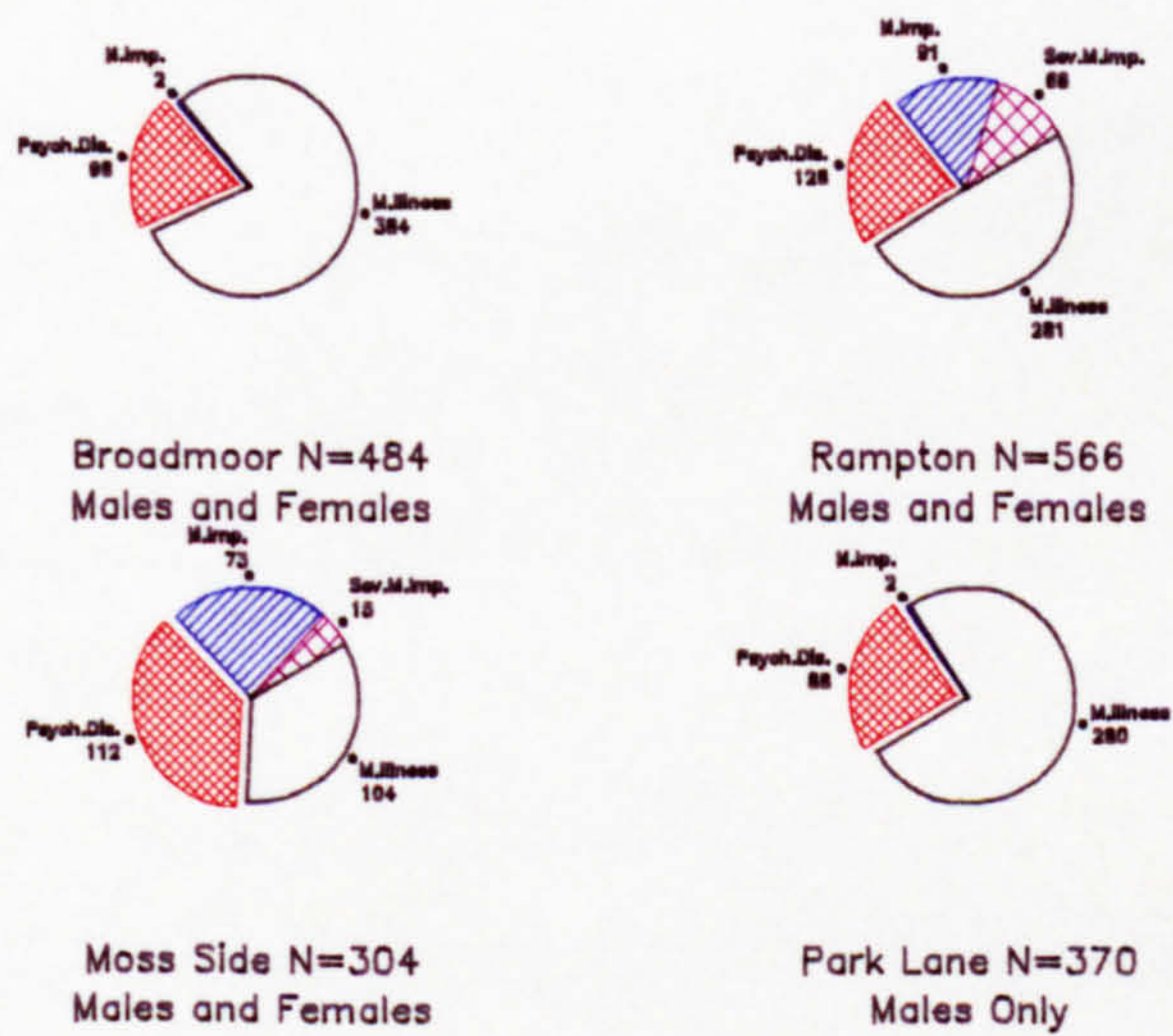
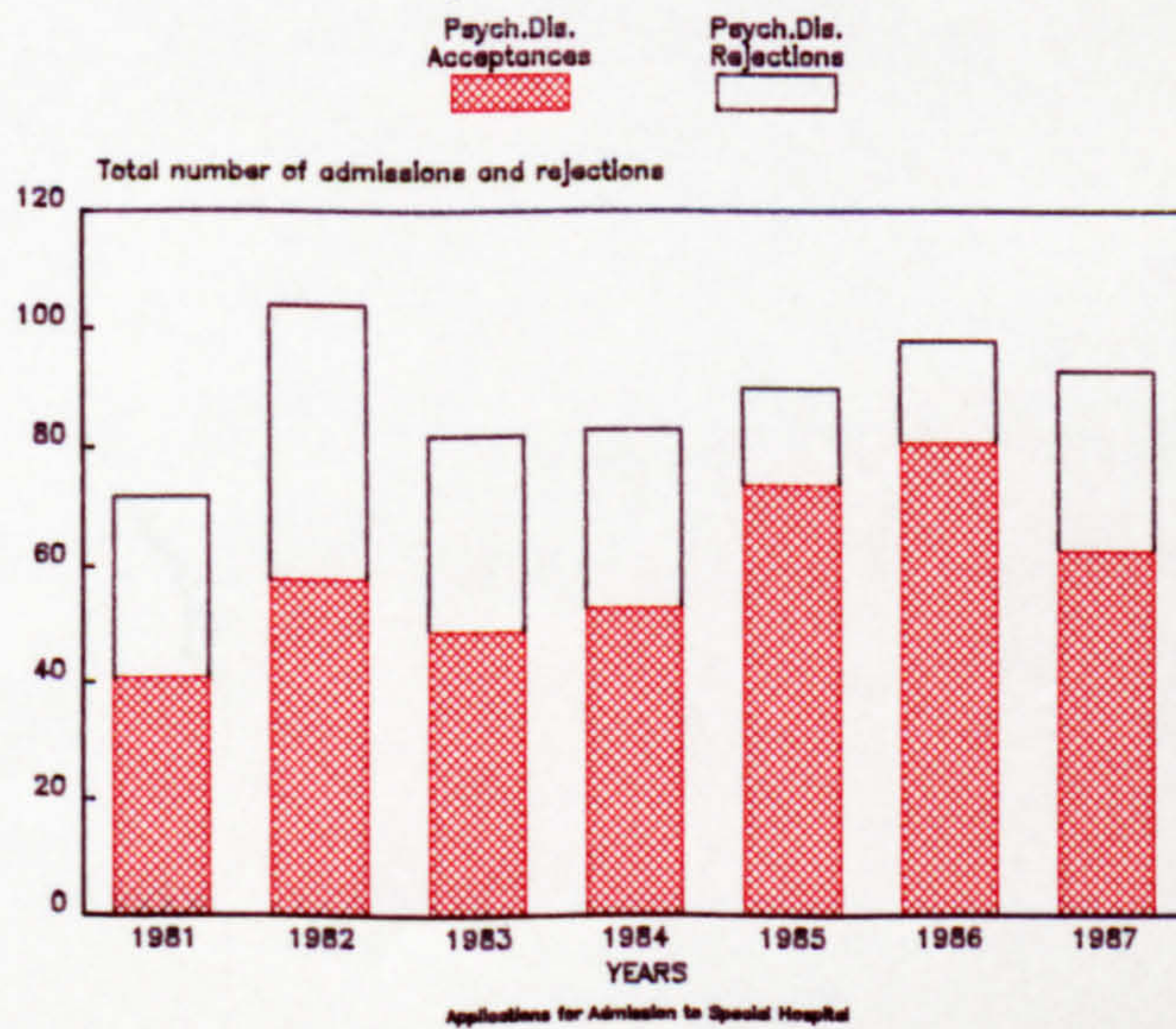


Figure 2.3.
Psychopathic Disorder



occurred in the form of Regional Secure Units which attempt to provide assessment and treatment in conditions of security less than that of the Special Hospital. The development of psychological and psychiatric services for this group of people have developed in a more or less idiosyncratic way . Pressures on services such as the progress of the care in the community programme which effectively moves the locus of the majority of services from the large institutions into the community at large and the ostensible overcrowding of the prison system, make ordered development of services very difficult. Classification criteria for admission are not considered to be, even in administrative terms, very clear. All the patients admitted to the Special Hospitals are admitted formally under the various sections of the Mental Health Act (1983), and are classified as suffering from:

- 1 Psychopathic Disorder or
- 2 Mental Illness or
- 3 Mental Impairment or
- 4 Severe Mental Impairment, or various combinations

of these. Figure 2.1. shows the distribution of these categories in the Special Hospitals. While this medico- legal classification system may have some face validity, it cannot be said to represent a psychological or psychiatric system of

definition in anything other than a crude way. Nevertheless, it has been shown that other classification systems based on more psychological approaches may correspond to an extent with this system (e.g. Blackburn, 1986; Blackburn and Lee-Evans, 1985).

The different Special Hospitals do not specialise in the care and treatment of particular patient groups although some exclusion categories do operate. Park Lane Hospital, the most recently built, does not, at the moment admit women patients or those deemed to be suffering from Mental Impairment or Severe Mental Impairment. Similarly Broadmoor Hospital, at the moment does not provide services for those suffering from Mental Impairment or Severe Mental Impairment. Both Moss Side Hospital and Rampton Hospital admit patients of all classifications.

Figure 2.2. shows the distribution of the various classifications among the four Special Hospitals. Moss Side has, for a number of years tended to cater for young males who are considered to require Special Hospital treatment. Black (1973) showed that the majority of patients admitted to Broadmoor had previous convictions for serious assault, including serious sexual assault. However, though increasingly less common, some patients may be admitted as a consequence of being serious management problems, such as exhibiting extreme

self- injury.

2.2.PSYCHOPATHIC DISORDER

2.2.1. Psychopathic Disorder :The Medico-Legal Classification

Of particular interest is that group of people deemed to be suffering from Psychopathic Disorder. In the terms of the Mental Health Act (1983), this means "a persistent disability of mind (whether or not including significant impairment of intelligence) which results in abnormally aggressive behaviour or seriously irresponsible conduct". Recent statistics published by the Department of Health indicate that of the 1724 patients detained in the four Special Hospitals, 426 (24.7%) were deemed to be suffering from Psychopathic Disorder (Special Hospitals Annual Statistics for 1987). Of these, the vast majority (78.2%) are "restricted" patients in that they cannot be discharged without the permission of the Home Office. Also the vast majority of these patients are men (75.1%). A lower proportion of women (65.1%) admitted under this classification are restricted patients. Although the total number and the proportion of patients admitted with this classification is now smaller than in, say, 1975, there is some evidence of a growing

trend in the proportion of admissions over rejections for admission in recent years (Ashcroft, 1986). In 1987, 67.7% of applications for admission in the Psychopathic Disorder category were accepted. Figure 2.3. shows the years 1981 to 1987. The proportion of patients resident in Moss Side Hospital who are classified as Psychopathic reflects the overall proportion in the Special Hospitals (24.01%). This group is also that which, perhaps, gives most rise to public concern. The Department of Health and Social Security along with the Home Office published a consultation document in August 1986 in which some of these anxieties were aired. It was considered at that time, that the Home Office favoured a modification of the Criminal Justice Act and or the Mental Health Act to secure the result that a court could make a hospital order on the grounds of Psychopathic Disorder only where it was satisfied that the offender did not need to be subject to a restriction under the Mental Health Act. Effectively, this would have meant that those people suffering from Psychopathic Disorder and requiring a restriction order would have gone to prison. Moves in this direction were opposed by virtually all of the professional bodies working in the field, including the British Psychological Society on the advice of the Special Hospitals Psychologists Advisory Group and the idea was dropped (at least shelved!). It has been argued that

recent developments both in the way this group of people are seen and treated, may be cause for some anticipatory optimism.

It should be noted that despite Black's (1973) finding that the majority of patients admitted to Broadmoor had previous histories of extreme violence to themselves or others, not all patients have exhibited this sort of interpersonal behaviour. Of particular interest in this group are those who show more detached irresponsible behaviour such as fire setting. A recent survey at Moss Side Hospital (Moss Side Annual Report, 1987) reported that this group was, in fact, the largest easily identifiable group in the hospital in terms of the index offence.

2.2.2. Psychopathy :The Personality Disorder

The International Classification of Diseases (ICD 9: World Health Organisation 1978) defines personality disorders as:

"Deeply ingrained patterns of behaviour generally recognizable by the time of adolescence or earlier and continuing throughout most of adult life, although often becoming less obvious in middle or

old age. The personality is abnormal either in the balance of its components, their quality and expression, or in its total aspects"

The third edition of the Diagnostic and Statistical Manual (DSM III: American Psychiatric Association, 1980), when considering personality traits, says these are:

"..enduring patterns of perceiving, relating to, and thinking about the environment and oneself, and are exhibited in a wide range of important social contexts. It is only when personality traits are inflexible and maladaptive and cause either significant impairment in social or occupational functioning or subjective distress that they constitute Personality Disorders"

It is notable that the term "Psychopathy" does not appear in the definitions of personality disorder contained in these manuals but "sociopathic" (ICD 9) and "anti-social personality" are the preferred terms. Although at least one strand of behavioural psychology has tended to undervalue the notions of traditional personality theory (e.g.Mischel, 1968), many social learning

theorists accept that people may display behaviour which is consistent across many settings. Indeed the radical behaviourist will argue that the identification of discriminative stimuli as part of a Functional Analysis (e.g. Owens and Ashcroft, 1982) may predict this. Similarly, personality theorists might argue for an "interactionist" model whereby people create their own environments by enacting behaviours on the basis of goals and outcome expectations (Blackburn, 1988). Certainly the search for a syndrome of psychopathic or anti-social personality is not a new pre-occupation (Cameron and Margaret, 1951). The somewhat sterile notion of "moral insanity" persisted from the introduction by Prichard (1835) to the current definition in the Mental Health Act (Pichot, 1978).

A number of attempts have been made to distinguish types of anti-social personalities. Some have stood the test of time better than others. Karpman (1941) proposed that psychopaths were either primary i.e. characterised by egoistic, uninhibited expression unaffected by conscience or guilt feelings; or secondary i.e. characterised by anti-social behaviour as an outcome of neurosis. This dichotomous arrangement also was part of Karpman's distinction between "psychopathic" people and those

having other types of personality disorder, who he saw mainly relegated to the ranks of the neurotic. This notion was taken up by Cleckley (1976) who proposed 16 criteria of psychopathic personality:

- 1 Superficial charm
- 2 Absence of psychotic signs
- 3 Absence of nervousness
- 4 Unreliability
- 5 Untruthfulness and insincerity
- 6 Lack of remorse or shame
- 7 Inadequately motivated anti- social behaviour
- 8 Failure to learn from experience
- 9 Egocentricity and incapacity for love
- 10 Emotional poverty
- 11 Lack of insight
- 12 Unresponsiveness in interpersonal relations
- 13 Uninviting behaviour, sometimes with alcohol
- 14 Empty suicide threats
- 15 Impersonal sex life
- 16 Failure to follow a life plan

A further analysis of ratings using these criteria seems to boil them down primarily to a factor of Hostility versus Lack of warmth (Blackburn and Maybury, 1985).

Blackburn (1988) has pointed out the difficulty in including criteria relating to anti-social behaviour in a typology of personality. Chronic social deviation or rule-breaking and personality traits are effectively in different universes of discourse and it is perhaps not surprising, that criteria including social references produce heterogeneous groupings.

An alternative way to look at the problem is to concentrate more on the type of behaviour.

2.3. THE VIOLENT OFFENDER

There is an increasing concern in British society about the level of inter-personal violence in every-day life. This may range from that violence displayed by the "football hooligan" or the "Benidorm yobbo" to the ostensible violence shown by three and four year olds "as a consequence" of watching "Tom and Jerry" cartoons. As indicated earlier, there is nothing new in this and it is, perhaps salutary to remember that the level of

violence in Britain really would not compare to that say in France between 1589 and 1608, when no less than eight thousand people were killed as a consequence of sword fighting in duels.

Nevertheless, as mentioned above, Black (1973) showed that a majority of patients admitted to Broadmoor Hospital had previous convictions for serious assault, including sexual assault and in 1986, for example, 30% of Moss Side's resident population was of people whose index offence was assault (excluding sexual offences) or homicide. This is a major section of the hospital population.

A number of viewpoints may be expressed when considering interpersonal violence. Some of these are considered below.

2.3.1. The Biological Viewpoint

Some biologically oriented studies have looked at variables such as Testosterone levels in monkeys (Rose et al., 1971, 1972) and humans (e.g. Doering, 1974, 1975). The direction of causality is, however a problem in this research and while the approach has been popular at different times, as far as the current studies are concerned, its significance is limited.

A second biological approach has been to study genetic influences. There is, for example, some evidence that Down's Syndrome children are easier to manage than a similar group thus supporting the contention that these children are less aggressive. There is also the research that has claimed that those males having the extra "Y" chromosome (known as the "XYY" syndrome) show increased levels of violent behaviour from matched counterparts, (see Mark and Erwin, 1970) although this has been challenged by various workers, such as Price (1978) and Casey et al. (1973), that any violence was more likely to be against property rather than people and by Jacobs et al. (1971) that the incidence of the syndrome is no greater among "violent" sub-groups than among the population at large or indeed that any differences can be explained by different intellectual levels (Wilkin et al., 1976). Again, this has limited relevance to the current studies.

A third biological approach has been to look at neurological factors in violent behaviour. While much of the the early work on electrical stimulation of the brain would lead one to conclude that there is a clear relationship between brain function (or dysfunction) and aggressive or violent behaviour,

more recent work would indicate that this is very much mediated by social and environmental contingencies (e.g. Delgado 1967, 1969). Work with brain damaged people has produced inconclusive evidence of a close link between brain pathology and violence.

On the one hand Gunn and Fenton (1971) in a study of 434 temporal lobe epileptics indicated that violence was rare and on the other Mark and Erwin (1970) noted various similarities between experiences of temporal lobe seizures and feelings preceding a violent attack. It may, of course, also be the case that brain injury is a consequence of violent behaviour.

Nevertheless, a recent survey of patients at Moss Side Hospital has indicated that about 38% of patients have histories of brain injury. That the social mediation of violence is important in brain injury has been shown by Jackson (personal communication) whose survey of over 400 brain injured people in Britain and America showed that violent behaviour seen in these people was related to subsequent frustration due to the handicap imposed by the injury.

2.3.2. The Anthropological Viewpoint

While one may say that anthropological approaches to the study of violent behaviour are beyond the scope of a study on interpersonal communication of emotion in a Special Hospital population, it is important to keep in context the wider implications of society's influence on the establishment and maintenance of expectations in this regard. The people of Tahiti have been described as "gentle and peaceful", for example, as have the Tasaday (Nance, 1975) and the Hopi (Brandt, 1954). On the other hand, the Yanomamo Indians of northern Brazil are extremely violent to each other, a Yanomamo women feeling unloved if her man did not leave her scarred and bruised in his interactions with her (Chagnon, 1977). However, to present cultural peculiarities of this kind as explanations of violent behaviour is at best naive and at worst dangerous, in that it may present warring outgroups with the excuse for such violent intervention as genocide (e.g. the justification for the Indian Wars in nineteenth century America). Attempts to describe such cultural characteristics as being adaptive are also liable to mislead. Harris (1976) proposed an explanation of warfare among the Maring of New Guinea in terms of its overall benefit in ecological and economic terms. However,

Blacking (1983) pointed out, the fact that, say, the Yanomamo are violent now may have seemed adaptive once may not be the case now and indeed may be just the opposite and threaten them with extinction. Also, the simple assertion that sub-groups in the larger society adequately explain violent behaviour is equally flawed. Although such studies may be very interesting, even very useful (e.g. Patrick, 1973), they only go part of the way and we need to consider processes which might be useful in explaining and possibly alleviating violent behaviour.

2.3.3. The Learning Viewpoint

There is a large literature on the learning aspects of violent and generally anti-social behaviour. Techniques such as shaping have been widely used in the training of men and animals to both emit and to suppress violent and aggressive behaviour (Azrin and Hutchinson, 1967; Walters and Brown, 1963). There are now numerous examples of the use of behavioural and social learning approaches in the care and re-settlement of offenders, parts of which have often been programmes to modify violent behaviour (e.g. Phillips, 1968). A number of workers have shown that reinforcers maintaining aggressive behaviour may be relatively arbitrary or may have an intrinsic relationship to

the behaviour (Owens and Bagshaw, 1984). Thus attacking a victim may produce a number of consequences such as crying, defensiveness, submission etc., which may serve reinforcing functions for some individuals and hence help to maintain such behaviour in the attacker. Such consequences may be seen as intrinsic to the behaviour being exhibited and bear an obvious relationship to it. On the other hand, aggressive behaviour may also be reinforced by arbitrary consequences which, whilst desirable from the attacker's point of view may bear no relationship to the type of behaviour. Thus the food with which Azrin and Hutchinson (1967) reinforced attacking behaviour in pigeons would not constitute a form of reinforcement intrinsic to attacking behaviour that signs of hurt on the part of the victim would. Examples of arbitrary reinforcers might be food and sexual contact in the natural environment (or even in a social context) or it might be money (as in "criminal" behaviour) or indeed status and prestige (Buss, 1971).

In a behavioural or functional- analytic approach to the analysis of violent behaviour, it is recognised that besides the role of specific consequences of behaviour, particular antecedents may also need to be considered. Such antecedents may be known

behaviourally as discriminative stimuli, stimuli which influence the probability of occurrence of some subsequent behaviour. Perhaps the most widely studied of such stimuli are models of the behaviour which the subject might later imitate (e.g. Bandura et al., 1959). Modelling has been of particular concern in the context of the influence of the media on subsequent violence (e.g. Brody, 1977) and much of the research in this field has been concerned with the determination of factors which influence whether or not a model will later be imitated.

In addition to the role of behavioural models, however, it is possible to note other discriminative stimuli. One obvious possibility here concerns stimuli which might be seen as indicating a potential attack, causing a subject to show violent behaviour pre-emptively. Such considerations lead to the possibility that recognition of the emotional state of another person may be of particular importance in determining the likelihood of interpersonal violence. Not only may the stimuli permitting such recognition be important as discriminative stimuli, as described above, but also as potential reinforcers. In particular, it may be noted (as discussed above) that changes in perceived emotional state of a victim might constitute a form of natural reinforcement of violent or aggressive behaviour.

Similarly such stimuli might also act as "inhibitors" of violent behaviour.

2.3.4. The Cognitive Viewpoint

The paradox, often reported (e.g Howells, 1983), in the relationship between severity of violent behaviour and personality measures of control and hostility (Megargee, 1966, 1971) is usually considered in terms of the concepts of undercontrolled and overcontrolled personality types, with many seriously violent offenders not conforming to the "popular stereotype of the violent offender, being characterised by traits of social inhibitedness, low assertiveness and denial of anger rather than by impulsive aggressiveness". Megargee explained this in terms of a theory of overcontrol which stated briefly that some people may be excessively overinhibited about the expression of anger and hostility and that such persons may summate frustrations over a long period of time until their threshold is exceeded and an explosive and excessively violent act is precipitated. The introduction of the term "Anger" into the scenario of violent behaviour brings with it the implication of emotional and cognitive processes. Arguably the most comprehensive analysis of the role of cognitive structuring in

the genesis of anger has been provided by Novaco (1978). In brief, Novaco's contention is that "aversive events function as provocations because of the way that they are construed". Other violence inducing ways of construing the social environment have been described such as "malevolent intent" (Epstein and Taylor, 1967; Greenwell and Dengerink, 1973; Nickel, 1974) and "paranoid cognitions" (Howells, 1981). These attributional processes are considered to be particularly relevant in determining the affective and behavioural states which follow aversive environmental stimulation (Ferguson and Rule, 1983). Grieger (1982) sees people who hold these cognitive styles as "time bombs ready to explode".

While there is now a substantial literature on the "cognitive styles" of violent offenders, including analyses of violent events and how they might be described by the offender (Toch, 1969, 1975 [1], 1975 [2]), analyses of sensitivities to the emotional expression of others are minimal. We may study in detail the extent to which a person may become angry (e.g. Biaggio, 1980; Biaggio et al., 1981), but not the extent to which anger, or indeed fear may be perceived in others.

Thomas- Peter (1988) has proposed that psychopaths, irrespective

of sub- group within this description tend to make more extreme judgements, especially in respect of social interaction and that they make these judgements quicker than normals. This type of impulsivity is reported by Heckel et al. (1981) and is reported by Ross and Fabiano (1985) in some types of offender. This may be construed as inadequately developed problem solving skills (e.g. Camp et al., 1977; Feuerstein, 1980; Kendall and Finch, 1979). Whereas some individuals may never have learned to stop and think before they act, the thinking of others may just be poorly developed perhaps as a consequence of the history of reinforcement where fast action paid off better than stopping to think. Individuals who have never learned that it helps to solve a problem by stopping to analyse it, are not likely to do so. Indeed, it has been postulated that stopping increases anxiety and is to be avoided (Heckel et al., 1981). The subtle cues of facially communicated emotion may therefore not be perceived as readily by this group of people.

2.2. THE SEX OFFENDER

If any one group of offenders is likely to arouse public disgust it sex offenders. Paedophiliacs in particular seem to arouse public ire in a singularly powerful fashion. It seems to be the

case that the public are more concerned about sex offending than perhaps any other sort of crime, at least if one were to go by the number of column inches devoted to it in the tabloid press.

It has also been claimed that the amount of research, assessment and treatment attention on sex offenders may be disproportionate to the number of sex offenders in the population (Howells, 1987). However, Rampton Hospital in 1986 had 27% of its male population with a history of sex offending a proportion not much less than that reported in 1975 of 30% (Pratt, 1986; Fowles, 1977). A recent survey of Moss Side Hospital showed that 19% of the male patients had been admitted with sex offending as the prime index offence.

Although interest in the area of deviant sexual behaviour is not new (e.g. Krafft- Ebing, 1894) the 1960's and early 1970's saw an enormous increase in published work in the area. Much of this tended to concentrate on the aspects of sexual arousal which were relevant to deviant sexual behaviour and it is relatively recently that appeals have been made for more multi-faceted approaches to this area (Crawford, 1979, 1981; Owens, 1986, Perkins, 1986; Howells, 1985). This is not to say that study of deviant sexual arousal has not been important; it

quite clearly has. The use of penile plethysmography, for example has allowed direct work on changing sexual responses to various sorts of sexual stimuli to be carried out (e.g. Laws, 1984; Abel et al., 1981). Recent work by Pratt (1986) seems to indicate that the combination of self-monitoring reports of arousal and objective measurement using penile plethysmography is able to discriminate between sex offenders, non-sex offenders and normals. Whilst some workers have claimed that rapists do differ from normals in their pattern of sexual arousal (Abel et al., 1977; Barbaree et al., 1979; Quinsey et al., 1981), it has also been shown that arousal to stimulus depictions of rape scenes also occurs in normal males (Malamuth and Check, 1980 [1],[2], 1983; Malamuth, 1981, 1983; Malamuth and Donnerstein, 1982).

Studies of various types of sex offenders indicate that many have problems with social skills, problem-solving, and assertiveness, and that they lack basic sexual knowledge and skills (e.g. Burgess et al., 1980; Crawford, 1979 [2]; Lee-Evans, 1986). In some ways it would appear that sex offending may have close similarities with violent offending in general and that the determinants of the behaviour are just as multifaceted. Certainly sexual violence can sometimes be shown to

have features of angry aggression (Groth, 1979; Howells, 1985). Clinical reports have indicated that many sex offenders evidence such cognitive problems as an inability to discriminate sexual from non-sexual behaviour (e.g. Murphy et al., 1983). They may confuse affectional responses as sexual and they may perceive non-existent sexual connotations in the behaviour of women. They have stereotyped perceptions of women and uncritically accept rape myths (e.g. that sex must be violent for women to experience pleasure). Avery-Clarke (1983) has suggested that sex offenders consistently engage in irrational thinking and that they have frequent negative thoughts about themselves. It has been suggested that sex offenders may transform their anxiety into anger against a selected victim and through a learning process anger reduction becomes paired with the release of sexual tension. Whilst Avery-Clarke emphasises the value of empathy training for these people and certainly the implications of the evidence suggests that some sex offenders are significantly insensitive to the plight of the victim or that they rationalise their behaviour to a significant extent. Workers have also emphasised the importance of bearing in mind the effect of victim behaviour on the offending behaviour (e.g. Segal and Marshall, 1986) and although there is some evidence that some sex offenders are differentially aroused by scenes of

sexual behaviour involving the expression of emotion in the victim and when there is no emotion expressed (e.g. Wyndra et al., 1984), there is little direct evidence about the most effective mode of emotional expression or indeed the potential inhibitory effects of emotional expression of the victim. However, Pollack (1980) has shown that some violent offenders show some difficulty in recognising emotional expression in others and Lipton (1987), in the context of hetero- social role-play found that rapists were poorer than other prisoners in their accuracy of recognition of emotional expression. Clearly this aspect of social interaction may have powerful implications for the assessment and treatment of these people.

2.3.THE ARSONIST

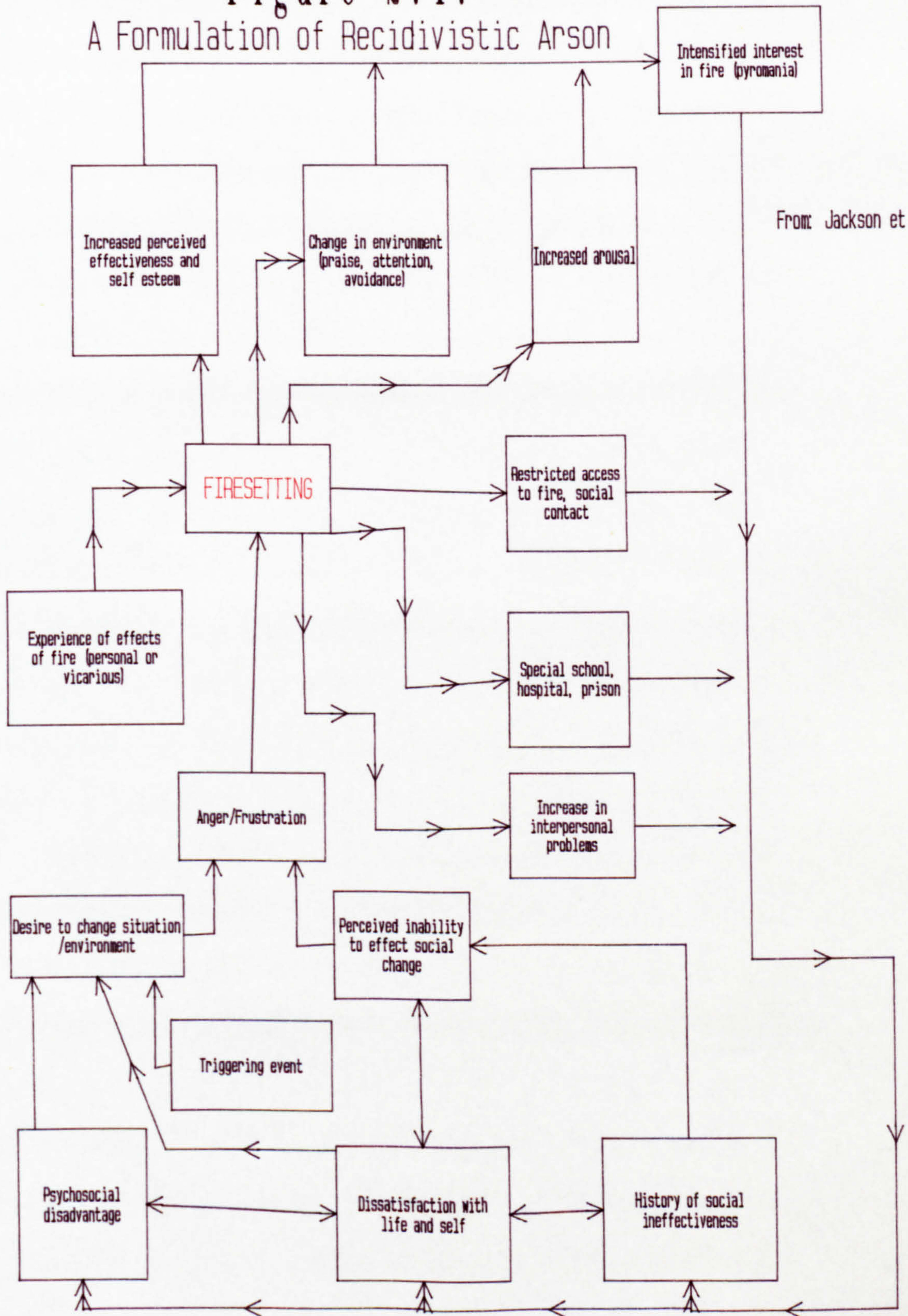
Not all people who are found guilty of illegally setting fire to property would be considered to be mentally abnormal, just as not all people who commit sexual assaults or indeed indulge in interpersonal violence would be. However, psychiatry in relation to fire setting has traditionally discriminated those who appear on the face of it to be "motiveless" from those who appear to set fire as part of say, insurance fraud or other pecuniary motivation. Arson is now and has been for many years

an important aspect of the index offending of a significant proportion of Special Hospital patients (McKerracher and Dacre, 1966). A survey at Moss Side Hospital (1986) showed that more than 25% of the residents had a history of Arson, the most frequent single index offence.

The Diagnostic and Statistical Manual, Third Edition (1983), refers to "Pyromania" as a disorder of impulse control, but this classification is excluded if there is evidence of organic mental disorder, schizophrenia, anti-social personality disorder or conduct disorder. Indeed Yesavage et al. (1983) suggests that the strict definition of DSM III indicates a very low incidence of this type of "Pyromaniac". Koson and Dvoskin (1982) were unable to find any arsonists in their research sample who conformed to this definition. Clearly, as a distinct psychiatric entity, "Pyromania" can hardly be said to exist at all. Kafrey (1980) has pointed out that a remarkably high proportion of a sample 5 to 10 year olds have a fascination with fire which supported Lewis and Yarnell's (1951) similar assertion. Several studies have pointed out that arsonists as a group fall into a number of different diagnostic categories, including schizophrenia, alcoholism, anti-social personality, affective disorder, personality disorder, drug dependence and

Figure 2.4.

A Formulation of Recidivistic Arson



From Jackson et al. (1987)

organic brain syndrome (e.g. McKerracher and Dacre, 1966; Inciardi, 1970). Similarly a high incidence of physical abnormality has been noted (Lewis and Yarnell, 1951) as has an incidence of low I.Q. (Yarnell, 1940; Lewis and Yarnell, 1951; Nurcombe, 1964) and low educational achievement (Koson and Dvoskin, 1982).

The clear heterogeneity of the offender group has led Jackson et al. (1987) to view fire-setting as simply one set of behaviours which is amenable to functional analysis. Figure 2.4. shows a diagrammatic formulation of their analysis. Their general conclusion is that while more research is required their plan represents a framework on which to hang various subsequent items of evidence to produce packages of therapeutic intervention. They acknowledge the notion that arson may be a displacement of aggression (McKerracher and Dacre, 1966) but see this not as a cathartic expression of aggression against property rather than person but as an attempt to take control of the environment where aggressive responses against the person may have proved ineffective. Indeed they see Arsonists as a particularly disadvantaged group who are able to exercise little or no control over their environment.

Some studies (e.g. Yarnell, 1940; Stewart and Culver, 1982) have indicated that pre- adolescent fire- setters are more likely to be solitary arsonists and respond to the event with anxiety. It certainly seems to be the case from Moss Side that most of the hospitalised Arsonists are people who have set fires from an early age and have tended to set them alone. It is difficult to see how immediate social reinforcers would account for this behaviour, whereas when this occurs in groups, peer group reinforcers may well be the most significant reinforcers. In a subsequent study Jackson et al. (1987) showed that Arsonists were significantly less assertive than either violent offenders or controls which might suggest that Arsonists do find difficulty in exercising control over their social environment. This may also relate to Hill et al.'s (1983) contention that Arson represents an assault upon property because of the absence of a suitable victim for the aggression although Jackson et al. are more attracted by the view that, as was found in the Moss Side sample, Arsonists are generally held in care from an earlier age and this effective withdrawal from normal environments and close supervision may result in more assaults against the "institution" rather than the people in it.

Some theorists have suggested that fire- setters may be sexually

motivated for their behaviour (Stekel, 1924; Freud, 1932; Gold, 1962), however, empirical research has failed to confirm this contention (McKerracher and Dacre, 1966; Bradford, 1982; Kosen and Dvoskin, 1982), although some cases of Arsonists masturbating to fire have been recorded (e.g. Lewis and Yarnell, 1951). Jackson et al. (1987) contend that this may merely be a reflection of difficulty in labelling arousal patterns in the presence of the consequences of their behaviour, particularly when this occurs in early puberty.

Arsonists have also been viewed as having low self-esteem (Tennant et al., 1971, McKerracher and Dacre, 1966). In this regard they may not be very different from other groups of "psychopathic" offenders. This may well be a consequence of rejection, particularly by the family, (Kafrey, 1980) from an early age. Be this as it may, it seems likely that Arsonists will be sensitive to expressions of social disapproval. If this is the case, then this group should be easily differentiated from other groups of mentally abnormal offenders who, it is suggested may well show reduced sensitivity to the emotional expression of others.

CHAPTER THREE

A Preliminary Investigation Of Accuracy of Emotional Recognition in a Mentally Abnormal Offender Population

3.1 INTRODUCTION

The first study conducted was a preliminary investigation of responses to the full set of slides of facial affect used by Ekman and Friesen in a population of patients in a British Special Hospital. This was conducted with a view to comparing this population with the American one and possibly adapting it so that it might be used as a clinical technique.

3.2 METHOD

3.2.1 Subjects

A total of 31 volunteer patients were selected according to the following criteria, based on a careful scrutiny of case records and clinical interview effected as part of routine clinical work.

Group 1: Violent Offenders (n=9).

Subjects qualifying for inclusion in this group had the following defining characteristics, namely male patients having a history of interpersonal violence against other individuals but having a total absence of sexual offences or arson.

Group 2: Sex Offenders (n=8).

Subjects qualifying for inclusion in this group had the following characteristics, namely male patients having a history of sexual offences but having a total absence of arson offences.

Group 3: Arsonists (n=14).

Subjects qualifying for inclusion in this group had the following defining characteristics, namely male patients having a history of attacks of arson against property but a total absence of any offence of a sexual nature, or any evidence of sexual gratification from fire setting.

All of the patients were classified under the Mental Health Act as suffering from Psychopathic Disorder. None had a Psychiatric diagnosis of mental illness, mental impairment or severe mental impairment.

The groups did not differ in Verbal I.Q. as measured by the Wechsler Adult Intelligence Scale and all had I.Q.'s above 70. The groups did not differ in age either.(see Table 3.1).

Table 3.1.
Mean Age and Verbal I.Q.

	All Patients	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N	31	9	8	14		
Age						
Mean	26.58	22.78	28.75	27.79	1.37	N.S.
S.D.	(8.39)	(4.00)	(11.66)	(8.05)		
V.I.Q.						
Mean	83.13	80.44	85.13	83.71	0.23	N.S.
S.D.	(14.42)	(13.59)	(18.16)	(13.45)		

3.2.2 Test Materials

The materials used were 110 monochrome slides selected by Ekman and Friesen as optimally representing the emotions of Happiness, Sadness, Fear, Anger, Surprise and Disgust plus slides which were considered by them to be emotionally neutral.

The distribution of slides in terms of Emotion and Gender is shown in Table 3.2.

Table 3.2.

	Total	Male	Female
Happiness	18	9	9
Sadness	17	8	9
Fear	15	7	8
Anger	17	7	10
Surprise	14	6	8
Disgust	15	7	8
Neutral	14	6	8
TOTAL	110	50	60

Each slide was a monochrome photograph depicting the face of one of 14 actors, 8 females and 6 males, who had been instructed specifically to mould their facial muscles in strictly determined ways. The resulting "expression" was empirically determined as optimally representing the emotions listed above. Studies by Ekman et al. (1976) indicate that these slides show high validity with greater than 85% of subjects identifying all the slides as the intended emotion. (Figures 3.1 to 3.14)

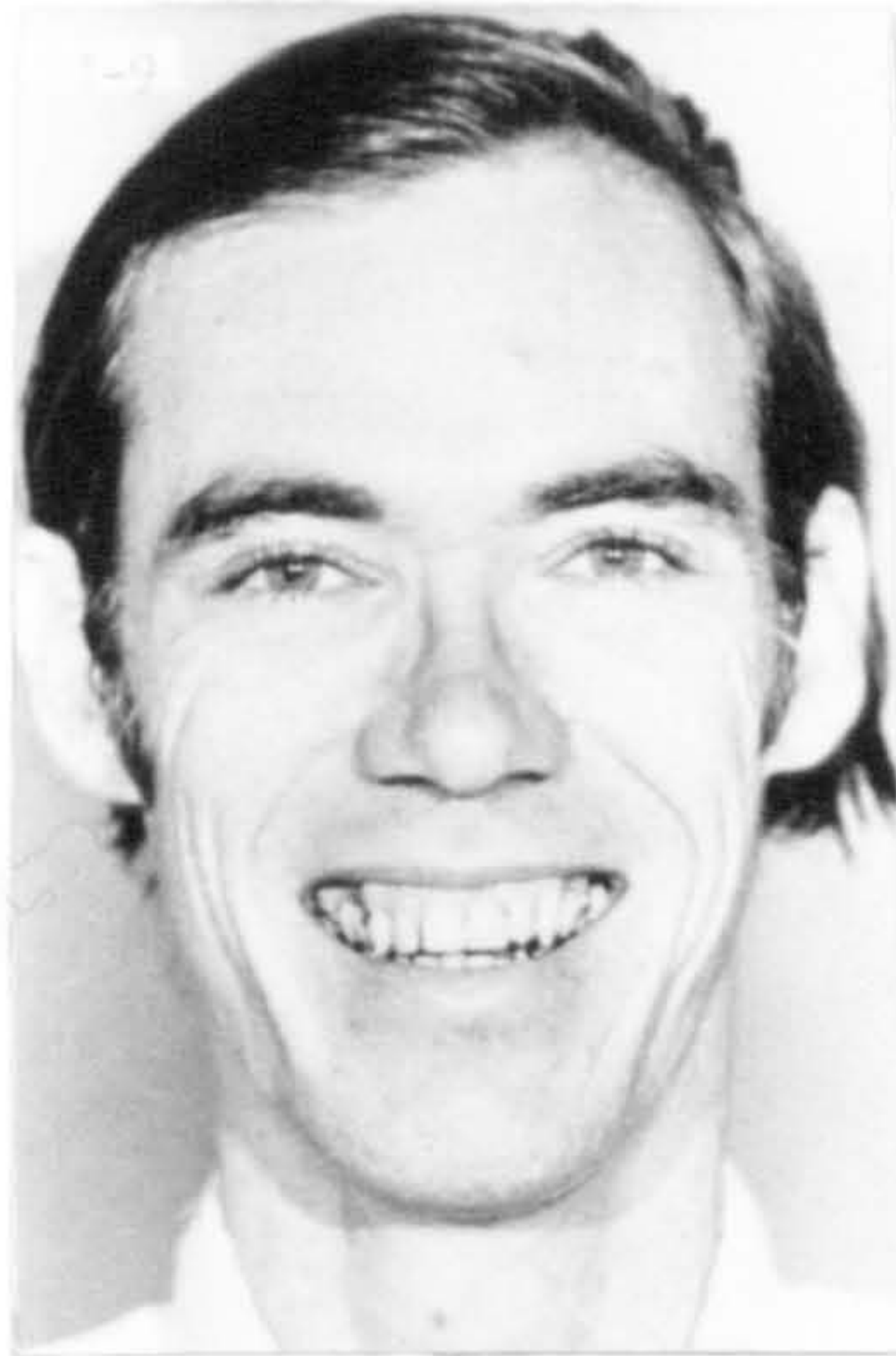


Figure 3.1.
Happiness
Male

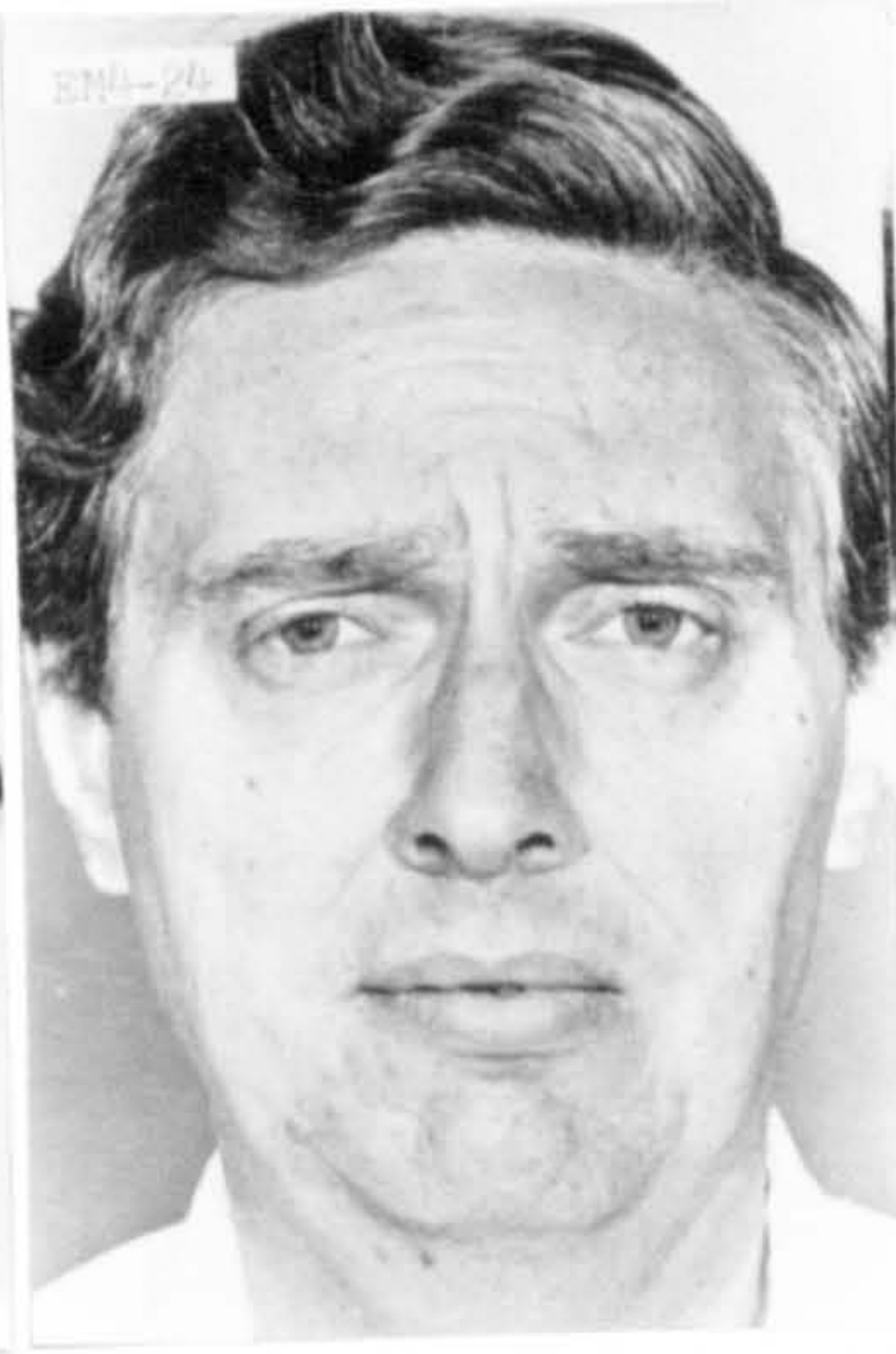


Figure 3.3.
Sadness
Male

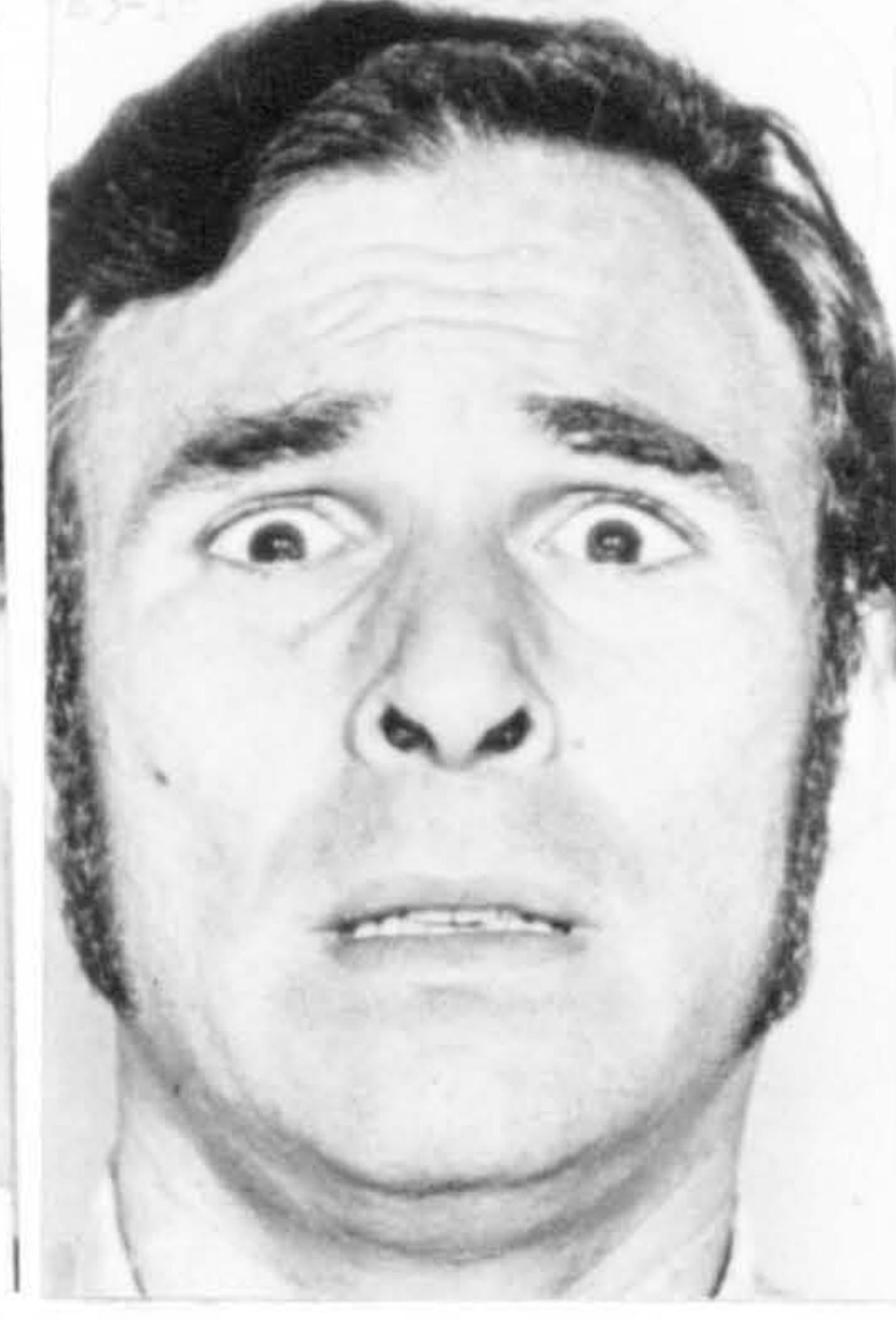


Figure 3.5.
Fear
Male



Figure 3.2.
Happiness
Female



Figure 3.4.
Sadness
Female



Figure 3.6.
Fear
Female

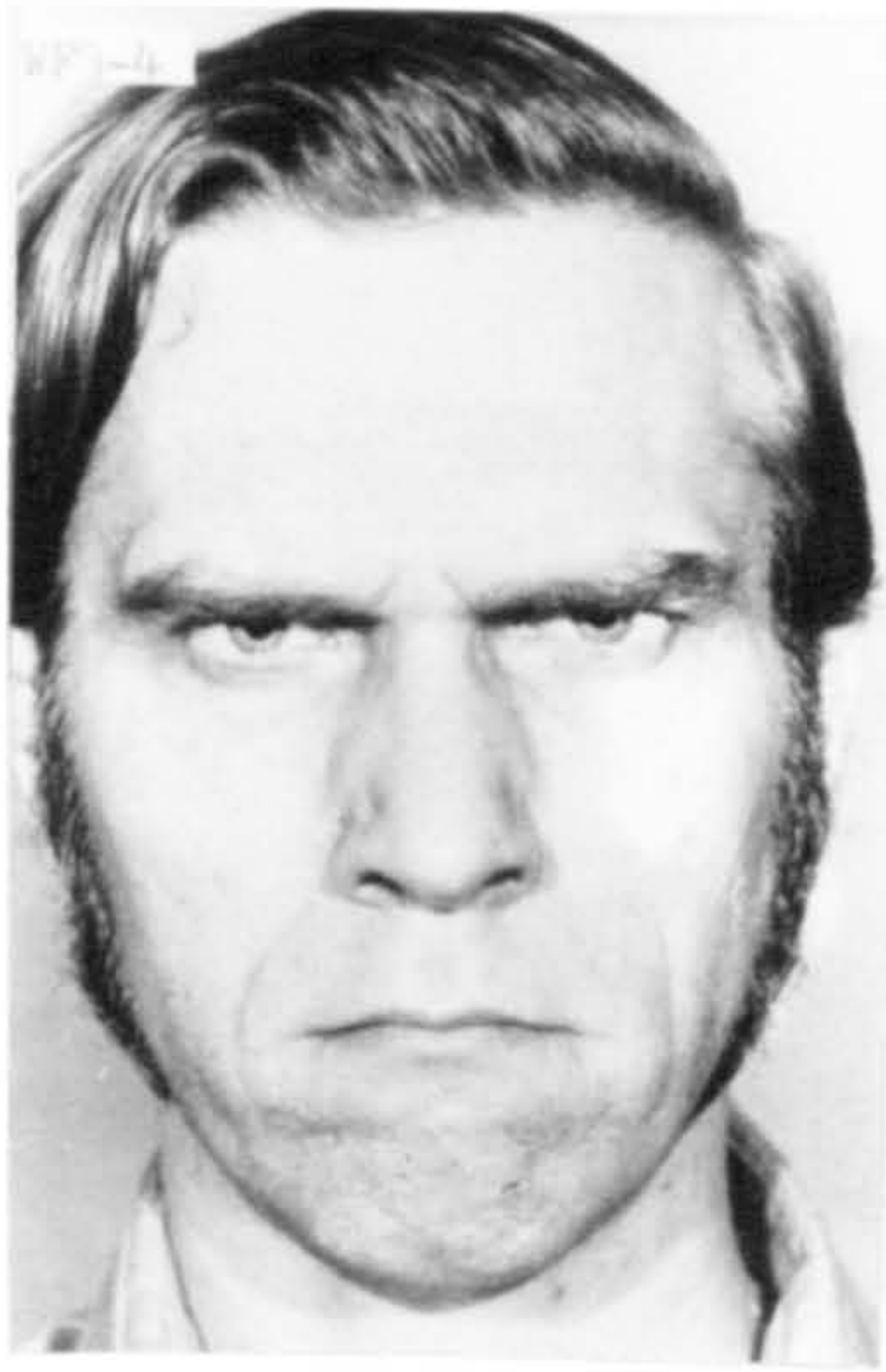


Figure 3.7.
Anger
Male

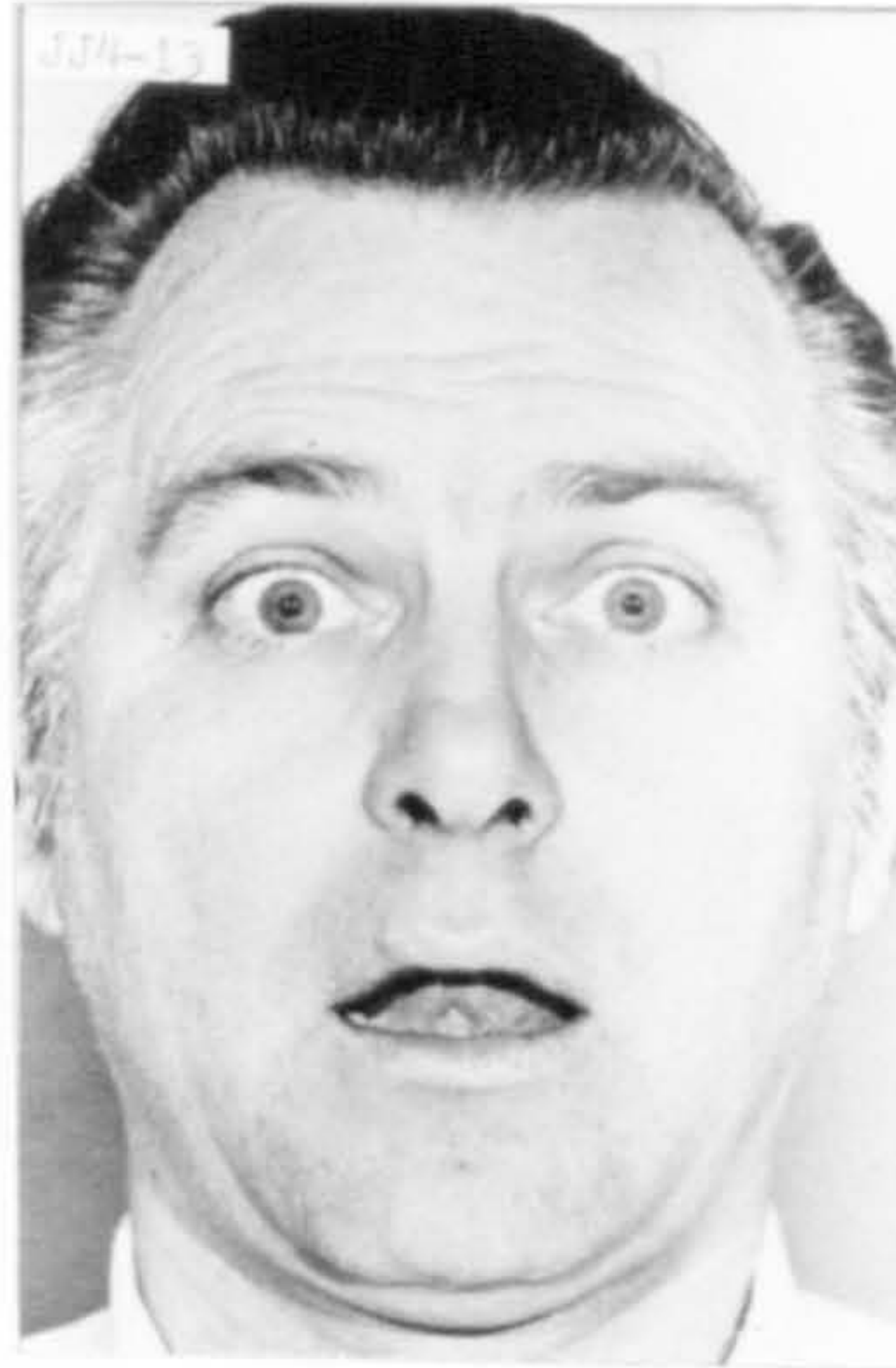


Figure 3.9.
Surprise
Male

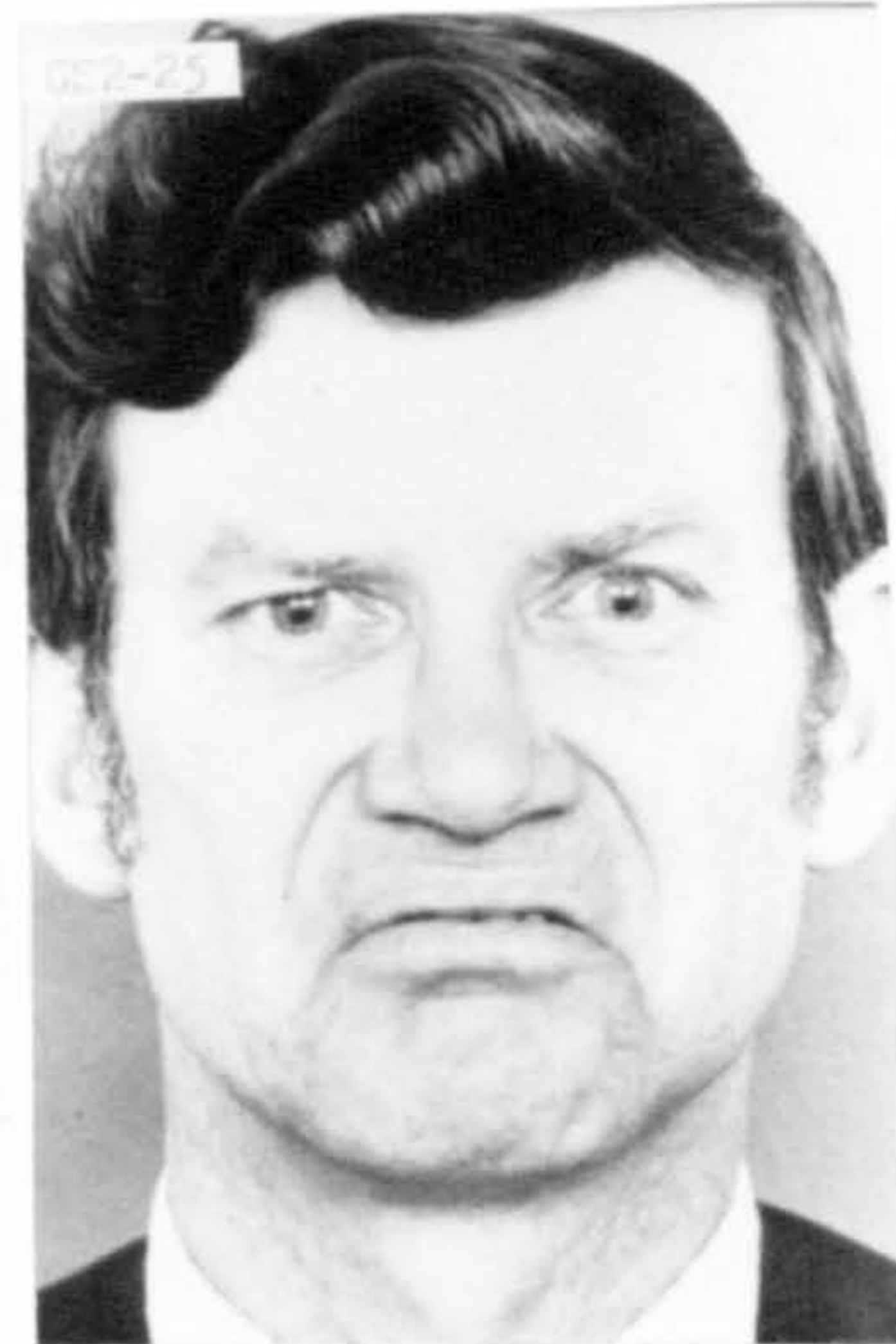


Figure 3.11.
Disgust
Male



Figure 3.8.
Anger
Female



Figure 3.10.
Surprise
Female



Figure 3.12.
Disgust
Female

These were randomly placed within one of three columns. The
three were therefore presented in pseudo-random fashion by



Figure 3.13.

Neutral

Female

Figure 3.14

Neutral

Female

3.2.3 Procedure

Subjects were tested singly in a quiet, well ventilated and illuminated room in the Psychology Department at Moss Side Hospital, Maghull, near Liverpool.

Each slide was presented with the the use of a Kodak Carousel Projector (Model SAV2000) on to a screen.

These were randomly placed within one of three carousels. The slides were therefore presented in pseudo-random fashion by

randomising the order of carousel across subjects. A cue-sheet was provided which gave the seven options as reminders to the subjects. The procedure used in developing the normative data by Ekman (1976) was adopted so that post hoc comparisons could be made. Each subject was asked at the beginning of the session to give the meaning of each of the emotion words e.g. "what does 'fear' mean?". Subjects were also asked to construct a sentence using the emotion word. Subjects who were unable to define and use all the emotion words were excluded from the study.

Each slide was presented for a period of 10 seconds. During the following 5 seconds subjects were required to respond verbally with one emotion response from the cue-sheet. The subject's response for each slide was recorded. The next slide was then presented and the same procedure repeated for each slide.

3.3.RESULTS

Using the emotion name classification derived by Ekman (1976), Table 3.3 shows the Mean % Correct obtained from the 31

patients in the sample. A comparison with Ekman's results is also shown.

Table 3.3
Mean % correct (S.D).

	Ekman Data	All Patients	Violent Off .	Sex Off.	Arson	Sig.
N=		31	9	8	14	
Slide category						
Happ.	98.6	94.98 (6.63)	94.44 (6.21)	92.36 (9.82)	96.83 (4.20)	N.S.
Sadness	89.18	58.25 (18.81)	55.56 (15.31)	54.41 (15.32)	62.18 (22.69)	N.S.
Fear	87.67	46.45 (25.50)	54.07 (26.34)	27.50 (16.88)	52.38 (24.92)	p<.01
Anger	88.89	59.07 (17.68)	58.17 (15.12)	55.88 (19.89)	61.34 (18.85)	N.S.
Surp.	92.36	73.27 (21.90)	69.84 (24.43)	75.89 (20.18)	73.98 (22.52)	N.S.
Disgust	92.33	53.33 (30.36)	45.19 (31.58)	42.50 (27.59)	64.76 (29.05)	N.S.
Neutral (4 slides)	67.25	67.28 (26.58)	64.29 (21.43)	69.64 (35.15)	67.86 (25.94)	N.S.

The results show clearly that, as a group, the patients were not identifying the emotions which were presented as well as did Ekman's sample. This is particularly true of Disgust,

Sadness, Fear and Anger. Some of the emotional categories also produced significant biases in terms of error distribution. Tables 3.4 to 3.10 show the distribution of errors across the different categories of emotional expression. The distribution of responses to "Neutral" slides is presented separately in Table 3.11. The apparent discrepancies which occasionally occur are due to rounding errors.

Table 3.4
Mean % Error
Happiness Slides

Response Category	Overall	Violent Off.	Sex Off.	Arsonists
Sadness	0.36	0.62	0.69	0
Fear	0	0	0	0
Anger	0.36	0	0.69	0.40
Surprise	2.33	3.09	4.86	0.40
Disgust	0	0	0	0
Neutral	1.43	1.23	1.39	1.59

Table 3.5
Mean % Error
Sadness Slides

Response Category	Overall	Violent Off .	Sex Off.	Arsonists
Happiness	0.76	0	2.21	0.42
Fear	7.97	8.50	8.82	7.14
Anger	7.97	7.84	8.82	7.56
Surprise	3.80	7.20	3.68	1.68
Disgust	7.21	3.92	9.56	7.98
Neutral	11.39	13.73	11.76	9.66

Table 3.6
Mean % Error
Fear Slides

Response Category	Overall	Violent Off.	Sex Off.	Arsonists
Happiness	0.86	0	0.83	1.43
Sadness	5.38	4.44	4.17	6.67
Anger	19.78	21.48	26.67	14.76
Surprise	15.05	8.89	26.67	12.38
Disgust	8.39	6.67	8.33	9.52
Neutral	2.80	1.48	5.83	1.90

Table 3.7
Mean % Error
Anger Slides

Response Category	Overall	Violent Off.	Sex Off.	Arsonists
Happiness	1.14	0.65	2.94	0.42
Sadness	8.35	5.88	10.29	8.82
Fear	5.12	1.96	5.15	7.14
Surprise	4.00	5.88	5.88	1.68
Disgust	12.52	16.34	11.76	10.50
Neutral	8.92	9.80	8.08	8.82

Table 3.8
Mean % Error
Surprise Slides

Response Category	Overall	Violent Off.	Sex Off.	Arsonists
Happiness	4.61	2.38	8.93	3.57
Sadness	2.07	2.38	1.79	2.04
Fear	12.90	15.87	7.14	14.29
Anger	1.38	2.38	1.79	0.51
Disgust	3.00	4.76	1.79	2.55
Neutral	2.07	0.79	2.68	2.55

Table 3.9
Mean % Error
Disgust Slides

Response Category	Overall	Violent Off .	Sex Off.	Arsonists
Happiness	0.86	1.48	1.67	0
Sadness	6.45	4.44	10.83	5.24
Fear	2.58	0.74	4.17	2.86
Anger	30.54	45.93	33.33	19.05
Surprise	0.86	0	2.50	0.48
Neutral	3.66	1.48	5.00	4.29

Table 3.10
Mean % Error
Neutral Slides

Response Category	Overall	Violent Off .	Sex Off.	Arsonists
Happiness	6.68	10.32	5.36	5.10
Sadness	8.53	9.52	7.14	8.67
Fear	3.46	0.79	6.25	3.57
Anger	4.15	0.79	4.46	6.12
Surprise	6.22	8.73	5.36	5.10
Disgust	2.53	3.97	1.79	2.04

However, a response of "neutral" to slides which were not "neutral" was an error most common in slides depicting "sadness". This is shown in Table 3.5. and 3.11.

Table 3.11
Mean % "Neutral" within each slide category

Category of slide	Overall	Violent Off.	Sex Off.	Arsonists
Happiness	1.43	1.23	1.39	1.59
Sadness	11.39	13.73	11.76	9.66
Fear	2.80	1.48	5.83	9.52
Anger	8.91	9.80	8.09	8.82
Surprise	2.07	0.79	2.68	2.55
Disgust	3.66	1.48	5.0	4.29

As can be seen from Table 3.3, the overall success rate on Fear slides is low. Moreover, there is a distinct difference between the subgroups. The mean % correct for sex-offenders on the identification of fear expression was only 27.5, compared with 52.38 and 54.07 for violent offenders and arsonists. This difference is significant at beyond the 1% level. Moreover, the distribution of these errors in the sex-offender group is primarily shared between Anger and Surprise (26.67 in both). Slides depicting happiness produced the fewest errors.

It was apparent during the sessions that some slides were producing greater accuracy or error than others. Table 3.12 shows an example, using only the first three slides, of the distribution of errors across slides.

Table 3.12
Percentage of judgements given in each category

Ekman Slide	Happ.	Sadness	Fear	Anger	Surp.	Disgust	Neutral
1							
Ekman	100	0	0	0	0	0	0
Violent Off.	89	11	0	0	0	0	0
Sex Off.	100	0	0	0	0	0	0
Arson	93	0	0	0	0	0	3
Ekman Slide	Happ.	Sadness	Fear	Anger	Surp.	Disgust	Neutral
2							
Ekman	0	90	6	3	0	0	0
Violent Off.	0	78	11	11	0	0	0
Sex Off.	0	63	12.5	12.5	0	12.5	0
Arson	0	79	0	7	7	7	0
Ekman Slide	Happ.	Sadness	Fear	Anger	Surp.	Disgust	Neutral
3							
Ekman	0	3	0	97	0	0	0
Violent Off.	0	0	0	67	0	22	11
Sex Off.	0	0	12.5	75	0	12.5	0
Arson	0	14.3	7.1	57	0	14.3	7.1

A further analysis was performed to investigate whether there was any difference between the groups in their responses to slides depicting males and slides depicting females. The results are presented in Tables 3.13. to 3.19.

Table 3.13
Mean % "Correct" Happiness

Group	Mean	S.D.
Violent-Male slides	93.83	9.80
Violent-Female Slides	95.06	8.07
Sex Off.-Male Slides	94.44	8.40
Sex Off.-Female Slides	90.28	15.07
Arsonists-Male Slides	96.83	5.21
Arsonists-Female Slides	96.83	6.80

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	61	4611.71			
Group	2	210.25	105.13	1.36	N.S.
Gender of slide	1	13.98	13.98	0.18	N.S.
Interaction	2	68.34	34.17	0.44	N.S.
Error	56	4325.15	77.23		

Table 3.14
Mean % "Correct" Sadness

Group	Mean	S.D.
Violent-Male Slides	40.28	23.20
Violent-Female Slides	69.14	16.46
Sex Off.-Male Slides	37.50	16.37
Sex Off.-Female slides	69.44	18.55
Arsonists-Male Slides	49.11	23.75
Arsonists-Female Slides	73.81	24.89

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	61	39078.31			
Group	2	838.48	419.24	0.90	N.S.
Gender of slide	1	11886.4	11886.4	25.47	<.001
Interaction	2	140.90	70.45	.15	N.S.
Error	56	26139.05	466.77		

Table 3.15
Mean % "Correct" Fear

Group	Mean	S.D.
Violent-Male Slides	53.97	26.51
Violent-Female Slides	54.17	28.64
Sex Off.-Male Slides	26.79	23.46
Sex Off.-Female Slides	28.13	12.94
Arsonists-Male Slides	54.08	28.67
Arsonists-Female Slides	50.89	23.75

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	61	43143.93			
Group	2	7837.68	3918.94	6.23	>.01
Gender of slide	1	4.43	4.43	0.007	N.S.
Interaction	2	61.87	30.93	0.05	N.S.
Error	56	35227.72	629.07		

Table 3.16
Mean % "Correct" Anger

Group	Mean	S.D.
Violent-Male Slides	50.79	22.71
Violent-Female Slides	63.33	12.25
Sex Off.-Male Slides	46.43	23.84
Sex Off.-Female slides	62.50	22.52
Arsonists-Male Slides	45.92	23.22
Arsonists-Female Slides	72.14	17.17

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	61	30472.28			
Group	2	213.51	106.75	0.25	N.S.
Gender of Slide	1	4888.71	4888.71	11.55	>.01
Interaction	2	581.29	290.65	0.69	N.S.
Error	56	23703.95	423.28		

Table 3.17
Mean % "Correct" Surprise

Group	Mean	S.D.
Violent-Male slides	61.11	35.36
Violent-Female Slides	76.39	19.21
Sex Off.-Male Slides	72.92	26.32
Sex Off.-Female Slides	78.13	22.90
Arsonists-Male Slides	70.24	26.29
Arsonists-Female Slides	76.79	23.95

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	61	39917.39			
Group	2	426.45	213.22	0.31	N.S.
Gender of Slide	1	1188.18	1188.18	1.75	N.S.
Interaction	2	275.88	137.94	0.20	N.S.
Error	56	38031.99	679.14		

Table 3.18
Mean % "Correct" Disgust

Group	Mean	S.D.
Violent-Male Slides	39.68	31.77
Violent-Female Slides	50.00	34.23
Sex Off.-Male Slides	42.86	32.40
Sex Off.-Female Slides	42.19	35.94
Arsonists-Male Slides	59.18	35.82
Arsonists-Female Slides	69.64	25.34

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	61	66710.26			
Group	2	6601.61	3300.81	3.14	.05
Gender of Slide	1	657.30	657.30	0.63	N.S.
Interaction	2	363.96	181.98	0.17	N.S.
Error	56	58862.07	1051.11		

Table 3.19
Mean % "Correct" Neutral

Group/Slide	Mean	S.D.
Violent-Male Slides	70.37	24.69
Violent-Female Slides	59.72	21.45
Sex Off.-Male Slides	70.83	40.58
Sex Off.-Female Slides	68.75	40.58
Arsonists-Male Slides	69.05	18.32
Arsonists-Female Slides	66.96	34.18

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	61	49146.51			
Group	2	198.85	99.43	.12	N.S.
Gender of Slide	1	356.83	356.83	.41	N.S.
Interaction	2	234.27	117.13	.14	N.S.
Error	56	48389.69	864.10		

It is clear that the gender of the slide can be important when assessing the ability of the subject accurately to identify the emotional expression. Significant differences were apparent in the emotions of sadness, anger and disgust with each of these emotions being more easily recognised in the female faces. There were no significant interactions.

The fact that the general accuracy among the three groups is lower than that reported by Ekman in his standardisation sample raises questions that may only be answered by the replication of the procedure with a normal sample. For example, are the patients less able as a group, to identify

the emotional expression of others or is this merely a characteristic of a group of British people assessing the expressions which have been determined by an American sample?

The variation of error between gender of slide is also a finding that would suggest that replication using a British sample might be important.

The findings of this chapter determined the nature and form of the next study to be carried out, namely the replication of the study with a non clinical British sample. This is described in the next chapter.

CHAPTER FOUR

An Investigation Of Accuracy of Emotional Recognition in a Normal Population

4.1.INTRODUCTION

The generally lower level of accuracy in the patient groups reported in Chapter Three, when compared with the original Ekman normative data, raised the question of whether the results were simply due to a difference in cultural norms between a British sample and those reported on by Ekman. A readily available group of volunteers was the Medical students who were receiving lectures in Clinical Psychology at the University of Liverpool.

It was decided that some idea of cultural differences might be displayed if the 110 slides used by Ekman were presented to this group of students in a manner as similar as possible as that used with the patients at Moss Side Hospital.

4.2.METHOD

4.2.1.Subjects

A total of 112 third year medical students volunteered to take part in the experiment. These comprised 57 Males and 55 Females. No formal measure was taken of intellectual level although it must be assumed that the mean verbal I.Q. would be of at least average level and therefore significantly higher than the patient sample. Moreover the mean age was significantly less than the patient sample. Nevertheless, while the group of students was different in these respects, it was considered to be worthwhile to collect the data if only to compare them with the results obtained by Ekman. The mean ages of the male and female student samples are shown in Table 4.1. Care was taken to prevent collaboration between subjects.

Table 4.1.

Demographic Comparison of the Normal and Patient Samples

	Violent Off.	Sex Off.	Arson	Control Male	Control Female	F-ratio	Sig.
N	9	8	14	57	55		
<u>Age</u>							
Mean	22.78	28.75	27.79	18.89	18.84	27.70	<.001
S.D.	(3.99)	(11.66)	(8.05)	(0.94)	(1.08)		

4.2.2.Test Materials

The same test materials were used as with the patients except that due to an error in the presentation procedure, one slide was omitted. This slide was one depicting "Sadness".

4.2.3.Procedure

The subjects were tested as a group in a lecture theatre in the Medical School at Liverpool University. Slides were presented in the same random order as with the patient group using a Kodak Carousel projector and three carousels. Subjects were asked to mark on a prepared scoring sheet which emotion they thought was being depicted by each slide. (see Appendix i)

Slides were grouped in sevens on the sheets and each group reversed the order in which emotions to be marked were presented, in order to avoid positional bias.

Each slide was presented for a period of 10 seconds. During the next 5 seconds subjects were required to respond by underlining an emotion on the score sheet. The next slide was then presented and

the same procedure repeated for each slide.

4.3.RESULTS

Using the emotion name classification from Ekman (1976), Table 4.2. and Figure 4.1. shows the Mean % Correct obtained from the 112 medical students in the sample. Subjects were classified according to gender. A comparison with Ekman's results is also shown and a summary of an analysis of variance comparison of the samples of male and female medical students. The means obtained by Ekman et al. is shown for comparison purposes.

Figure 4.1.
Identification of Emotion

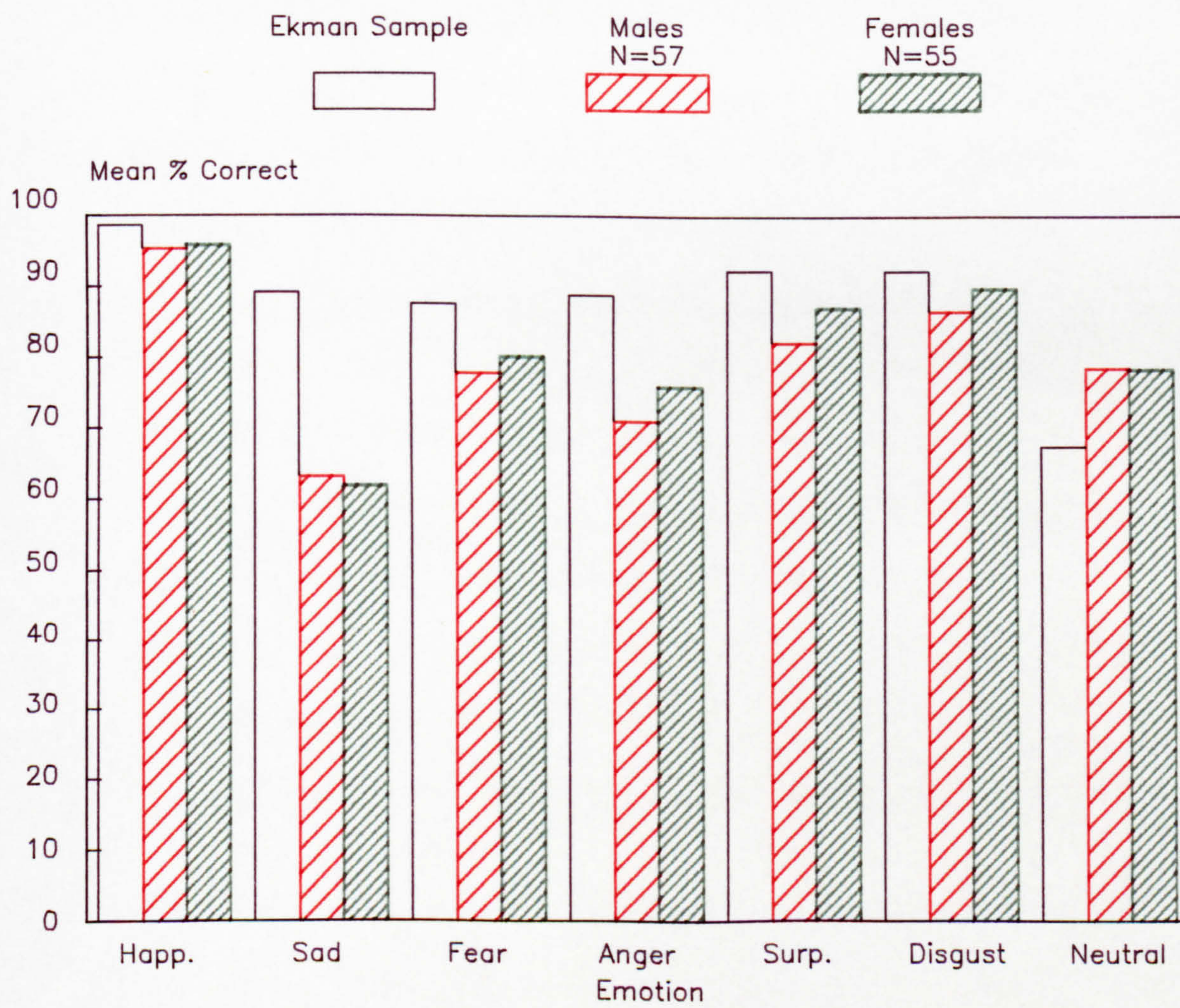


Table 4.2.

Mean % Correct (S.D.)

	Ekman Data	Male	Female	Sig.
N		57	55	
Slide Category				
Happ.	98.6	95.32 (8.39)	95.76 (5.75)	N.S.
Sad	89.18	63.16 (10.80)	61.82 (10.80)	N.S.
Fear	87.67	77.89 (14.09)	80.12 (12.80)	N.S.
Anger	88.89	71.00 (14.66)	75.83 (13.43)	N.S.
Surp.	92.36	82.21 (14.10)	87.14 (10.68)	N.S.
Disg.	92.33	86.67 (13.09)	89.82 (11.96)	N.S.
Neut.	67.25	78.45 (16.67)	78.18 (14.57)	N.S.

The distribution of errors is shown in Tables 4.3. to 4.9.

Table 4.3.

Mean % Error

Happiness Slides

Response Category	Males	Females
Sadness	0.29	0.20
Fear	0.68	0.30
Anger	0.29	0.10
Surprise	0.97	1.21
Disgust	0.29	0.40
Neutral	1.31	1.36

Table 4.4.

Mean % Error

Sadness Slides

Response Category	Males	Females
Happiness	0.87	0.34
Fear	5.81	9.20
Anger	6.58	6.14
Surprise	1.64	2.16
Disgust	11.62	12.84
Neutral	9.43	6.70

Table 4.5.
Mean % Error
Fear Slides

Response Category	Males	Females
Happiness	0.35	0.24
Sadness	2.81	1.58
Anger	2.34	3.27
Surprise	10.88	10.55
Disgust	4.56	3.15
Neutral	0.82	0.36

Table 4.6.
Mean % Error
Anger Slides

Response Category	Males	Females
Happiness	0.21	0.22
Sadness	3.41	2.03
Fear	5.26	5.03
Surprise	2.06	1.39
Disgust	10.63	10.80
Neutral	7.22	4.17

Table 4.7.

Mean % Error

Surprise Slides

Response Category	Males	Females
Happiness	0.88	0.65
Sadness	0.50	0.52
Fear	14.41	10.52
Anger	0.25	0.13
Disgust	0.63	0.78
Neutral	0.75	0.13

Table 4.8.

Mean % Error

Disgust Slides

Response Category	Males	Females
Happiness	3.12	0.24
Sadness	1.29	0.24
Fear	0.58	0.36
Anger	9.94	7.27
Surprise	0.47	0.24
Neutral	0.58	1.21

Table 4.9.Mean % ErrorNeutral Slides

Response Category	Males	Females
Happiness	4.51	5.71
Sadness	6.52	5.32
Fear	1.00	0.65
Anger	4.26	3.12
Surprise	1.13	1.04
Disgust	3.51	5.19

In general, the female subjects were more accurate in identifying the emotional expressions as characterised by Ekman (1976), although no statistically significant differences between the two groups emerged. It is clear that the mean percentage correct was lower in all emotions than Ekman reported in the American sample. This difference was most marked in the emotion of sadness. The British sample more accurately identified neutral slides than the American one.

In general the error rate was low. This was especially true of slides depicting happiness. The distribution of errors therefore represents small numbers. Most of the errors in judging the Sadness slides were confusions with Disgust (11.6% and 12.8%), although confusions, especially Fear (9.2%) in female subjects and

Neutral (9.4%) in males were also apparent. Anger slides were most commonly confused with Disgust (10.6% and 10.8%). The error rate on Disgust slides was quite low with the most common confusions occurring with Anger. Although the rate of error on Surprise slides was again low, the highest category of confusion occurred with this set of slides. This was a confusion with Fear (14.4% and 10.5%). The error rate on Fear slides was generally higher but again the main confusion was with Surprise (10.9% and 10.6%).

A further analysis was performed to investigate whether there was any difference between the groups in their ability to identify emotions in slides depicting males and females. Tables 4.10. to 4.17. show the results from this analysis.

Table 4.10.
Mean % "Correct" Happiness

Group	Mean	S.D.
Males-Male slides	95.61	8.01
Males-Female slides	95.09	11.20
Females-Male slides	97.05	6.79
Females-Female slides	94.73	7.42

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	223	16246.85			
Group	1	16.05	16.05	0.22	N.S.
Gender of slide	1	113.24	113.24	1.55	N.S.
Interaction	1	44.94	44.94	0.61	N.S.
Error	220	16075.12	73.07		

Table 4.11.
Mean % "Correct" Sadness

Group	Mean	S.D.
Males-Male slides	52.63	14.32
Males-Female slides	76.69	11.65
Females-Male slides	52.73	13.89
Females-Female slides	73.51	12.72

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	223	66764.88			
Group	1	133.59	133.59	0.77	N.S.
Gender of slide	1	28138.99	28138.99	161.81	<.001
Interaction	1	150.65	150.65	0.87	N.S.
Error	220	38259.06	173.90		

Table 4.12.
Mean % "Correct" Fear

Group	Mean	S.D.
Males-Male slides	78.51	16.66
Males-Female slides	77.19	17.04
Females-Male slides	82.95	14.10
Females-Female slides	76.88	17.28

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	223	59977.32			
Group	1	239.40	239.40	0.90	N.S.
Gender of slide	1	763.75	763.75	2.86	N.S.
Interaction	1	316.52	316.52	1.19	N.S.
Error	220	58674.86	266.70		

Table 4.13.
Mean % "Correct" Anger

Group	Mean	S.D.
Males-Male slides	75.44	17.23
Males-Female slides	67.89	17.40
Females-Male slides	81.30	14.77
Females-Female slides	72.00	16.49

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	223	65436.22			
Group	1	1389.88	1389.88	5.09	N.S.
Gender of slide	1	3970.14	3970.14	14.55	<.01
Interaction	1	43.10	43.10	0.16	N.S.
Error	220	60046.60	272.94		

Table 4.14.
Mean % "Correct" Surprise

Group	Mean	S.D.
Males-Male slides	78.29	15.59
Males-Female slides	87.43	16.45
Females-Male slides	84.32	13.44
Females-Female slides	90.91	12.35

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	223	51586.06			
Group	1	1068.77	1068.77	5.03	N.S.
Gender of slide	1	3462.22	3462.66	16.29	<.01
Interaction	1	90.76	90.76	0.43	N.S.
Error	220	46745.92	212.48		

Table 4.15.
Mean % "Correct" Disgust

Group	Mean	S.D.
Males-Male slides	84.56	20.36
Males-Female slides	87.72	12.39
Females-Male slides	89.45	14.83
Females-Female slides	90.00	14.27

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	223	55713.84			
Group	1	720.27	720.27	2.90	N.S.
Gender of slide	1	191.95	191.95	0.77	N.S.
Interaction	1	95.52	95.52	0.38	N.S.
Error	220	54701.18	248.64		

Table 4.16.
Mean % "Correct" Neutral

Group	Mean	S.D.
Males-Male slides	79.30	22.35
Males-Female slides	77.97	18.36
Females-Male slides	83.27	18.36
Females-Female slides	75.35	16.52

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	223	81608.47			
Group	1	25.71	25.71	0.07	N.S.
Gender of slide	1	1196.13	1196.13	3.30	N.S.
Interaction	1	608.47	608.47	1.68	N.S.
Error	220	79808.06	362.76		

The emotions of Sadness, Anger and Surprise showed differences according to the gender of the person depicted in the slide.

Anger was more easily identified in males than females. Sadness and Surprise were more easily recognised in females. No significant interactions were apparent.

Given these results, it was considered appropriate to consider again the results obtained from the patient samples reported in Chapter Three.

Comparison with the Patient Population.

On slides depicting Happiness and Sadness, there was no significant difference between the patient groups and the controls. This was especially true of the Arsonists, who, in fact had a higher mean accuracy on Sadness than the Female controls. In all other respects the patient sample was less able as a group accurately to identify the emotions depicted. This is shown in Tables 4.17. to 4.23. and Figure 4.2. This finding was not unexpected and is consistent with virtually all such studies on psychiatric patient populations. Separation of means refers to the grouping shown by multiple comparison tests between the groups.

Figure 4.2.
Identification of Emotion

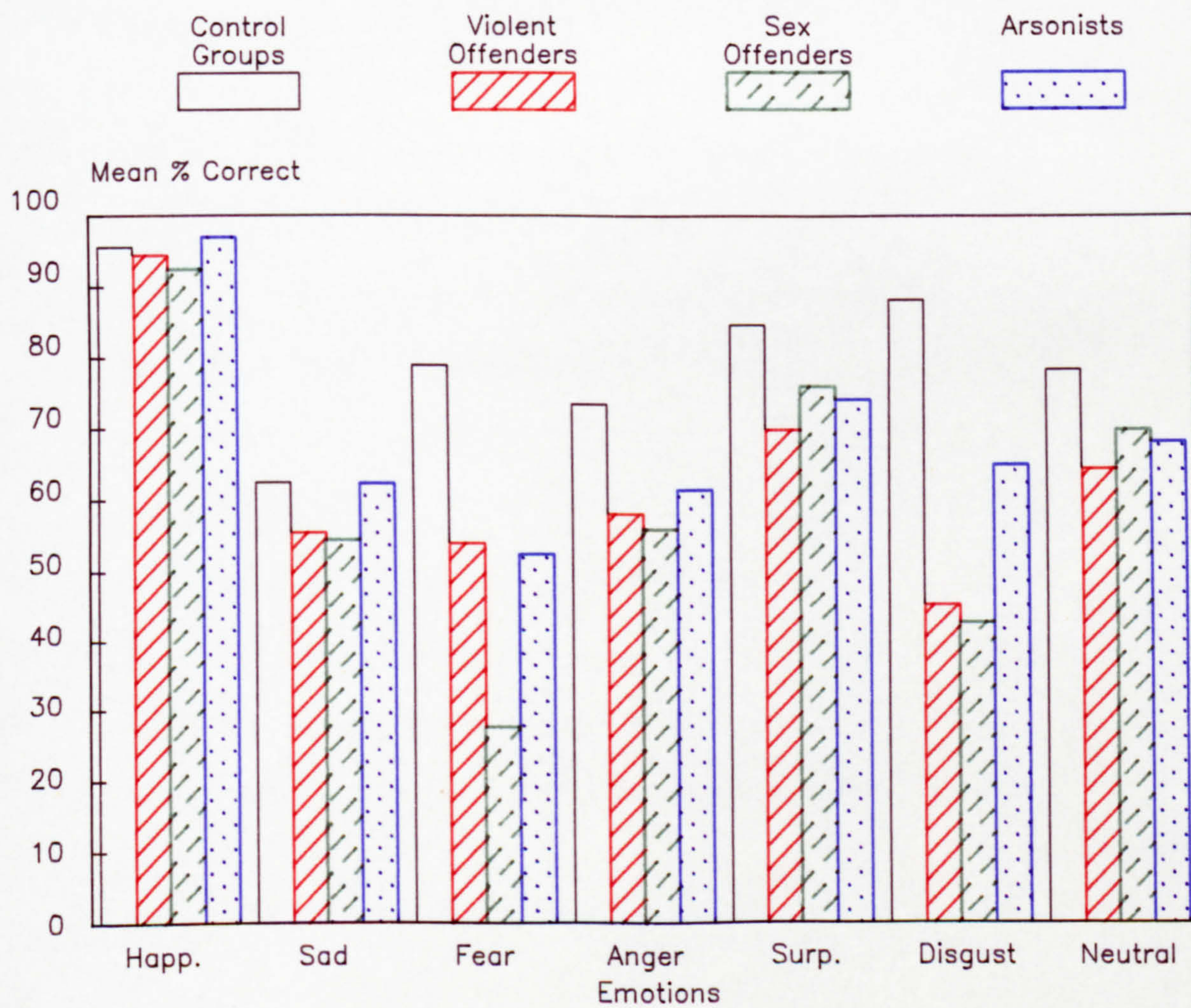


Table 4.17.
Mean % Correct (S.D.)

	Male Controls	Female Controls	Violent Off.	Sex Off.	Arsonists
N=	57	55	9	8	14
Happiness	95.32 (8.39)	95.76 (5.75)	94.44 (6.21)	92.36 (9.82)	96.83 (4.20)

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	142	7056.46			
Group	4	117.89	29.47	0.59	N.S.
Error	138	6938.57	50.28		

Table 4.18.
Mean % Correct (S.D.)

	Male Controls	Female Controls	Violent Off.	Sex Off.	Arsonists
N=	57	55	9	8	14
Sadness	63.16 (10.80)	61.82 (10.80)	55.56 (15.31)	54.41 (15.32)	62.18 (22.69)

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	142	23941.09			
Group	4	887.87	221.97	1.33	N.S.
Error	138	23053.22	167.05		

Table 4.19.
Mean % Correct (S.D.)

	Male Controls	Female Controls	Violent Off.	Sex Off.	Arsonists
N=	57	55	9	8	14
Fear	77.89 (14.09)	80.12 (12.80)	54.07 (26.34)	27.50 (16.88)	52.38 (24.92)
Separation of Means	C	C	B	A	B
<u>Analysis of Variance</u>					
Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	142	65320.28			
Group	4	29730.25	7432.56	28.82	<.0001
Error	138	35590.035		257.90	

Table 4.20.
Mean % Correct (S.D.)

	Male Controls	Female Controls	Violent Off.	Sex Off.	Arsonists
N=	57	55	9	8	14
Anger	71.00 (14.66)	75.83 (13.43)	58.17 (15.12)	55.88 (19.89)	61.34 (18.85)
Separation of Means	B	B	A	A	A
<u>Analysis of Variance</u>					
Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	142	36801.12			
Group	4	5819.04	1454.76	6.48	<.001
Error	138	30982.08	224.51		

Table 4.21.
Mean % Correct (S.D.)

	Male Controls	Female Controls	Violent Off.	Sex Off.	Arsonists
N=	57	55	9	8	14
Surprise	82.21 (14.10)	87.14 (10.68)	69.84 (24.43)	75.89 (20.18)	73.98 (22.52)
Separation of Means	BC	C	A	AB	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	142	35497.36			
Group	4	3982.54	995.64	4.36	<.05
Error	138	31514.82	228.37		

Table 4.22.
Mean % Correct (S.D.)

	Male Controls	Female Controls	Violent Off.	Sex Off.	Arsonists	
N=	57	55	9	8	14	
Disgust	86.67 (13.09)	89.82 (11.96)	45.19 (31.58)	42.50 (27.59)	64.76 (29.05)	
Separation of Means	C	C	A	A	B	
<u>Analysis of Variance</u>						
Source		D.F.	S.S.	M.S.	F-ratio	Sig.
Total		142	74783.53			
Group		4	33183.67	8295.92	27.52	<.0001
Error		138	41599.86	301.45		

Table 4.23.
Mean % Correct (S.D.)

	Male Controls	Female Controls	Violent Off.	Sex Off.	Arsonists	
N=	57	55	9	8	14	
Neutral	78.45 (16.67)	78.18 (14.57)	64.29 (21.43)	69.64 (35.15)	67.86 (25.94)	
<u>Analysis of Variance</u>						
Source		D.F.	S.S.	M.S.	F-ratio	Sig.
Total		142	51191.67			
Group		4	3088.66	772.16	2.22	N.S.
Error		138	48103.00	348.57		

Highly significant differences emerged between the patient and

control groups on the emotions of Fear, Anger and Disgust. The female controls were significantly different from each of the patient sub-groups on Surprise and Violent Offenders and Arsonists were significantly different from male controls, although the level of significance of the differences on this emotion was very much lower than on the emotions of Fear, Anger and Disgust.

Thus, the initial analysis shows these results to be quite promising in discriminating between groups. It was decided, therefore to look at this more closely; in particular, to look more closely, not only at absolute accuracy but also at the pattern of errors.

Unfortunately, the very much lower level of error among the control group really precluded the possibility of an analysis of the distribution of the errors and hence a comparison with the patient sample. Moreover, even at the optimum rate of presentation, the procedure was quite lengthy and difficult to administer as a clinical technique. It was decided therefore to try to streamline the technique, first of all to standardise the procedure using computer control, secondly, to improve the methodology so that an analysis of "confusions" between emotions could be more accurately carried out: and finally to reduce the

number of slides from 114 to about 40 so that if the results were as promising as heretofore, a clinical method of assessment could be developed which would not fatigue the client and which would be easily administered. This is presented in the next chapter.

CHAPTER FIVE

The Development of a Computerised Technique to Evaluate the Relative Perceived Strength of Emotion in Facial Expression

5.1. INTRODUCTION

As indicated in Chapter Four, the patient sample as a whole showed more difficulty in the accurate identification of emotional expression than the control groups. Moreover, some emotions caused particular difficulty for some of the mentally abnormal offenders; for example, the Sex Offender sub-group were less able accurately to identify the emotion of Fear in facial expression. Over all, the emotions which caused most confusion were those of Fear, Anger, Disgust and to some extent Surprise. The Arsonist group was most like the Normal sample.

In Chapter Three, it was shown that, particularly in the Sex Offender sub-group, most confusions arose around the emotions of Fear, Anger and Surprise. Slides depicting Happiness showed the

fewest errors. It was less easy to evaluate the distribution of confusions among the various emotions in the Control group, as reported in the last chapter, since these groups made significantly fewer errors and the absolute numbers of errors falling in to any one confusion category was very low.

In addition to this, the presentation of the whole set of 110 slides, even when the time schedule was stringently followed, was time consuming and fatiguing for the subjects and the researcher. Informal discussion with the subjects after presentation of the series indicated that some slides seemed to display more than one emotion and observation of subjects during the session suggested that the imposed pace of 10 seconds per slide exposure, plus 5 seconds after each slide to respond, was uncomfortable for some of them.

Each of these points led to a decision to modify the procedure so that it could be self-pacing, shorter, automatically controlled and producing data that could allow for an analysis of the distribution of confusions among the emotional expressions. It was considered that a potential way forward might be to bring the procedure under real time computer control and to allow the subjects to rate each slide on each of the

emotions of Happiness, Sadness, Fear, Anger, Surprise and Disgust.

5.2.METHOD

5.2.1.Subjects

A total of 26 male volunteer patients was selected according to the criteria outlined in Chapter Three as belonging to one of three groups: Violent Offenders, Sex Offenders and Arsonists. Most of the patients were those who had, six to nine months earlier, participated in the Preliminary Investigation. In addition a control sample of 30 normal male volunteer subjects was selected from the work force at Hesketh Park Hospital in the Southport and Formby Health District. These subjects worked in various fields including Occupational Therapy, Engineering Support Services and Transport.

The Mean Age and I.Q. of the patient groups and the Mean Age of the Control Group are presented in Table 5.1.

Table 5.1.

	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	7	9	10		
Age Mean	35.67	20.00	24.89	24.40	7.62	<.001
S.D.	(12.53)	(3.11)	(4.94)	(4.99)		
Separation of Means	B	A	AB	AB		
I.Q. Mean		82.14	81.44	83.10		
S.D.		(12.29)	(17.10)	(11.49)	0.03	N.S.

As can be seen from the table, the mean Age of the Control group was significantly higher than the Violent Offender group.

Neither of these groups was significantly different from the Arsonists or Sex Offender group.

5.2.2. Test Materials

In the two initial screening phases of the experiment (described below), a selection of 44 slides was selected from the original 110 monochrome slides described in Chapter Three. The selection criteria for these slides are described in the Procedure section

below.

For the main phase, the stimulus materials used were a sub-set of 42 of the 110 slides described in Chapter Three. These were selected by the following criteria.

- 3 male slides depicting Happiness
- 3 female slides depicting Happiness

- 3 Male slides depicting Sadness
- 3 Female slides depicting Sadness

- 3 Male slides depicting Fear
- 3 Female slides depicting Fear

- 3 Male slides depicting Anger
- 3 Female slides depicting Anger

- 3 male slides depicting Surprise
- 3 Female slides depicting Surprise

- 3 Male slides depicting Disgust
- 3 Female slides depicting Disgust

3 Male slides depicting a Neutral expression

3 Female slides depicting a Neutral expression

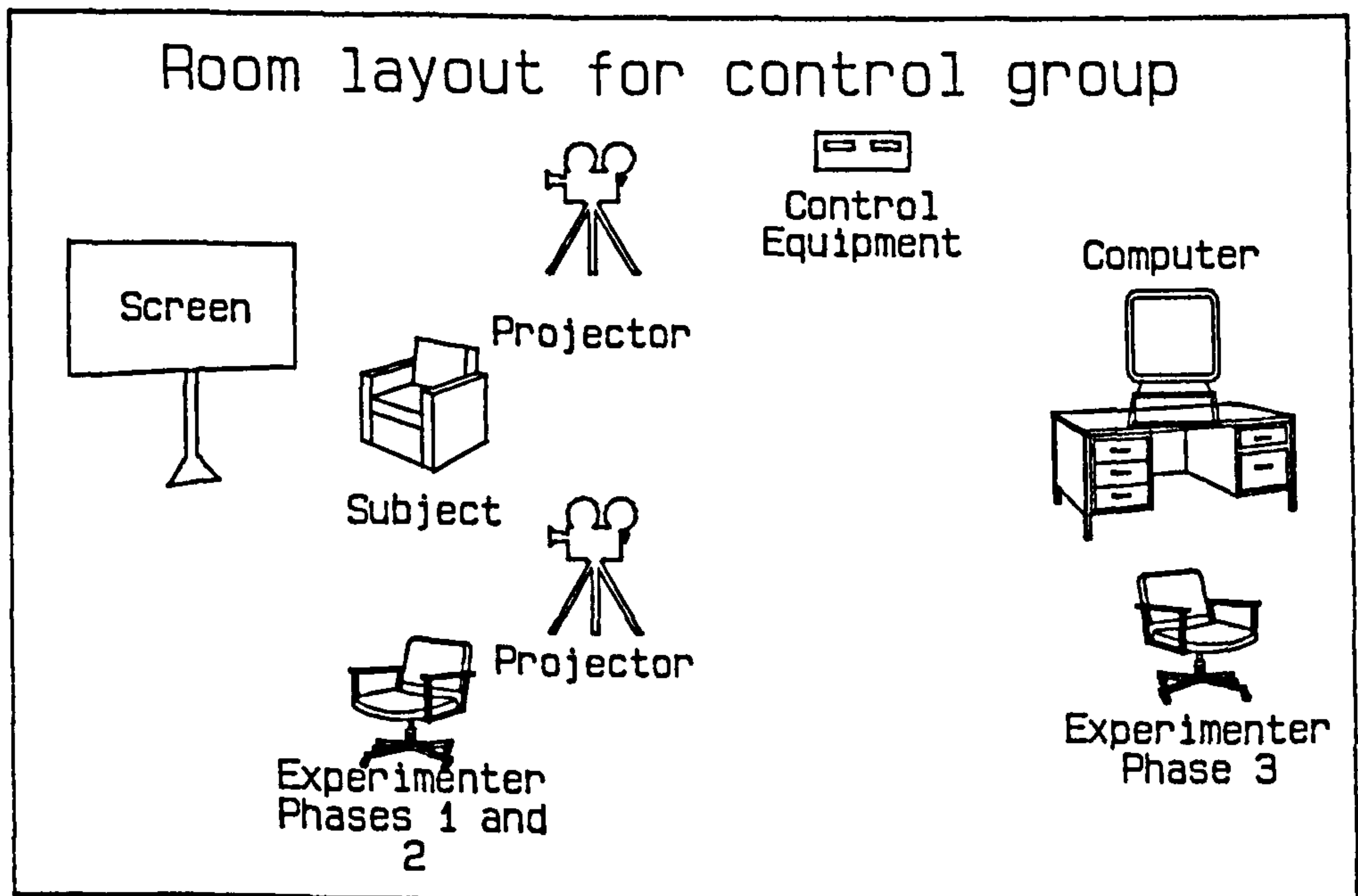
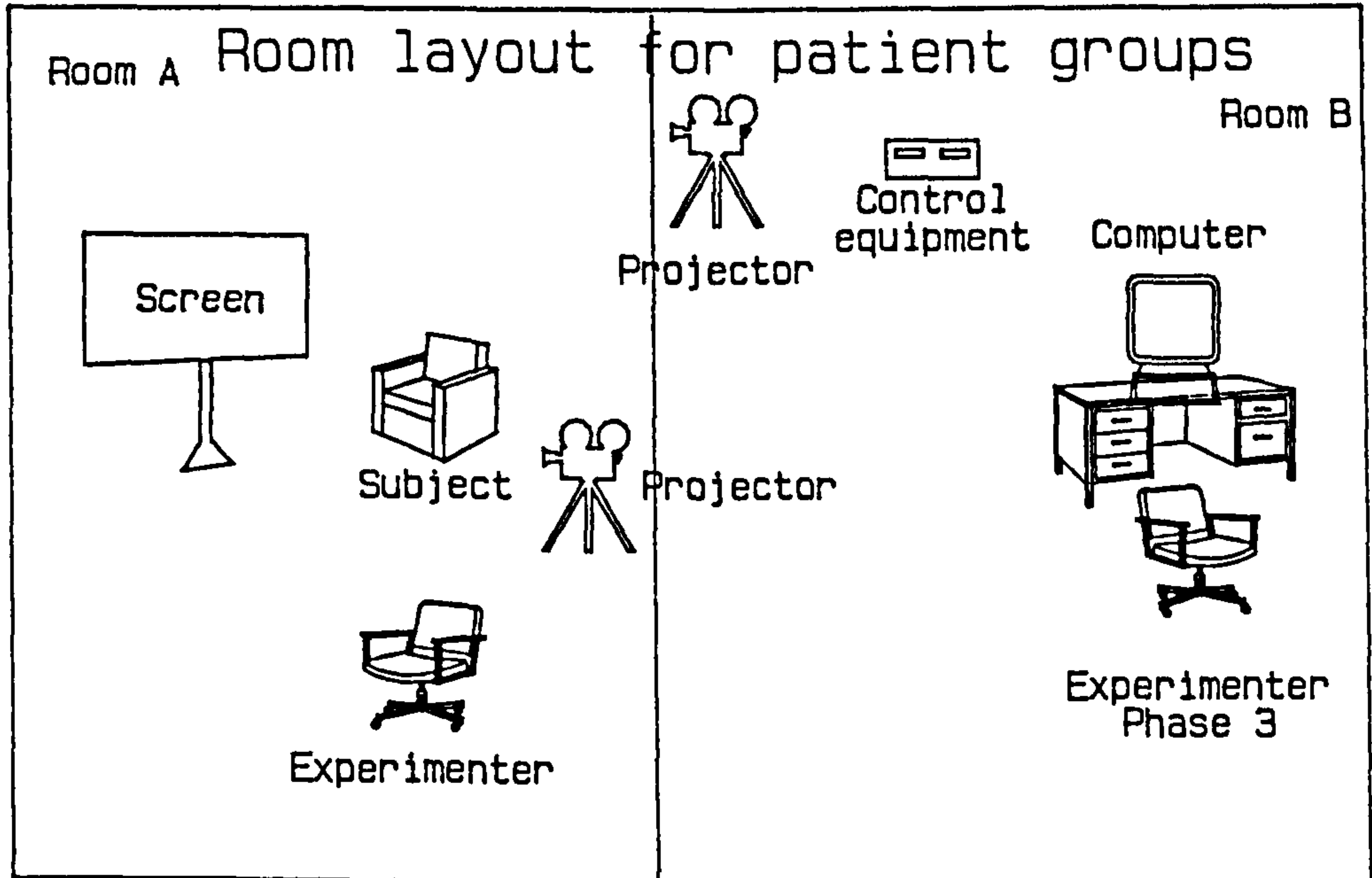
Each group of slides was selected from the Preliminary Investigation as being the three slides which produced the widest spread of errors by the patient population across emotions from the full set of slides in that category. This was in the hope that these slides, having in the Preliminary Investigation produced the widest range of errors, would now allow for a wide range of rating on each emotion.

5.2.3.Location

Patient Groups

The subjects were tested in the same quiet, well ventilated and illuminated room (Room A) in the Psychology Department at Moss Side Hospital as in the Preliminary Investigation. The computer, control equipment and one projector were located in an adjacent room (Room B). Observation was able to be maintained through a one-way screen. Projection from the projector located in Room B was effected through a one way projection port to the

Figure 5.1.



right of the observation screen. The second projector was located to the left side of the subject, in Room A, at approximately the same distance from the screen, namely approximately 12 feet, as the subject. The testing took place over a period of four months. Figure 5.1. shows the layout of the rooms.

Control Group

The subjects were tested in a small side ward which had been converted in to an office at Hesketh Park Hospital, Southport. The computer, control equipment and projectors were located at the back of the room and the subjects were seated comfortably towards the front of the room, approximately 12 feet from the projection screen. The testing took place over a period of one week. Figure 5.1. also shows the layout of this room.

5.2.4. Equipment

1. Two Kodak Carousel Projectors (Model SAV2000)
2. Two remote control consoles each with the facility for switching slides forwards or backwards in the

carousel cartridge and a fine focus control

3. One projection screen

4. One Hewlett Packard Series 200 computer (Model HP9816) with 1.75 M.Byte of R.A.M. space, one 20 M.Byte Hard Disc drive (Model HP9833H) incorporating a 1M.Byte floppy disc drive, one dual 500K.Byte disc drive (Model HP9121), one thermal graphics printer (Model HP9870G) and one bus expander (Model HP917000).

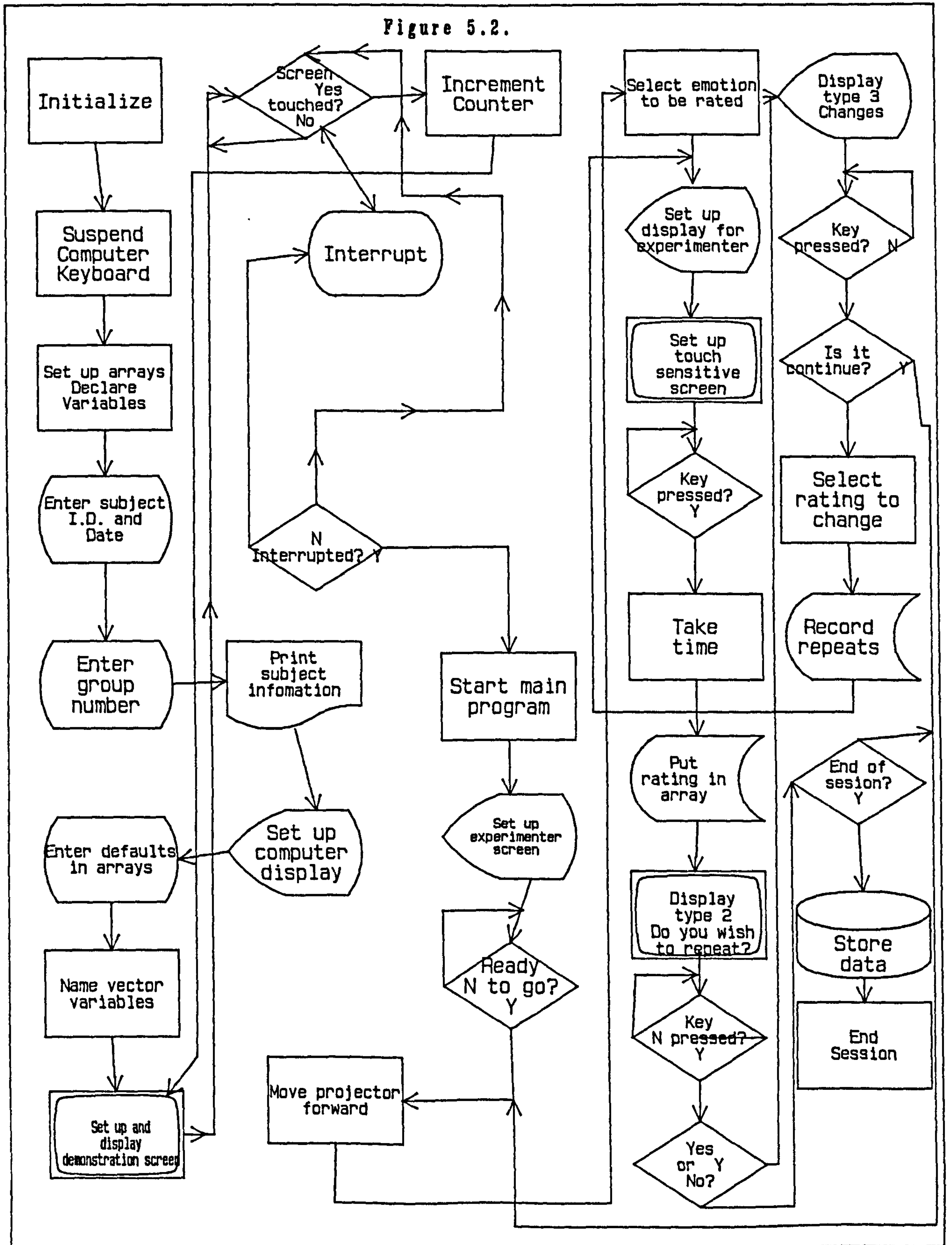
5. One Biodata relay box with 4 two pole relays.

6. One Epson E-1330 hand held touch sensitive screen. This device is a 10 c.m. by 15 c.m. box containing microchip circuitry to drive the Liquid Crystal display which is overlaid by a green transparent mask. The mask is divided into a 10 by 6 grid, each cell of which is touch sensitive. The display is a 80 by 25 character screen with the capability of displaying any of the A.S.C.I.I. characters.

In phases 1 and 2 (described below), the hand held remote control consoles were connected to the projectors. In phase 3,

one projector was connected via the remote control socket, to the common and normally open contacts of one relay in the relay box so that when the appropriate relay closed, the carousel on the projector was rotated forward by one position. Thus the next slide in sequence could be shown. As part of the Biodata Interface, the relays were controlled by signals from the computer along the standard Hewlett Packard Interface Bus (HP-IB) which is an industrial standard inter- device/computer communications bus similar to the IEEE-488, but with higher specification relating to speed of operation. The touch sensitive screen was also connected to the computer, first of all via a 25 pin D Series parallel connector into an interface constructed to convert the communications standard to that of the HP-IB and thus via this link along the HP-IB to the computer. The various items of data logged by the system were stored in an array until the end of any one session and then transformed into a data file compatible with the statistical packages available. They could then be transferred via the HP-IB on to the double-sided floppy disc in the HP9833H disc drive. The control and data logging program from this basic outline was further developed during the months of data collection, primarily to improve the format and monitoring information display for the experimenter during the testing session. The final data logging

Figure 5.2.



program is shown in Appendix ii. Figure 5.2. shows the flow of the program as it operates in real time.

5.2.5.Procedure

Each subject session consisted of three phases. The first one was introduced in order to screen out any subjects who were unable to make a simple discrimination task concerning facial recognition. The second phase was devised in order to ascertain whether subjects were able to discriminate between emotional expressions without necessarily naming them. The third phase was the experiment proper which was a rating task.

Phase 1

The experimenter sat to the left of the subject and presented the following instructions. "I am going to present a series of photographs of people's faces. For this first part you will see two faces side by side on the screen at the same time. I simply want you to tell me whether you think these photographs are of the same person or of two different people."

Sixteen slides were presented in eight pairs. Each projector

was manually controlled by the experimenter using a remote control console, one of which was connected through the adjoining wall in to Room B to the projector located in that room. The experimenter recorded whether the subject considered the photographs to be of the same person or of different people. The pairs were the same for each subject and they were presented in pseudo random order. Four pairs were of the same person and four were of different people. Two of the 'same' pairs were of women and two of the 'same' pairs were of men. Similarly, the 'different' pairs were of men and women. The pairs were always of the same sex. Each of the six emotions of Happiness, Sadness, Fear, Anger, Surprise and Disgust was represented as was the Neutral category. Table 5.2. shows a summary description of the slides presented.

Table 5.2.
Same or Different Person

Order of Presentation	Same/Different Person	Emotions	Gender
1	Same	Neutral+Anger	F
2	Different	Surprise+Surprise	M
3	Same	Surprise+Neutral	F
4	Same	Neutral+Anger	M
5	Different	Happiness+Surprise	F
6	Different	Sadness+Sadness	F
7	Different	Surprise+Fear	M
8	Same	Happiness+Sadness	M

Phase 2

The second phase followed directly after the previous one. The following instructions were presented by the Experimenter who was still sitting to the left of the subject as the subject faced the screen. 'I am now going to show you some more slides. Again, they will be shown together on the screen. This time, I would like you to say whether the emotions being shown by the people are the same or different.' Again, each projector was manually controlled by the experimenter in the same way as in phase 1. Fourteen pairs of slides were presented as follows:-

Table 5.3.
Same or Different Emotion

Order of presentation	Same/Different	Emotion(s) Depicted	Gender
1	Same	Happiness	M+M
2	Different	Anger+Fear	M+M
3	Different	Neutral+Anger	F+F
4	Same	Disgust	F+F
5	Different	Happiness+Anger	F+M
6	Same	Sadness	F+F
7	Same	Fear	F+M
8	Different	Fear+Sad	F+M
9	Same	Surprise	F+F
10	Same	Neutral	M+F
11	Same	Anger	F+F
12	Different	Surprise+Happiness	M+M
13	Different	Fear+Disgust	F+F
14	Different	Disgust+Neutral	M+F

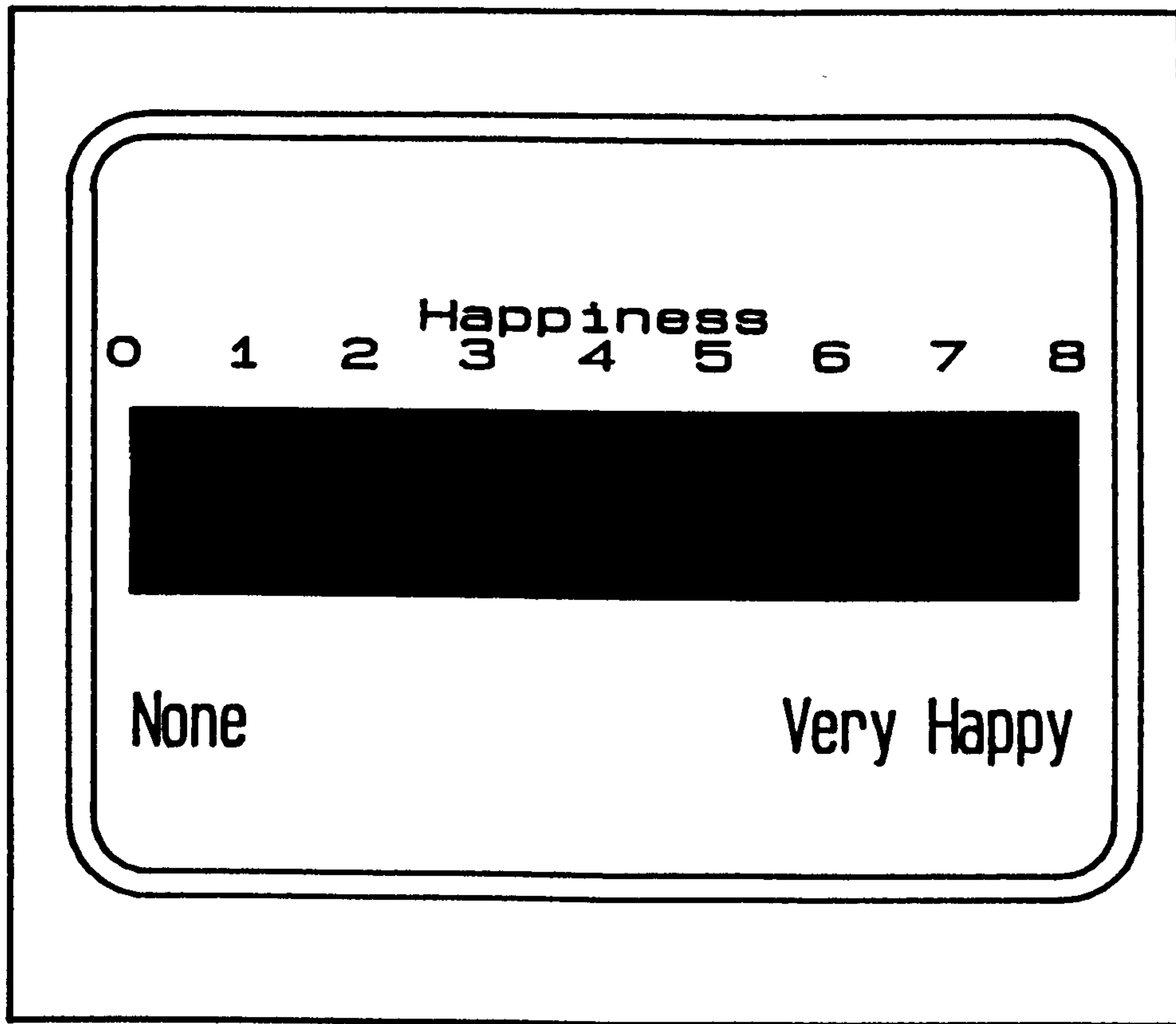
Phase 3

The remote control console to the projector in Room B was disconnected and the computer controlled relay device was connected instead. The subject was given the hand held touch sensitive screen. The program to control and log response data, the first part of which consisted of an entry routine to record the subject identifier, group and date and then a demonstration sub-program, was started. The following instructions were given. 'This time only one face will be presented on the large projector screen in front of you.' Pointing to the small touch sensitive screen the instructions continued. 'This is a touch sensitive

screen. You will see that something is written on it. At the top of the screen you will see the name of an emotion, for example "Happiness". Along the middle of the screen is a black bar. At the left of the bar is the word "None". At the right hand end of the bar are the words "Very Happy". These words refer to how much of the emotion described at the top of the screen you may think is present. Along the top of the bar you will see, going from left to right, the numbers 0 to 8.' At this point, time was taken to make sure that the subject was able to read the information on the screen. Instructions continued. 'You will see that when you touch this bar across the centre of the screen, the screen goes blank and immediately, another message appears. This time another word describing an emotion appears at the top of the screen. For example, this word might be "Sadness". As before, there is a black bar across the middle of the screen. To the left of the bar is the word "None" and to the right of the bar are the words "Very Sad". The numbers 0 to 8 are again written across the top of the bar. The position at which you press the bar is important. If you feel that none of the emotion described at the top of the screen is present, then you will press at or near to where the word "None" is written. This will mean you are giving a rating of "0". If you think that a lot of the emotion is present, then you will press the bar at or near to the right hand edge. This will

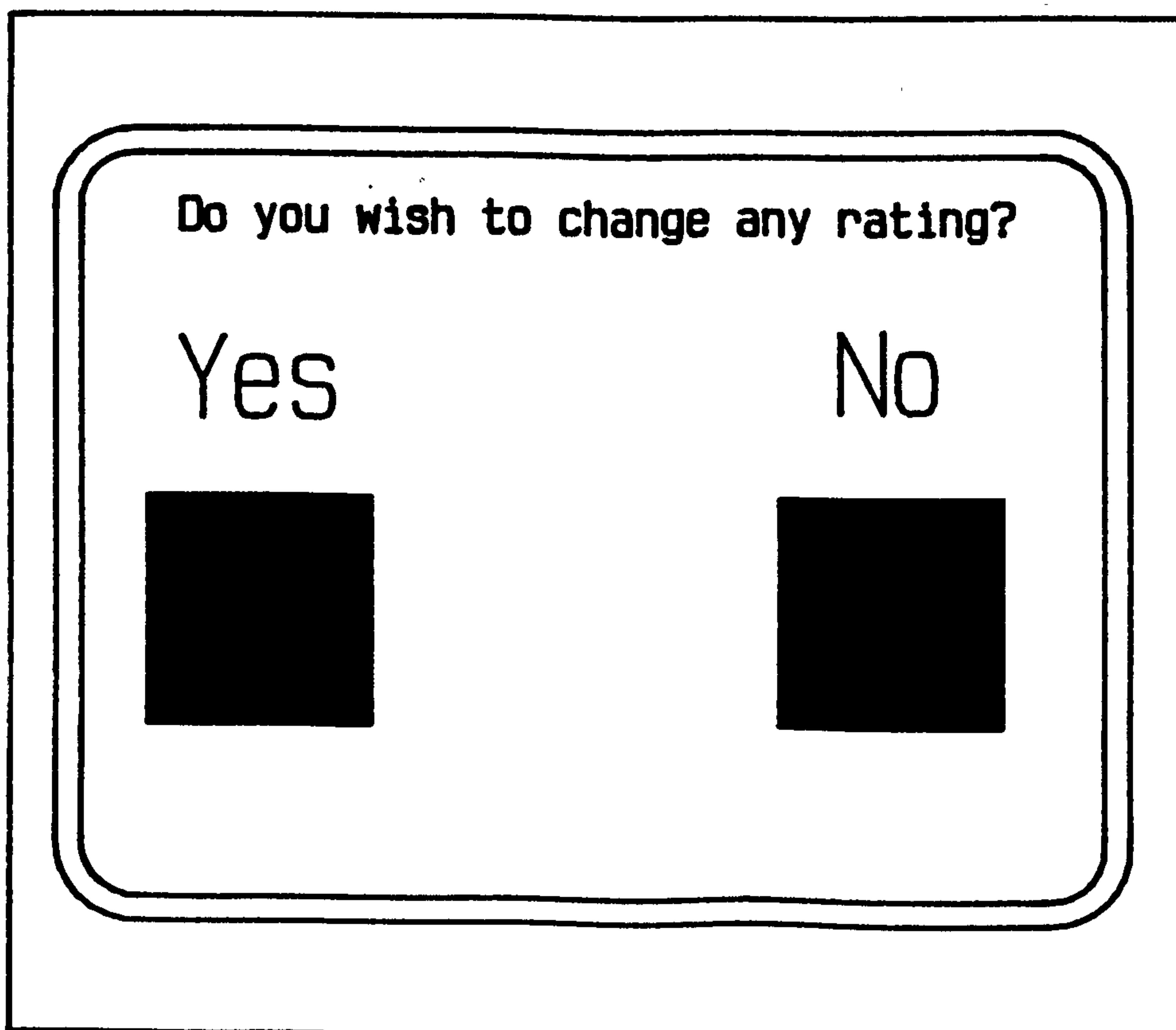
mean you are giving a rating of "8". If you think that the amount of the emotion is somewhere between these two then you will press the bar somewhere in between. This will mean you are giving a rating of something between "0" and "8". Think of it as though it were a thermometer of emotion with the temperature of emotion going up to the right hand side. For each slide, you will be asked to do this for each of six emotions; Happiness, Sadness, Fear, Anger, Surprise and Disgust. Please read the screen carefully as the order in which you are asked to rate each emotion will not be the same each time. For example, sometimes you will be asked to rate Happiness and then this will be followed by Anger. On the next occasion, Happiness may be followed by Disgust and so on. When you have rated all six emotions, you will be asked if you wish to change any rating. If you answer "No" by pressing the box labelled "NO" on the screen, the next slide will appear on the large projector screen in front of you. Similarly, if you answer "Yes" by pressing the box labelled "YES" on the small screen, you will then be asked to indicate which emotion you want to repeat. Press the emotion label which you wish to change and a screen like the one which appeared before will come up on the screen. Press the bar according to how you want to rate it. You will then be asked if you want to repeat any ratings. You will press "YES" or "NO" and the process will be repeated.'

Figure 5.3.



Display Type 1

Figure 5.4



Display Type 2

When it was ascertained that the subject fully understood the procedure, the computer was switched into the main program and the control and data logging started.

The computer then randomly selected the emotion to be rated. The rating display including the selected emotion was then put up on to the hand held touch sensitive screen (Display type 1) and simultaneously, the first slide was presented on the projection screen. When the subject responded by pressing the appropriate position on the display, the next emotion was randomly selected from the remaining five. The rating was stored in an appropriate point in the data array. This was repeated until each of the six emotions had been rated. An example of such a display is shown in Figure 5.3.

The subject was then asked if he wished to change any rating and was given the opportunity to answer "YES" or "NO" by pressing the appropriate part of the screen (Display type 2). This display is shown in Figure 5.4. If the subject responded by pressing the "NO" box indicated, the next slide was presented. If the subject responded by pressing the "YES" box, a further display (Display type 3) was presented showing each of his ratings and indicating that he should press that part of the screen where the rating he

Figure 5.5.

Which emotion do you wish to repeat?

Happiness	8	Surprise	2
Sadness	0	Disgust	0
Fear	0		
Anger	0		

Continue

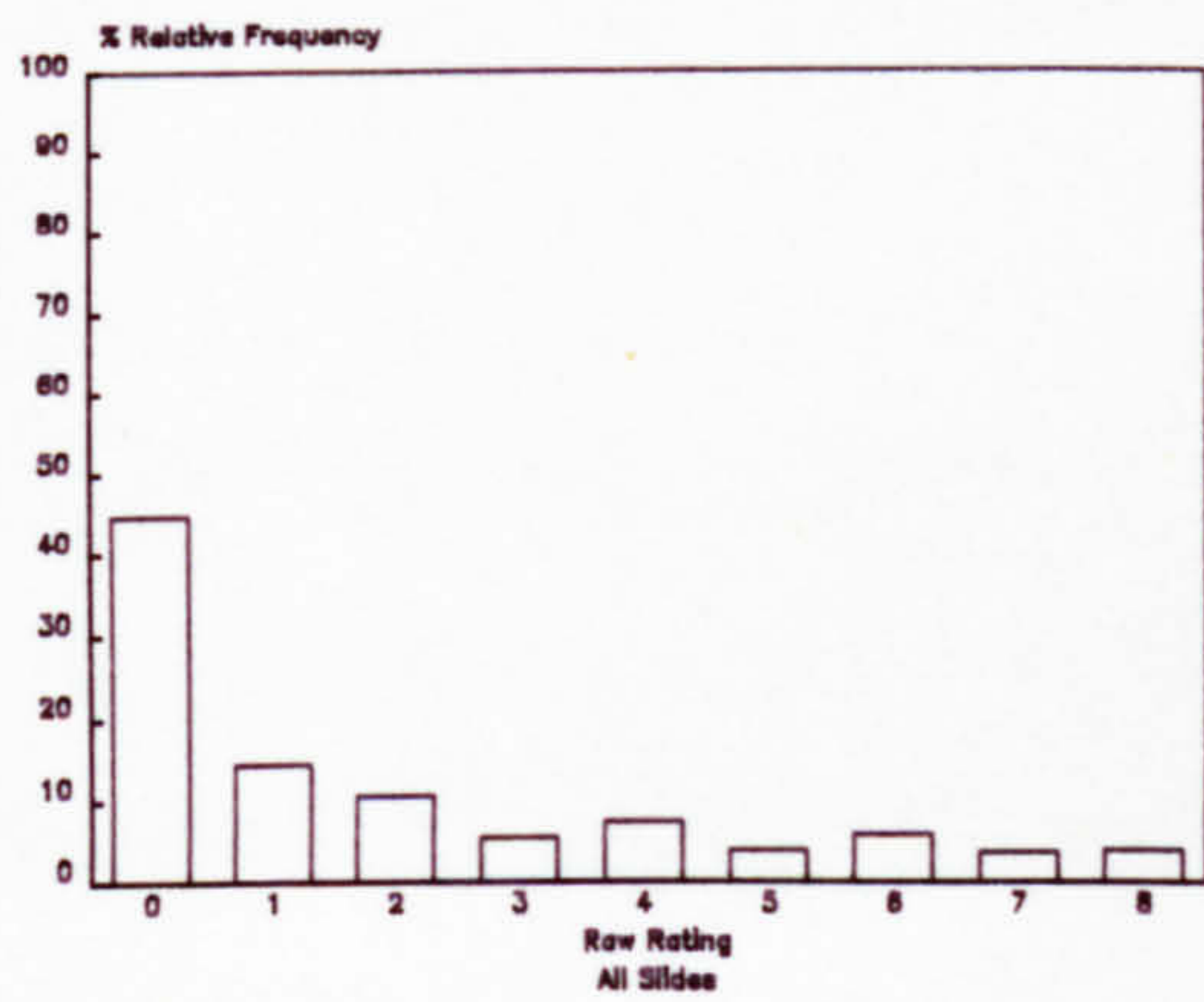
Display Type 3

wanted to change was illustrated. This display is shown in Figure 5.5.

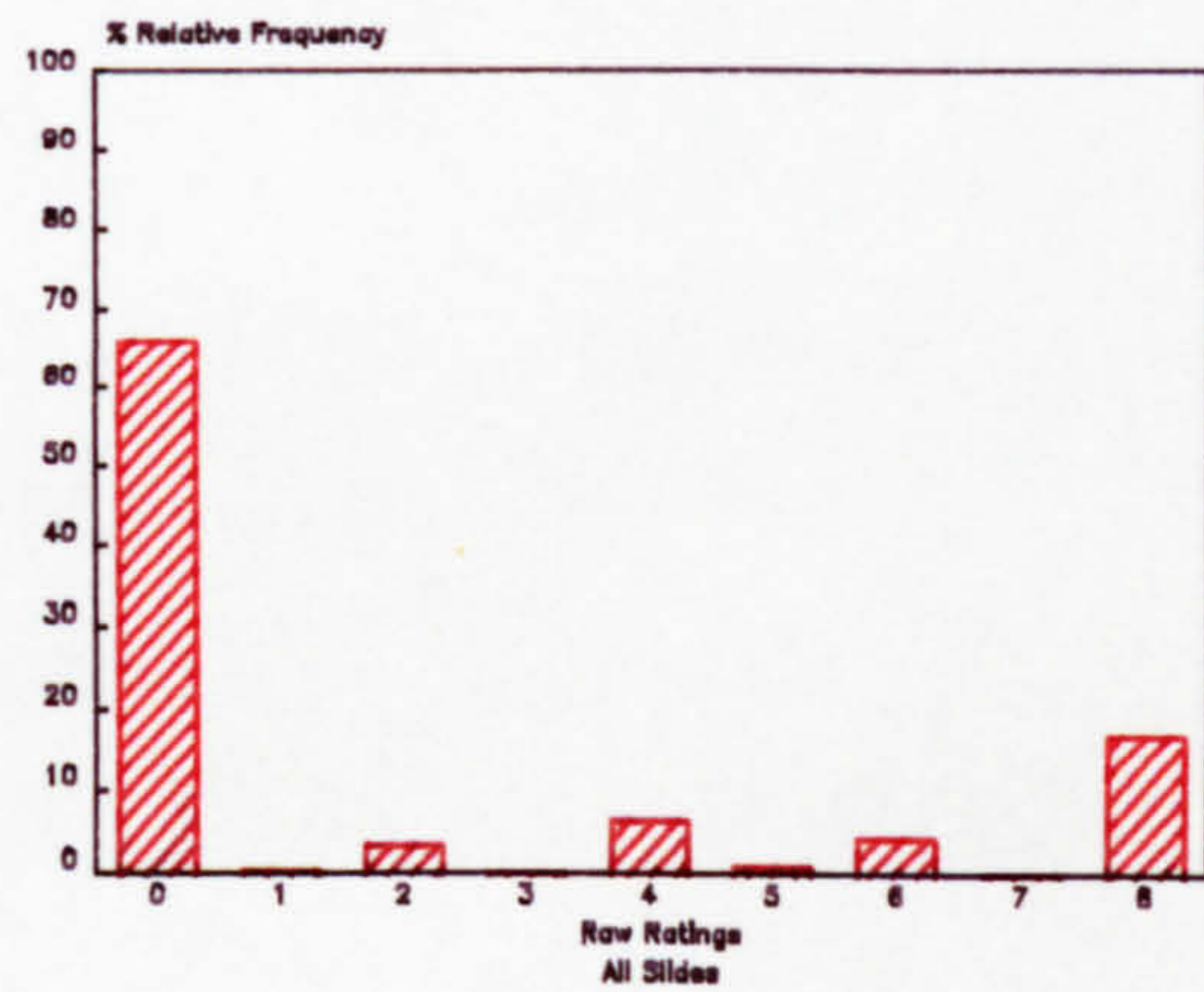
If, having seen his ratings, he no longer wished to change any, he could press that part of the screen where the word "Continue" was displayed and the previous display (Display type 2) was then presented from which he could choose to go to the next slide or again to change a rating. Should he choose to change a rating from Display type 3 by pressing the appropriate part of the screen, a Display type 1 was presented containing the relevant emotion. From this, he was able to make a rating. The new rating substituted the old rating in the data array and a record was also kept of the previous rating. The Display type 2 was then presented and the process repeated. Records were also stored of the time between the presentation of the Display type 1 and the response.

Figure 5.6.

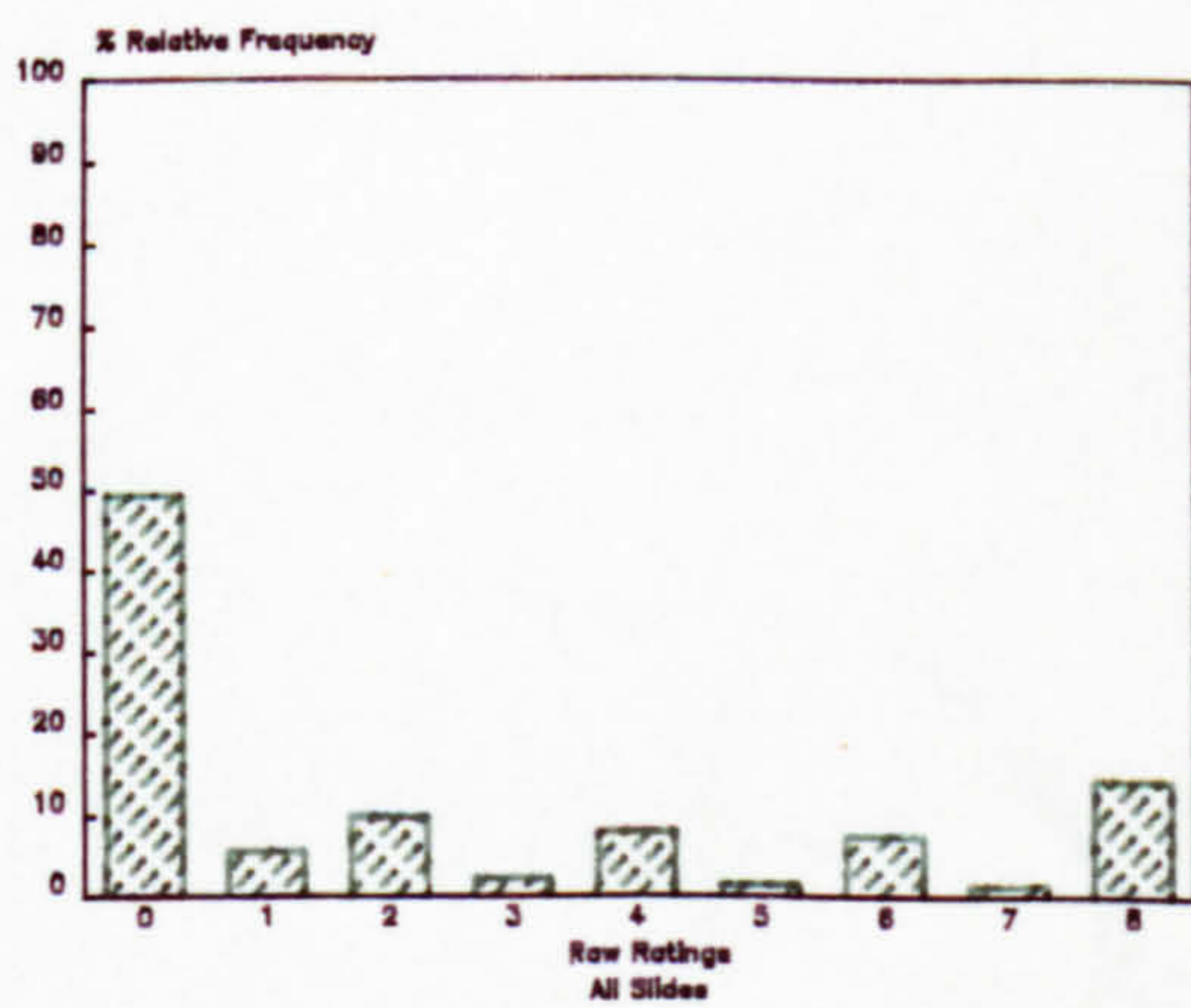
Distribution of Raw Ratings
Control Group



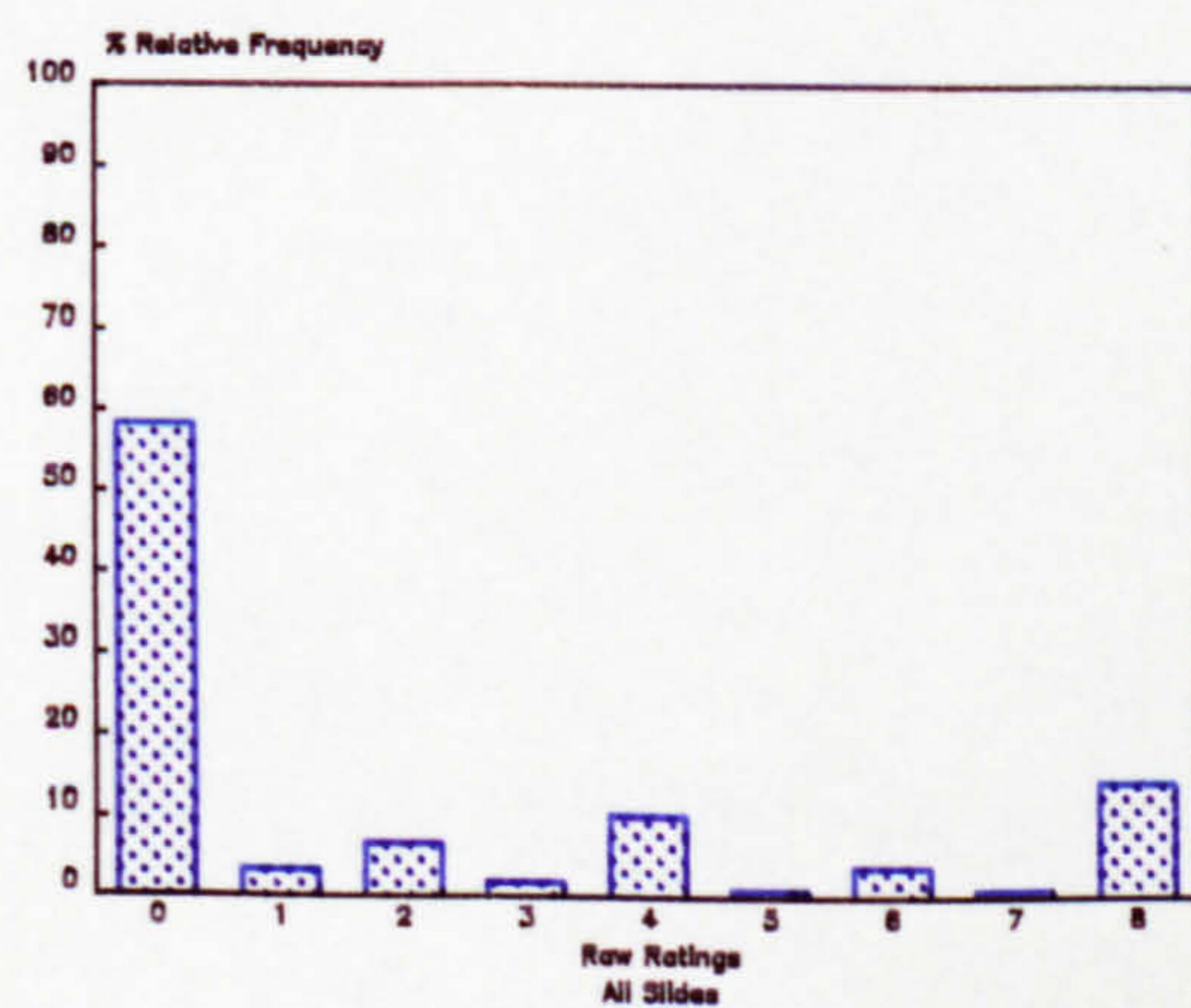
Distribution of Ratings
Violent Offenders



Distribution of Ratings
Sex Offenders



Distribution of Ratings
Arsonists



5.3. RESULTS

5.3.1. Absolute Ratings

Tables 5.5. to 5.8. show the distribution of all ratings on all slides for the four groups. Histograms of these data are shown in Figure 5.6.

Table 5.5. Relative Frequency of Raw Rating
across all Emotions and all Slides for all Subjects

Rating	All Patients N=26		Control Group N=30	
	Absolute Frequency	% Relative Frequency	Absolute Frequency	% Relative Frequency
0	3582	56.86	3372	44.60
1	222	3.52	1093	14.46
2	446	7.08	796	10.53
3	102	1.62	416	5.50
4	539	8.56	554	7.33
5	75	1.19	301	3.98
6	339	5.38	441	5.83
7	58	0.92	285	3.77
8	937	14.88	302	4.00

Table 5.6. Relative Frequency of Raw Rating across all Emotions and all Slides for the Violent Offender Group

Rating	Absolute Frequency	% Relative Frequency
0	999	66.07
1	8	0.53
2	56	3.70
3	4	0.26
4	101	6.68
5	17	1.12
6	70	4.63
7	4	0.27
8	253	16.73

Table 5.7. Relative Frequency of Raw Rating across all Emotions and all Slides for the Sex Offender Group

Rating	Absolute Frequency	% Relative Frequency
0	1117	49.25
1	128	5.64
2	222	9.79
3	53	2.34
4	182	8.03
5	37	1.63
6	171	7.54
7	34	1.50
8	324	14.29

Table 5.8. Relative Frequency of Raw Rating across all Emotions
and all Slides for the Arsonist Group

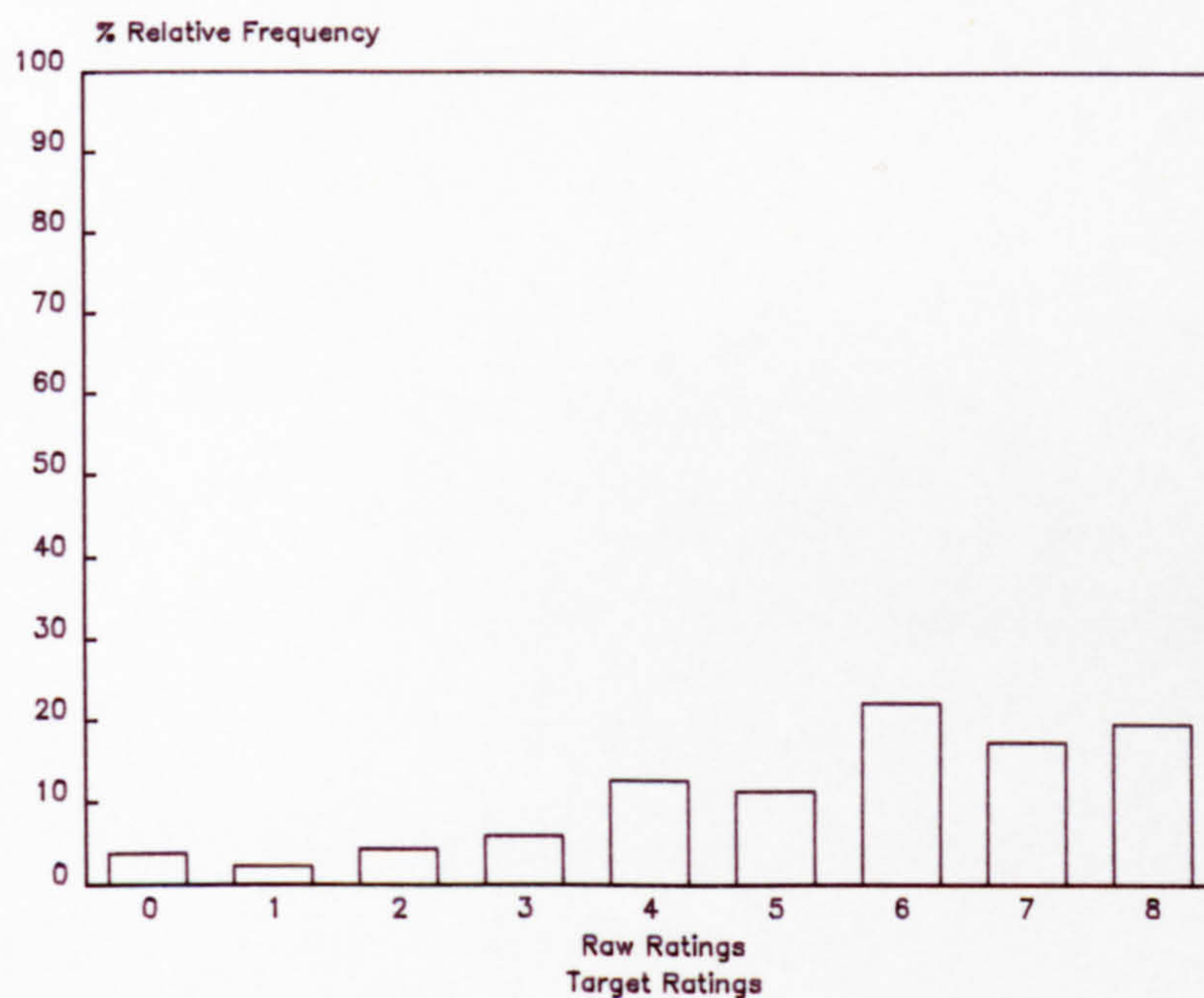
Rating	Absolute Frequency	% Relative Frequency
0	1466	58.18
1	86	3.41
2	168	6.67
3	45	1.79
4	256	10.16
5	21	0.83
6	98	3.89
7	20	0.79
8	360	14.29

The general pattern of these distributions is fairly similar across all groups in that, as expected, the most frequent rating is zero. The reason for this is simply that for most ratings, the emotion to be rated is probably seen as irrelevant to most of the slides being shown. However, one difference between the Control group and each of the patient groups that is outstanding is that the patient groups used the high extreme category far more often. Indeed both extreme categories accounted for 82.70%, 63.54% and 72.46% in the Violent Offender, Sex Offender and Arsonist groups respectively, whereas the Control group used these extreme categories on only 48.60% of ratings.

The greater tendency to use such extremes may be interpreted in a number of ways. For example it may imply greater impulsivity or

Figure 5.7.

Distribution of Ratings Control Group



Distribution of Ratings All Patients

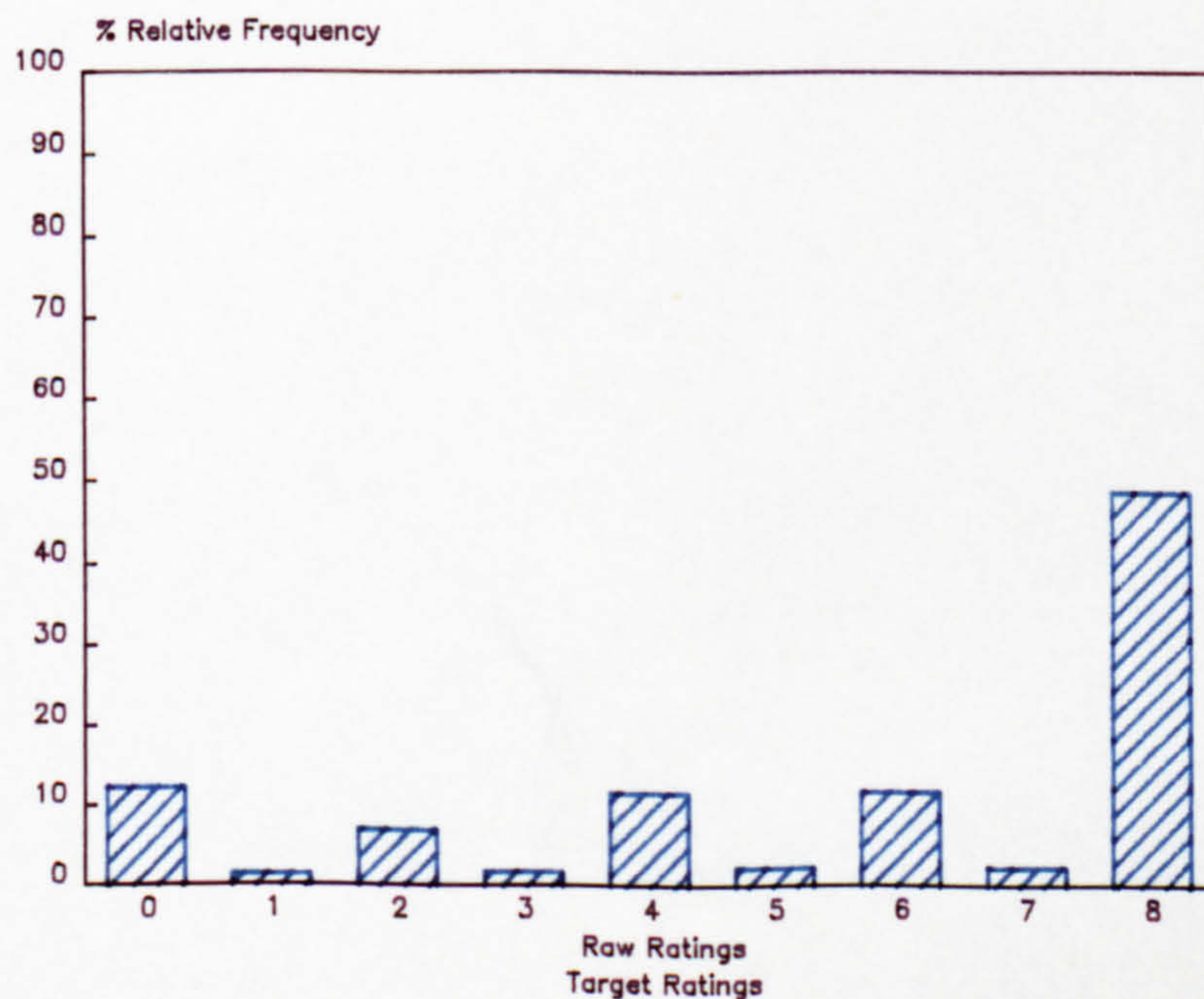
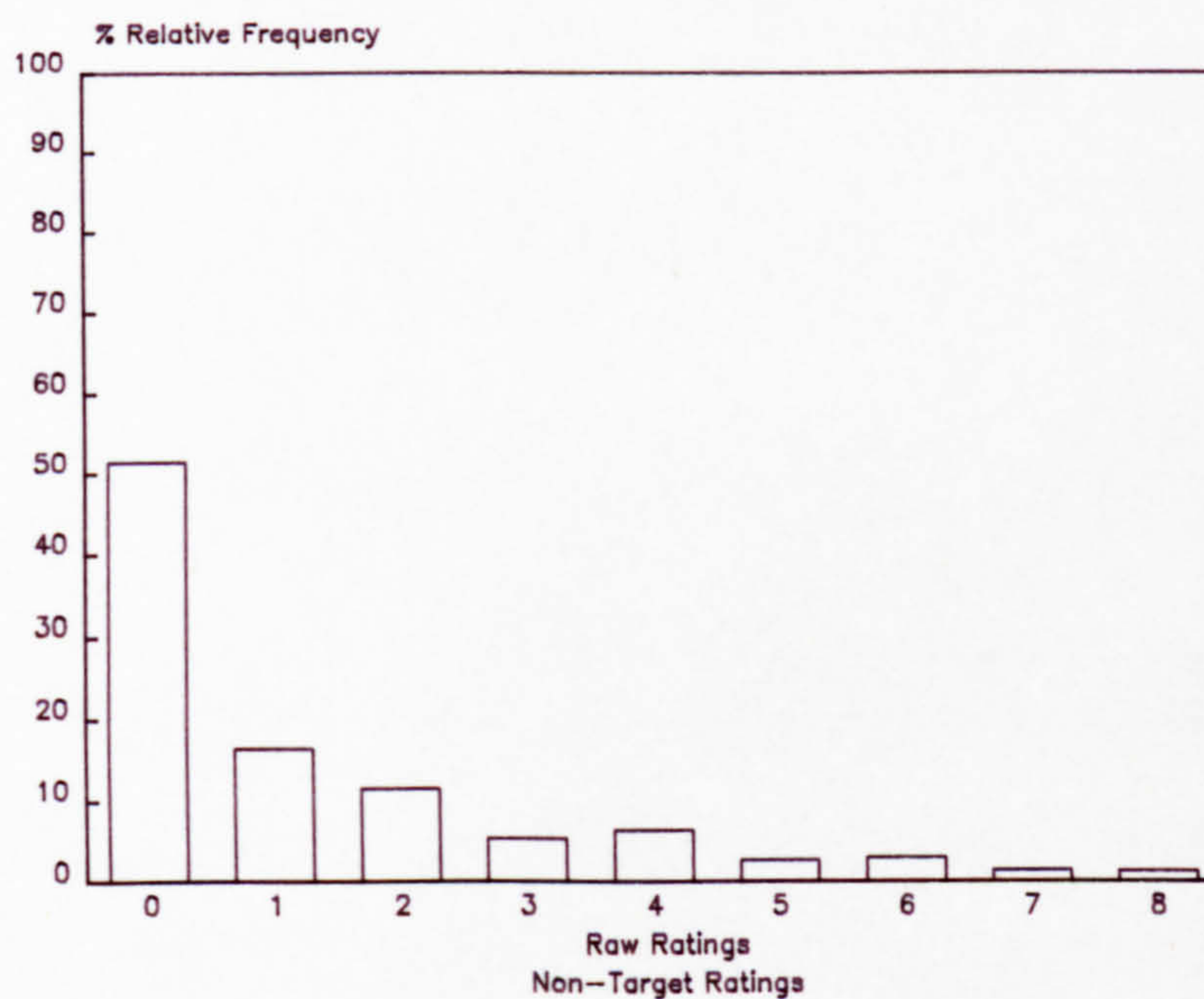
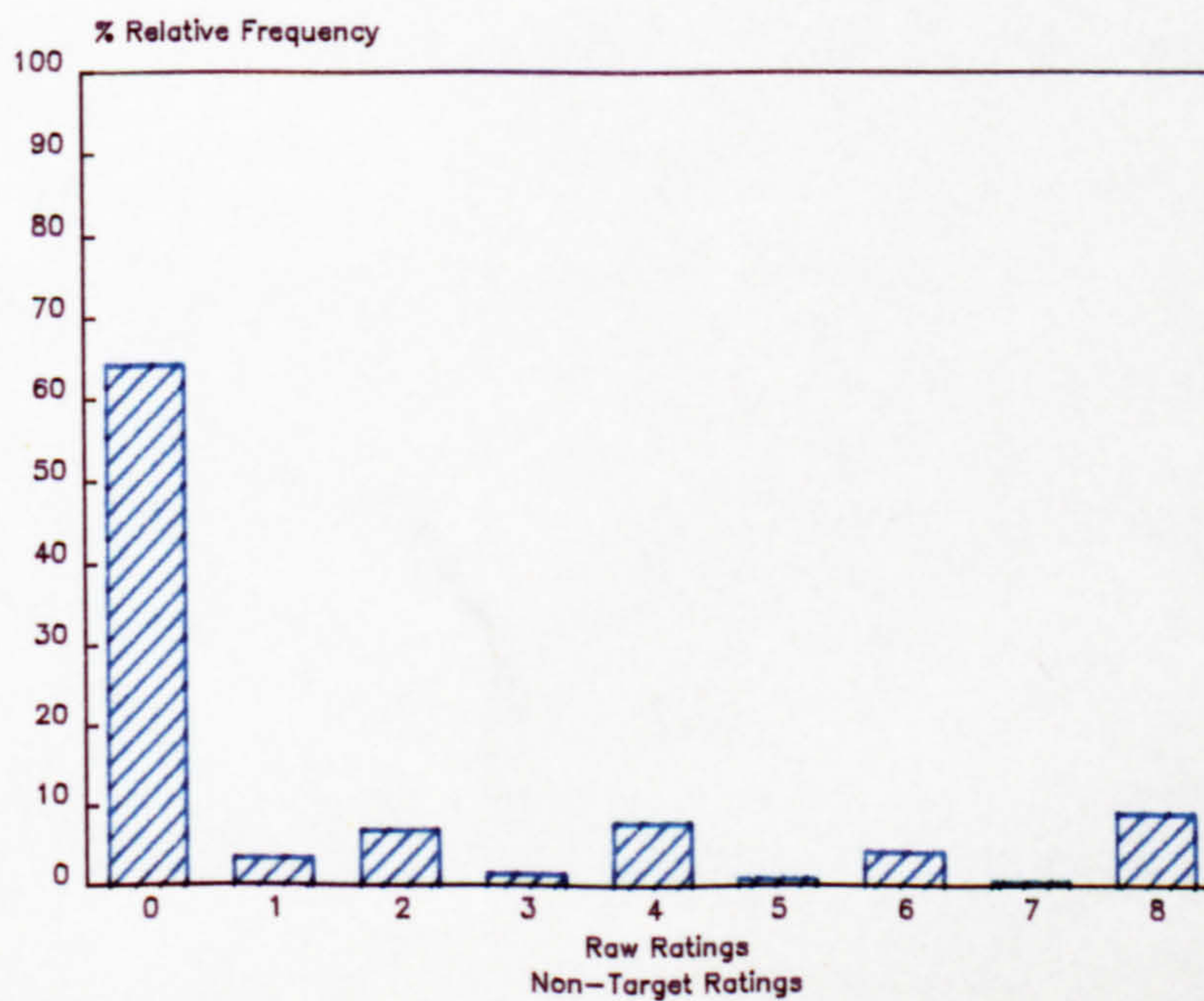


Figure 5.8.

Distribution of Ratings Control Group



Distribution of Ratings All Patients



a tendency actually to make extreme social judgements, with obvious implications for offenders.

Table 5.9. shows how these distributions appear when the data are split according to whether the slide is being rated on the emotion being shown or some other emotion i.e. the target emotion or non- target emotion (e.g. Happy slide rated on Happiness etc.).

Table 5.9. Relative Frequency of Raw Rating
across Target Emotions and all Slides for all Subjects

Rating	All Patients N=26		Control Group N=30	
	Absolute Frequency	% Relative Frequency	Absolute Frequency	% Relative Frequency
0	111	12.33	42	3.89
1	14	1.56	26	2.41
2	64	7.11	48	4.44
3	17	1.89	65	6.02
4	105	11.67	137	12.69
5	22	2.44	123	11.39
6	106	11.78	240	22.22
7	22	2.44	187	17.32
8	439	48.78	212	19.63

These data are shown in Figure 5.7.

Similarly, Table 5.10. and Figure 5.8. show the distribution of ratings when only non- target ratings are considered.

Table 5.10. Relative Frequency of Raw Rating
across Non- Target Emotions and all Slides for all Subjects

Rating	All Patients N=26		Control Group N=30	
	Absolute Frequency	% Relative Frequency	Absolute Frequency	% Relative Frequency
0	3471	64.28	3330	51.39
1	208	3.85	1067	16.47
2	382	7.07	748	11.54
3	85	1.57	351	5.42
4	434	8.04	417	6.44
5	53	0.98	178	2.75
6	233	4.32	201	3.10
7	36	0.67	98	1.51
8	498	9.22	90	1.39

It is apparent that the patient groups maintain their tendency to use the extreme ends of the rating scale whether or not the emotion being rated is the target emotion. In fact the second most frequent rating in both cases is the rating at the opposite end of the scale from the most frequent which is determined by the target. So where ratings are of the target emotion, the most frequent rating for the patient group is "8" but the second most frequent is "0". This is in contrast with the Control group which showed a much more gradual fall off from the high end on target ratings. Both groups showed steeper declines from the "0" end on non- target ratings but again with the patient groups being much less gradual.

Thus the notion of extreme judgement is supported. Such results

have possible implications both in terms of a tendency to regard others as being extreme (thus provoking extreme reactions) and/or a possible tendency to impulsivity.

Table 5.11. shows the mean rating of each emotion over all slides and the analysis of variance between groups.

Table 5.11.
Mean (S.D.) ratings over all slides

	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
	N=30	7	9	10		
<u>Happiness</u>	0.71 (0.67)	0.47 (1.12)	1.44 (2.17)	0.27 (0.45)	2.08	N.S.
<u>Sadness</u>	1.26 (1.30)	1.07 (1.46)	2.50 (2.65)	1.88 (1.65)	1.62	N.S.
<u>Fear</u>	0.68 (0.94)	0.76 (1.20)	1.31 (1.95)	1.23 (1.74)	0.81	N.S.
<u>Anger</u>	2.41 (1.58)	3.40 (2.38)	3.76 (1.51)	3.65 (2.28)	2.13	N.S.
<u>Surprise</u>	0.78 (0.78)	1.21 (1.43)	1.30 (1.80)	1.02 (1.48)	0.56	N.S.
<u>Disgust</u>	5.34 (1.60)	5.36 (1.98)	4.41 (1.95)	5.87 (2.45)	0.99	N.S.

Whilst it is clear that overall, the mean ratings differ between emotions, there were no significant differences between the groups. The mean ratings of Disgust and Anger were relatively high.

It is, however, the way rating categories were differentially applied which is of more interest.

A score was derived by taking the mean absolute rating on each of the emotions of Happiness, Sadness, Fear, Anger, Surprise and Disgust over each of the six slides in each of the seven categories of slide e.g. Happiness slides, Sadness slides through to Neutral slides. These were calculated for each subject. The mean of these scores was calculated for each of the groups. These results, and a one-way analysis of variance between groups, are shown in Tables 5.12. to 5.18. More detailed summary tables are presented in Appendix iii.

Table 5.12.
Means (S.D.) and Summary One-Way Analysis of Variance

Rating	<u>Happiness Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	7	9	10		
Happiness						
Mean	6.19	6.67	6.56	6.90	1.25	N.S.
S.D.	0.93	0.79	1.76	0.92		
Separation	A	A	A	A		
Sadness						
Mean	0.34	0.05	1.28	0.38	3.28	<.05
S.D.	0.51	0.13	1.93	0.62		
Separation	A	A	B	A		
Fear						
Mean	0.18	0.26	1.09	0.25	2.30	N.S.
S.D.	0.25	0.69	2.18	0.49		
Separation	A	A	A	A		
Anger						
Mean	0.18	0.17	1.22	0.32	3.12	<.05
S.D.	0.31	0.29	2.07	0.84		
Separation	A	A	B	A		
Surprise						
Mean	1.06	1.14	1.70	1.28	0.52	N.S.
S.D.	1.13	1.59	2.00	1.26		
Separation	A	A	A	A		
Disgust						
Mean	0.22	0.31	0.87	0.07	2.30	N.S.
S.D.	0.33	0.68	1.64	0.16		
Separation	A	A	A	A		

Table 5.13.
Means (S.D.) and Summary One-Way Analysis of Variance

Rating	<u>Sadness Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	7	9	10		
Happiness						
Mean	0.24	0.24	1.28	0.40	2.52	N.S.
S.D.	0.39	0.63	2.01	1.26		
Separation	A	A	A	A		
Sadness						
Mean	5.17	5.07	4.85	5.73	0.47	N.S.
S.D.	1.49	2.36	2.19	1.30		
Separation	A	A	A	A		
Fear						
Mean	2.91	2.69	2.74	2.55	0.10	N.S.
S.D.	1.96	2.22	1.73	1.83		
Separation	A	A	A	A		
Anger						
Mean	1.78	0.86	2.72	2.77	2.49	N.S.
S.D.	1.38	1.99	1.95	2.05		
Separation	A	A	A	A		
Surprise						
Mean	1.32	2.81	1.81	0.87	3.01	<.05
S.D.	1.13	1.58	1.78	1.70		
Separation	A	B	AB	A		
Disgust						
Mean	1.97	1.76	2.52	1.87	0.31	N.S.
S.D.	1.63	1.88	2.06	2.09		
Separation	A	A	A	A		

Table 5.14.
Means (S.D.) and Summary One-Way Analysis of Variance

Rating	<u>Fear Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	7	9	10		
Happiness						
Mean	0.34	0.21	0.91	0.20	1.55	N.S.
S.D.	0.51	0.32	1.69	0.20		
Separation	A	A	A	A		
Sadness						
Mean	2.16	2.69	2.11	3.80	2.41	N.S.
S.D.	1.72	1.20	1.71	2.12		
Separation	A	A	A	A		
Fear						
Mean	5.13	5.26	5.56	4.90	0.30	N.S.
S.D.	1.22	2.33	1.64	1.79		
Separation	A	A	A	A		
Anger						
Mean	2.02	0.79	3.26	3.30	5.27	<.01
S.D.	1.41	0.90	2.37	1.23		
Separation	AB	A	B	B		
Surprise						
Mean	4.26	4.67	3.46	2.75	2.02	N.S.
S.D.	1.54	2.53	1.79	2.65		
Separation	A	A	A	A		
Disgust						
Mean	2.31	1.60	2.26	3.13	0.89	N.S.
S.D.	1.81	1.82	2.52	2.02		
Separation	A	A	A	A		

Table 5.15.
Means (S.D.) and Summary One-Way Analysis of Variance

Rating	<u>Anger Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	7	9	10		
Happiness						
Mean	0.48	0.86	0.94	0.03	1.97	N.S.
S.D.	0.60	1.51	2.28	0.07		
Separation	A	A	A	A		
Sadness						
Mean	1.91	0.48	2.80	2.58	5.83	<.01
S.D.	1.46	0.13	1.93	1.28		
Separation	B	A	B	B		
Fear						
Mean	1.58	0.76	1.91	1.55	0.79	N.S.
S.D.	1.56	1.37	1.39	1.61		
Separation	A	A	A	A		
Anger						
Mean	4.79	3.81	4.87	5.08	1.21	N.S.
S.D.	1.36	1.93	0.95	1.63		
Separation	A	A	A	A		
Surprise						
Mean	1.26	2.86	2.22	0.98	3.89	<.05
S.D.	2.86	1.46	1.99	1.67		
Separation	AB	B	AB	A		
Disgust						
Mean	3.50	4.12	3.52	2.93	0.41	N.S.
S.D.	1.97	2.80	1.97	1.99		
Separation	A	A	A	A		

Table 5.16.
Means (S.D.) and Summary One-Way Analysis of Variance

Rating	<u>Surprise Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	7	9	10		
Happiness						
Mean	1.58	1.00	2.07	1.35	0.88	N.S.
S.D.	1.04	1.93	1.97	1.26		
Separation	A	A	A	A		
Sadness						
Mean	1.08	0.05	1.43	1.33	1.62	N.S.
S.D.	1.28	0.13	1.93	1.51		
Separation	A	A	A	A		
Fear						
Mean	2.52	1.76	2.67	2.18	0.54	N.S.
S.D.	1.67	1.47	1.87	1.43		
Separation	A	A	A	A		
Anger						
Mean	0.70	0.38	1.11	0.55	0.87	N.S.
S.D.	0.80	1.01	1.45	0.92		
Separation	A	A	A	A		
Surprise						
Mean	6.45	6.10	5.93	5.32	1.76	N.S.
S.D.	1.12	1.74	1.47	1.76		
Separation	A	A	A	A		
Disgust						
Mean	1.08	1.00	1.22	0.83	0.17	N.S.
S.D.	1.04	0.69	2.05	1.14		
Separation	A	A	A	A		

Table 5.17.
Means (S.D.) and Summary One-Way Analysis of Variance

Rating	<u>Disgust Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	7	9	10		
Happiness						
Mean	0.71	0.48	1.44	0.27	2.08	N.S.
S.D.	0.67	1.12	2.17	0.45		
Separation	A	A	A	A		
Sadness						
Mean	1.26	1.07	2.50	1.88	1.62	N.S.
S.D.	1.30	1.46	2.65	1.65		
Separation	A	A	A	A		
Fear						
Mean	0.68	0.76	1.31	1.23	0.81	N.S.
S.D.	0.94	1.20	1.95	1.74		
Separation	A	A	A	A		
Anger						
Mean	2.41	3.40	3.76	3.65	2.13	N.S.
S.D.	1.58	2.38	1.51	2.28		
Separation	A	A	A	A		
Surprise						
Mean	0.78	1.21	1.30	1.02	0.56	N.S.
S.D.	0.78	1.43	1.80	1.48		
Separation	A	A	A	A		
Disgust						
Mean	5.34	5.36	4.41	5.87	0.99	N.S.
S.D.	1.60	1.98	1.95	2.45		
Separation	A	A	A	A		

Table 5.18.
Means (S.D.) and Summary One-Way Analysis of Variance

Rating	<u>Neutral Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	7	9	10		
Happiness						
Mean	1.53	1.76	2.26	1.32	1.45	N.S.
S.D.	1.19	1.71	1.93	1.42		
Separation	A	A	A	A		
Sadness						
Mean	2.10	0.79	1.91	2.42	2.16	N.S.
S.D.	1.36	0.92	1.86	1.20		
Separation	A	A	A	A		
Fear						
Mean	1.03	0.29	0.96	1.00	0.68	N.S.
S.D.	1.21	0.50	1.54	1.53		
Separation	A	A	A	A		
Anger						
Mean	0.97	0.69	1.26	1.37	0.53	N.S.
S.D.	1.00	1.49	2.40	1.51		
Separation	A	A	A	A		
Surprise						
Mean	0.73	2.64	1.78	0.90	4.98	<.01
S.D.	0.76	2.20	1.99	1.01		
Separation	A	B	AB	A		
Disgust						
Mean	0.94	0.81	1.48	1.07	0.43	N.S.
S.D.	1.02	1.54	1.99	1.61		
Separation	A	A	A	A		

There were no differences at all between the groups on the ratings of the target emotion i.e those which according to the Ekman sample was depicted in the slides. However, this does not imply similarity of responding. Although successes might be similar,

it is, perhaps, in the incorrect responses that the most interesting results might be expected (since it is possible misinterpretations of an emotion that is most likely to be related to offending).

When ratings of emotions other than that depicted are analysed, some differences do occur. As a group, the Arsonists did not differ on any measure of absolute rating from the Controls. The Violent Offender group showed the most differences on these measures, both from other patient groups and from the Control group. The differences shown by the Violent Offender group from the Control group were:

1. Higher rating of Surprise on Sadness slides
2. Lower rating of Sadness on Anger slides
3. Higher rating of Surprise on Neutral slides

The only differences shown by the Sex Offender group from the Control group were:

1. Higher rating of Anger on Happiness slides
2. Higher rating of Sadness on Happiness slides

Some differences occurred between patient groups without a demonstrable differences occurring with the Control group. Violent

Offenders showed a lower rating of Anger on Fear slides than either of the other patient groups and a higher rating of Anger on Surprise slides than Arsonists.

While these results show differences in the mean absolute rating of strength of emotional expression, it was apparent that there were differences in the range of rating used by each individual. The main point of interest is really the way individuals in these circumstances would distribute their ratings among the different categories of slide. Such differences might be seen as reflecting characteristics like caution versus impulsivity ,a cautious respondent "hedging bets" or simply difficulty in resolving problematic examples.

It was decided, therefore to analyse the data following a transformation of the ratings on each emotion into Z-scores for each individual across the full set of 42 slides.

5.3.2. Transformed Scores

Tables 5.19. to 5.25. and Figures 5.9. to 5.15. show the further analysis using these transformed scores. Unfortunately, during the editing of the data associated with this

Figure 5.9.
Happiness Slides

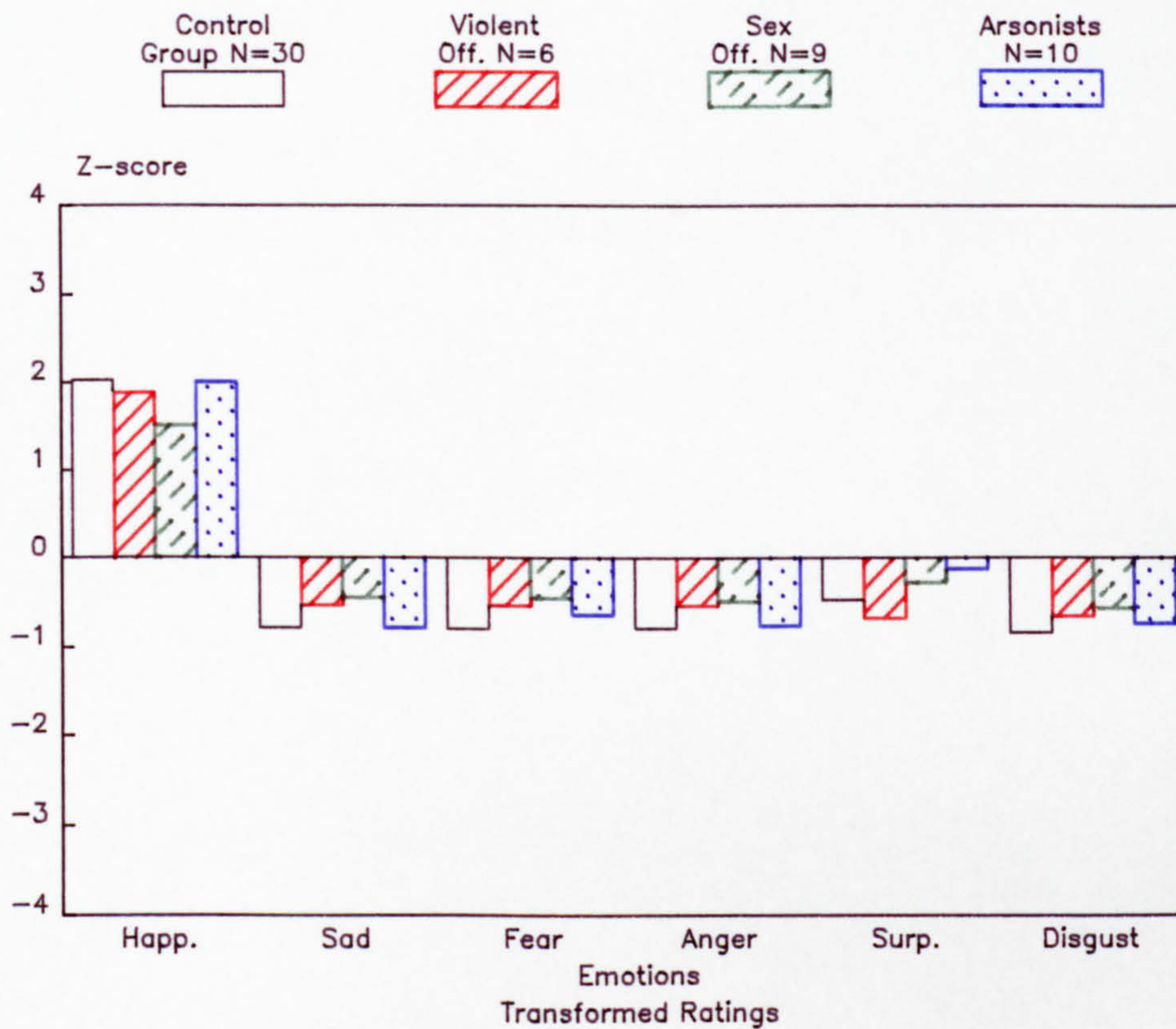


Figure 5.10.
Sadness Slides

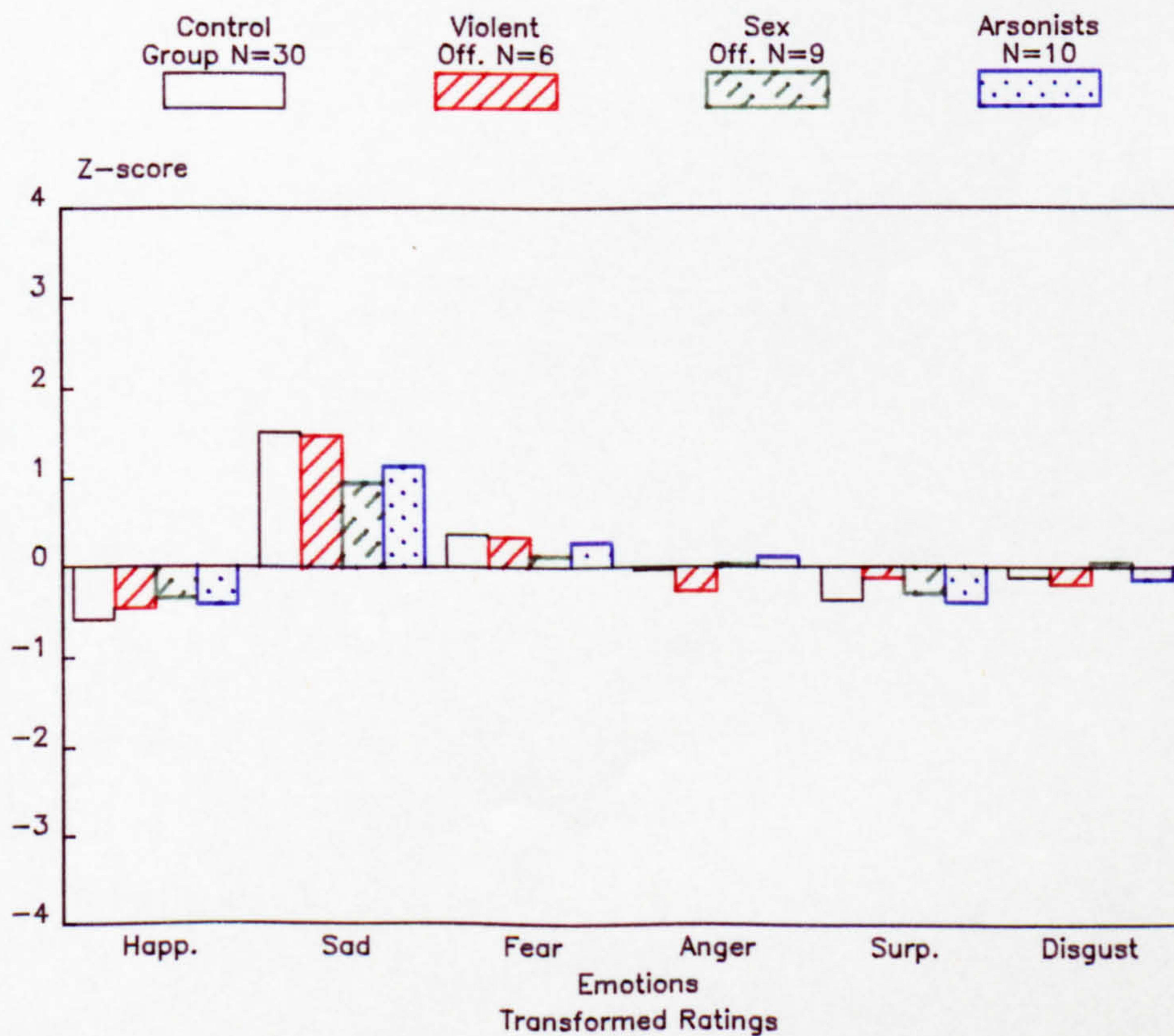


Figure 5.11.
Fear Slides

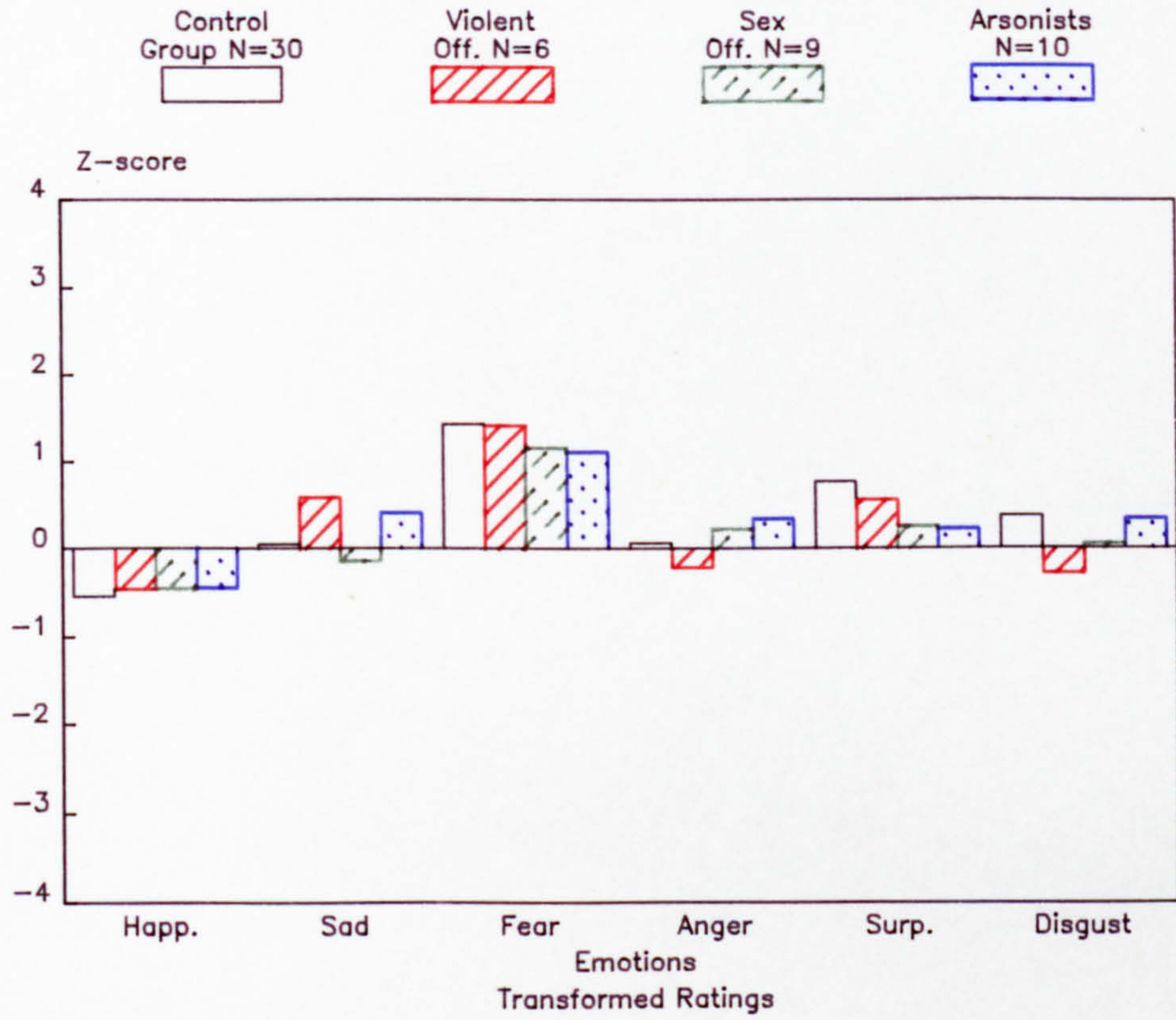


Figure 5.12.
Anger Slides

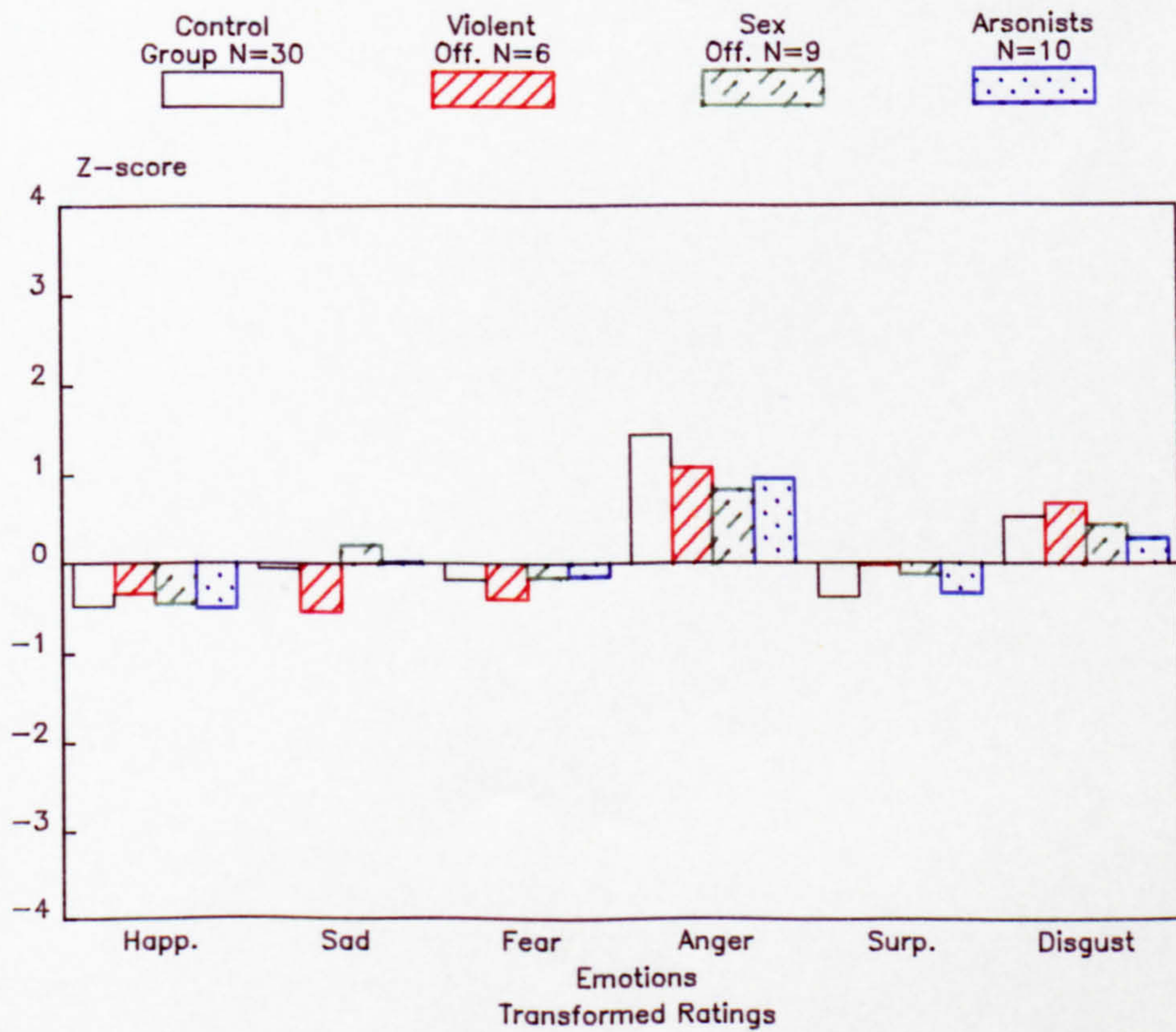


Figure 5.13.
Surprise Slides

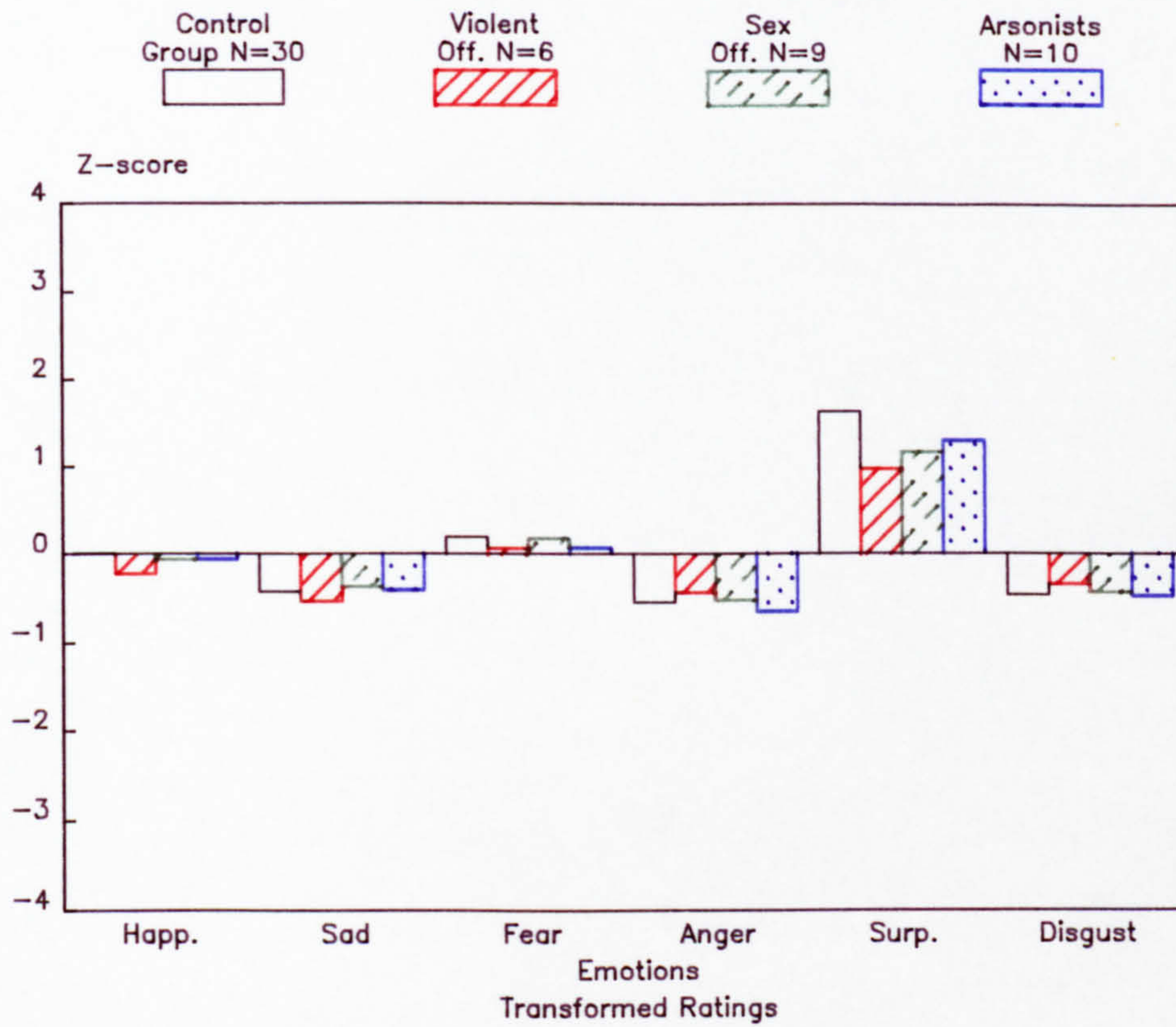


Figure 5.14.
Disgust Slides

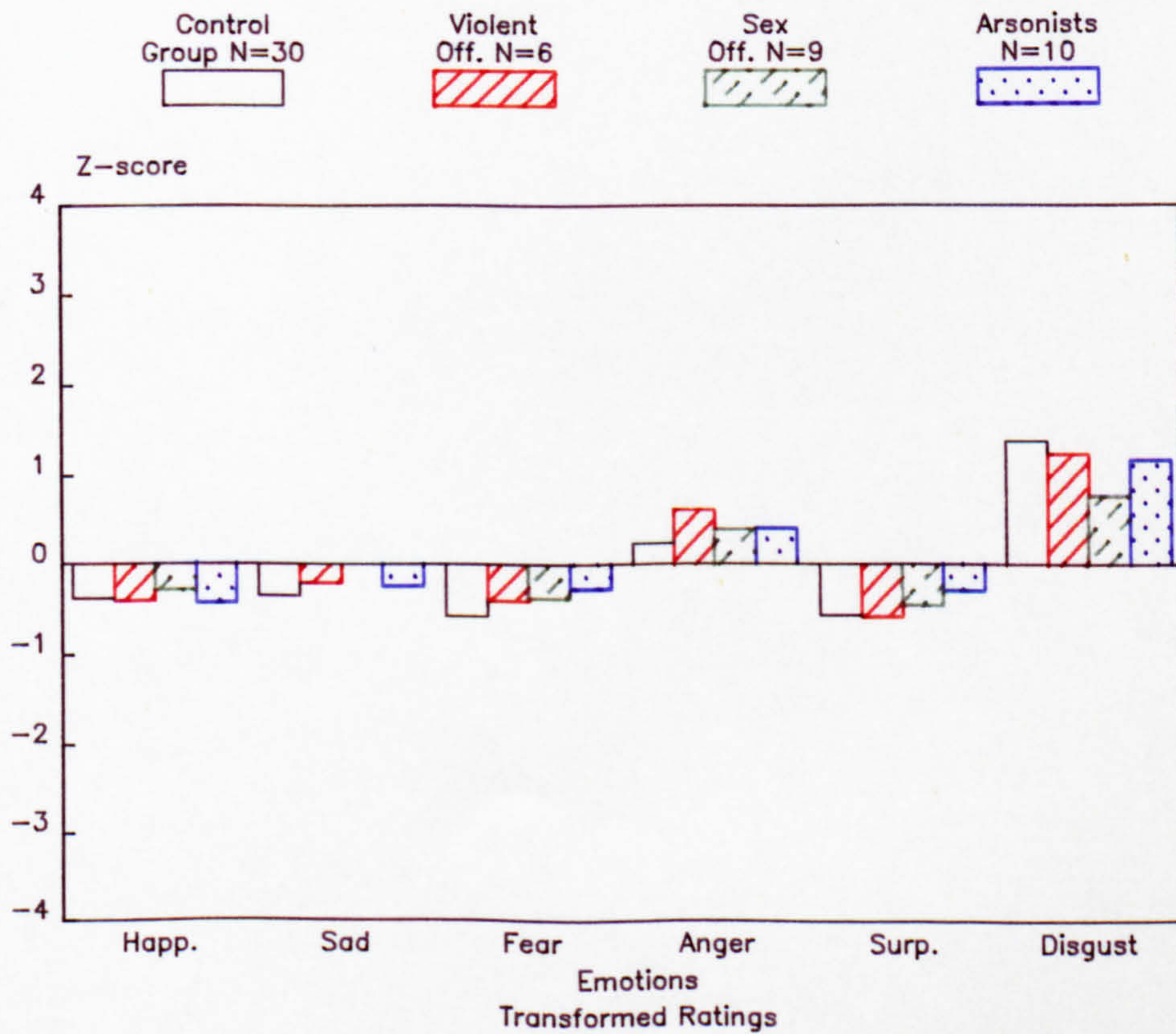
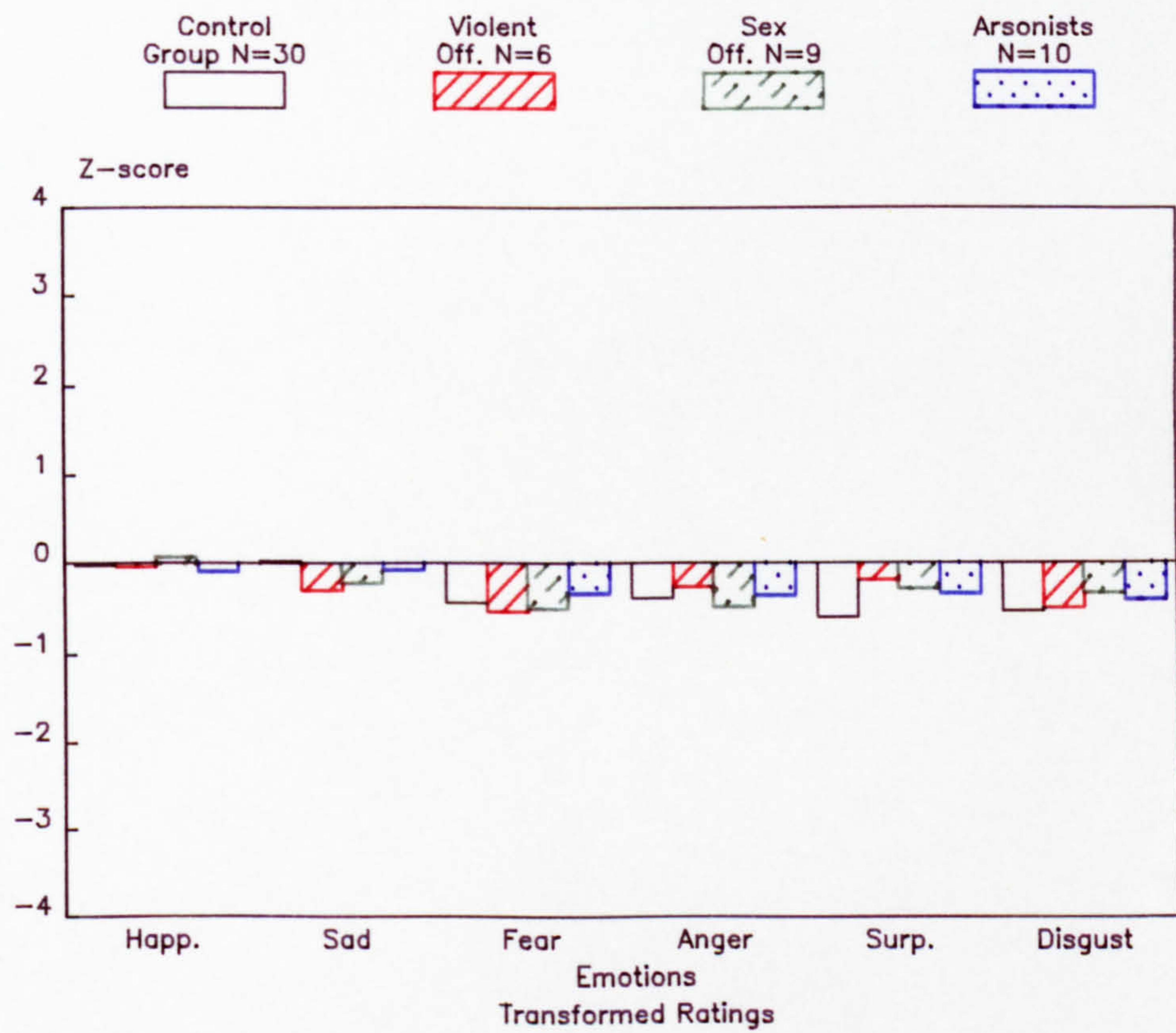


Figure 5.15.
Neutral Slides



transformation, the original data on one of the Violent Offender patients was erased and could not be recovered. Data on only six of these patients could therefore be included. More detailed summary tables are presented in Appendix iv.

Table 5.19.
Means (S.D.) and Summary One-Way Analysis of Variance

<u>Happiness Slides</u>						
Rating	Control	Violent	Sex	Arsonists	F-ratio	Sig.
	Group	Off.	Off.			
N=	30	6	9	10		
Happiness						
Mean	2.03	1.89	1.51	2.00	2.51	N.S.
S.D.	0.23	0.68	1.00	0.40		
Separation	A	A	A	A		
Sadness						
Mean	-0.79	-0.53	-0.45	-0.80	3.62	<.05
S.D.	0.33	0.08	0.37	0.31		
Separation	A	AB	B	A		
Fear						
Mean	-0.80	-0.53	-0.45	-0.65	3.45	<.05
S.D.	0.30	0.12	0.39	0.35		
Separation	A	AB	B	AB		
Anger						
Mean	-0.79	-0.53	-0.49	-0.77	2.62	N.S.
S.D.	0.27	0.13	0.43	0.47		
Separation	A	A	A	A		
Surprise						
Mean	-0.47	-0.67	-0.28	-0.13	3.86	<.05
S.D.	0.29	0.34	0.36	0.52		
Separation	AB	A	BC	C		
Disgust						
Mean	-0.84	-0.65	-0.57	-0.75	2.28	N.S.
S.D.	0.29	0.27	0.27	0.34		
Separation	A	A	A	A		

Table 5.20.
Means (S.D.) and Summary One-Way Analysis of Variance

Sadness Slides

Rating	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	6	9	10		
Happiness						
Mean	-0.59	-0.45	-0.34	-0.42	4.36	<.01
S.D.	0.16	0.05	0.31	0.26		
Separation	A	AB	B	AB		
Sadness						
Mean	1.52	1.49	0.95	1.13	3.39	<.05
S.D.	0.43	0.26	0.80	0.64		
Separation	B	B	A	AB		
Fear						
Mean	0.37	0.35	0.13	0.27	0.52	N.S.
S.D.	0.45	0.64	0.53	0.55		
Separation	A	A	A	A		
Anger						
Mean	-0.03	-0.26	0.03	0.11	1.02	N.S.
S.D.	0.41	0.44	0.48	0.40		
Separation	A	A	A	A		
Surprise						
Mean	-0.37	-0.11	-0.29	-0.40	1.33	N.S.
S.D.	0.29	0.34	0.25	0.40		
Separation	A	A	A	A		
Disgust						
Mean	-0.11	-0.18	0.06	-0.14	0.72	N.S.
S.D.	0.33	0.37	0.50	0.37		
Separation	A	A	A	A		

Table 5.21.
Means (S.D.) and Summary One-Way Analysis of Variance

<u>Fear Slides</u>						
Rating	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	6	9	10		
Happiness						
Mean	-0.55	-0.46	-0.46	-0.46	1.76	N.S.
S.D.	0.15	0.06	0.18	0.13		
Separation	A	A	A	A		
Sadness						
Mean	0.06	0.60	-0.14	0.41	5.51	<.01
S.D.	0.42	0.41	0.32	0.47		
Separation	AB	C	A	BC		
Fear						
Mean	1.43	1.42	1.16	1.10	1.49	N.S.
S.D.	0.41	0.53	0.63	0.64		
Separation	A	A	A	A		
Anger						
Mean	0.07	-0.21	0.23	0.34	2.87	<.05
S.D.	0.35	0.26	0.50	0.47		
Separation	AB	A	B	B		
Surprise						
Mean	0.77	0.57	0.26	0.22	4.79	<.01
S.D.	0.40	0.36	0.52	0.68		
Separation	B	AB	A	A		
Disgust						
Mean	0.38	-0.28	0.06	0.34	2.31	N.S.
S.D.	0.41	0.30	0.49	0.65		
Separation	A	A	A	A		

Table 5.22.
Means (S.D.) and Summary One-Way Analysis of Variance

<u>Anger Slides</u>						
Rating	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	6	9	10		
Happiness						
Mean	-0.48	-0.33	-0.45	-0.51	1.79	N.S.
S.D.	0.16	0.22	0.16	0.12		
Separation	A	A	A	A		
Sadness						
Mean	-0.05	-0.53	0.22	0.01	5.86	<.01
S.D.	0.32	0.08	0.53	0.27		
Separation	B	A	B	B		
Fear						
Mean	-0.18	-0.39	-0.15	-0.15	0.83	N.S.
S.D.	0.36	0.26	0.25	0.30		
Separation	A	A	A	A		
Anger						
Mean	1.45	1.08	0.83	0.95	4.91	<.01
S.D.	0.44	0.69	0.65	0.48		
Separation	B	AB	A	A		
Surprise						
Mean	-0.38	-0.01	-0.12	-0.34	3.66	<.05
S.D.	0.25	0.25	0.39	0.39		
Separation	A	B	AB	A		
Disgust						
Mean	0.53	0.69	0.44	0.28	0.93	N.S.
S.D.	0.48	0.53	0.62	0.46		
Separation	A	A	A	A		

Table 5.23.
Means (S.D.) and Summary One-Way Analysis of Variance

<u>Surprise Slides</u>						
Rating	Control	Violent	Sex	Arsonists	F-ratio	Sig.
N=	Group	Off.	Off.			
	30	6	9	10		
Happiness						
Mean	0.01	-0.22	-0.06	-0.07	0.91	N.S.
S.D.	0.31	0.35	0.36	0.27		
Separation	A	A	A	A		
Sadness						
Mean	-0.43	-0.53	-0.37	-0.42	0.39	N.S.
S.D.	0.29	0.07	0.34	0.33		
Separation	A	A	A	A		
Fear						
Mean	0.20	0.08	0.19	0.07	0.26	N.S.
S.D.	0.43	0.42	0.76	0.48		
Separation	A	A	A	A		
Anger						
Mean	-0.55	-0.43	-0.52	-0.66	2.12	N.S.
S.D.	0.16	0.18	0.25	0.18		
Separation	A	A	A	A		
Surprise						
Mean	1.63	0.98	1.17	1.29	5.07	<.01
S.D.	0.28	0.51	0.66	0.63		
Separation	B	A	A	AB		
Disgust						
Mean	-0.47	-0.34	-0.43	-0.49	0.50	N.S.
S.D.	0.22	0.35	0.37	0.20		
Separation	A	A	A	A		

Table 5.24.
Means (S.D.) and Summary One-Way Analysis of Variance

Disgust Slides

Rating	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	6	9	10		
Happiness						
Mean	-0.38	-0.40	-0.28	-0.44	1.27	N.S.
S.D.	0.14	0.13	0.34	0.09		
Separation	A	A	A	A		
Sadness						
Mean	-0.35	-0.20	-0.00	-0.25	1.88	N.S.
S.D.	0.33	0.40	0.56	0.40		
Separation	A	A	A	A		
Fear						
Mean	-0.58	-0.40	-0.37	-0.28	3.79	<.05
S.D.	0.19	0.21	0.35	0.42		
Separation	AB	AB	B			
Anger						
Mean	0.24	0.62	0.40	0.40	1.06	N.S.
S.D.	0.46	0.72	0.37	0.60		
Separation	A	A	A	A		
Surprise						
Mean	-0.57	-0.58	-0.45	-0.30	3.26	<.05
S.D.	0.19	0.35	0.24	0.36		
Separation	A	A	AB	B		
Disgust						
Mean	1.39	1.25	0.78	1.17	1.91	N.S.
S.D.	0.58	0.68	0.84	0.78		
Separation	A	A	A	A		

Table 5.25.
Means (S.D.) and Summary One-Way Analysis of Variance

<u>Neutral Slides</u>						
Rating	Control	Violent	Sex	Arsonists	F-ratio	Sig.
N=	Group	Off.	Off.			
	30	6	9	10		
Happiness						
Mean	-0.03	-0.03	0.08	-0.10	0.44	N.S.
S.D.	0.31	0.44	0.42	0.29		
Separation	A	A	A	A		
Sadness						
Mean	0.03	-0.30	-0.22	-0.08	1.80	N.S.
S.D.	0.40	0.23	0.48	0.38		
Separation	A	A	A	A		
Fear						
Mean	-0.44	-0.53	-0.50	-0.35	1.16	N.S.
S.D.	0.23	0.15	0.19	0.24		
Separation	A	A	A	A		
Anger						
Mean	-0.39	-0.26	-0.48	-0.37	0.67	N.S.
S.D.	0.28	0.42	0.29	0.24		
Separation	A	A	A	A		
Surprise						
Mean	-0.60	-0.18	-0.28	-0.35	5.61	<.01
S.D.	0.18	0.65	0.38	0.19		
Separation	A	B	B	AB		
Disgust						
Mean	-0.53	-0.49	-0.33	-0.42	1.04	N.S.
S.D.	0.30	0.24	0.41	0.25		
Separation	A	A	A	A		

Having transformed the ratings into Z-scores, differences between ratings of the target emotion emerged. Each of these involved differences from the Control group. The largest of these was the rating of Surprise on the Surprise slides where the Control group

rated the level higher than both the Violent Offender and Sex Offender groups. A comparable result, however was the rating of Anger on Anger slides with the Control group again rating the level higher than both the Sex Offender group and the Arsonists. Sex Offenders also rated Sadness on Sadness slides lower than both the Control group and the Violent Offender group. Anger and Fear slides showed the largest differences between the groups, particularly the ratings of Sadness on Anger slides, which Violent Offenders rated lower than all of the other groups and the rating of Sadness on Fear slides which showed Sex Offenders rating low and Violent Offenders rating high. On no category of slide did the rating of Disgust show any significant differences between the groups. The Sex Offender group seemed to show most differences from the Control group and these occurred on all categories of slide on each rating apart from Disgust in various combinations. Only the Sex Offender group differed from the Controls on the rating of Sadness slides. Whilst the Violent Offender group showed differences from the Control group on the rating of Fear, Anger, Surprise and Neutral slides, these differences were restricted to ratings on Sadness and Surprise. The Arson group showed smaller differences from the Control group than the others. The differences were restricted to four categories of slide, with those depicting Sadness, Surprise and Neutral expressions showing

no differences. The ratings showing differences from the Control group among the Arson group were three examples of differences on Surprise rating, one on Anger and one on Fear.

Clearly, there are complex differences in the various groups' assessments of the emotional states of others. To some extent, such complexity may be a function of interrelationships between various categories used. An attempt was therefore made to clarify these relationships using correlational and principal component analyses.

5.3.3. Principal Components Analysis and Correlations between Ratings

Intuitively, one would expect that any high rating of Happiness on an individual slide would produce a corresponding low rating of Sadness. Similarly, one might expect ratings such as Fear, Anger and Disgust to be related in that they represent, on the whole negative emotions. The relationship of these emotions to each other may give some clues to the emotion construct system of individuals and may help to discriminate between groups.

Consequently an analysis was performed to test whether this was the case. Tables 5.26. to 5.29. shows the correlations between the mean ratings for each subject of each emotion on each of the 7 categories of slide.

Table 5.26.
Product Moment Correlations between Mean Ratings
for each Category of Slide :Control Group

Ratings	Ratings				
	Sad	Fear	Anger	Surp.	Disg.
Happiness	-.51	-.47	-.50	-.14	-.50
Sadness		.36	.17	-.14	.07
Fear			.10	.52	-.02
Anger				-.20	.58
Surprise					-.20

Table 5.27.
Product Moment Correlations between Mean Ratings
for each Category of Slide :Violent Offenders

Ratings	Ratings				
	Sad	Fear	Anger	Surp.	Disg.
Happiness	-.34	-.34	-.28	-.41	-.40
Sadness		.54	-.13	.01	-.17
Fear			-.18	.44	-.14
Anger				-.16	.52
Surprise					-.15

Table 5.28.
Product Moment Correlations between Mean Ratings
for each Category of Slide :Sex Offenders

Ratings	Ratings				
	Sad	Fear	Anger	Surp.	Disg.
Happiness	-.36	-.40	-.48	-.17	-.46
Sadness		.11	.23	-.17	.22
Fear			.10	.41	.02
Anger				-.27	.70
Surprise					-.26

Table 5.29.
Product Moment Correlations between Mean Ratings
for each Category of Slide :Arsonists

Ratings	Ratings				
	Sad	Fear	Anger	Surp.	Disg.
Happiness	-.52	-.46	-.56	.03	-.49
Sadness		.46	.28	-.26	.13
Fear			.26	.14	.15
Anger				-.37	.53
Surprise					-.20

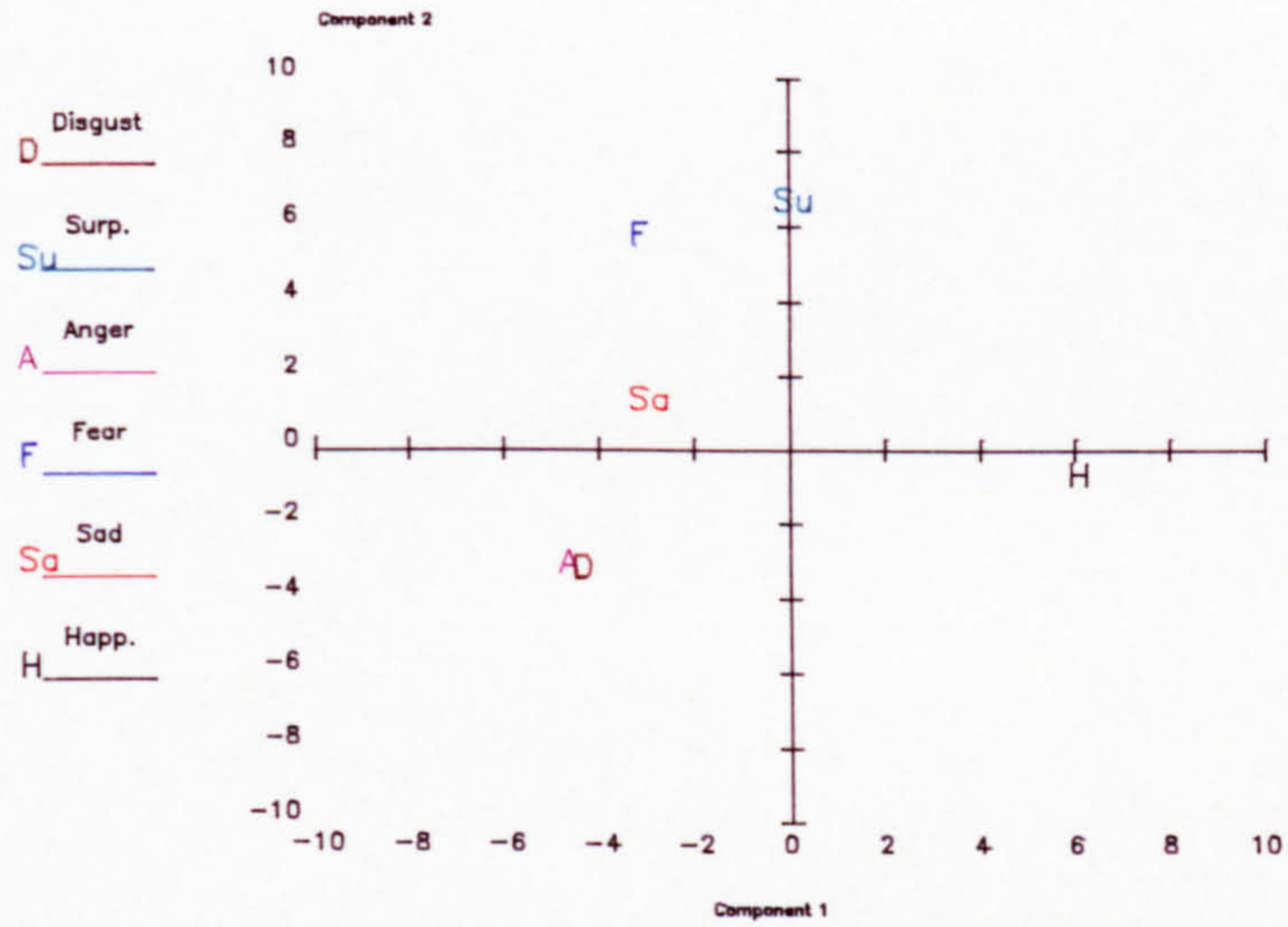
On the face of it, the groups were very similar in the way that they structured the relationships between the emotion ratings across slides. For example, the rating of all subjects indicated a strong positive relationship between Anger and Disgust. Similarly, all agreed that there was a strong negative relationship between Happiness and Sadness, although this was

more marked in the Control and Arsonist groups. All agreed that there was a strong negative relationship between Happiness and Fear and between Happiness and Disgust. When other relationships are considered, the Violent Offender group are perhaps less typical. In particular, they were less typical in their construction of Anger, indicating as they did small negative relationships between Anger and Sadness and Anger and Fear.

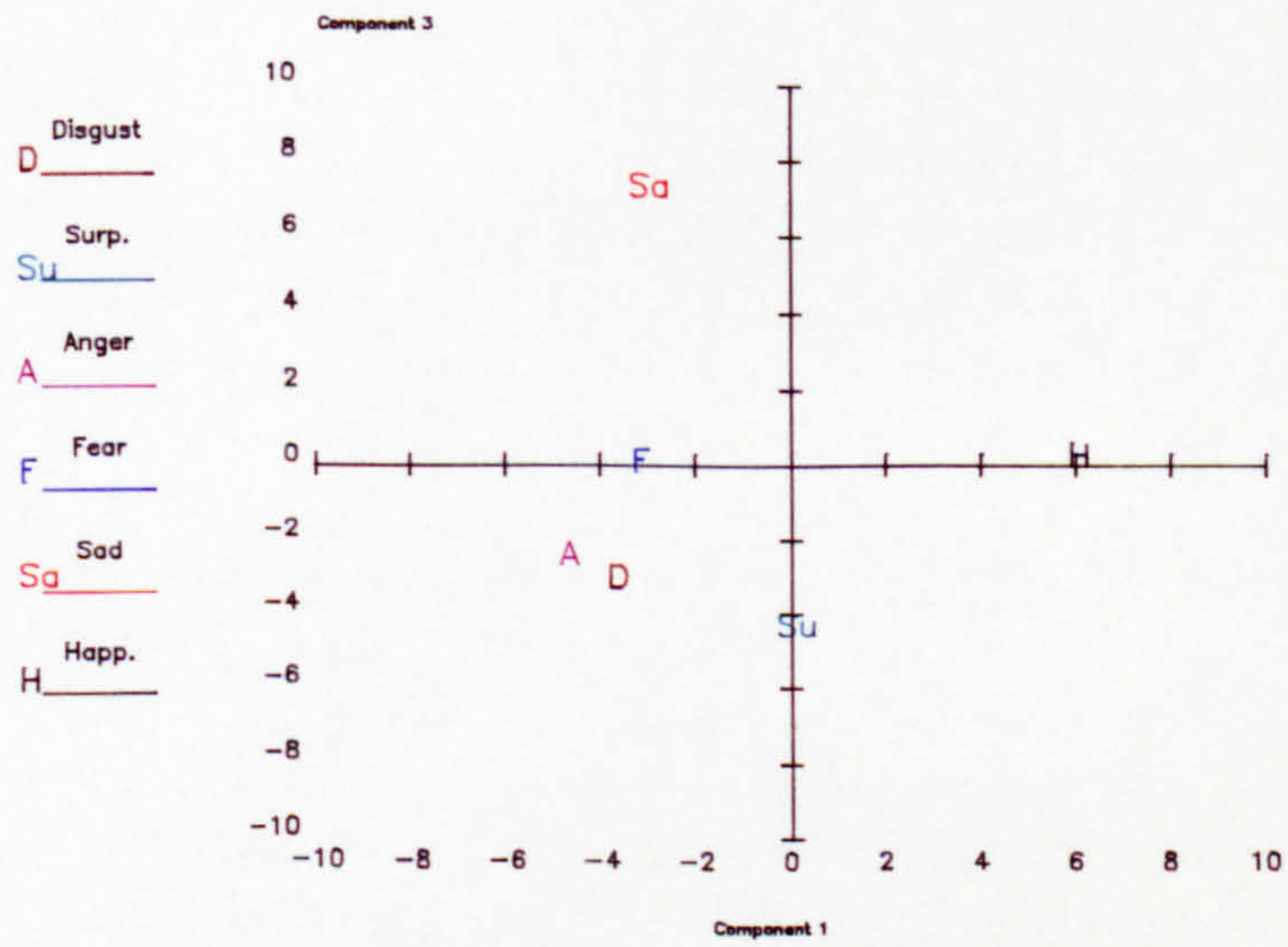
On the basis of this, it was decided to perform Principal Components Analyses on each set of data from each group. The results of these are shown in Tables 5.30. to 5.33. The plots of the Principal Components are shown in Figures 5.16. to 5.19.

Figure 5.16.

Principal Components: Control Group



Principal Components: Control Group



Principal Components: Control Group

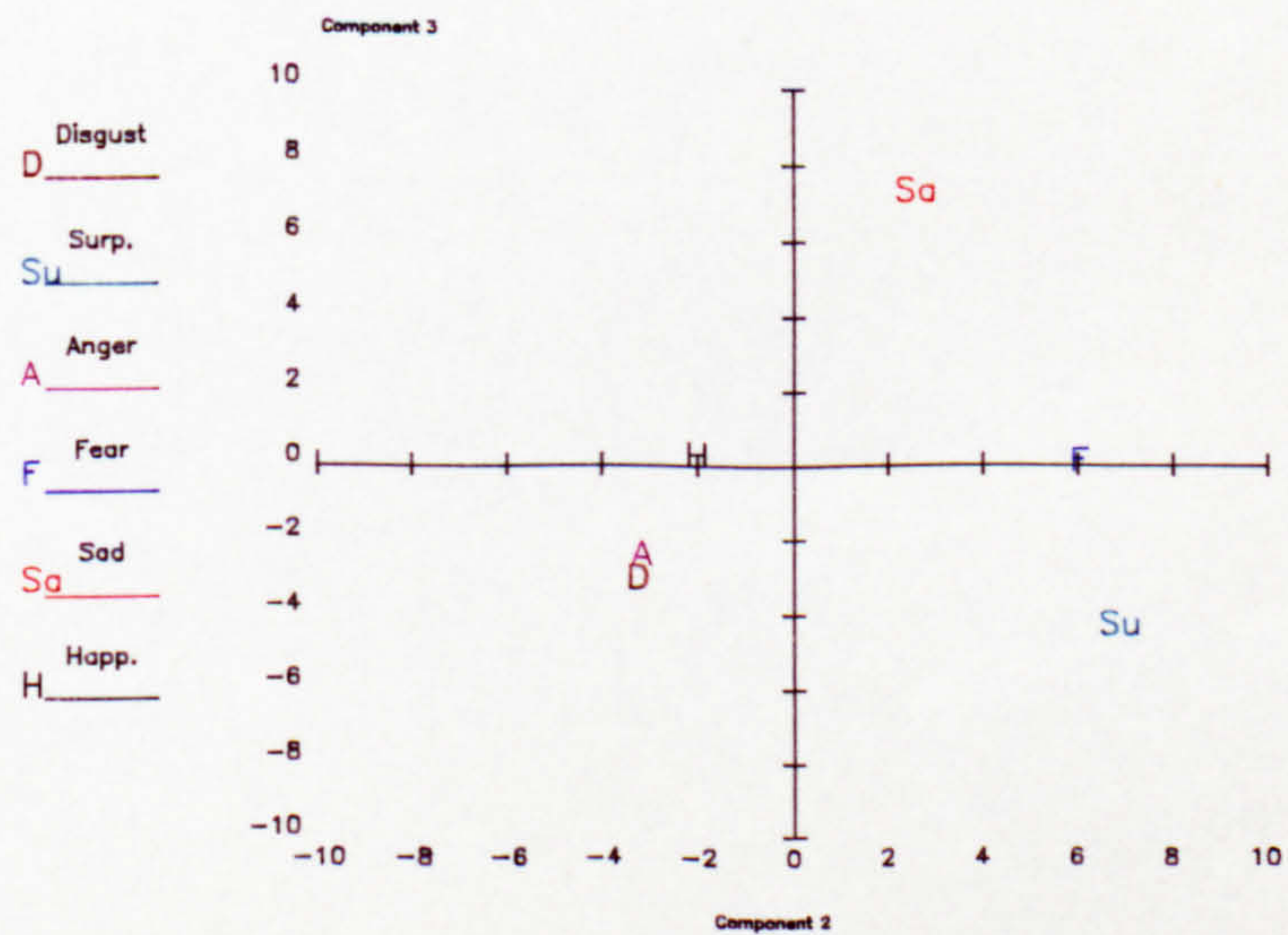
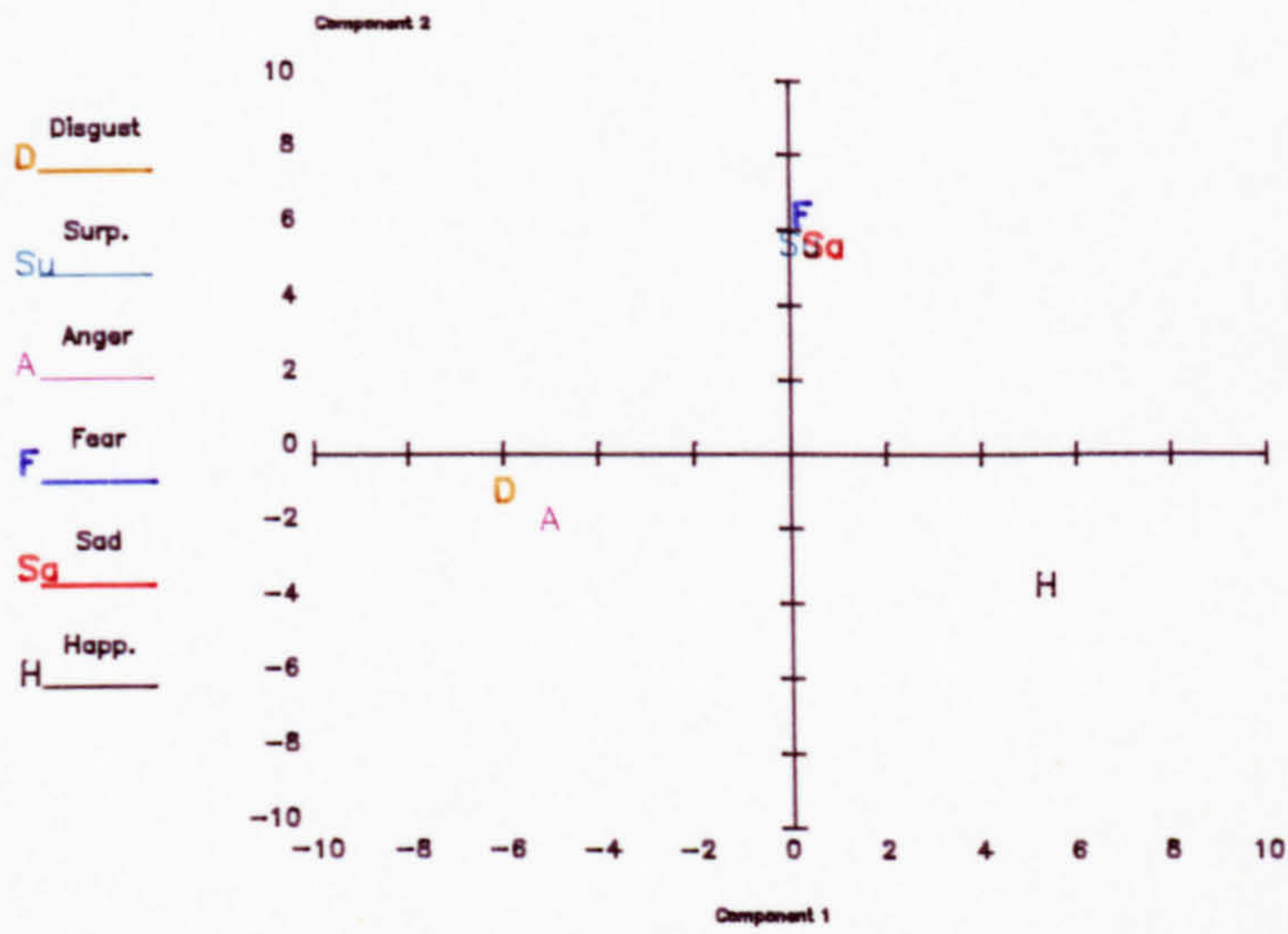
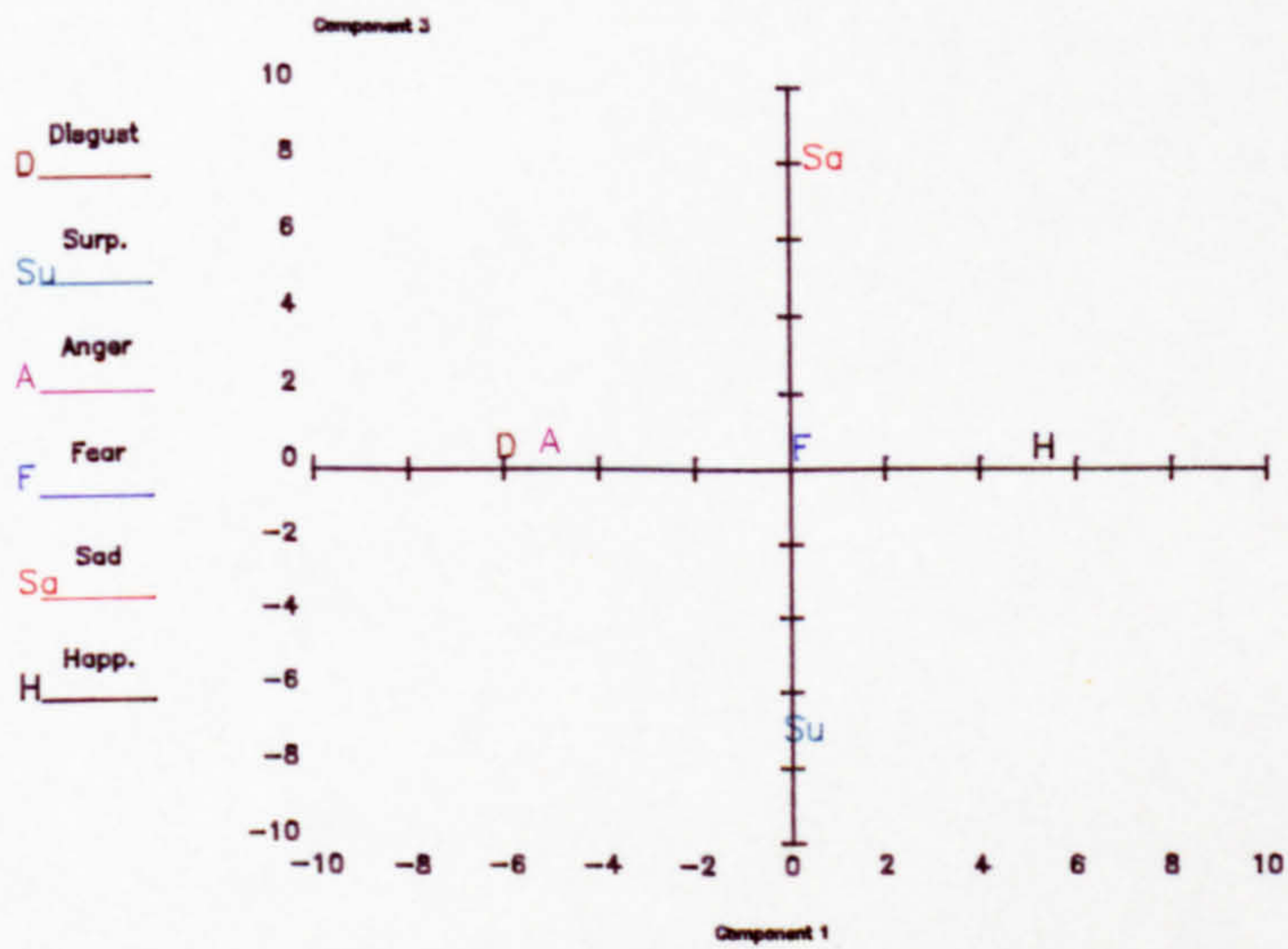


Figure 5.17.

Principal Components: Violent Offenders



Principal Components: Violent Offenders



Principal Components: Violent Offenders

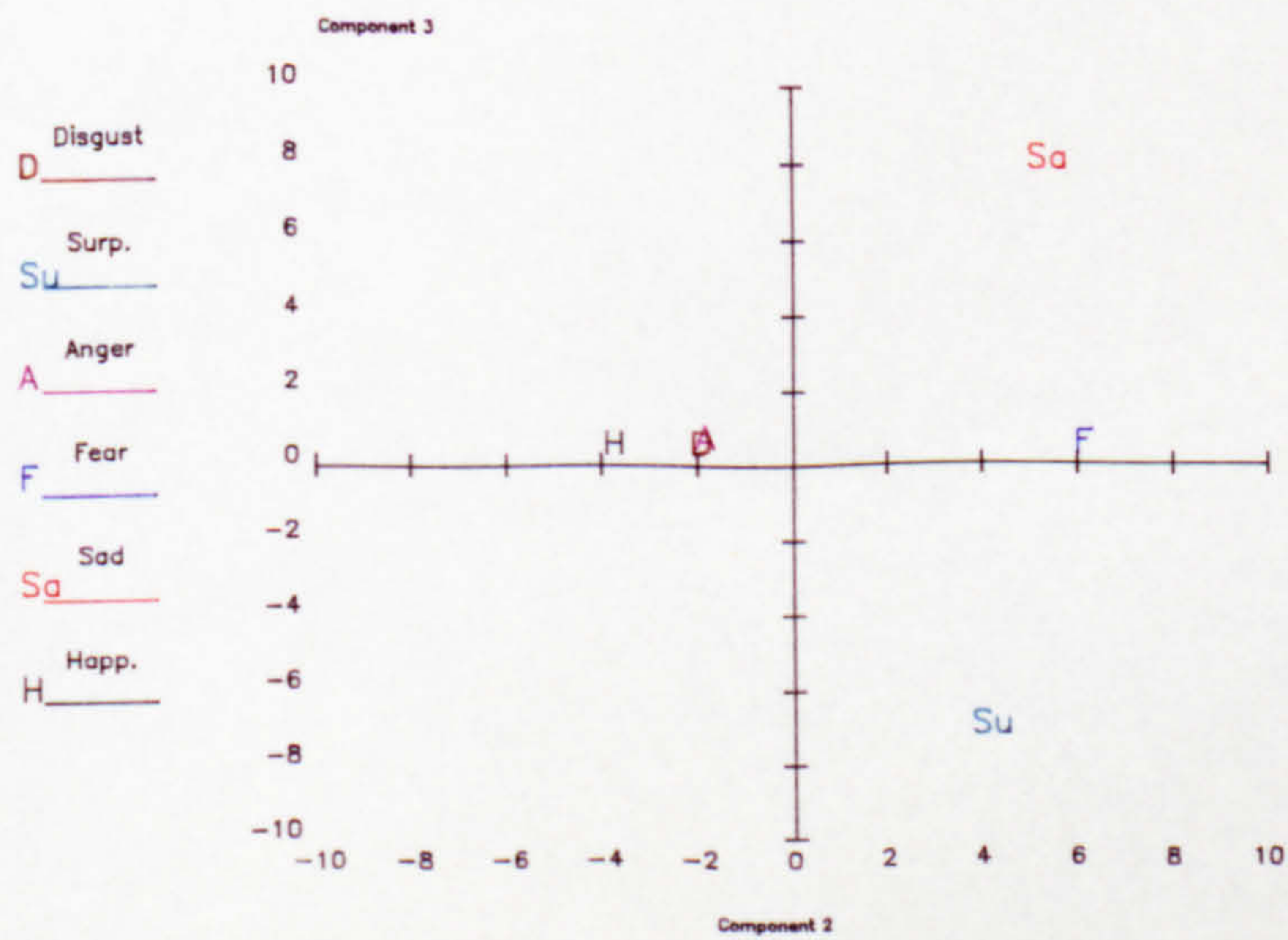
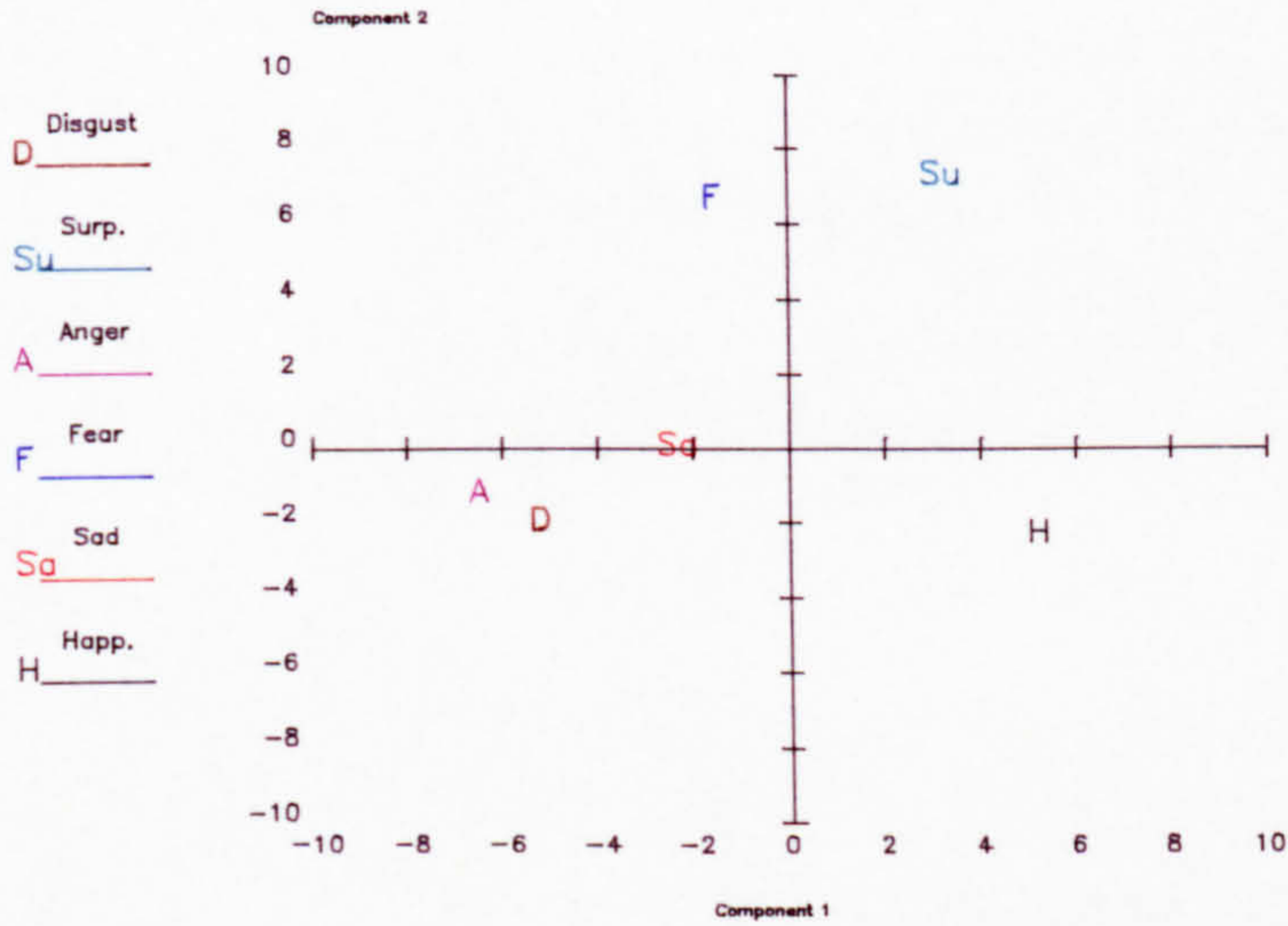
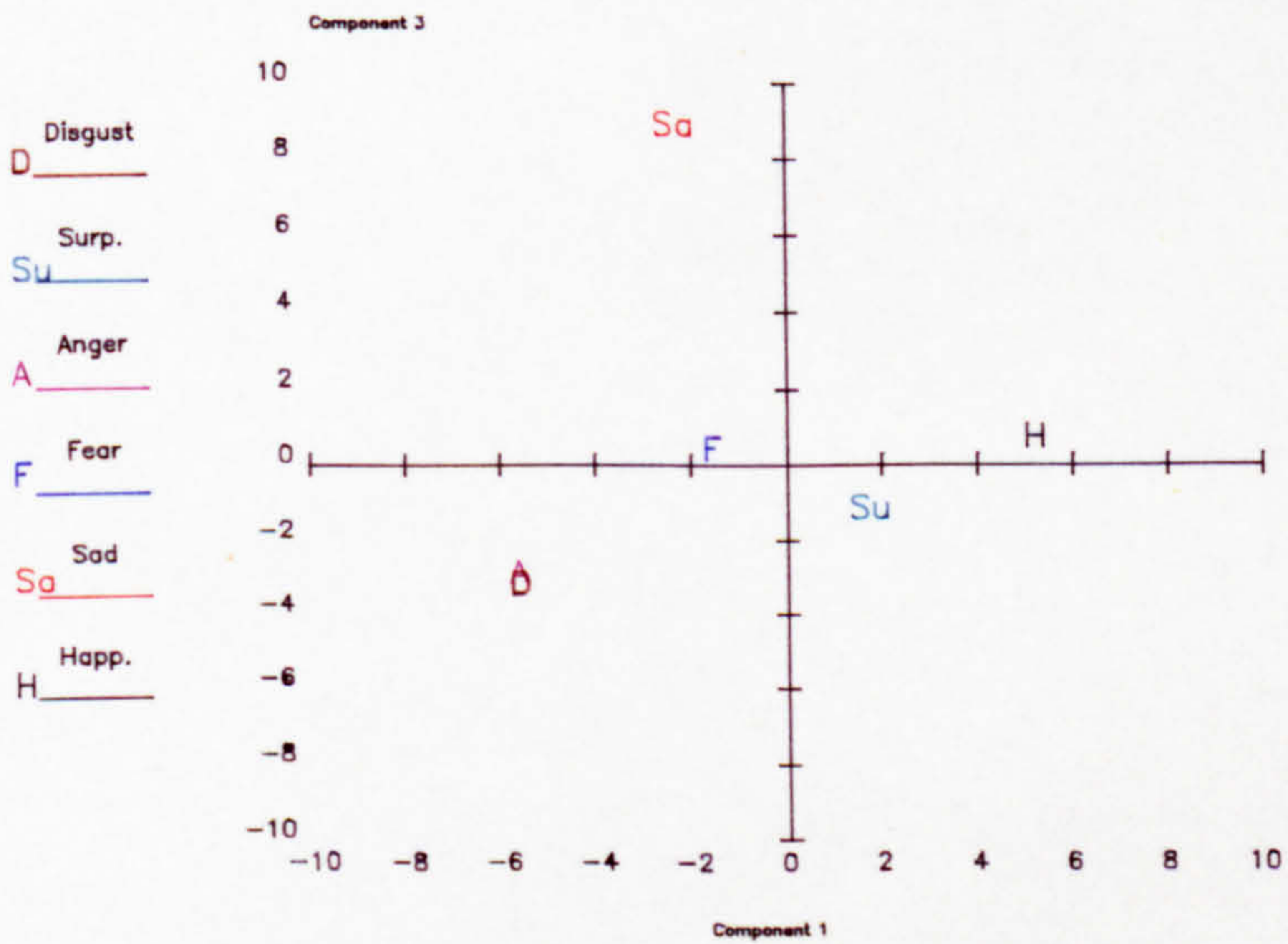


Figure 5.18.

Principal Components: Sex Offenders



Principal Components: Sex Offenders



Principal Components: Sex Offenders

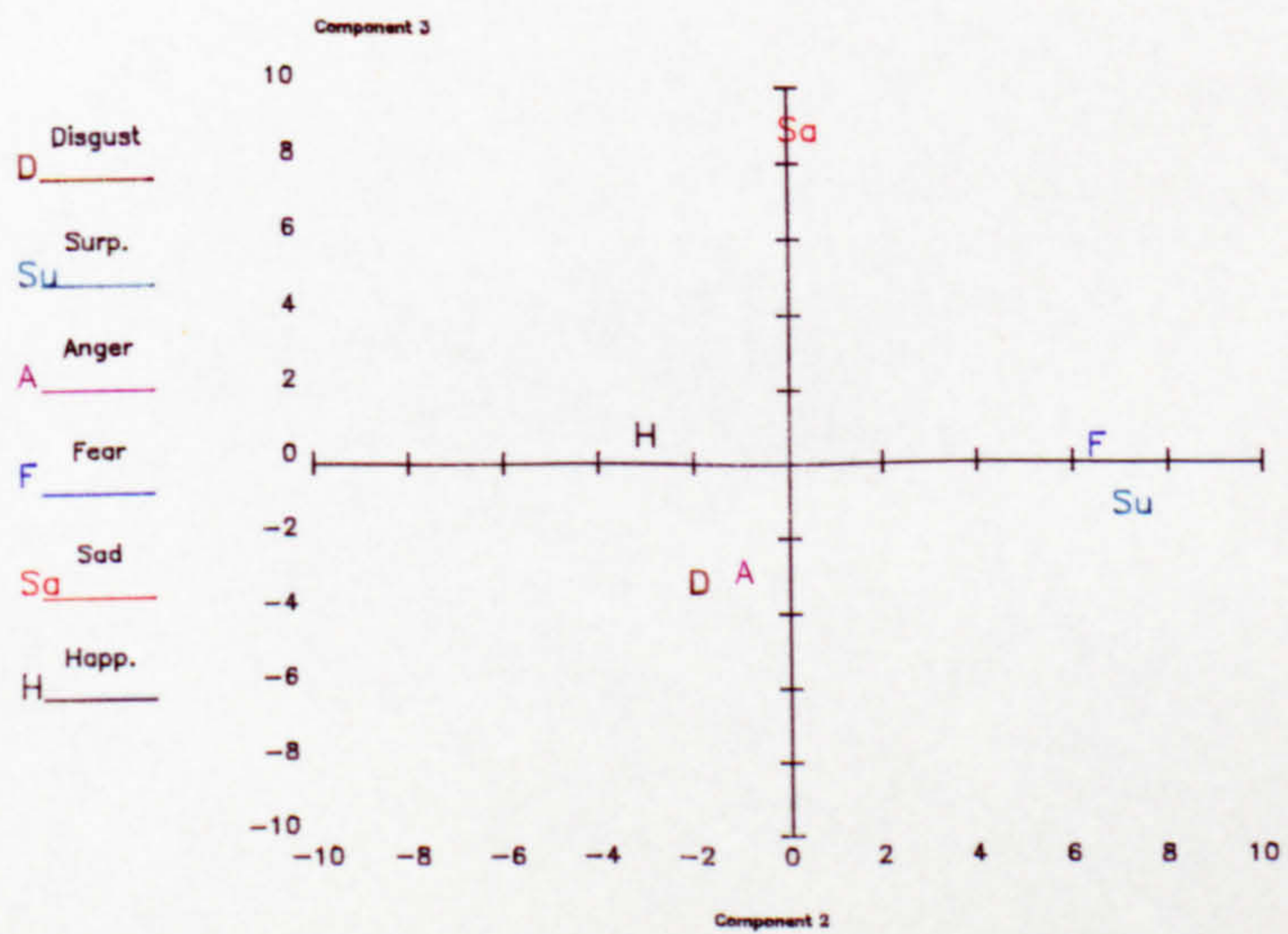
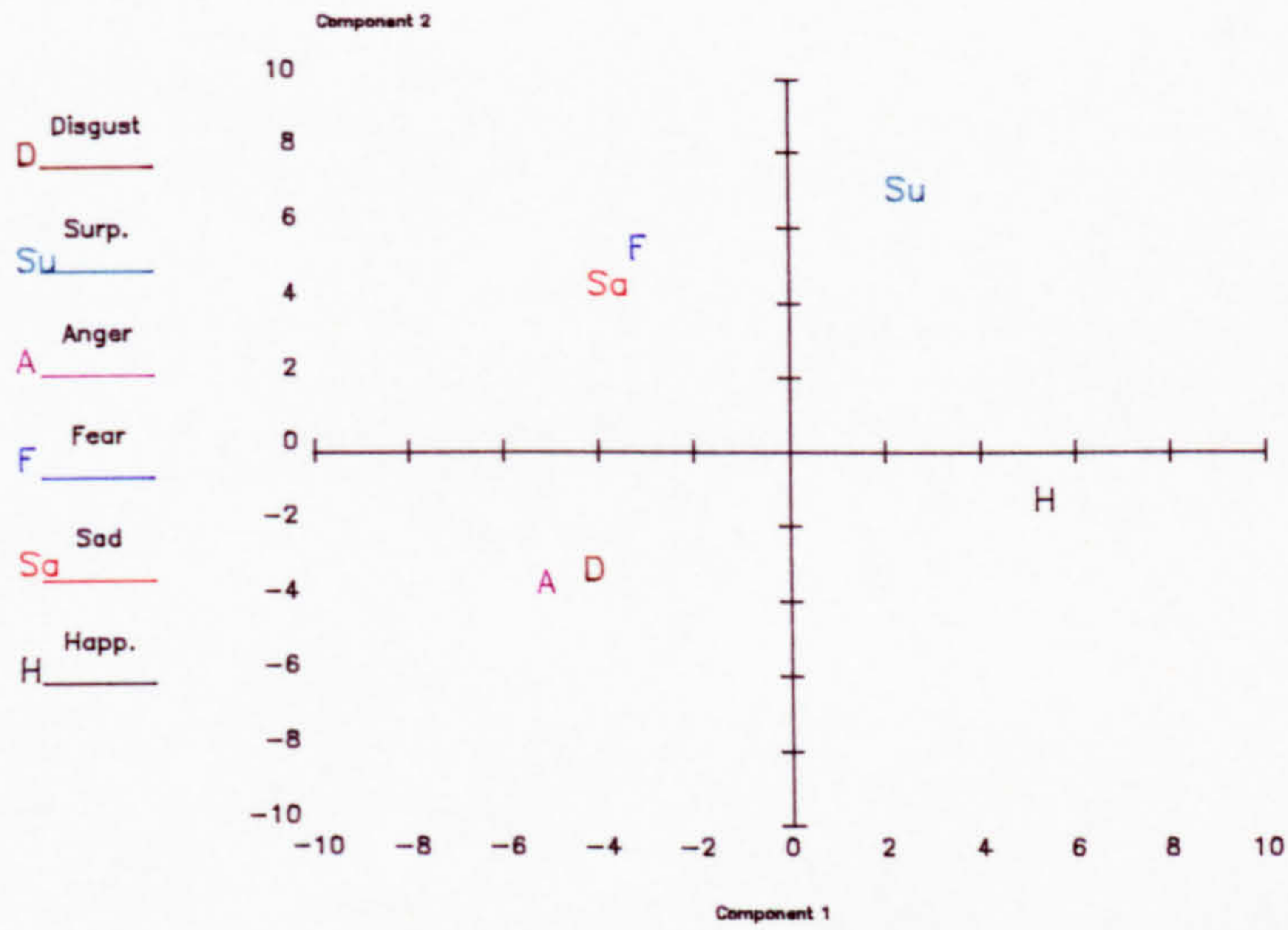
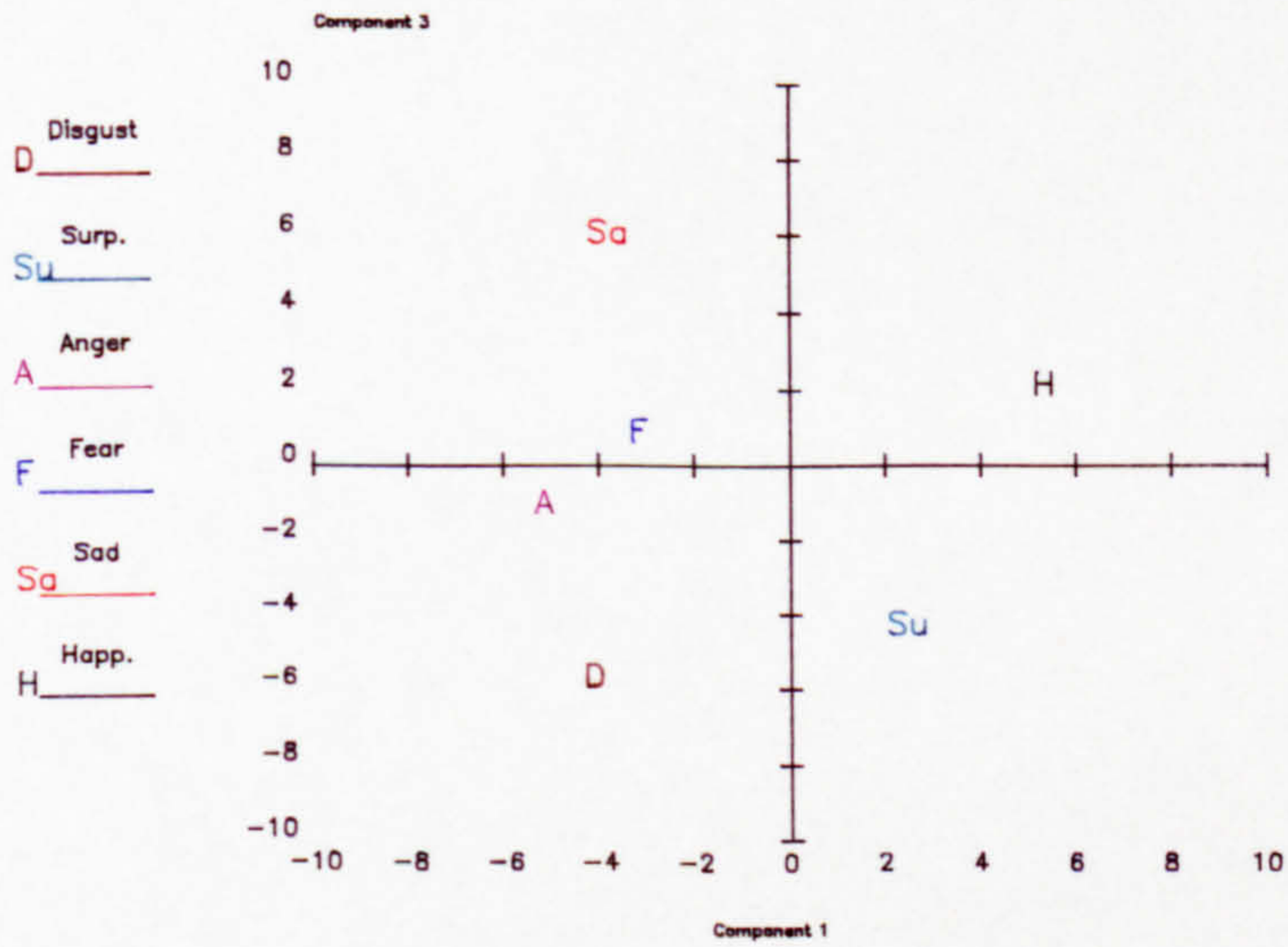


Figure 5.19.

Principal Components: Arsonists



Principal Components: Arsonists



Principal Components: Arsonists

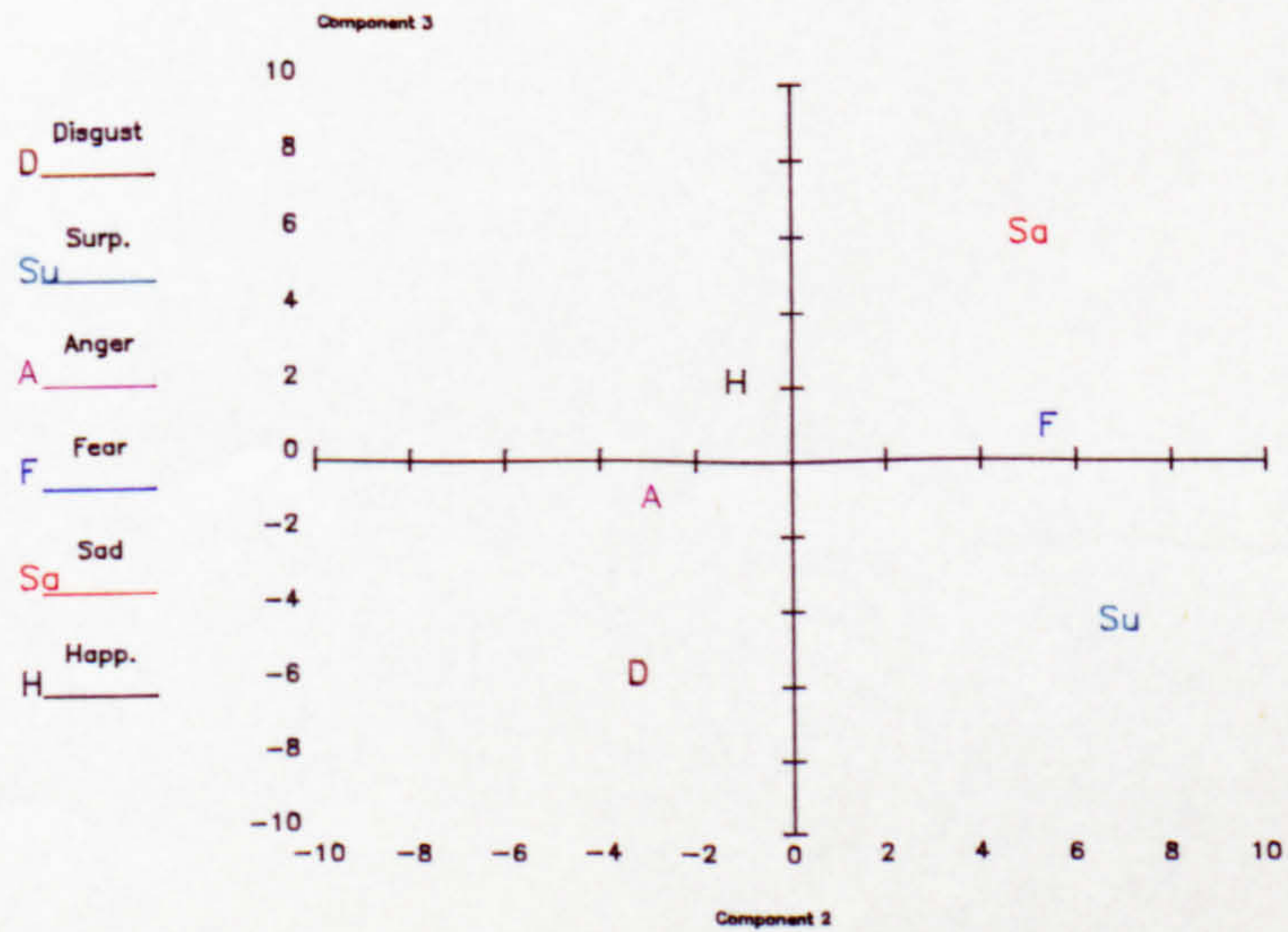


Table 5.30.
Principal Component Analysis: Control Group

	Component		
	1	2	3
Rating			
Happiness	.59	-.11	.00
Sadness	-.38	.12	-.76
Fear	-.33	.58	.02
Anger	-.47	-.31	.25
Surprise	-.02	.63	.46
Disgust	-.43	-.38	.37
Eigenvalue	2.37	1.69	0.99
% of variance	39.44	28.24	16.48
Cumulative %	39.44	67.68	84.16

Table 5.31.
Principal Component Analysis: Violent Offenders

	Component		
	1	2	3
Rating			
Happiness	.40	-.52	.07
Sadness	-.47	-.01	.68
Fear	-.59	-.00	.09
Anger	.20	.58	.09
Surprise	-.45	.04	-.72
Disgust	.16	.62	.02
Eigenvalue	2.08	1.81	1.00
% of variance	34.72	30.16	16.70
Cumulative %	34.72	64.88	81.57

Table 5.32.
Principal Component Analysis:Sex Offenders

	Component		
	1	2	3
Rating			
Happiness	.50	-.33	-.02
Sadness	-.34	-.01	.88
Fear	-.18	.63	.01
Anger	-.55	-.15	-.30
Surprise	.14	.66	-.17
Disgust	-.53	-.19	-.32
Eigenvalue	2.36	1.61	0.88
% of variance	39.33	26.89	14.72
Cumulative %	39.33	66.22	80.93

Table 5.33.
Principal Component Analysis:Arsonists

	Component		
	1	2	3
Rating			
Happiness	.52	-.18	.17
Sadness	-.41	.24	.60
Fear	-.36	.56	.07
Anger	-.48	-.30	-.16
Surprise	.20	.65	-.55
Disgust	-.40	-.29	-.53
Eigenvalue	2.64	1.28	0.95
% of variance	43.95	21.35	15.81
Cumulative %	43.95	65.30	81.11

As can be seen from the tables, in each group the first three components accounted for about 80% of the total variance. In the Sex Offender, Arsonist and Control groups, the first

component accounted for about 40% of the total variance and was clearly a component which polarised Happiness versus Anger and Disgust. This component emerged as the second component for the Violent Offender group. For the Violent Offender group, the first component to emerge was a component which polarised Fear (and to some extent, Sadness and Surprise) versus Happiness. The second component in the other groups again had Fear, along with Surprise, at one end and Anger and Disgust at the other pole for the Arsonist and Control groups and Happiness at the other pole for the Sex Offender group. The third component is very similar in all four groups, with Sadness at one end and Surprise and/or Anger and/or Disgust at the other. The fact that the components are relatively similar is demonstrated in Tables 5.34. to 5.36. which shows the correlations between the groups on the various components. For the Violent Offender group, components 1 and 2 are reversed in order of magnitude. (i.e. component 2 is represented as component 1)

Table 5.34.
Correlation between Component Co-efficients across Groups
Derived from separate Analyses for each Group
Component 1

	Group		
Group	Sex Off.	Arsonists	Controls
Violent Off.	-.89	-.77	-.83
Sex Off.		.96	.96
Arsonists			.97

Table 5.35.
Correlation between Component Co-efficients across Groups
Derived from separate Analyses for each Group
Component 2

	Group		
Group	Sex Off.	Arsonists	Controls
Violent Off.	-.85	-.91	-.84
Sex Off.		.96	.96
Arsonists			.97

Table 5.36.
Correlation between Component Co-efficients across Groups
Derived from separate Analyses for each Group
Component 3

	Group		
Group	Sex Off.	Arsonists	Controls
Violent Off.	.69	.83	-.85
Sex Off.		.85	-.96
Arsonists			-.95

While the order of the components does not necessarily match,

nevertheless, the component structure appears to be very stable indeed. As this was the case, it was considered appropriate to join the data together to do a Principal Components Analysis across all the groups. Table 5.37. shows the correlations between mean ratings for each of the slide categories.

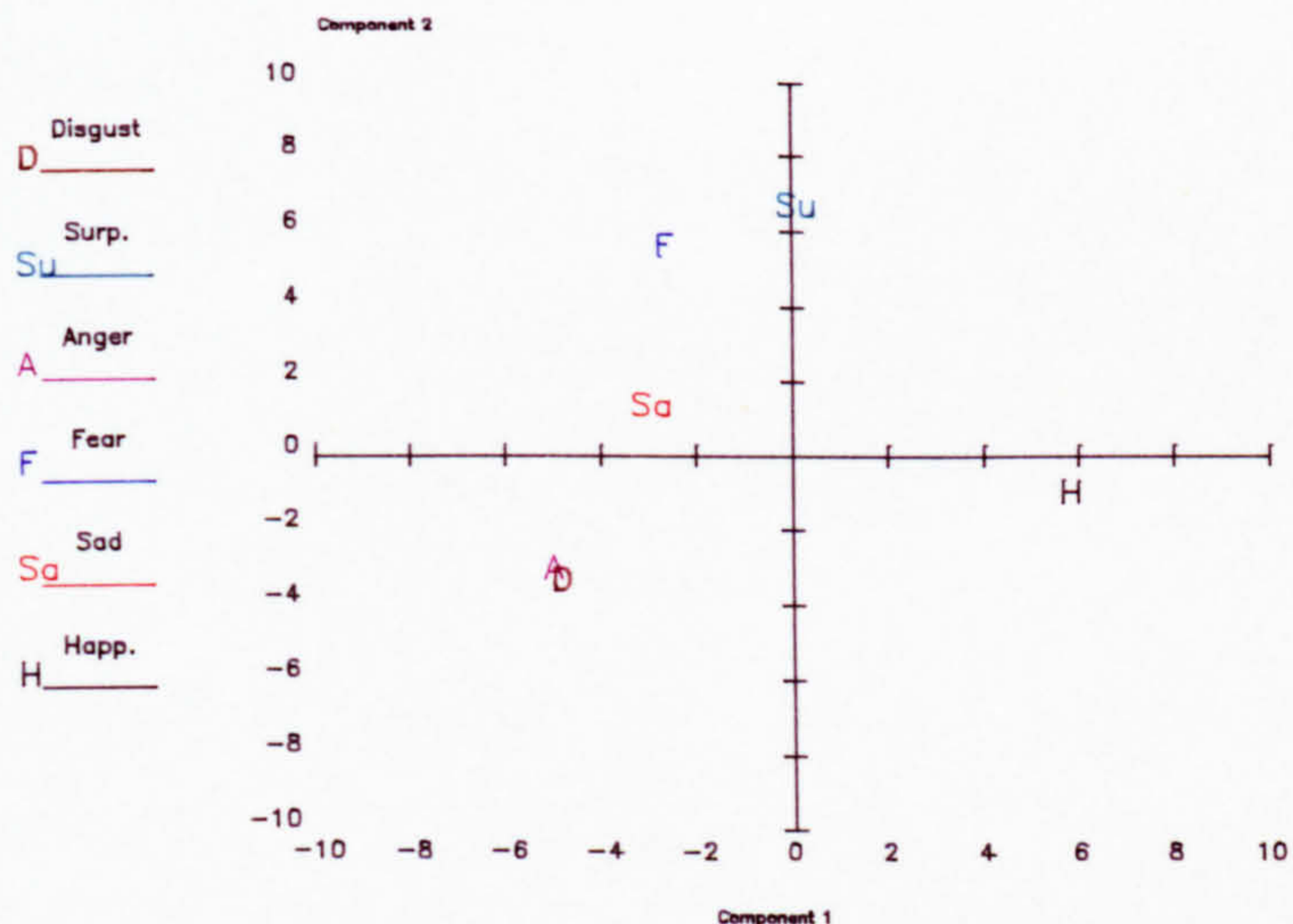
Table 5.37.
Product Moment Correlations between Mean Ratings
for each Category of Slide :All Subjects

Ratings	Ratings				
	Sad	Fear	Anger	Surp.	Disg.
Happiness	-.48	-.44	-.49	-.14	-.48
Sadness		.35	.16	-.15	.07
Fear			.09	.44	-.00
Anger				-.23	.58
Surprise					-.20

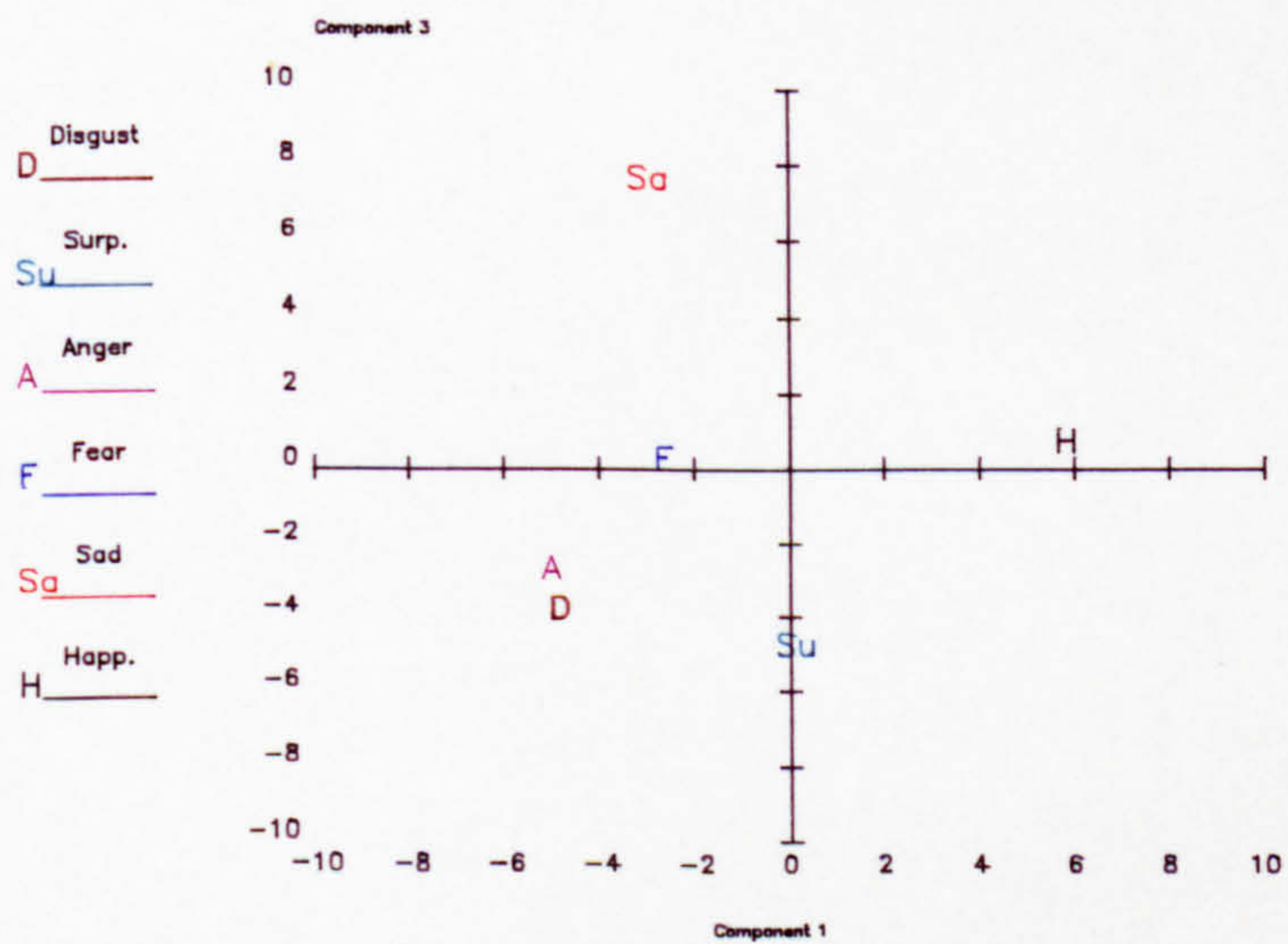
Table 5.38. shows the Principal Component co-efficients for each of the rating categories and Figure 5.20. shows the plots of these.

Figure 5.20.

Principal Components: All Subjects



Principal Components: All Subjects



Principal Components: All Subjects

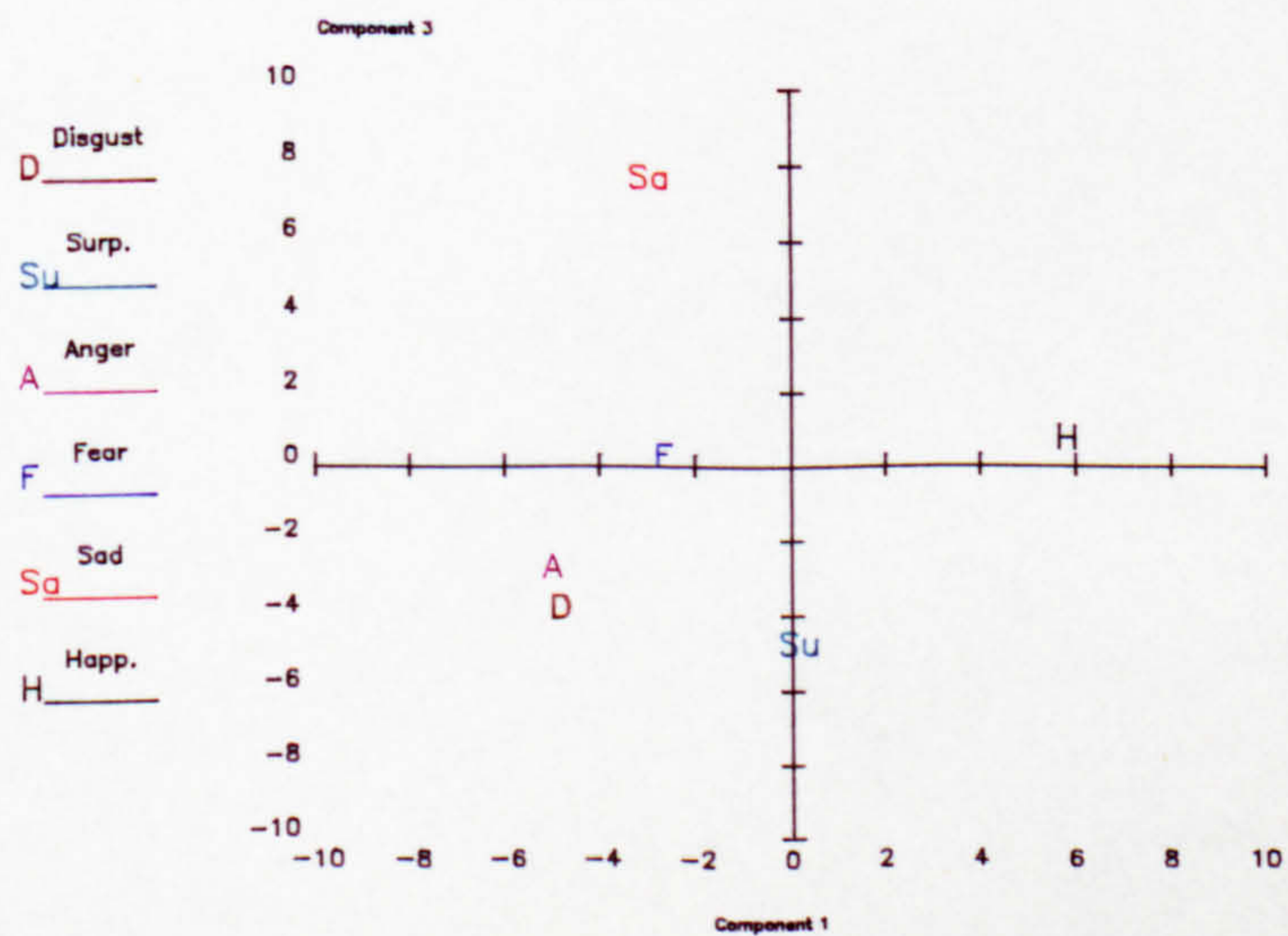


Table 5.38.
Principal Component Analysis: All Subjects

	Component		
	1	2	3
Rating			
Happiness	.58	-.15	.04
Sadness	-.38	.16	.75
Fear	-.31	.58	-.00
Anger	-.48	-.31	-.22
Surprise	.03	.63	-.50
Disgust	-.44	-.36	-.37
Eigenvalue	2.33	1.64	0.99
% of variance	38.78	27.28	16.45
Cumulative %	38.78	66.07	82.51

As expected, the first three components accounted for about 80% of the total variance and had a structure very similar to that which emerged from the previous analyses. In particular, the components were very similar to those derived from the Control Group, a characteristic which may be accounted for by the proportionately higher N of this group.

In summary, the three main components were:

Happiness versus Anger and Disgust (with Sadness and Fear).

This is probably a Positive - Negative (or Pleasant - Unpleasant) emotion component.

Surprise and Fear versus Anger and Disgust. This is in line with the Accepting / Rejecting dimension in Schlosberg's terms.

Sadness versus Surprise and Disgust. This may well be a measure of Intensity/ Passivity (or Potency).

The variations observed between the groups on the first Principal Components Analysis suggested that the components may prove to be discriminators between the groups.

The component scores were therefore calculated for each of the rating categories.

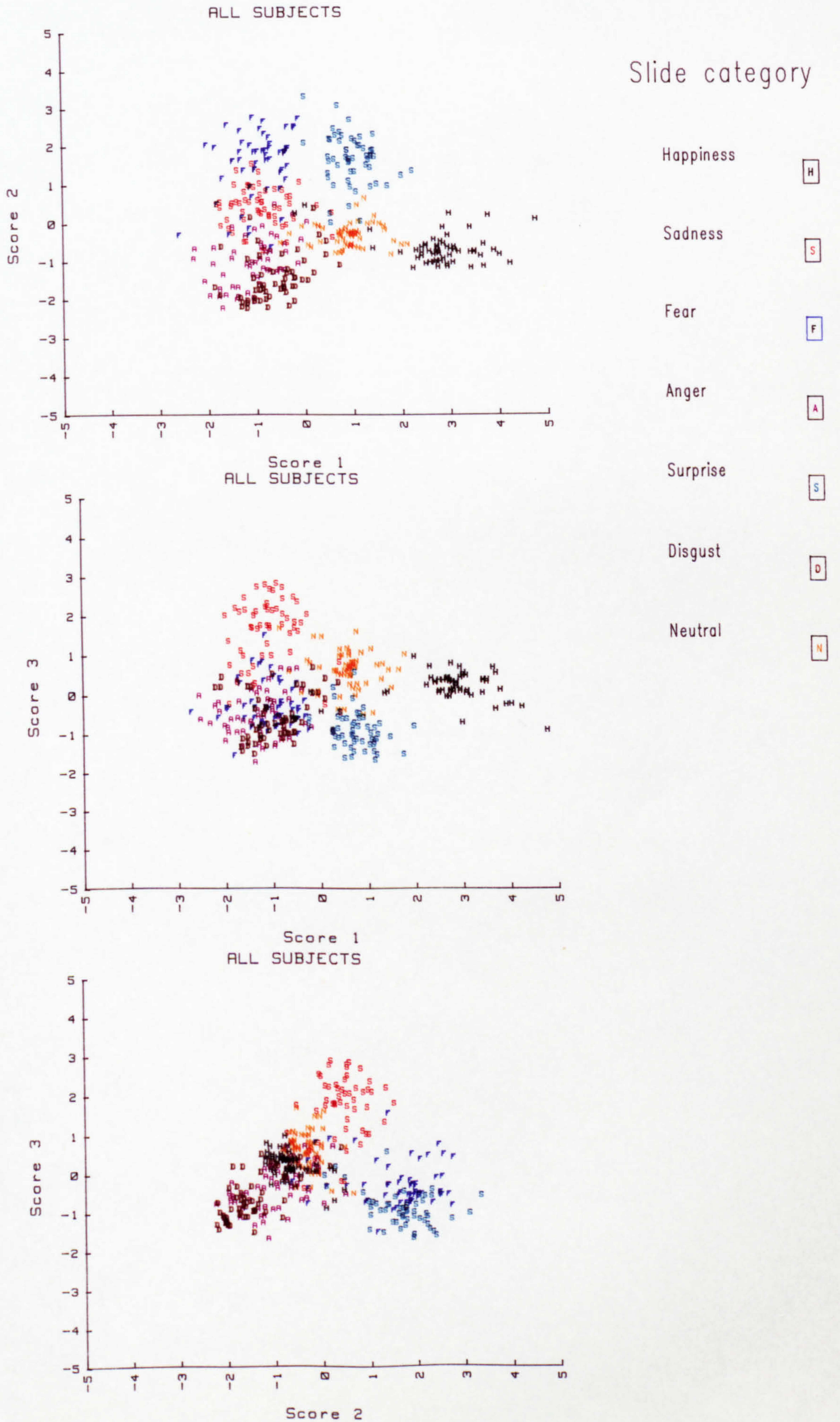
Figure 5.21. shows the scatter of component scores for each of the slides. The first part of the figure shows very clearly the discrimination between the different slide categories.

Happiness slides are particularly easily discriminated. Neutral slides do, on the whole take up a neutral position and Surprise and Fear are mutually separated and discriminable from Anger and Disgust. The close relationship between Anger and Disgust is apparent.

The second part of the figure clearly shows a Sadness - Surprise discrimination, again with Happiness very well defined.

Figure 5.21.

Distribution of Component Scores



The third part of the figure illustrates four main groupings of slides

1 Surprise and Fear

2 Sadness

3 Anger and Disgust

4 Happiness and Neutral

It is also clear that while the groups are easily identifiable, many of them have outlying exceptions.

A one way analysis of variance was performed to investigate whether the groups differed significantly from each other on the three components for the different categories of slide. Tables 5.39. to 5.45. show the results of this analysis. More detailed tables are presented in Appendix v.

Table 5.39.
Mean component score (S.D.) and Summary One-Way Analysis of Variance
Happiness Slides

	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	6	9	10		
Component 1	3.08	2.46	2.07	2.95	4.65	<.01
S.D.	0.52	0.57	1.30	0.88		
Separation	B	AB	A	B		
Component 2						
Mean	-0.79	-0.87	-0.46	-0.45	4.01	<.05
S.D.	0.24	0.36	0.57	0.44		
Separation	A	A	B	B		
Component 3						
Mean	0.24	0.46	0.22	-0.32	3.13	<.05
S.D.	0.29	0.27	0.36	0.42		
Separation	AB	B	AB	A		

Table 5.40.
Mean component score (S.D.) and Summary One-Way Analysis of Variance
Sadness Slides

	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	6	9	10		
Component 1	-1.25	-0.93	-0.83	-0.97	1.86	N.S.
S.D.	0.45	0.54	0.79	0.51		
Separation	A	A	A	A		
Component 2						
Mean	0.48	0.76	0.09	0.22	3.49	<.05
S.D.	0.37	0.38	0.54	0.63		
Separation	AB	B	A	A		
Component 3						
Mean	1.82	1.73	1.08	1.42	2.12	N.S.
S.D.	0.73	0.48	0.98	0.98		
Separation	A	A	A	A		

Table 5.41.
Mean component score (S.D.) and Summary One-Way Analysis of Variance
Fear Slides

	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	6	9	10		
Component 1						
Mean	-1.04	-0.89	-0.90	-1.39	1.97	N.S.
S.D.	0.45	0.29	0.50	0.73		
Separation	A	A	A	A		
Component 2						
Mean	1.79	1.99	1.03	0.89	5.64	<.01
S.D.	0.62	0.57	1.15	0.82		
Separation	B	B	A	A		
Component 3						
Mean	-0.50	0.42	-0.43	-0.02	7.10	<.01
S.D.	0.45	0.69	0.23	0.65		
Separation	A	C	AB	BC		

Table 5.42.
Mean component score (S.D.) and Summary One-Way Analysis of Variance
Anger Slides

	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	6	9	10		
Component 1						
Mean	-1.50	-0.90	-1.15	-1.08	3.39	<.05
S.D.	0.47	0.38	0.84	0.39		
Separation	A	B	AB	AB		
Component 2						
Mean	-1.25	-1.15	-0.65	-0.84	2.79	N.S.
S.D.	0.64	0.36	0.55	0.65		
Separation	A	A	A	A		
Component 3						
Mean	-0.52	-1.21	-0.19	-0.22	6.62	<.01
S.D.	0.42	0.36	0.72	0.50		
Separation	A	B	A	A		

Table 5.43.
Mean component score (S.D.) and Summary One-Way Analysis of Variance
Surprise Slides

	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	6	9	10		
Component 1						
Mean	0.83	0.61	0.71	0.90	0.79	N.S.
S.D.	0.40	0.28	0.64	0.34		
Separation	A	A	A	A		
Component 2						
Mean	1.83	1.12	1.45	1.52	2.68	N.S.
S.D.	0.47	0.69	1.00	0.64		
Separation	A	A	A	A		
Component 3						
Mean	-1.09	-0.89	-0.76	-0.83	1.79	N.S.
S.D.	0.35	0.33	0.55	0.64		
Separation	A	A	A	A		

Table 5.44.
Mean component score (S.D.) and Summary One-Way Analysis of Variance
Disgust Slides

	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	6	9	10		
Component 1						
Mean	-0.82	-1.15	-0.76	-1.00	0.83	N.S.
S.D.	0.54	0.64	0.73	0.47		
Separation	A	A	A	A		
Component 2						
Mean	-1.67	-1.60	-1.15	-1.15	3.44	<.05
S.D.	0.39	0.51	0.82	0.75		
Separation	A	AB	B	B		
Component 3						
Mean	-0.74	-0.64	-0.21	-0.77	2.13	N.S.
S.D.	0.46	0.74	0.81	0.56		
Separation	A	A	A	A		

Table 5.45.
Mean component score (S.D.) and Summary One-Way Analysis of Variance
Neutral Slides

	Control Group	Violent Off.	Sex Off.	Arsonists	F-ratio	Sig.
N=	30	6	9	10		
Component 1						
Mean	0.69	0.80	0.86	0.59	0.53	N.S.
S.D.	0.58	0.14	0.54	0.52		
Separation	A	A	A	A		
Component 2						
Mean	-0.40	-0.27	-0.31	-0.20	1.17	N.S.
S.D.	0.30	0.47	0.28	0.20		
Separation	A	A	A	A		
Component 3						
Mean	0.79	0.12	0.27	0.45	6.56	<.01
S.D.	0.35	0.59	0.56	0.44		
Separation	B	A	A	AB		

Only one category of slide did not discriminate between any of the groups on any component score and that was Surprise. The most significant differences all occurred as differences between the Controls and other groups. These were that Sex Offenders scored lower on the first component than the Control group when rating Happiness slides, Sex Offenders and Arsonists scored lower than Controls and Violent offenders on the second component when rating Fear slides, Violent Offenders clearly scored higher than Controls on component three when rating Fear slides, higher than all groups on component three when rating Anger slides and Controls scored lower on component three than Violent Offenders and Sex Offenders when rating Neutral slides. The third

component differentiated between Violent Offenders and Controls across three categories of emotional expression namely Fear, Anger and Neutral.

The distribution of ratings, as indicated earlier, suggested that the patient groups tended to use extreme categories more frequently. Other researchers have suggested that this relates to greater impulsivity among offender groups. It may be important, therefore to consider speed of reaction when evaluating these phenomena, particularly since other researchers have suggested that this may be an aspect of cognitive style.

It was decided, therefore, to analyse differences in response speed between the groups.

5.3.4. Response Times

The interval between the prompt on the touch sensitive screen and the response of making a rating was recorded. As expected, the time to respond to the first prompt on the presentation of each slide was slower than on subsequent prompts. Clearly this was due to the fact that the first response was a different task from subsequent ratings as the subject was first required to

look at the slide before any rating could be made. Tables 5.46. and 5.47 show the mean times for each group over all categories of slide and illustrates the effect of order of presentation.

Table 5.46.
Mean Response Times and Order of Presentation: All Patient Groups

	Order of Presentation					
	First	Second	Third	Fourth	Fifth	Sixth
Happiness						
Mean	8.99	3.90	3.09	2.98	2.94	2.84
S.D.	14.59	5.03	3.16	2.59	3.39	4.28
N=	170	154	155	185	163	223
Sadness						
Mean	8.04	3.94	3.76	3.63	3.97	3.26
S.D.	7.31	5.03	3.70	2.97	3.96	2.27
N=	157	214	191	140	184	164
Fear						
Mean	7.09	2.93	3.29	3.19	3.55	3.67
S.D.	5.58	2.65	2.81	4.67	3.80	3.55
N=	168	166	170	212	162	172
Anger						
Mean	7.74	4.26	3.44	3.30	3.19	3.34
S.D.	8.27	6.02	4.24	2.55	2.51	2.76
N=	162	169	228	160	164	167
Surprise						
Mean	7.67	3.61	3.78	3.47	3.85	3.34
S.D.	7.15	2.80	3.27	3.28	9.55	3.02
N=	176	174	154	172	206	168
Disgust						
Mean	7.96	4.11	3.82	3.87	3.47	3.58
S.D.	10.34	4.23	3.69	4.44	3.50	3.11
N=	216	169	149	181	164	171

Table 5.47.
Mean Response Times and Order of Presentation: Control Group

	Order of Presentation					
	First	Second	Third	Fourth	Fifth	Sixth
Happiness						
Mean	4.85	2.37	2.40	2.22	2.24	2.26
S.D.	4.98	2.40	2.79	1.60	1.61	2.69
N=	223	218	178	220	205	216
Sadness						
Mean	5.36	2.73	2.68	2.51	2.75	2.62
S.D.	4.32	1.84	1.89	1.63	2.12	2.50
N=	199	204	214	211	217	215
Fear						
Mean	4.84	2.86	2.68	2.30	2.51	2.70
S.D.	3.46	2.76	2.99	1.54	1.94	2.48
N=	196	207	213	215	212	217
Anger						
Mean	5.12	2.82	2.31	2.59	2.53	2.61
S.D.	3.75	3.09	1.46	2.31	1.77	2.04
N=	201	202	238	194	226	199
Surprise						
Mean	4.98	2.94	2.69	2.41	2.54	2.83
S.D.	3.56	4.45	2.16	1.62	2.00	2.61
N=	226	209	195	219	204	207
Disgust						
Mean	4.69	2.64	2.47	2.45	2.45	2.28
S.D.	2.85	2.34	1.88	2.38	2.16	1.46
N=	215	220	222	201	196	206

As the first response in both patient groups and controls was clearly slower than subsequent responses, it was decided that a correction would have to be introduced to take account of this. If this was not done, the fact that the presentation order was

randomised across slides might have introduced a fortuitous bias due to uneven frequencies in a relatively small sample. It was considered that the best way to do this was to estimate the response time due to the first analysis of the slide by the subject. This was considered to be the difference between the mean response times for all ratings which occurred first and the mean response time for all subsequent ratings on each slide. This could then be subtracted from each response time on the first presentation. A computer program was therefore devised which would apply this correction for each of the subject groups separately and at the same time convert all response times into logarithms (base 10).

Table 5.48.
Mean Log. Response Time: All Slides (Seconds)

All Ratings

Group	N	Mean	S.D.	Separation
Controls	30	0.81	0.32	A
Violent Off.	6	0.86	0.48	A
Sex Off.	9	1.17	0.36	A
Arsonists	10	0.95	0.52	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	8.63			
Group	3	0.97	0.32	2.15	N.S.
Error	51	7.66	0.15		

As can be seen from Table 5.48., there was no difference between groups in their mean Log. Response Times over all response categories and all categories of emotion slides.

These data were then separated into response categories and a further analysis was performed to investigate whether groups had different response times when making particular types of rating.

On the assumption that response time was, at least to some extent a measure of experienced difficulty, this would indicate whether the groups showed any differences in making judgements about the level of particular emotions. Table 5.49. shows the results of this for all slides.

Tables 5.50. to 5.56. show the results when each category of

slide was analysed separately. More detailed tables are presented in Appendix vi.

Table 5.49.
Mean (S.D.) Log. Response Time
and Summary One-Way Analysis of Variance

Rating	<u>All Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	6	9	10		
Happiness						
Mean	0.71	0.70	1.14	0.78	2.66	N.S.
S.D.	0.34	0.50	0.39	0.53		
Separation	A	A	A	A		
Sadness						
Mean	0.87	1.00	1.24	1.24	2.13	N.S.
S.D.	0.33	0.46	0.37	0.37		
Separation	A	A	A	A		
Fear						
Mean	0.80	0.73	1.12	0.95	1.69	N.S.
S.D.	0.34	0.55	0.34	0.58		
Separation	A	A	A	A		
Anger						
Mean	0.81	0.80	1.15	1.00	2.03	N.S.
S.D.	0.35	0.45	0.33	0.55		
Separation	A	A	A	A		
Surprise						
Mean	0.85	1.01	1.17	0.93	1.27	N.S.
S.D.	0.36	0.50	0.46	0.58		
Separation	A	A	A	A		
Disgust						
Mean	0.80	0.92	1.21	1.11	3.48	<.05
S.D.	0.29	0.49	0.36	0.57		
Separation	A	AB	B	AB		

When all categories of slides were considered together, the only difference between groups to emerge was that Sex Offenders were slower when rating Disgust than were the Controls, perhaps reflecting some degree of difficulty with this concept by the Sex Offender group.

Table 5.50.
Mean (S.D.) Log. Response Time
and Summary One-Way Analysis of Variance

Rating	<u>Happiness Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	6	9	10		
Happiness						
Mean	0.74	0.75	1.00	0.87	1.23	N.S.
S.D.	0.36	0.44	0.38	0.40		
Separation	A	A	A	A		
Sadness						
Mean	0.49	0.66	0.99	0.66	1.94	N.S.
S.D.	0.51	0.67	0.32	0.71		
Separation	A	A	A	A		
Fear						
Mean	0.44	0.28	0.75	0.56	1.30	N.S.
S.D.	0.41	0.58	0.40	0.75		
Separation	A	A	A	A		
Anger						
Mean	0.39	0.45	0.75	0.70	1.56	N.S.
S.D.	0.51	0.38	0.43	0.71		
Separation	A	A	A	A		
Surprise						
Mean	0.74	0.67	1.13	0.95	1.95	N.S.
S.D.	0.44	0.53	0.46	0.59		
Separation	A	A	A	A		
Disgust						
Mean	0.39	0.33	0.97	0.84	4.24	<.01
S.D.	0.45	0.71	0.40	0.69		
Separation	AB	A	C	BC		

Table 5.51.
Mean (S.D.) Log. Response Time
and Summary One-Way Analysis of Variance

Rating	<u>Sadness Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	6	9	10		
Happiness						
Mean	0.56	0.64	1.17	0.44	3.76	<.05
S.D.	0.44	0.67	0.39	0.75		
Separation	A	A	B	A		
Sadness						
Mean	0.87	1.05	1.15	0.98	1.14	N.S.
S.D.	0.87	1.05	1.15	0.98		
Separation	A	A	A	A		
Fear						
Mean	0.89	0.78	1.14	0.97	0.84	N.S.
S.D.	0.41	0.78	0.49	0.53		
Separation	A	A	A	A		
Anger						
Mean	0.92	0.67	1.21	1.12	2.51	N.S.
S.D.	0.37	0.49	0.39	0.55		
Separation	A	A	A	A		
Surprise						
Mean	0.91	1.20	1.25	0.73	2.02	N.S.
S.D.	0.48	0.59	0.57	0.66		
Separation	A	A	A	A		
Disgust						
Mean	0.91	0.76	1.26	1.14	2.30	N.S.
S.D.	0.32	0.50	0.56	0.61		
Separation	A	A	A	A		

Table 5.52.
Mean (S.D.) Log. Response Time
and Summary One-Way Analysis of Variance

Rating	<u>Fear Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	6	9	10		
Happiness						
Mean	0.84	0.96	1.35	0.93	3.09	<.05
S.D.	0.36	0.70	0.37	0.56		
Separation	A	AB	B	A		
Sadness						
Mean	1.09	1.46	1.42	1.22	2.05	N.S.
S.D.	0.44	0.46	0.34	0.54		
Separation	A	A	A	A		
Fear						
Mean	1.06	1.04	1.53	1.31	3.28	<.05
S.D.	0.31	0.53	0.46	0.61		
Separation	A	A	B	AB		
Anger						
Mean	1.10	1.14	1.52	1.37	2.40	N.S.
S.D.	0.41	0.70	0.39	0.48		
Separation	A	A	A	A		
Surprise						
Mean	1.07	1.45	1.48	1.24	2.47	N.S.
S.D.	0.44	0.48	0.48	0.52		
Separation	A	A	A	A		
Disgust						
Mean	1.08	1.30	1.43	1.43	2.45	N.S.
S.D.	0.40	0.53	0.49	0.49		
Separation	A	A	A	A		

Table 5.53.
Mean (S.D.) Log. Response Time
and Summary One-Way Analysis of Variance

Rating	<u>Anger Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	6	9	10		
Happiness						
Mean	0.50	0.36	1.05	0.53	3.13	<.05
S.D.	0.47	0.39	0.51	0.68		
Separation	A	A	B	A		
Sadness						
Mean	0.86	0.91	1.19	0.99	1.59	N.S.
S.D.	0.36	0.26	0.46	0.53		
Separation	A	A	A	A		
Fear						
Mean	0.82	0.66	1.20	0.95	1.95	N.S.
S.D.	0.48	0.53	0.43	0.52		
Separation	A	A	A	A		
Anger						
Mean	0.86	0.86	1.11	1.02	1.24	N.S.
S.D.	0.39	0.38	0.25	0.48		
Separation	A	A	A	A		
Surprise						
Mean	0.76	1.01	1.01	0.71	1.13	N.S.
S.D.	0.39	0.45	0.40	0.74		
Separation	A	A	A	A		
Disgust						
Mean	0.83	0.90	1.06	1.05	1.16	N.S.
S.D.	0.30	0.50	0.48	0.60		
Separation	A	A	A	A		

Table 5.54.
Mean (S.D.) Log. Response Time
and Summary One-Way Analysis of Variance

Rating	<u>Surprise Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	6	9	10		
Happiness						
Mean	0.78	0.66	0.93	0.85	0.41	N.S.
S.D.	0.39	0.56	0.73	0.52		
Separation	A	A	A	A		
Sadness						
Mean	0.84	0.90	1.17	0.77	1.29	N.S.
S.D.	0.36	0.65	0.41	0.74		
Separation	A	A	A	A		
Fear						
Mean	0.86	1.04	0.95	0.90	0.28	N.S.
S.D.	0.32	0.82	0.55	0.64		
Separation	A	A	A	A		
Anger						
Mean	0.64	0.57	1.11	0.87	2.43	N.S.
S.D.	0.46	0.63	0.33	0.68		
Separation	A	A	A	A		
Surprise						
Mean	0.76	0.83	0.97	0.97	0.81	N.S.
S.D.	0.33	0.56	0.63	0.56		
Separation	A	A	A	A		
Disgust						
Mean	0.66	0.93	1.02	0.95	2.06	N.S.
S.D.	0.38	0.46	0.39	0.75		
Separation	A	A	A	A		

Table 5.55.
Mean (S.D.) Log. Response Time
and Summary One-Way Analysis of Variance

Rating	<u>Disgust Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	6	9	10		
Happiness						
Mean	0.78	0.81	1.14	0.90	1.29	N.S.
S.D.	0.39	0.59	0.56	0.59		
Separation	A	A	A	A		
Sadness						
Mean	0.97	0.96	1.47	1.07	2.84	<.05
S.D.	0.38	0.66	0.39	0.62		
Separation	A	A	B	AB		
Fear						
Mean	0.91	0.74	1.22	1.17	2.26	N.S.
S.D.	0.41	0.65	0.27	0.55		
Separation	A	A	A	A		
Anger						
Mean	1.03	1.09	1.28	1.04	0.64	N.S.
S.D.	0.38	0.63	0.53	0.57		
Separation	A	A	A	A		
Surprise						
Mean	0.96	1.08	1.19	0.98	0.38	N.S.
S.D.	0.53	0.70	0.59	0.79		
Separation	A	A	A	A		
Disgust						
Mean	0.96	1.16	1.44	1.26	3.11	<.05
S.D.	0.38	0.66	0.41	0.53		
Separation	A	AB	B	AB		

Table 5.56.
Mean (S.D.) Log. Response Time
and Summary One-Way Analysis of Variance

Rating	<u>Neutral Slides</u>				F-ratio	Sig.
	Control Group	Violent Off.	Sex Off.	Arsonists		
N=	30	6	9	10		
Happiness						
Mean	0.79	0.69	1.31	0.93	2.11	N.S.
S.D.	0.49	0.40	0.71	0.77		
Separation	A	A	A	A		
Sadness						
Mean	0.94	1.04	1.31	1.02	0.85	N.S.
S.D.	0.60	0.67	0.45	0.69		
Separation	A	A	A	A		
Fear						
Mean	0.63	0.61	1.06	0.79	1.23	N.S.
S.D.	0.66	0.45	0.41	0.73		
Separation	A	A	A	A		
Anger						
Mean	0.71	0.84	1.09	0.87	0.85	N.S.
S.D.	0.63	0.39	0.57	0.81		
Separation	A	A	A	A		
Surprise						
Mean	0.76	0.80	1.13	0.93	1.11	N.S.
S.D.	0.50	0.51	0.57	0.68		
Separation	A	A	A	A		
Disgust						
Mean	0.74	1.03	1.29	1.10	3.47	<.05
S.D.	0.49	0.58	0.45	0.53		
Separation	A	AB	B	AB		

As can be seen, more differences between the groups emerged when the results were split according to the category of slide being

considered. All of the differences, however, were due to the relatively slower response times by the Sex Offender group.

These differences were as follows:

On Happiness slides:

Sex Offenders were slower than Controls and Violent Offenders, Violent offenders were faster than Sex Offenders and Arsonists, when rating Disgust.

On Sadness slides:

Sex Offenders were slower than all other groups when rating Happiness.

On Fear slides:

Sex Offenders were slower than Controls and Arsonists when rating Happiness. Sex Offenders were slower than Controls and Violent Offenders when rating Fear.

On Anger slides:

Sex Offenders were slower than all other groups when rating Happiness.

On Disgust slides:

Sex Offenders were slower than Controls and Violent Offenders when rating Sadness. Sex Offenders were slower than Controls when rating Disgust.

On Neutral slides:

Sex Offenders were slower than Controls when rating Disgust.

No differences emerged between the groups on Surprise slides.

Whilst fewer differences are apparent between groups other than the Sex Offenders, the different slide categories seem to show differences between each other in terms of the response times. It was decided therefore to evaluate the differences between the slide categories.

Table 5.57. shows the Mean Log. Response Time for each category of slide.

Table 5.57.Mean (S.D.) Log. Response TimesAcross slide Categories

Subject N Group		Slide Category						
		Happ.	Sad	Fear	Anger	Surp.	Disg.	Neut.
All	55	0.64 (0.45)	0.91 (0.41)	1.17 (0.39)	0.85 (0.39)	0.83 (0.43)	1.02 (0.42)	0.87 (0.26)
Violent Off.	6	0.52 (0.51)	0.98 (0.39)	1.32 (0.37)	0.91 (0.30)	0.91 (0.62)	0.83 (0.59)	0.69 (0.22)
Sex Off.	9	0.93 (0.35)	0.94 (0.51)	1.49 (0.34)	0.76 (0.42)	0.99 (0.27)	1.28 (0.28)	0.85 (0.25)
Arson Off.	10	0.76 (0.60)	0.90 (0.51)	1.01 (0.28)	0.88 (0.30)	0.70 (0.44)	1.11 (0.43)	0.96 (0.25)
Control Group	30	0.53 (0.39)	0.90 (0.36)	1.09 (0.39)	0.85 (0.43)	0.81 (0.42)	0.95 (0.40)	0.89 (0.27)

Tables 5.58. to 5.62. show the results of a series of paired comparisons between slide categories for each group.

Table 5.58.

Summary of Paired Comparisons between
Slide Categories
T tests for Differences between
Mean Log. Response Times: All Groups

t= (sig.)	sign indicates result of subtraction of column mean from row mean					
Slide Category	Sad.	Fear	Anger	Surp.	Disg.	Neut.
Happiness	-3.13 <.01	-7.82 <.01	-2.54 <.05	-2.68 <.01	-4.31 <.01	-3.33 <.01
Sadness		-3.04 <.01	1.08 N.S.	1.09 N.S.	-1.62 N.S.	0.58 N.S.
Fear			3.89 <.01	5.16 <.01	1.79 N.S.	4.48 <.01
Anger				0.18 N.S.	-2.84 <.01	-0.45 N.S.
Surprise					-2.23 <.05	-0.73 N.S.
Disgust						2.34 <.05

Table 5.59.

Summary of Paired Comparisons between
Slide Categories
T tests for Differences between
Mean Log. Response Times: Violent Offenders

t= (sig.)	sign indicates result of subtraction of column mean from row mean					
	Sad.	Fear	Anger	Surp.	Disg.	Neut.
Slide Category						
Happiness	-1.49 N.S.	-4.96 <.01	-1.34 N.S.	-4.14 <.01	-0.71 N.S.	-0.65 N.S.
Sadness		-1.46 N.S.	0.87 N.S.	0.19 N.S.	0.55 N.S.	1.43 N.S.
Fear			1.76 N.S.	1.76 N.S.	1.43 N.S.	3.12 <.05
Anger				-.01 N.S.	0.33 N.S.	1.28 N.S.
Surprise					0.19 N.S.	0.78 N.S.
Disgust						0.73 N.S.

Table 5.60.

Summary of Paired Comparisons between
Slide Categories
T tests for Differences between
Mean Log. Response Times: Sex Offenders

t= (sig.)	sign indicates result of subtraction of column mean from row mean					
Slide Category	Sad.	Fear	Anger	Surp.	Disg.	Neut.
Happiness	-.04 N.S.	-4.03 <.01	0.97 N.S.	-0.47 N.S.	-2.70 <.05	0.63 N.S.
Sadness		-2.95 <.05	1.38 N.S.	-0.30 N.S.	-1.74 N.S.	0.47 N.S.
Fear			4.01 <.01	4.59 <.01	1.25 N.S.	4.36 <.01
Anger				-1.52 N.S.	-2.93 <.05	-0.59 N.S.
Surprise					-2.29 <.05	1.19 N.S.
Disgust						6.56 <.01

Table 5.61.

Summary of Paired Comparisons between
Slide Categories
T tests for Differences between
Mean Log. Response Times: Arsonists

t= (sig.)	sign indicates result of subtraction of column mean from row mean					
Slide Category	Sad.	Fear	Anger	Surp.	Disg.	Neut.
Happiness	-0.53 N.S.	-1.43 N.S.	-0.66 N.S.	0.31 N.S.	-1.44 N.S.	-0.93 N.S.
Sadness		-0.56 N.S.	0.20 N.S.	1.43 N.S.	-1.77 N.S.	-0.37 N.S.
Fear			1.03 N.S.	2.41 <.05	-0.72 N.S.	0.41 N.S.
Anger				1.50 N.S.	-2.19 N.S.	-0.78 N.S.
Surprise					-2.61 <.05	-1.59 N.S.
Disgust						1.02 N.S.

Table 5.62.

Summary of Paired Comparisons between
Slide Categories
T tests for Differences between
Mean Log. Response Times: Control Group

t= (sig.)	sign indicates result of subtraction of column mean from row mean					
Slide Category	Sad.	Fear	Anger	Surp.	Disg.	Neut.
Happiness	-3.25 <.01	-6.04 <.01	-2.92 <.01	-2.82 <.01	-3.67 <.01	-4.15 <.01
Sadness		-1.66 N.S.	0.46 N.S.	0.85 N.S.	-0.69 N.S.	0.05 N.S.
Fear			2.00 N.S.	2.87 <.01	1.22 N.S.	2.47 <.05
Anger				0.30 N.S.	-1.42 N.S.	-0.42 N.S.
Surprise					-1.25 N.S.	-1.21 N.S.
Disgust						0.68 N.S.

The tables show that, taking the subjects as a whole, response times to slides depicting Happiness are, in general faster than to other slides and, on the whole response times to Fear slides and Disgust slides are slower than to other slides. However, when the groups are separated, it becomes apparent that the higher response speed to Happiness slides is an effect mainly observed in the normal control group and is not so clear in the

other groups. The results once again indicate slower response times in the Sex Offender group; in this instance to Fear and Disgust. The only observed differences between slide categories among the Arsonist group were that the response to Fear and Disgust slides were significantly slower than that to Surprise. Violent Offenders showed different speeds only between Happiness slides and those of Fear and Surprise, with Happiness being significantly faster.

This interesting result obviously leads on to the question of whether there any differences between response times, not when responding to different categories of slide but when responding to the same slides by rating different emotions. Table 5.63. shows the means and standard deviations of Log. response times of mean ratings of each type by each group.

Table 5.63.Mean (S.D.) Log. Response TimesAcross Rating Categories

Subject Group	N	<u>Rating Category</u>					
		Happ.	Sad	Fear	Anger	Surp.	Disg.
All	55	0.79 (0.42)	0.96 (0.41)	0.87 (0.43)	0.90 (0.41)	0.93 (0.44)	0.93 (0.41)
Violent Off.	6	0.70 (0.50)	1.00 (0.46)	0.73 (0.55)	0.80 (0.45)	1.01 (0.50)	0.92 (0.49)
Sex Off.	9	1.14 (0.39)	1.24 (0.37)	1.12 (0.34)	1.15 (0.33)	1.17 (0.46)	1.21 (0.36)
Arson Off.	10	0.78 (0.53)	0.96 (0.55)	0.95 (0.58)	1.00 (0.55)	0.93 (0.58)	1.11 (0.57)
Controls	30	0.71 (0.34)	0.87 (0.33)	0.80 (0.34)	0.81 (0.35)	0.85 (0.36)	0.80 (0.29)

Tables 5.64. to 5.68. show the results of the paired comparisons of mean Log. Response times between rating categories for each of the groups.

Table 5.64.

Summary of Paired Comparisons between
Rating Categories
T tests for Differences between
Mean Log. Response Times: All Subjects

t= (sig.)	sign indicates result of subtraction of column mean from row mean.				
Response Category	Sad.	Fear	Anger	Surp.	Disg.
Happiness	-6.39 <.01	-2.98 <.01	-4.19 <.01	-5.99 <.01	-3.61 <.01
Sadness		4.21 <.01	3.21 <.01	1.27 N.S.	0.98 N.S.
Fear			-1.35 N.S.	-2.21 <.05	-1.87 N.S.
Anger				-1.42 N.S.	-1.28 N.S.
Surprise					-.02 N.S.

Table 5.65.

Summary of Paired Comparisons between
Rating Categories
T tests for Differences between
Mean Log. Response Times: Violent Offenders

t=	sign indicates result of subtraction of				
(sig.)	column mean from row mean.				
Response	Sad.	Fear	Anger	Surp.	Disg.
Category					
Happiness	-3.99 <.01	-0.37 N.S.	-2.06 N.S.	-4.90 <.01	-3.04 <.05
Sadness		3.51 <.05	4.09 <.01	-0.20 N.S.	3.58 <.05
Fear			-0.91 N.S.	-2.82 <.05	-2.27 <.05
Anger				-3.09 <.05	-1.93 N.S.
Surprise					3.17 <.05

Table 5.66.

Summary of Paired Comparisons between
Rating Categories
T tests for Differences between
Mean Log. Response Times: Sex Offenders

t= (sig.)	sign indicates result of subtraction of column mean from row mean.				
Response Category	Sad.	Fear	Anger	Surp.	Disg.
Happiness	-2.01 N.S.	0.31 N.S.	-0.35 N.S.	-0.77 N.S.	-1.13 N.S.
Sadness		2.68 <.05	1.98 N.S.	1.80 N.S.	0.65 N.S.
Fear			-0.68 N.S.	-0.72 N.S.	-1.65 N.S.
Anger				-0.24 N.S.	-1.72 N.S.
Surprise					-0.66 N.S.

Table 5.67.

Summary of Paired Comparisons between
Rating Categories
T tests for Differences between
Mean Log. Response Times: Arsonists

t=	sign indicates result of subtraction of				
(sig.)	column mean from row mean.				
Response	Sad.	Fear	Anger	Surp.	Disg.
Category					
Happiness	-2.36 <.05	-1.96 N.S.	-2.86 <.05	-2.93 <.05	-1.76 N.S.
Sadness		0.10 N.S.	-0.79 N.S.	0.58 N.S.	-1.06 N.S.
Fear			-1.07 N.S.	0.29 N.S.	-1.12 N.S.
Anger				1.17 N.S.	-0.87 N.S.
Surprise					-1.08 N.S.

Table 5.68.

Summary of Paired Comparisons between
Rating Categories
T tests for Differences between
Mean Log. Response Times: Control Group

t= (sig.)	sign indicates result of subtraction of column mean from row mean.				
Response Category	Sad.	Fear	Anger	Surp.	Disg.
Happiness	-4.59 <.01	-2.86 <.01	-2.92 <.01	-4.28 <.01	-4.03 <.01
Sadness		3.52 <.01	2.59 <.05	0.55 N.S.	2.64 <.05
Fear			-0.24 N.S.	-1.84 N.S.	0.26 N.S.
Anger				-1.34 N.S.	0.48 N.S.
Surprise					2.23 <.05

Over all the response times for the different rating categories are not so markedly different from each other as were the response times to the different slide categories. However, some similarities between the two emerged:

In general, the ratings of Happiness were faster than the ratings of other emotions. This was particularly true of the Normal control Group. This pattern also occurred between the different slide categories.

Sex Offenders showed no differences in response times other than between Sadness and Fear, with Fear being rated faster. Even Happiness ratings were not significantly different from other emotions. Indeed, in absolute terms, the fastest category of rating was Fear in this group. It may be interesting to speculate on the possibility that such offenders may be prone to make faster judgements about fear in others and that this may be a factor in such offences as rape.

Sadness and Surprise were rated most slowly over all, although the Arson group rated Disgust and Anger more slowly.

5.4.SUMMARY

The computerised rating scheme has been described. It has been shown how ratings may be elicited along with response timings.

While differences between the groups have been shown, particularly between Violent Offenders and other groups, these differences become more apparent when account is taken of the range of responses. Moreover, the patient groups all showed

significant differences from the controls in terms of the use of extreme ratings.

Principal Component Analysis showed a structure very similar to that outlined by Schlosberg (1954) and component scores derived from this emphasised the differences between the Violent Offender group and other subjects.

No evidence was found that the patient groups made faster judgements than controls. Indeed, if anything the Sex Offender groups responded slower than other groups especially when category of slide was taken into account.

CHAPTER SIX

Discussion and Conclusions

6.1.INTRODUCTION

The recognition of emotional expression in others is a skill which varies across the population. While there has been a debate in psychology about whether the expression of emotion is culturally and environmentally determined or whether it is biologically inherited, there does not appear to be any significant debate about whether the recognition of emotion is learned or inherited.

The current studies have considered the variability of this skill across a particular sub-group of people whom we consider to be mentally abnormal in terms of the extremes of their interactions with fellow human beings. This group of people have been sub- divided according to the particular nature of the "offending" they exhibit.

It might be supposed that there would be systematic differences

between the different patient groups as well as between a "normal" sample and the "abnormal" groups that might help the clinical worker to target the differences for treatment purposes.

6.2.THE PRELIMINARY STUDY

The first finding from this study was that the patients, as a whole showed a lower ability to correctly recognise the emotional expressions of the faces depicted in the slides used than that shown by the population on which the test had been standardised. The errors were fewer on the emotions which are deemed to be positive emotions (Happiness and Surprise), a finding which has been reported elsewhere in other groups (e.g. Gray et al., 1983). Moreover the ability of one group, the Sex Offender group was particularly low on the emotion of Fear. The clinical implications of this could be very significant in that if this Sex Offender group showed this particular deficit, while one may not be able to generalise, it clearly would be important to bear this deficit in mind when planning social skills programmes, for example.

The insensitivity to the expression of Fear could potentially be

an explanatory factor in accounting for sex offending. If a person is unable to detect the expression of fear, particularly if this is confused with some other emotion, the potentially inhibiting discriminative stimulus may not operate as such. A number of researchers have shown that while there may be difficulty in discriminating between types of sex offender, for example between rapists and paedophiles, it is generally less difficult to discriminate between sex offenders, as a group, and non-sex offenders (Freund et al., 1979, 1982; Pratt, 1987). Moreover, there is an ongoing debate about whether rapists, in particular, respond in a preferential way to violence in the context of sexual behaviour or whether they merely are not inhibited by the violence. On the one hand Quinsey et al. (1981, 1984) support the view that rapists are specifically aroused by depictions of non-consenting sexual intercourse, whereas Barbaree et al. (1979) have suggested that it is the violence and force within the rape (in this case auditorally presented) sequences which inhibits or suppresses sexual arousal. The fact that non-rapists in this study showed a differential response to the various rape sequences; that is a lower level of arousal, is held to be supportive of this view. Freund et al. (1979, 1984) suggest that, in fact, there may be two types of heterosexual sex offender, one a more extreme type

who respond to violent non- consenting sexual interaction by enhanced sexual arousal in an exclusive way; and another, less extreme group, who are not exclusive in their sexual preferences but are not inhibited by scenes of violent interaction. The results of the preliminary study would appear to support the lack of inhibition hypothesis, although the relatively limited sample would prohibit generalisation. However, Pratt (1987), with a very similar sub- group also supported this view, using patterns of penile erectile response as the dependent variable.

McFall (1982) proposed an information- processing model of social interaction which had three components by which individuals transform information from stimulus input to behavioural output. These are;

- 1 Decoding skills: the afferent processes involved in accurately receiving, perceiving and interpreting incoming sensory information;
- 2 Decision skills: the central processes involved in generating response options, matching these to the task demands, selecting the best option in the behavioural repertoire and evaluating the subjective utility of that option's predicted outcomes;

3 Execution skills: the efferent processes involved in smoothly executing a response, monitoring its impact on the environment and making necessary adjustments to achieve the desired impact.

Lipton et al. (1987), in a study involving rapists, non-rapist violent men and non-violent men showed that rapists were particularly insensitive to hetero-social cues and that non-rapist violent men also showed insensitivity but not to the extent shown by rapists. These effects were particularly apparent when the subjects viewed "first date interactions" rather than intimate interactions between couples who were more familiar with each other. Moreover, all subjects found more difficulty in reading cues from men than from women. This finding seems to be concordant with that of Buck (1972), quoted in Chapter One, which purported to show that women were better "senders" of emotional expression than men. While this study did not address questions of difficulty involving decision skills or execution skills, it is clear that there were decoding skills deficits in this sample of violent offenders.

The published research to date has not addressed the component of facially expressed emotion in this area. The preliminary study reported in Chapter Three would appear to support the view that sex offenders have difficulty with decoding skills, even when the stimuli are simple depiction of facial expression, devoid of contextual information. Although no differences were apparent between male and female faces on the emotion of Fear, the other negative emotions of Anger, Sadness and Disgust all showed differences with higher accuracy occurring with the female faces as stimuli. This finding again supports that of Lipton et al. (1987).

The other significant finding from this preliminary investigation was that the distribution of errors on Fear slides was very different between the Sex Offender group and the Violent Offender group. The Sex Offenders evenly distributed the errors, showing Fear to be just as easily mistaken for Anger as for Surprise (26.67% on both). Arsonists also distributed their errors on this emotion primarily between Surprise and Anger, though at a very much lower rate. On the other hand, the Violent Offenders were far more likely to see Fear as Anger (21.48% Anger and only 8.89% as Surprise). In other words, the Sex Offender group were more likely to view Fear as a positive

emotion (Surprise) than those whose violent behaviour did not involve sexual behaviour. The fact that this group often saw Fear as Anger may well fit with a cognitive style which attributes hostility to the victim, as is reported in many studies (e.g. Epstein and Taylor, 1967; Howells, 1981).

The proposition by Jackson et al. (1987) that Arsonists might be more sensitive to negative social cues is not clearly supported by the study, although they achieved a level of accuracy in identifying the emotion of Disgust that almost reached statistical significance.

6.3.THE SECOND STUDY

In general, the error rate was higher than the American sample on which the slides were validated but was considerably lower than the patient samples, particularly on negative emotions.

Again, the finding that, on the whole, the Male slides produced most difficulty for the subjects, except on the emotion of Anger, when this emotion was more easily recognised in men.

This was the opposite of the finding for the patient groups, all of which found more difficulty in recognising Anger in men. One

might argue that this is due to a sub- cultural difference between the two groups in that expressions of anger in men may be interpreted as mere bravado (the "macho" look), in a semi-delinquent group, whereas in a more educated group these norms may not apply and indeed the expression of anger in men may be much more of a significant discriminative stimulus.

As indicated above Sex Offenders were very significantly different from the other patient groups on the recognition of Fear. Interestingly, the Violent Offenders and Arsonists were also worse at recognising Fear than the normal group but this was also true of Anger, Disgust and to some extent Surprise. It is possible that this to some extent, may represent a possible difference between the groups in intellectual level and general social skills, a finding supported by Gray et al.(1983) who found that those with lower intellectual level had more difficulty with the recognition of negative emotions. It is clear that the negative emotions of Fear, Anger and Disgust caused more difficulty for the patients although Surprise, a positive emotion, also caused difficulty yet Sadness, a negative emotion, did not. The normal group was much less likely to nominate Anger for Fear slides than were any of the patient groups. Indeed the error of nominating Surprise slides

as Fear was at a level very similar to that shown by the Arsonist group, which only serves to emphasise the general level of insensitivity to Fear in the Sex Offender group and the tendency of the Violent Offender group to see Fear as Anger.

6.4.THE RATING OF EMOTIONAL EXPRESSION

As indicated above, the previous studies had concentrated exclusively on an analysis of the decoding skills in the recognition of facially expressed emotion. It was not clear, primarily because of the ordinal nature of the data, how each emotional expression related to another. Moreover, the very low error rates, particularly in the normal samples, precluded any possibility of comparing groups with any confidence on the question of how errors were distributed. From a procedural point of view, whilst the preliminary results showed considerable promise, the subjects found the experience tiring, the imposed pace was uncomfortable and artificial and they often reported that they were aware of more than one emotion being expressed (emotion "blends"- an effect that the standardisation had supposedly eliminated; Kiritz and Ekman, 1971). In addition, there was no possibility of looking at any aspect of either decision skills or execution skills (McFall, 1982).

While the computerised procedural study did not address the issue of execution skills, it was successful in ameliorating some disadvantages of the previous studies but the results were considerably more complex.

6.4.1. Procedural facilitation

While each session was approximately the same length as in the previous studies, subjects seemed to find the experience of being able to self-pace much less uncomfortable and therefore less tiring. Certainly there were fewer negative comments and some were very enthusiastic indeed. The Hewlett Pckard 9816 computer system used was not an inexpensive one, however, there is no doubt that replication of similar research, or the use of the procedure in clinical work could easily be done using equipment more readily available and less expensive. Computers with user ports such as the BBC (Acorn) 2, 2+ or Master series for example could easily run similar programmes to control the portable touch sensitive screen. The ability to collect more information, such as response times is greatly enhanced.

Moreover the data may be structured in a form which is readily available for statistical analysis. This, at least was true in

theory although in retrospect, the statistical packages available for the Hewlett Packard turned out to be rather cumbersome and a large amount of editing and re-arranging of the data had to take place, albeit by writing computer programmes to accomplish it.

6.4.2. The Subjects

It was unfortunate but true that the mean age of the Violent Offender group was lower than the Control group, just as in the previous study, the mean age of the patients was higher than the control group. While there is evidence that age may be a significant variable at pre-school level (Buck, 1973), there is no evidence that this is significant later in life.

6.4.3. The rating of strength of emotion

All subjects were able to rate the selection of slides on emotions other than those which Ekman and Friesen indicated were exemplified by each slide. For example, a slide which even 98.6% of Ekman's subjects might choose as an expression of Happiness, might also be rated as above zero (some present) on some other emotion such as, particularly in this case, Surprise.

The mean ratings of each emotion were not significantly different between any of the groups when all categories of slide were taken into account. In other words there was no particular bias by any single group to say, rate slides higher or lower on Happiness or Sadness etc. However, it was quite clear that the patient groups were more likely to use the extreme categories more often. This was true whether the ratings being considered were the target emotion or not. So, for example, while all subjects rated the target emotion towards the top end of the scale, as one might expect, the patient groups more far more categorical about it. In other words if they considered the emotion to be present, they were much more likely to give a rating of "8". Moreover, the next most likely rating was "0" even on "target" ratings. To a large extent, the converse applied to non- target ratings where while most ratings would get a rating of "0", the next most frequent rating was "8". This suggests that the patient groups were much more confident about their ratings than the Control group and were more categorical. This supports the contention by Thomas- Peter (1988) that psychopaths are more likely to make more extreme social judgements.

As indicated in Chapter Five, analyses of the ratings were made

in terms of absolute ratings and also in terms of deviations from the mean rating on each emotion by each subject, thus correcting for the range on each emotion by each subject. Each group rated the target emotion highest as a group, except for the Violent Offenders who rated Anger slides higher on Disgust than Anger. However, when the transformed scores were considered, this difference disappeared, with each target emotion receiving the highest rating. In the previous studies, perhaps the most significant finding was that Sex Offenders appeared to have difficulty in recognising Fear. With this limited range of slides, this effect was not so clear. Fear slides were rated highest on Fear, however, for the Sex Offenders, the second and third highest ratings were for Surprise and Anger and this effect was still apparent when corrections were made for the individual's range. Only this group showed this effect. This supports the previous finding where Sex Offenders were shown to have a tendency to see Fear as either Surprise or Anger.

On the whole, the Violent Offender group seemed to differ most from the Controls. In effect, there are three ways in which the ratings may be viewed; in terms of Absolute ratings; in terms of the transformed rating and also in terms of the order of the

rating for each category of slide.

Two differences occur both before and after transformation of scores and when order is taken into account. These are that Violent Offenders see lower levels of Sadness in the Anger slides and they also see higher levels of Surprise on Neutral slides. Two other differences also show up in terms of the differences between the means of the transformed scores and when the order of these transformed scores are considered. These are that Violent Offenders rated higher Sadness on Fear slides and Arsonists rated lower Surprise on Fear slides. It is apparent that only two ratings are producing these differences; Surprise and Sadness. At first sight, there seems to be little of useful note in these findings. However when the relationships between the ratings of emotion are considered, i.e. the correlations between ratings, discussed in the next section, a pattern seems to emerge.

6.4.4. Principal Components Analysis

Three main components emerged from the ratings and these were relatively stable across the four groups of subjects. The first two components accounted for about 65% of the total variance,

although for the Violent Offenders these were relatively evenly weighted and, indeed, in absolute terms, the order of magnitude was reversed from that found in the other groups. Although there are some slight differences, these components look very similar to those described by Schlosberg (1954). The first is clearly a positive- negative dimension with the pleasant emotion of Happiness determining the positive end of the continuum and Anger and Disgust marking the other end. The second component also looks very similar to the Accepting- Rejecting dimension described by Schlosberg, with Surprise and Fear at one end and Disgust and Anger at the other. The third component has Sadness at one end and Surprise and to some extent Disgust at the other. From Schlosberg's dimensions one would perhaps not expect to find Disgust in the position it is, if the dimension was one of High to Low Intensity. However, the Violent Offenders clearly mark this dimension with Sadness at one end and Surprise and no other emotion at the other end. This may well be the reason why the Violent Offenders are differentiated so well from the other groups when using the Sadness and Surprise ratings. They appear to have a clearly defined Intensity construct. However, it is this component when applied to the slide categories of Fear, Anger and Neutral which brings out the differences in the Violent Offender group. Violent Offenders rated Fear slides as

more "passive" than either Controls or Sex Offenders and Anger slides as more "passive" than any of the other groups. Along with the Sex Offender group, Violent Offenders rated the Neutral slides as more "intense" than the Control group did. The Violent Offender group also tended to see the Anger slides as more "positive" than the Control group, in other words expressions of Anger appear to be less aversive to this group than normals. Schlosberg (1942) saw the dimension of Accepting-Rejecting as a reflection of a mechanism to control sensory input. The rejecting end of the dimension is a shutting out of stimulation from the emotional object. A more appropriate description has been given by Gray et al. (1983) as Attention-Rejection. Presumably the mid-range of the scale would be a detached indifference. Both Sex Offenders and Arsonists rated Fear slides more towards the Rejection end than either Controls or Violent Offenders. In other words, within the above theoretical framework, these groups do not see expressions of Fear as having so much of an Attentional characteristic but as more detached. This may go some way to accounting for the finding in the preliminary study that Sex Offenders were less sensitive to expressions of Fear. The fact that there were no differences between the groups on the first component on Fear expressions would indicate that all groups find the expression

of Fear as equally aversive. While all of the groups rated the Happiness expressions as strongly positive, the Sex Offender group rated expressions of Happiness as less positive than either the Control group or the Arsonist group. This may indicate that the Sex Offenders find expressions of Happiness as less reinforcing than the other groups. The Violent Offenders were not significantly different from any of the groups on this measurement and were somewhere in between the Sex Offenders on the one hand and the Controls and Arsonists on the other.

6.4.5. Response Times

As one might expect, the time to reach a conclusion about Happiness was, particularly in the normal Control group, less than for other emotions. This finding supports those reported elsewhere in that a number of researchers have indicated that the recognition of Happiness is the least difficult discrimination (e.g. Ekman and Friesen, 1967). Therefore, if response time is, at least to some extent, a measure of facility, then a faster time indicates a greater facility. There is, however, no evidence to support the contention that that psychopaths are more likely to make faster judgements than

normals (Thomas- Peter, 1988). Indeed, the Sex Offender group, on the whole were more likely to be slower than either the Controls or the other patient groups. This was especially true when the slides depicting Fear and Disgust were considered separately. Sex Offenders rated Fear slides more slowly than all other slides except those depicting Disgust (in fact, in absolute terms they also rated Fear slower than Disgust though not significantly so). However, this appears to be merely an exaggeration of the general finding that the rating of Fear slides took longer than other emotions, except in the Arsonist group who took marginally longer to rate Disgust slides.

Response times in the different rating categories also showed, particularly in the Control group, that the rating of Happiness was generally easier than other ratings. This again was particularly marked in the Control group. However, the Sex Offender group showed fewer differences overall. This may well be a floor effect in that they responded slower generally. The fact that they showed only one significant difference between categories, namely that the rating of Fear was faster than the rating of Sadness, supports this.

6.5.GENERAL CONCLUSION

Overall one is left with the conclusion that while the approach of investigating the recognition of emotional expression is potentially very promising, the relationship between the emotions being expressed and their recognition in the eyes of the beholder is an important but complex variable. As a clinical procedure, the technique is relatively easy to carry out but requires refinement, particularly in the area of the selection of appropriate stimulus material.

REFERENCES

Abel G G, Blanchard E B and Barlow D H 1981 Measurement of sexual arousal in several paraphilias: the effect of stimulus modality, instructional set and stimulus content. Behaviour Research and Therapy 19 25-31

Abel G G, Blanchard E B and Guild D 1977 The components of rapists' sexual arousal. Archives of General Psychiatry 34 395-403

Allport F H 1924 Social Psychology. Boston Houghton Mifflin

American Psychiatric Association 1980 Diagnostic and statistical manual of mental disorders. 3rd Edition Washington D C

Argyle M 1969 Social interaction London Methuen

Argyle M 1978 Editorial: Non verbal communication and mental disorder. Psychological Medicine 8 551-554

- Argyle M and Cook M 1976 *Gaze and mutual gaze*. London
Cambridge University Press
- Ashcroft J B 1986 *The treatment of psychopaths: Proposed
changes in legislation*. Paper presented to British
Psychological Society London Conference
- Azrin N H and Hutchinson R R 1967 *Conditioning of the
aggressive behaviour of pigeons by a fixed interval schedule of
reinforcement*. *Journal of the Experimental Analysis of
Behaviour* 10 395-402
- Bandura A 1973 *Aggression: a social learning analysis*. New
Jersey Prentice Hall
- Bandura A, Ross D and Ross S 1961 *Transmission of aggression
through imitation of aggressive models*. *Journal of Abnormal and
Social Psychology* 63 575-582
- Bandura A and Walters R H 1959 *Adolescent aggression*. New
York Ronald Press

Bannister D and Salmon P 1966 Schizophrenic thought disorder: specific or diffuse? *British Journal of Medical Psychology* 39 215-219

Barbaree H E, Marshall W L and Lanthier R D 1979 Deviant sexual arousal in rapists. *Behaviour Research and Therapy* 17 215-222

Biaggio M K 1980 Assessment of anger arousal. *Journal of Personality Assessment* 44 289-298

Biaggio M K, Supplee K and Curtis N 1981 Reliability and validity of four anger scales. *Journal of Personality Assessment* 45 639-648

Birdwhistell R L 1963 The kinesic level in the investigation of the emotions. In: Knapp P H (ed) *Expressions of the emotions in man*. New York International University Press

Birdwhistell R L 1967 *Communication without words*. In: Alexandre D *L'Aventure Humaine* Paris Societe d'Etudes Litteraires et Artistique

Black D A 1973 A decade of psychological investigation of the male population of Broadmoor Special Hospital Research Reports No 8 Special Hospitals Research Unit

Blackburn R and Maybury C 1985 Identifying the psychopath: the relation of Cleckley's criteria to the interpersonal domain. *Personality and Individual Differences* 6 375-386

Blackburn R and Lee-Evans J M 1985 Reactions of primary and secondary psychopaths to anger-evoking situations. *British Journal of Clinical Psychology* 24 93-100

Blackburn R 1986 Patterns of personality deviation among violent offenders. *British Journal of Criminology* 26 254-269

Blackburn R 1988 Psychopathy and personality disorder in adult abnormal psychology. In: Miller E and Cooper E J (eds) *Edinburgh Churchill Livingstone*

Blacking J 1983 The social construction of violence: towards an anthropology of peace. Unpublished MSc thesis Belfast Queen's University

Borod J C, Koff E, Perlman M and Nicholas M 1985 Channels of emotional expression in patients with unilateral brain damage
Archives of Neurology 42 345-348

Borod J C, Koff E, Caron H S 1983 Right hemisphere specialisation for the expression and appreciation of emotion: A focus on the face. In: Perelman E (ed) *Cognitive processes in the right hemisphere*. New York Academic Press

Bradford J M W 1982 Arson: a clinical study. *Canadian Journal of Psychiatry* 27 188-193

Brandt R B 1954 *Hopi ethics: a theoretical analysis*. Chicago University Press

Brody S 1977 *Screen violence and film censorship*. Home Office Research Unit Report No. 40 London Her Majesty's Stationery Office

Brooks D N and Aughton M E 1979 Psychological consequences of blunt head injury. *International Rehabilitation Medicine* 1 140-165

- Bruyer R 1981 Asymmetry of facial expression in brain damaged subjects. *Neuropsychologia* 19 615-624
- Buck R and Duffy R J 1980 Nonverbal communication of affect in brain-damaged patients. *Cortex* 16 351-362
- Buck R W, Savin V J, Miller R E and Caul W F 1972 Communication of affect through facial expression in humans. *Journal of Personality and Social Psychology* 23 362-371
- Buck R W 1973 Nonverbal communication of affect in children. Report 73-8 Pittsburgh Department of Psychology Carnegie-Mellon University
- Burgess R, Jewett R, Sandham J and Hudson B 1980 Working with sex offenders: a social skills training group. *British Journal of Social Work* 10 133-142
- Buss A H 1971 Aggression pays. In: Singer J L (ed) *The control of aggression and violence*. *Journal of Personality and Social Psychology* 22 296-302
- Cameron N and Margaret A 1951 *Behaviour pathology*. Boston

Houghton Mifflin

Camp H N, Blom G E, Herbert F and Van Doornick W J 1977 Think aloud: a program for developing self-control in young aggressive boys. *Journal of Abnormal Child Psychology* 5 157-168

Casey M D, Blank C E, McLean T M, Kohn P, Street D R K, McDougall S M, Gooder J and Platts J 1973 Male patients with chromosome abnormalities in the state hospitals. *Journal of Mental Deficiency Research* 16 215-256

Chagnon N A 1977 *Yanomamo: the fierce people*. New York Holt, Rinehart and Winston

Cleckley H 1976 *The mask of sanity*. 6th edition St.Louis Mosby

Crawford D A 1979 [1] Modification of deviant sexual behaviour: the need for a comprehensive approach. *British Journal of Medical Psychology* 52 151-156

Crawford D A 1979 [2] A social skills programme with sex offenders. In: Cooke C and Watson G (eds) London Pergamon

Press

Cutting J 1981 Judgement of emotional expression in schizophrenia. *British Journal of Psychiatry* 139 1-6

Darwin C 1872 *Expression of the emotions in man and animals*. London Murray (recently 1955 New York Philosophical Press and 1965 Chicago University of Chicago Press)

Delgado J M R 1967 Social rank and radio-stimulated aggression in monkeys. *Journal of Nervous and Mental Disease* 144 383-390

Delgado J M R 1969 *Physical control of the mind*. New York Harper and Row

DHSS 1975 *Report of the committee on abnormal offenders*. London Her Majesty's Stationery Office

Dittman A T 1972 *Interpersonal messages of emotion* New York Springer

Doering C H, Brodie H K H, Kraemer H C, Moos R W, Becker H B and Hamburg D A 1975 Negative affect and plasma testosterone: a

longitudinal human study. *Psychosomatic Medicine* 37 484-491

Dougherty F E, Bartlett E S and Izard C E 1974 Responses of schizophrenics to expressions of the fundamental emotions.

Journal of Clinical Psychology 30 243-246

Duchenne B 1862 *Mecanisme de la physionomie humaine ou analyse electro-physiologique de l'expression des passions.* Paris

Bailliere

Duffy E 1934 Emotion: an example of the need for reorientation in psychology. *Psychological Review* 41 184-198

Duffy E 1941 An explanation of 'emotional' phenomena without the use of the concept of 'emotion'. *Journal of General*

Psychology 25 283-293

Eibl-Eibesfeldt I 1972 Similarities and differences between cultures in expressive movements. In: Hinde R A (ed) *Nonverbal communication.* London Cambridge University Press

Ekman P 1968 The recognition and display of facial behaviour in literate and non-literate cultures. *Proceedings of the APA*

Convention 3 727

Ekman P (ed) 1972 Darwin and facial expression: a century of research in review. New York Academic Press

Ekman P and Friesen W V 1967 Head and body cues in the judgement of emotion: a reformulation. *Perceptual and Motor Skills* 24 711-724

Ekman P and Friesen W V 1968 Nonverbal behavior in psychotherapy research. *Research in Psychotherapy* 3 179-216

Ekman P and Friesen W V 1969 Nonverbal leakage and clues to deception. *Psychiatry* 38 88-166

Ekman P and Friesen W V 1971 Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology* 17 124-129

Ekman P and Friesen W V 1975 *Unmasking the face*. New Jersey Englewood Cliffs: Prentice-Hall

Ekman P and Friesen W F 1976 *Facial Affect Slides*. Palo Alto

Consulting Psychologists Press

Ekman P, Friesen W F and Ellsworth P 1972 Emotions in the human face: Guidelines for research and an integration of the findings. New York Pergamon Press

Ekman P, Sorenson E R and Friesen W V 1969 Pan-cultural elements in facial displays of emotions. *Science* 164 86-88

Ekman P, Friesen W V, O'Sullivan M and Scherer K 1980 Relative importance of face, body and speech in judgements of personality and affect. *Journal of Personality and Social Psychology* 38 270-277

Epstein J S and Taylor S P 1967 Instigation to aggression as a function of degree of defeat and perceived aggressive intent of the opponent. *Journal of Personality* 35 265-289

Exline R V, Gollheil E, Paredes A and Winklemeier D 1968 Gaze direction as a factor in the accurate judgement of nonverbal expressions of affect. *Proceedings of the 76th APA Convention*

Ferguson T J and Rule B G 1983 An attributional perspective on

anger and aggression. In: Green R G and Donnerstein E L (eds)
Aggression: theoretical and empirical reviews. Vol 1 Theoretical
and methodological issues. New York Academic Press

Feuerstein R 1980 Instrumental enrichment: an intervention
program for cognitive modifiability. Baltimore University Park
Press

Fowles M W 1977 Sex offenders in Rampton. In: Gunn J (ed)
Sex Offenders- a symposium. Special Hospitals Research Unit
Report No. 14. London DHSS

Fraser W I and Grieve R 1981 Communicating with normal and
retarded children. Bristol Wright

Freud S 1932 The acquisition of power over fire. In: Jones E
(ed) 1956 Collected papers. Sigmund Freud Vol 5 London
Hogarth Press and Institute of Psychoanalysis

Freund K, Chan S and Coulthard R 1979 Pallometric diagnosis
with 'non admitters'. Behaviour Research and Therapy 17
451-457

Freund K, Scher H, Chan S and Ben-Aron M 1982 Experimental analysis of pedophilia. *Behaviour Research and Therapy* 20 105-112

Gold L 1962 Psychiatric profile of the fire-setter. *Journal of Forensic Sciences* 7 404-417

Goldstein A J 1973 *Structured learning therapy: towards a psychotherapy for the poor*. New York Academic Press

Goldstein K 1952 The effect of brain damage on personality *Psychiatry* 15 245-260

Gray J M, Fraser W L and Leudar I 1983 *British Journal of Psychiatry* 142 566-571

Greenwell J and Dengerink H 1973 The role of perceived versus actual attack in human physical aggression. *Journal of Personality and Social Psychology* 26 66-74

Grieger R 1982 Anger problems. In: Grieger R and Grieger I Z (eds) *Cognition and emotional disturbance*. New York Human Sciences Press

Groth A N 1979 Men who rape: the psychology of the offender.
New York Plenum

Gunn J C and Fenton G 1969 Epilepsy in prisons: a diagnostic
survey. *British Medical Journal* 4 326-329

Haggard E A and Isaacs K S 1966 Micromomentary facial
expressions as indicators of ego mechanisms in psychotherapy.
In: Gottschalk L A and Auerbach A H (eds) *Methods of research
in psychotherapy*. New York Appleton-Century-Crofts

Harris M 1976 *Cows, pigs, wars and witches*. London
Fontana/Collins

Hebb D O 1946 Emotion in man and animal: an analysis of the
intuitive processes of recognition. *Psychological Review* 53
88-106

Heckel R, Allen S and Stone P 1981 A comparison of self-rated
high and low success problem solvers. *Journal of Psychology*
107 173-176

- Hersen M and Bellack A S 1976 Social skills training for chronic psychiatric patients: rationale, research findings and future directions. *Comprehensive Psychiatry* 17 559-580
- Hill R W, Langevin R, Paitich D, Handy L, Russon A and Wilkinson L 1982 Is arson an aggressive act or a property offence? A controlled study of psychiatric referrals. *Canadian Journal of Psychiatry* 27 648-654
- Howells K 1981 Social relationships in violent offenders. In: Duck S and Gilmour R (eds) *Personal relationships in disorder*. London Academic Press
- Howells K 1983 Social construing and violent behaviour in mentally abnormal offenders. In: Hinton J (ed) *Dangerousness: problems of assessment and prediction*. London Allen and Unwin
- Howells K 1985 Clinical aspects of sexual violence. In: Karas E (ed) *Current issues in clinical psychology*. 2 New York Plenum
- Howells K 1987 Forensic problems: investigation. In: Lindsay S and Powell G (eds) *A handbook of clinical psychology*.

Aldershot Gower

Hunt W A 1941 Recent developments in the field of emotion.
Psychological Bulletin 38:5 249-276

Izard C 1968 Cross-cultural research findings on development
in recognition of facial behaviour. Proceedings of APA
Convention 3 727

Izard C 1970 The emotions and emotion constructs in
personality and and culture research. In: Cattell R B (ed)
Handbook of modern personality theory. Chicago Aldine

Izard C 1971 The face of emotion. New York
Appleton-Century-Crofts

Jackson H F, Glass C A and Hope S 1987 A functional analysis
of recidivistic arson. British Journal of Clinical Psychology
26 175-185

Jacobs P A, Price W H, Richmond S and Ratcliffe R A W 1971
Chromosome surveys in penal institutions and approved schools.
Journal of Medical Genetics 8 49-58

Kafrey D 1980 Playing with matches. Children and fire. In:
Canter D (ed) Fires and human behaviour. New York Wiley

Karpman B 1941 On the need for separating psychopathy into two
distinct clinical types: symptomatic and ideopathic. Journal of
Criminology and Psychopathology 3 112-137

Kendall P C and Finch A J 1979 Developing non-impulsive
behaviour in children: cognitive-behavioural strategies for
self-control. In: Cognitive-behavioural interventions: theory,
research and procedures. New York Academic Press

Knudsen H and Muzekari L H 1983 The effects of verbal
statements of context on facial expressions of emotion. Journal
of Nonverbal Behavior 7 202-212

Koson D F and Dvoskin J 1982 Arson: a diagnostic study.
Bulletin of the American Academy of Psychiatry and the Law 10
19-49

Krafft-Ebbing V R 1894 Psychopathia sexualis Stuttgart Ferd
Enke

Kreutzer M A and Charlesworth W R 1973 Infant's reactions to different expressions of emotions. Philadelphia Society for Research and Child Development

La Barre W 1947 The cultural basis of emotions and gestures. *Journal of Personality* 16

Lanzetta J T and Kleck R E 1970 Encoding and decoding of nonverbal affect in humans. *Journal of Personality and Social Psychology* 16 12-19

Lanzetta J T and Orr S P 1981 Stimulus properties of facial expressions and their influence on the classical conditioning of fear. *Motivation and Emotion* 5 225-234

Laws D R 1984 The assessment of dangerous sexual behaviour in males. *Medicine and the Law: An International Journal* 3 127-140

Lee-Evans M J 1986 The direct assessment of sexual skills in an institutional setting. In: Pratt P S (ed) *Sexual assessment: issues and radical alternatives*. Issues in

Criminological and Legal Psychology 8 Leicester British Psychological Society

Lewis N D C and Yarnell H 1951 Pathological firesetting (pyromania). Nervous and Mental Disease Monographs 82

Ley R G and Bryden M P 1981 Consciousness, emotion and the right hemisphere. In: Stevens R and Underwood G (eds) Aspects of consciousness. New York Academic Press

Libet J and Lewensohn P M 1973 Concept of social skill with special reference to the behaviour of distressed persons. Journal of Consulting and Clinical Psychology 40 304-312

Lipton D N, McDonel E C and McFall R M 1987 Heterosocial perception in rapists. Journal of Consulting and Clinical Psychology 55(1) 17-21

Longabaugh R, Eldred S H, Bell N W and Sherman L J 1966 The interactional world of the chronic schizophrenic patient. Psychiatry 29 78-99

McDavid J and Schroder H M 1957 The interpretation of approval

and disapproval by delinquent and non-delinquent adolescents.

Journal of Personality 25 539-549

McFall R M 1982 A review and reformulation of the concept of social skills. *Behavioural Assessment* 4 1-33

McKerracher D W and Dacre J I 1966 A study of arsonists in a special security hospital. *British Journal Psychiatry* 112 1151-1154

Malamuth N M 1981 Rape proclivity among males. *Journal of Social Issues* 37 138-157

Malamuth N M 1983 Factors associated with rape as predictors of laboratory aggression against women. *Journal of Personality and Social Psychology* 45 432-442

Malamuth N M and Check J V P 1980 [1] Sexual arousal to rape and consenting depictions: the importance of the woman's sexual arousal. *Journal of Abnormal Psychology* 89 763-766

Malamuth N M and Check J V P 1980 [2] Penile tumescence and perceptual responses to rape as a function of the victim's

perceived reactions. *Journal of Applied Social Psychology* 10
528-547

Malamuth N M and Donnerstein E 1982 The effects of aggressive,
pornographic mass media stimuli. In: *Advances in experimental
social psychology* 15 New York Academic Press

Mark V H and Erwin F R 1970 *Violence and the brain.* Maryland
Harper and Row

Mehrabian A 1972 *Nonverbal communication.* Chicago Aldine

Mischel W 1968 *Personality and assessment.* New York Wiley

Murphy W D, Coleman E M, and Haynes M R 1983 Treatment and
evaluation issues with the mentally retarded sex offender. In:
Greer J G and Stuart J R (eds) *The sexual aggressor: current
perspectives on treatment.* New York Van Nostrand Rinehold

Muzekari L H and Bates M E 1977 Judgements of emotion among
chronic schizophrenics. *Journal of Clinical Psycholgy* 33
662-666

Muzekari L H, Knudsen H and Evans T 1986 Effect of context on perception of emotion among psychiatric patients. *Perceptual and Motor Skills* 62 79-84

Nance J 1975 *The gentle Tasaday*. London Gollancz

Nickel T W 1974 The attribution of intention as a critical factor in the relationship between frustration and aggression. *Journal of Personality* 42 482-492

Novaco R W 1975 *Anger control: the development and evaluation of an experimental treatment*. Lexington D C Heath

Novaco R W 1978 Anger and coping with stress. In: Foreyt J P and Rathjen D P (eds) *Cognitive Behaviour Therapy*. New York Plenum

Nurcombe B 1964 Children who set fires. *Medical Journal of Australia* 18 579-584

Oddy M and Humphrey M 1980 Social recovery during the first year following severe head injury. *Journal of Neurology, Neurosurgery and Psychiatry* 43 798-802

- Oddy M, Humphrey M and Uttley D 1978 Stresses upon the relatives of head injured patients. *British Journal of Psychiatry* 133 507-513
- Ostwald P F 1963 *Soundmaking*. Springfield Charles C Thomas
- Owens R G 1986 The relationship between sexual arousal and sexual behaviour. In: Pratt P S (ed) *Sexual Assessment: issues and radical alternatives*. *Issues in Criminological and Legal Psychology* 8 Leicester British Psychological Society
- Owens R G and Ashcroft J B 1982 Functional analysis in applied psychology. *British Journal of Clinical Psychology* 21 181-189
- Owens R G and Ashcroft J B 1985 *Violence: a guide for the caring professions*. Beckenham Croom Helm
- Owens R G and Bagshaw M 1984 First steps in the functional analysis of aggression. In: Karas E (ed) *Current issues in clinical psychology* 1 New York Plenum
- Patrick J 1973 *A Glasgow gang observed*. London Eyre Methuen

Perkins D 1986 Sex offending: a psychological approach. In: Hollin C and Howells K (eds) Clinical approaches to criminal behaviour. *Issues in Criminological and Legal Psychology* 9
Leicester British Psychological Society

Phillips E L 1968 Achievement Place: token reinforcement procedures in a home-style rehabilitation setting for pre-delinquent boys. *Journal of Applied Behavior Analysis* 1
213-223

Piaget J 1953 The origin of intelligence in the child.
London Routledge

Pichot P 1978 Psychopathic behaviour: a historical overview. In: Hare R D and Schalling D (eds) Psychopathic behaviour: approaches to research. Chichester Wiley

Piderit T 1886 Mimik und physiognomik. Detmold Meyer

Plutchik R 1962 The emotions: facts, theories and a new model.
New York Random House

Plutchik R 1980 *Emotion: a psychorevolutionary synthesis*. New York Harper and Row

Pollack N 1980 *The relationship between criminal behaviour and constricted role-taking activity*. PhD thesis Toronto University of Toronto

Pratt P S 1986 *The classification of sexual offenders: an investigation into methods of discriminating amongst various groups in an institutional setting*. PhD thesis Liverpool University of Liverpool

Price W H 1978 *Sex chromosome abnormalities in Special Hospital patients*. In: Gunn J (ed) *Sex offenders: a symposium* London DHSS

Prichard J C 1835 *Treatise on insanity*. London Gilbert and Piper

Quinsey V L, Chaplin T C and Upfold D 1984 *Sexual arousal to non-sexual violence and sadomasochistic themes among rapists and non-sex offenders*. *Journal of Consulting and Clinical Psychology* 52 651-657

Quinsey V L, Chaplin T C and Varney G A 1981 A comparison of rapists' and non-sex offenders' sexual preference for mutually consenting sex, rape and physical abuse of women. *Behaviour Assessment* 3 127-135

Rose R M, Gordon T P and Bernstein I S 1972 Plasma testosterone levels in the male rhesus: influence of sexual and social stimuli. *Science* 178 643-645

Rose R M, Holaday J W and Bernstein I S 1971 Plasma testosterone, dominance rank and aggressive behaviour in male rhesus monkeys. *Nature* 231 366-368

Ross R R and Fabiano E A 1985 *Time to think: a cognitive model of delinquency prevention and offender rehabilitation.* Johnson City Institute of Social Sciences and Arts

Segal Z V and Marshall W L 1986 Discrepancies between self-efficacy predictions and actual performance in a population of rapists and child molesters. *Cognitive Therapy and Research* 10(3) 363-375

Shannon C E 1948 A mathematical theory of communication Bell System Technical Journal 27 379-423, 623-656

Shannon C E and Weaver W 1949 The mathematical theory of communication. Urbana University of Illinois Press

Scherer K R 1974 Acoustic concomitants of emotional dimensions: judging affect from synthesised tone sequences. In: Weitz S (ed) Nonverbal communication. New York Oxford University Press

Schlosberg H 1954 Three dimensions of emotion. Psychological Review 61 81-88

Spence S 1980 Social skills training with children and adolescents. Barnstaple NFER Publishing Company

Stekel W 1924 Pyromania. In: Peculiarities of behaviour. 2 New York Boni and Liveright

Stewart M A and Culver K W 1982 Children who set fires: the clinical picture and follow-up. British Journal of Psychiatry 140 357-363

Tennant T G, McQuaid A, Loughnane T and Hands A J 1971 Female arsonists. *British Journal of Psychiatry* 119 497-502

Thomas-Peter B 1988 Construct theory and cognitive style in personality disordered offenders. London Paper presented to a Conference on PCP, Deviancy and Social Work

Toch H 1969 *Violent men*. Harmondsworth Penguin

Toch H 1975 [1] *Men in crisis: human breakdown in prison*. Chicago Aldine

Toch H 1975 [2] The psychology of imprisonment. In: Toch H (ed) *Psychology of crime and criminal justice*. New York Holt, Rinehart and Winston

Tomkins S S 1962 *Affect, imagery and consciousness*. Vol 1 The positive affects. New York Springer

Tomkins S S and McCarter R 1964 What and where are the primary affects? some evidence for a theory. *Perceptual and Motor Skills* 18 119-158

Trower P, Argyle M and Bryant B 1977 Social skills and mental health London Tavistock

Trower P, Bryant B and Argyle M 1978 Social skills and mental health. London Methuen

Tucker D M 1981 Lateral brain function, emotion and conceptualisation. *Psychological Bulletin* 89 19-46

Walker E, Marwitz S M and Emory E 1980 A cross-sectional study of emotion recognition in schizophrenics. *Journal of Abnormal Psychology* 89 428-436

Walker N 1968 Crime and punishment in Britain Edinburgh Edinburgh University Press

Walters R H and Brown M 1963 Studies of reinforcement of aggression III: transfer of responses to an interpersonal situation. *Child Development* 34 563-571

Wilkin H A, Mednick S A, Schulsinger F, Bakkestom E, Christiansen K O, Goodenough D R, Philip J, Ruben D B and

Stocking M 1976 Criminality in XYY and XXY men *Science* 196
547-555

Williams E 1974 An analysis of gaze in schizophrenics.
British Journal of Social and Clinical Psychology 39 246-252

World Health Organization 1978 *Mental disorder: glossary and
guide to their classification in accordance with the ninth
revision of the International Classification of Diseases.*
Geneva World Health Organization

Wyndra A, Marshall W L, Earls C M and Barbaree H E
Identification of cues and control of sexual arousal by rapists.
Behaviour Research and Therapy 21 469-476

Yarnell H, Benezech M, Cessaldi P, Bourgois M and Addad M 1983
Arson in mentally ill and criminal populations. *Journal of
Clinical Psychology* 44 128-130

Yesavage H 1940 Firesetting in children. *American Journal of
Orthopsychiatry* 10 282-286

Zabell R H 1979 Recognition of emotions in facial expressions

by emotionally disturbed and nondisturbed children. *Psychology
in the Schools* 16 119-126

APPENDIX I
EMOTIONAL EXPRESSION RECORD SHEET

1.	happy	sad	fear	anger	surprise	disgust	neutral
2.	happy	sad	fear	anger	surprise	disgust	neutral
3.	happy	sad	fear	anger	surprise	disgust	neutral
4.	happy	sad	fear	anger	surprise	disgust	neutral
5.	happy	sad	fear	anger	surprise	disgust	neutral
6.	happy	sad	fear	anger	surprise	disgust	neutral
7.	happy	sad	fear	anger	surprise	disgust	neutral
8.	neutral	disgust	anger	surprise	fear	sad	happy
9.	neutral	disgust	anger	surprise	fear	sad	happy
10.	neutral	disgust	anger	surprise	fear	sad	happy
11.	neutral	disgust	anger	surprise	fear	sad	happy
12.	neutral	disgust	anger	surprise	fear	sad	happy
13.	neutral	disgust	anger	surprise	fear	sad	happy
14.	neutral	disgust	anger	surprise	fear	sad	happy
15.	happy	sad	fear	anger	surprise	disgust	neutral
16.	happy	sad	fear	anger	surprise	disgust	neutral
17.	happy	sad	fear	anger	surprise	disgust	neutral
18.	happy	sad	fear	anger	surprise	disgust	neutral
19.	happy	sad	fear	anger	surprise	disgust	neutral
20.	happy	sad	fear	anger	surprise	disgust	neutral
21.	happy	sad	fear	anger	surprise	disgust	neutral
22.	neutral	disgust	anger	surprise	fear	sad	happy
23.	neutral	disgust	anger	surprise	fear	sad	happy
24.	neutral	disgust	anger	surprise	fear	sad	happy
25.	neutral	disgust	anger	surprise	fear	sad	happy
26.	neutral	disgust	anger	surprise	fear	sad	happy
27.	neutral	disgust	anger	surprise	fear	sad	happy
28.	neutral	disgust	anger	surprise	fear	sad	happy
29.	happy	sad	fear	anger	surprise	disgust	neutral
30.	happy	sad	fear	anger	surprise	disgust	neutral
31.	happy	sad	fear	anger	surprise	disgust	neutral
32.	happy	sad	fear	anger	surprise	disgust	neutral
33.	happy	sad	fear	anger	surprise	disgust	neutral
34.	happy	sad	fear	anger	surprise	disgust	neutral
35.	happy	sad	fear	anger	surprise	disgust	neutral
36.	neutral	disgust	anger	surprise	fear	sad	happy
37.	neutral	disgust	anger	surprise	fear	sad	happy
38.	neutral	disgust	anger	surprise	fear	sad	happy
39.	neutral	disgust	anger	surprise	fear	sad	happy
40.	neutral	disgust	anger	surprise	fear	sad	happy
41.	neutral	disgust	anger	surprise	fear	sad	happy
42.	neutral	disgust	anger	surprise	fear	sad	happy
43.	happy	sad	fear	anger	surprise	disgust	neutral
44.	happy	sad	fear	anger	surprise	disgust	neutral
45.	happy	sad	fear	anger	surprise	disgust	neutral
46.	happy	sad	fear	anger	surprise	disgust	neutral
47.	happy	sad	fear	anger	surprise	disgust	neutral
48.	happy	sad	fear	anger	surprise	disgust	neutral
49.	happy	sad	fear	anger	surprise	disgust	neutral

98.	neutral	disgust	anger	surprise	fear	sad	happy
99.	happy	sad	fear	anger	surprise	disgust	neutral
100.	happy	sad	fear	anger	surprise	disgust	neutral
101.	happy	sad	fear	anger	surprise	disgust	neutral
102.	happy	sad	fear	anger	surprise	disgust	neutral
103.	happy	sad	fear	anger	surprise	disgust	neutral
104.	happy	sad	fear	anger	surprise	disgust	neutral
105.	happy	sad	fear	anger	surprise	disgust	neutral
106.	neutral	disgust	anger	surprise	fear	sad	happy
107.	neutral	disgust	anger	surprise	fear	sad	happy
108.	neutral	disgust	anger	surprise	fear	sad	happy
109.	neutral	disgust	anger	surprise	fear	sad	happy
110.	neutral	disgust	anger	surprise	fear	sad	happy

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APPENDIX II

```

10 ! EMOTION14 11.5.88
20 ON ERROR GOSUB Cancel
30 INITIALIZE ":MEMORY,0",8
40 RE-STORE KEY "AIDS:MEMORY,0"
50 OUTPUT 2;" 5 KEY X";
60 SUSPEND INTERACTIVE
70 ALLOCATE Title$(80),Variable_name$(49)[10],Sn$(19)[10],Sc(19),A$(80)
80 ALLOCATE Vn$(49)[10],Time_slide(1:10)
90 INTEGER Row_in,Column_in,Array(0:6),Picture,Selection,Emotion,Temp,Rep,I,J,
100 REAL No_slides,Variables,Reaction,No,Nv,Ns
110 Starter(Title$,No_slides,Group,Subject)
120 Variables=31
130 Ns=1
140 ALLOCATE Slide(Variables-1,No_slides-1)
150 MAT Slide= (99)
151 FOR I=0 TO No_slides-1
152 Slide(Variables-2,I)=Group
153 Slide(Variables-1,I)=Subject
154 NEXT I
160 Assignment:ON ERROR GOTO Check
170 ASSIGN @File TO "CORR:,702,1"
180 ENTER @File,1;A$,No,Nv,Vn$(*),Ns,Sn$(*),Sc(*)
190 ALLOCATE Slide2(Nv-1,No-1)
200 ENTER @File,2
210 ENTER @File;Slide2(*)
220 ASSIGN @File TO *
230 OFF ERROR
240 FOR I=0 TO Nv-1
250 Variable_name$(I)=Vn$(I)
260 FOR J=0 TO No-1
270 Slide(I,J)=Slide2(I,J)
280 NEXT J
290 NEXT I
300 OUTPUT 2;" K";
310 DIM Emo$(7)[9],Var$(4)[4]
320 ! Clear_keyboard
330 Emo$(1)="HAPPINESS"
340 Emo$(2)="SADNESS"
350 Emo$(3)="FEAR"
360 Emo$(4)="ANGER"
370 Emo$(5)="SURPRISE"
380 Emo$(6)="DISGUST"
390 Emo$(7)="CONTINUE"
400 Var$(1)=":ORD"
410 Var$(2)=":TIM"
420 Var$(3)=":RAT"
430 Var$(4)=":PRE"
440 X=5
450 FOR I=1 TO 6
460 FOR J=1 TO 4
470 Variable_name$(X)=Emo$(I)[1,6]&Var$(J)
480 X=X+1
490 NEXT J
500 NEXT I
501 Variable_name$(X)="GROUP"
502 Variable_name$(X+1)="SUBJECT"
510 Picture=0
520 GOSUB Demo
530 Screen_up(Emo$(*))
540 ! START OF PROG
550 GOSUB Keys
560 DISP "Press CONTINUE to commence"
570 PAUSE
580 Forward_proj
581 Timp1=TIMEDATE
590 REPEAT

```


APPENDIX II

```

600 Clear_keyboard      ! LCD CLS
610 Picture=Picture+1
620 RANDOMIZE
630 !
640 Selection=0
650 !
660 REPEAT
670   Rep=0
680   CALL Emotion_select(Emotion,Selection,Array(*))
690   DISP "EMOTION=";Emo$(Emotion),"CORRECT= ";
700   SELECT Slide(1,Picture-1)
710   CASE 7
720     DISP "NEUTRAL",
730   CASE ELSE
740     DISP Emo$(Slide(1,Picture-1)),
750   END SELECT
760   DISP "SLIDE NUMBER=";Picture,"TO GO..";TIME$(Estimate)
770   PRINT TABXY(5,24);Title$,No_slides;" SLIDES"
780   CALL Rate_scrn(Emotion,Reaction)
790   Data_ac(Emotion,Reaction,Slide(*),R_t,Picture,Rep,Row_in,Column_in,Selec
800   WAIT .5
810 UNTIL Selection=6
820 !
830 !   END OF FIRST RATINGS
840 !
850 Clear_keyboard      ! LCD CLS
860 Posn(4,2)
870 PRINT "Do you wish to repeat any ratings?"
880 FOR J=5 TO 30 STEP 25
890   FOR I=5 TO 10
900     Posn(J,I)
910     PRINT RPT$(CHR$(255),8)
920   NEXT I
930 NEXT J
940 Posn(8,13)
950 PRINT "YES          /          NO"
960 Receive(Row_in,Column_in,R_t)
970 IF Column_in=0 THEN 960
980 GOSUB Checker
990 IF (Column_in<9 AND Column_in>4) THEN 960
1000 ! If yes.....
1010 IF Column_in>=7 THEN 1060
1020 PRINTER IS CRT
1030 DISP "
1040 CALL Again(Emo$(*),Slide(*),Reaction,Picture,Rep,Row_in,Column_in,Temp,Se1
1050 IF Emotion>0 AND Emotion<7 THEN 850
1060 OUTPUT 2;" K";
1063 Timp2=TIMEDATE
1064 Rot=Rot+1
1065 IF Rot>10 THEN
1066 IF Tim_flag=0 THEN Tim_flag=1
1067 Rot=1
1068 END IF
1069 Time_slide(Rot)=Timp2-Timp1
1070 Timp1=Timp2
1072 IF Tim_flag=0 THEN
1073 Estimate=(SUM(Time_slide)/Rot)*(No_slides-Picture)
1074 ELSE
1075 Estimate=(SUM(Time_slide)/10)*(No_slides-Picture)
1076 END IF
1077 Forward_proj
1080 Clear_keyboard
1090 UNTIL Picture=No_slides
1100 PRINTER IS CRT
1110 CALL Store_file(Title$,No_slides,Variables,Variable_name$(*),Ns,Sn$(*),Sc(*))
1120 Log_stop: !

```

APPENDIX II

```

1130 Clear_keyboard
1140 RESUME INTERACTIVE
1150 LOAD KEY "AIDS:MEMORY,0"
1160 PRINTER IS CRT
1170 GCLEAR
1180 OUTPUT 2;" K";
1190 MASS STORAGE IS ":",702,0"
1200 LOAD "AUTOST"
1210 Keys: !
1220 FOR I=0 TO 9
1230     ON KEY I LABEL " " GOSUB Beeper
1240 NEXT I
1250 ON KEY 7 LABEL "ABORT" GOTO Log_stop
1260 RETURN
1270 Beeper:      !
1280 BEEP 1000,.2
1290 RETURN
1300 Check:      !
1310 OUTPUT 2;" K";
1320 GOSUB Beeper
1330 PRINT "YOU MUST HAVE A DISK WITH FILE 'CORR' ON SMALL FLOPPY"
1340 DISP "PRESS 'CONTINUE' WHEN THIS IS DONE"
1350 PAUSE
1360 GOTO Assignment
1370 Cancel:      !
1380 DISP "UNABLE TO SCRATCH CURRENT SOFT-KEYS"
1390 OFF ERROR
1400 RETURN
1410 Demo: !
1420 ON KEY 7 LABEL "Start" GOTO Ret
1430 J=1
1440 FOR I=1 TO 6
1450     DISP "Demonstration",J
1460     J=J+1
1470     Rate_scrn(I,1)
1480     Receive(Row_in,Column_in,R_t)
1490     IF Row_in=0 THEN 1480
1500     GOSUB Checker
1510     Clear_keyboard
1520 NEXT I
1530 GOTO 1440
1540 Ret:Clear_keyboard
1550 RETURN
1560 Checker:!
1570 Transmit(3)
1580 Transmit(2)
1590 SEND 7;TALK 11 MLA
1600 ENTER 7 USING "#,B";Checker
1610 IF Checker<>0 THEN 1560
1620 SEND 7;UNT
1630 End_check:RETURN
1640 Ending:END
1650 !
1660 !#####
1670 SUB Transmit(Zup)
1680 !PRIMARY ADDR
1690 SEND 7;LISTEN 11 MTA
1700 OUTPUT 7 USING "#,B";Zup
1710 SEND 7;UNL
1720 SUBEND
1730 !
1740 !#####
1750 !
1760 SUB Receive(INTEGER Row_in,Column_in,REAL R_t)
1770     Transmit(3)
1780     Transmit(2)

```

APPENDIX II

```

1790 INTEGER Value,Checker
1800 SEND 7;TALK 11 MLA
1810 ENTER 7 USING "#,B";Value
1820 R_t=TIMEDATE
1830 Column_in=BINAND(Value,240)/16
1840 Row_in=BINAND(Value,15)
1850 SEND 7;UNT
1860 SUBEND
1870 !
1880 !#####
1890 !
1900 SUB Posn(INTEGER Col,Row)
1910 PRINTER IS 711
1920 SEND 7;LISTEN 11 MTA
1930 OUTPUT 7 USING "#,B";2,Col,Row
1940 SEND 7;UNL
1950 Transmit(4) !LCD PRINT
1960 SUBEND
1970 !
1980 !#####
1990 !
2000 SUB Emotion_select(INTEGER Emotion,Selection,Array(*))
2010 INTEGER X
2020 Selection=Selection+1
2030 Choose:Array(Selection)=INT(RND*6+1)
2040 X=Selection
2050 REPEAT
2060 X=X-1
2070 IF Array(Selection)=Array(X) THEN GOTO Choose
2080 UNTIL X<2
2090 Emotion=INT(Array(Selection))
2100 SUBEND
2110 !
2120 !#####
2130 !
2140 ! Sub prog for second ratings
2150 SUB Again(Emo$(*),Slide(*),Reaction,INTEGER Picture,Rep,Row_in,Column_in,
2160 INTEGER Fmtc,Fmtr,I
2170 !
2180 DISP "REPEAT ";
2190 Rep=1
2200 Clear_keyboard ! LCD CLS
2210 Posn(4,2)
2220 !Transmit(4)
2230 PRINT "Which emotion do you wish to repeat?"
2240 Fmtc=9 ! start on col 9
2250 Fmtr=2 ! row 2
2260 FOR I=3 TO 18 STEP 3
2270 Posn(Fmtc,(Fmtr+I))
2280 PRINT Emo$(I/3);Slide(4*I/3+3,Picture-1)
2290 IF I=12 THEN
2300 Fmtc=24 ! start 2nd col
2310 Fmtr=-10 ! As I=12 start row 2
2320 END IF
2330 NEXT I
2340 Posn(24,14)
2350 PRINT "CONTINUE"
2360 Receive(Row_in,Column_in,R_t)
2370 IF Column_in<1 THEN 2360
2380 GOSUB Checker
2390 IF Row_in=2 AND Column_in<7 THEN Temp=1
2400 IF Row_in=3 AND Column_in<7 THEN Temp=2
2410 IF Row_in=4 AND Column_in<7 THEN Temp=3
2420 IF Row_in=5 AND Column_in<7 THEN Temp=4
2430 IF Row_in=2 AND Column_in>7 THEN Temp=5
2440 IF Row_in=3 AND Column_in>7 THEN Temp=6

```

APPENDIX II

```

2450 IF Row_in=5 AND Column_in>7 THEN Temp=7
2460 IF Column_in=7 OR (Row_in=4 AND Column_in>7) THEN 2360
2470 Clear_keyboard !LCD CLS
2480 IF Temp<>7 THEN !If Continue.....
2490 CALL Rate_scrn(Temp,Reaction)
2500 ELSE
2510 GOTO 2640
2520 END IF
2530 Selection=Slide(Temp*4+1,Picture-1)
2540 DISP Emo$(Temp),"SELECTION=";Selection
2550 Data_ac(Temp,Reaction,Slide(*),R_t,Picture,Rep,Row_in,Column_in,Selection)
2560 GOTO 2640
2570 Checker:Transmit(3)
2580 Transmit(2)
2590 SEND 7;TALK 11 MLA
2600 ENTER 7 USING "#,B";Checker
2610 IF Checker<>0 THEN 2570
2620 SEND 7;UNT
2630 End_check:RETURN
2640 SUBEND
2650 !
2660 ! #####
2670 !
2680 SUB Rate_scrn(INTEGER Emotion,REAL Reaction)
2690 INTEGER I
2700 Posn(17,3)
2710 SELECT Emotion
2720 CASE 1
2730 PRINT "HAPPINESS"
2740 Posn(1,12)
2750 PRINT "None Very Happy"
2760 PRINTER IS CRT
2770 PRINT TABXY(21,1);
2780 CASE 2
2790 PRINT "SADNESS "
2800 Posn(1,12)
2810 PRINT "None Very Sad"
2820 PRINTER IS CRT
2830 PRINT TABXY(21,4);
2840 CASE 3
2850 PRINT "FEAR "
2860 Posn(1,12)
2870 PRINT "None Very frightened"
2880 PRINTER IS CRT
2890 PRINT TABXY(21,7);
2900 CASE 4
2910 PRINT "ANGER "
2920 Posn(1,12)
2930 PRINT "None Very Angry"
2940 PRINTER IS CRT
2950 PRINT TABXY(21,10);
2960 CASE 5
2970 PRINT "SURPRISE"
2980 Posn(1,12)
2990 PRINT "None Very Surprised"
3000 PRINTER IS CRT
3010 PRINT TABXY(21,13);
3020 CASE 6
3030 PRINT "DISGUST "
3040 Posn(1,12)
3050 PRINT "None Very disgusted"
3060 PRINTER IS CRT
3070 PRINT TABXY(21,16);
3080 END SELECT
3090 !
3100 Posn(5,7)

```

APPENDIX II

```

3110 PRINT RPT$(CHR$(126),32)
3120 Posn(5,8)
3130 PRINT RPT$(CHR$(255),32)
3140 Posn(5,9)
3150 PRINT RPT$(CHR$(255),32)
3160 FOR I=5 TO 9
3170     Posn(I,6)
3180     PRINT (I-5)*2;
3190 NEXT I
3200 !
3210     Posn(1,1)
3220     PRINT
3230     Reaction=TIMEDATE
3240 SUBEND
3250 !
3260 !#####
3270 !
3280 SUB Data_ac(INTEGER Emotion,REAL Reaction,Slide(*),R_t,INTEGER Picture,Rep,
3290 ON KEY 7 LABEL "ABORT" GOTO 3610
3300 PRINTER IS CRT
3310 IF Emotion<1 OR Emotion>6 THEN 3610
3320 Receive(Row_in,Column_in,R_t)
3330 IF Column_in=0 THEN 3320
3340 GOSUB Checker
3350 Response=R_t-Reaction
3360 IF Column_in<3 OR Column_in>11 THEN 3320
3370 Clear_keyboard!CLEAR SCREEN
3380 IF Rep=0 THEN
3390     | 1st rating
3400     Slide(Emotion*4+3,Picture-1)=Column_in-3 |FIRST RATING
3410 ELSE
3420     | subsequent rating
3430     Slide(Emotion*4+4,Picture-1)=Slide(Emotion*4+3,Picture-1)!CHANGE
3440     Slide(Emotion*4+3,Picture-1)=Column_in-3! NEW RATING
3450 END IF
3460 Slide(Emotion*4+2,Picture-1)=DROUND(Response,3)! RESPONSE TIME
3470 Slide(Emotion*4+1,Picture-1)=Selection!ORDER
3480 PRINTER IS CRT
3490 PRINT Selection;
3500 PRINT "Response Time ";Slide(Emotion*4+2,Picture-1),
3510 PRINT "Rating ";Slide(Emotion*4+3,Picture-1),
3520 IF Slide(Emotion*4+4,Picture-1)<>99 THEN PRINT "Previous Rating ";Slide(
3530 GOTO 3610
3540 Checker:Transmit(3)
3550 Transmit(2)
3560 SEND 7;TALK 11 MLA
3570 ENTER 7 USING "#,B";Checker
3580 IF Checker<>0 THEN 3540
3590 SEND 7;UNT
3600 End_check:RETURN
3610 SUBEND
3620 !#####
3630 SUB Forward_proj
3640 |
3650 |
3660 | This subprogram closes relays on the Microlink
3670 | HDR4 module which causes the slide projector to
3680 | advance one place.
3690 |
3700 |
3710 |
3720 SEND 7;LISTEN 7 SEC 16 MTA | Sets Hdr4 to listen 254
3730 OUTPUT 7 USING "#,B";2 | control command
3740 WAIT .6
3750 OUTPUT 7 USING "#,B";0 | control command
3760 SEND 7;UNL | sets Hdr4 to unlisten

```

APPENDIX II

```

3770 |
3780 SUBEND | ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** ****
3790 |
3800 |
3810 |*****
3820 SUB Store_file(T$,No,Nv,Vn$(*),Ns,Sn$(*),Sc(*),D(*))
3830   INTEGER I
3840   ALLOCATE File$(17)
3850 Entry:ON ERROR GOTO Mfile
3860   INPUT "NAME OF FILE? ",File$
3870   File$=File$&"":,702,1"
3880 Test1:ASSIGN @Test TO File$
3890   ASSIGN @Test TO *
3900   GOTO Scrubber
3910 Mfile:CREATE BDAT File$,2+No*Nv*8 DIV 1280,1280
3920   ASSIGN @File TO File$
3930   OUTPUT @File,1;T$,No,Nv,Vn$(*),Ns,Sn$(*),Sc(*)
3940   OUTPUT @File,2
3950   OUTPUT @File;D(*)
3960   ASSIGN @File TO *
3970   OUTPUT 2;" K";
3980   GOTO 4200
3990 Scrubber: |
4000   OUTPUT 2;" K";
4010   OFF ERROR
4020   GOSUB Bleeper
4030   PRINT "A file has been established in this name"
4040   PRINT "Do you wish to write over it?"
4050   FOR I=1 TO 9
4060     ON KEY I GOSUB Bleeper
4070   NEXT I
4080   ON KEY 0 LABEL "YES" GOTO Yes
4090   ON KEY 4 LABEL "NO" GOTO No_no
4100   GOTO 4100
4110 Yes: |
4120   PURGE File$
4130   GOTO Mfile
4140 No_no: |
4150   GOTO Entry
4160 Bleeper: |
4170   BEEP 200,.5
4180   BEEP 350,.5
4190   RETURN
4200   OFF ERROR
4210 SUBEND
4220 | CLEAR KEYBOARD
4230 |*****
4240 SUB Clear_keyboard
4250   Transmit(7)
4260 SUBEND
4270 |*****
4280 SUB Starter(T$,No,Group,Subject)
4290   PRINTER IS CRT
4300   OUTPUT 2;" K";
4310   ALLOCATE Temp$(3)[20]
4320   PRINT TABXY(12,12);"Enter Subject Identifier, Date and Number of Slides
4330   LINPUT "Subject Name?----",Temp$(1)
4331   INPUT "Subject Number?-----",Subject
4332   INPUT "Group Number CONT=0....ASS=1...SEX=2...ARSON=3...?=4",Group
4340   PRINT
4350   LINPUT "Date?-----",Temp$(2)
4360   T$=TRIM$(Temp$(1))&" "&TRIM$(Temp$(2))
4370   No=42
4380   PRINT "Project Title=";T$
4390   PRINT "Number of Slides to be used=";No
4400   OUTPUT 2;" K";

```

APPENDIX II

```
4410 SUBEND
4420 SUB Screen_up(Emo$(*))
4430   GINIT
4440   GRAPHICS ON
4450   FOR I=1 TO 6
4460     MOVE 5,130-(I*12+22)
4470     LABEL Emo$(I)
4480   NEXT I
4490 SUBEND
```

APPENDIX III

ANALYSES OF VARIANCE: RAW RATINGS

Table iii.1.
Mean Absolute Rating Score: Happiness Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	6.19	0.93	A
Violent Off.	7	6.67	0.79	A
Sex Off. .	9	6.56	1.76	A
Arsonists	10	6.90	0.92	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	65.31			
Group	3	4.40	1.47	1.25	N.S.
Error	52	60.90	1.17		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	0.34	0.51	A
Violent Off.	7	0.05	0.13	A
Sex Off.	9	1.28	1.93	B
Arsonists	10	0.38	0.62	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	48.38			
Group	3	7.71	2.57	3.28	<.05
Error	52	40.68	0.78		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	0.18	0.25	A
Violent Off.	7	0.26	0.69	A
Sex Off.	9	1.09	2.18	A
Arsonists	10	0.25	0.49	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	50.76			
Group	3	5.95	1.98	2.30	N.S.
Error	52	44.81	0.86		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	0.18	0.31	A
Violent Off.	7	0.17	0.29	A
Sex Off.	9	1.22	2.07	B
Arsonists	10	0.32	0.84	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	51.72			
Group	3	7.90	2.63	3.12	<.05
Error	52	43.82	0.84		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	1.06	1.13	A
Violent Off.	7	1.14	1.59	A
Sex Off.	9	1.70	2.00	A
Arsonists	10	1.28	1.26	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	101.71			
Group	3	2.94	0.98	0.52	N.S.
Error	52	98.76	1.90		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	0.22	0.33	A
Violent Off.	7	0.31	0.68	A
Sex Off.	9	0.87	1.64	A
Arsonists	10	0.07	0.16	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	31.19			
Group	3	3.65	1.22	2.30	N.S.
Error	52	27.54	0.53		

Table iii.2.
Mean Absolute Rating Score: Sadness Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.24	0.39	A
Violent Off.	7	0.24	0.63	A
Sex Off.	9	1.28	2.01	A
Arsonists	10	0.40	1.26	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	61.09			
Group	3	7.77	2.59	2.52	N.S.
Error	52	53.32	1.03		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	5.17	1.49	A
Violent Off.	7	5.07	2.36	A
Sex Off.	9	4.85	2.19	A
Arsonists	10	5.73	1.30	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	155.66			
Group	3	4.08	1.36	0.47	N.S.
Error	52	151.58	2.92		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	2.91	1.96	A
Violent Off.	7	2.69	2.22	A
Sex Off.	9	2.74	1.73	A
Arsonists	10	2.55	1.83	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	195.81			
Group	3	1.07	0.36	0.10	N.S.
Error	52	194.74	3.74		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	1.78	1.38	A
Violent Off.	7	0.86	1.99	A
Sex Off.	9	2.72	1.95	A
Arsonists	10	2.77	2.05	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	168.22			
Group	3	21.12	7.04	2.49	N.S.
Error	52	147.10	2.83		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	1.32	1.13	A
Violent Off.	7	2.81	1.58	B
Sex Off.	9	1.81	1.78	AB
Arsonists	10	0.87	1.70	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	120.97			
Group	3	17.91	5.97	3.01	<.05
Error	52	103.06	1.98		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	1.97	1.63	A
Violent Off.	7	1.76	1.88	A
Sex Off.	9	2.52	2.06	A
Arsonists	10	1.87	2.09	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	174.05			
Group	3	3.02	1.01	0.31	N.S.
Error	52	171.03	3.29		

Table iii.3.
Mean Absolute Rating Score: Fear Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.34	0.51	A
Violent Off.	7	0.21	0.32	A
Sex Off.	9	0.91	1.69	A
Arsonists	10	0.20	0.20	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	37.19			
Group	3	3.05	1.02	1.55	N.S.
Error	52	34.12	0.66		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	2.16	1.72	A
Violent Off.	7	2.69	1.20	A
Sex Off.	9	2.11	1.71	A
Arsonists	10	3.80	2.12	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	180.91			
Group	3	22.07	7.36	2.41	N.S.
Error	52	158.84	3.05		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	5.13	1.22	A
Violent Off.	7	5.26	2.33	A
Sex Off.	9	5.56	1.64	A
Arsonists	10	4.90	1.79	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	127.97			
Group	3	2.16	0.72	0.30	N.S.
Error	52	125.80	2.42		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	2.02	1.41	AB
Violent Off.	7	0.79	0.90	A
Sex Off.	9	3.26	2.37	B
Arsonists	10	3.30	1.23	B

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	157.68			
Group	3	36.74	12.25	5.27	<.01
Error	52	53.32	1.03		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	4.26	1.54	A
Violent Off.	7	4.67	2.53	A
Sex Off.	9	3.46	1.79	A
Arsonists	10	2.75	2.65	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	218.61			
Group	3	22.84	7.61	2.02	N.S.
Error	52	195.76	3.76		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	2.31	1.81	A
Violent Off.	7	1.60	1.82	A
Sex Off.	9	2.26	2.52	A
Arsonists	10	3.13	2.02	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	212.49			
Group	3	10.40	3.47	0.89	N.S.
Error	52	202.10	3.89		

Table iii.4.
Mean Absolute Rating Score: Anger Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.48	0.60	A
Violent Off.	7	0.86	1.51	A
Sex Off.	9	0.94	2.28	A
Arsonists	10	0.03	0.07	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	47.39			
Group	3	4.84	1.61	1.97	N.S.
Error	52	42.55	0.82		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	1.91	1.46	B
Violent Off.	7	0.48	0.13	A
Sex Off.	9	2.80	1.93	B
Arsonists	10	2.58	1.28	B

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	142.30			
Group	3	35.83	11.94	5.83	<.01
Error	52	106.47	2.05		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	1.58	1.56	A
Violent Off.	7	0.76	1.37	A
Sex Off.	9	1.91	1.39	A
Arsonists	10	1.55	1.61	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	126.38			
Group	3	5.50	1.83	0.79	N.S.
Error	52	120.88	2.32		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	4.79	1.36	A
Violent Off.	7	3.81	1.93	A
Sex Off.	9	4.87	0.95	A
Arsonists	10	5.08	1.63	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	114.99			
Group	3	7.48	2.49	1.21	N.S.
Error	52	107.51	2.07		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	1.26	2.86	AB
Violent Off.	7	2.86	1.46	B
Sex Off.	9	2.22	1.99	AB
Arsonists	10	0.98	1.67	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	119.20			
Group	3	21.83	7.28	3.89	<.05
Error	52	97.37	1.87		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	3.50	1.97	A
Violent Off.	7	4.12	2.80	A
Sex Off.	9	3.52	1.97	A
Arsonists	10	2.93	1.99	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	23.83			
Group	3	5.35	1.78	0.41	N.S.
Error	52	226.48	4.36		

Table iii.5.
Mean Absolute Rating Score: Surprise Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	1.58	1.04	A
Violent Off.	7	1.00	1.93	A
Sex Off.	9	2.07	1.97	A
Arsonists	10	1.35	1.26	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	103.93			
Group	3	5.02	1.67	0.88	N.S.
Error	52	98.91	1.90		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	1.08	1.28	A
Violent Off.	7	.05	0.13	A
Sex Off.	9	1.43	1.93	A
Arsonists	10	1.33	1.51	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	106.84			
Group	3	9.14	3.05	1.62	N.S.
Error	52	97.70	1.88		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	2.52	1.67	A
Violent Off.	7	1.76	1.47	A
Sex Off.	9	2.67	1.87	A
Arsonists	10	2.18	1.43	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	144.52			
Group	3	4.40	1.47	0.54	N.S.
Error	52	140.11	2.69		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	0.70	0.80	A
Violent Off.	7	0.38	1.01	A
Sex Off.	9	1.11	1.45	A
Arsonists	10	0.55	0.92	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	51.42			
Group	3	2.46	0.82	0.87	N.S.
Error	52	48.95	0.94		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	6.45	1.12	A
Violent Off.	7	6.10	1.74	A
Sex Off.	9	5.93	1.47	A
Arsonists	10	5.32	1.76	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	109.43			
Group	3	10.06	3.35	1.76	N.S.
Error	52	99.37	1.91		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	1.08	1.04	A
Violent Off.	7	1.00	0.69	A
Sex Off.	9	1.22	2.05	A
Arsonists	10	0.83	1.14	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	80.27			
Group	3	0.79	0.26	0.17	N.S.
Error	52	79.49	1.53		

Table iii.6.
Mean Absolute Rating Score: Disgust Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.71	0.67	A
Violent Off.	7	0.48	1.12	A
Sex Off.	9	1.44	2.17	A
Arsonists	10	0.27	0.45	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	67.27			
Group	3	7.20	2.40	2.08	N.S.
Error	52	60.07	1.16		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	1.26	1.30	A
Violent Off.	7	1.07	1.46	A
Sex Off.	9	2.50	2.65	A
Arsonists	10	1.88	1.65	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	155.76			
Group	3	13.34	4.45	1.62	N.S.
Error	52	142.42	2.74		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	0.68	0.94	A
Violent Off.	7	0.76	1.20	A
Sex Off.	9	1.31	1.95	A
Arsonists	10	1.23	1.74	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	96.07			
Group	3	4.27	1.42	0.81	N.S.
Error	52	91.80	1.77		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	2.41	1.58	A
Violent Off.	7	3.40	2.38	A
Sex Off.	9	3.76	1.51	A
Arsonists	10	3.65	2.28	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	193.12			
Group	3	21.11	7.04	2.13	N.S.
Error	52	172.01	3.31		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	0.78	0.78	A
Violent Off.	7	1.21	1.43	A
Sex Off.	9	1.30	1.80	A
Arsonists	10	1.02	1.48	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	78.33			
Group	3	2.44	0.81	0.56	N.S.
Error	52	75.89	1.46		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	5.34	1.60	A
Violent Off.	7	5.36	1.98	A
Sex Off.	9	4.41	1.95	A
Arsonists	10	5.87	2.45	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	192.37			
Group	3	10.44	3.48	0.99	N.S.
Error	52	181.93	3.50		

Table iii.7.
Mean Absolute Rating Score: Neutral Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	1.53	1.19	A
Violent Off.	7	1.76	1.71	A
Sex Off.	9	2.26	1.93	A
Arsonists	10	1.32	1.42	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	115.17			
Group	3	8.91	2.97	1.45	N.S.
Error	52	106.26	2.04		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	2.10	1.36	A
Violent Off.	7	0.79	0.92	A
Sex Off.	9	1.91	1.86	A
Arsonists	10	2.42	1.20	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	111.50			
Group	3	12.35	4.12	2.16	N.S.
Error	52	99.15	1.91		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	1.03	1.21	A
Violent Off.	7	0.29	0.50	A
Sex Off.	9	0.96	1.54	A
Arsonists	10	1.00	1.53	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	87.28			
Group	3	3.28	1.09	0.68	N.S.
Error	52	83.99	1.62		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	0.97	1.00	A
Violent Off.	7	0.69	1.49	A
Sex Off.	9	1.26	2.40	A
Arsonists	10	1.37	1.51	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	84.77			
Group	3	2.51	0.84	0.53	N.S.
Error	52	82.26	1.58		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	0.73	0.76	A
Violent Off.	7	2.64	2.20	B
Sex Off.	9	1.78	1.99	AB
Arsonists	10	0.90	1.01	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	111.81			
Group	3	24.96	8.32	4.98	<.01
Error	52	86.85	1.67		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	0.94	1.02	A
Violent Off.	7	0.81	1.54	A
Sex Off.	9	1.48	1.99	A
Arsonists	10	1.07	1.61	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	55	101.58			
Group	3	2.44	0.81	0.43	N.S.
Error	52	99.14	1.91		

APPENDIX IV
ANALYSES OF VARIANCE: TRANSFORMED RATINGS

Table iv.1.
Mean Transformed Score: Happiness Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	2.03	0.23	A
Violent Off.	6	1.89	0.68	A
Sex Off.	9	1.51	1.00	A
Arsonists	10	2.00	0.40	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	15.22			
Group	3	1.96	0.65	2.51	N.S.
Error	51	13.26	0.26		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	-0.79	0.33	A
Violent Off.	6	-0.53	0.08	AB
Sex Off.	9	-0.45	0.37	B
Arsonists	10	-0.80	0.31	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	6.20			
Group	3	1.09	0.36	3.62	<.05
Error	51	5.11	0.10		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	-0.80	0.30	A
Violent Off.	6	-0.53	0.12	AB
Sex Off.	9	-0.45	0.39	B
Arsonists	10	-0.65	0.35	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	6.13			
Group	3	1.03	0.34	3.45	<.05
Error	51	5.10	0.10		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	-0.79	0.27	A
Violent Off.	6	-0.53	0.13	A
Sex Off.	9	-0.49	0.43	A
Arsonists	10	-0.77	0.47	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	6.50			
Group	3	0.87	0.29	2.62	N.S.
Error	51	5.64	0.11		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	-0.47	0.29	AB
Violent Off.	6	-0.67	0.34	A
Sex Off.	9	-0.28	0.36	BC
Arsonists	10	-0.13	0.52	C

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	7.84			
Group	3	1.45	0.49	3.86	<.05
Error	51	6.39	0.13		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	-0.84	0.29	A
Violent Off.	6	-0.65	0.27	A
Sex Off.	9	-0.57	0.27	A
Arsonists	10	-0.75	0.34	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	5.03			
Group	3	0.58	0.19	2.28	N.S.
Error	51	4.45	0.09		

Table iv.2.
Mean Transformed Score: Sadness Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	-0.59	0.16	A
Violent Off.	6	-0.45	0.05	AB
Sex Off.	9	-0.34	0.31	B
Arsonists	10	-0.42	0.26	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	2.72			
Group	3	0.56	0.19	4.36	<.01
Error	51	2.16	0.04		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	1.52	0.43	B
Violent Off.	6	1.49	0.26	B
Sex Off.	9	0.95	0.80	A
Arsonists	10	1.13	0.64	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	17.25			
Group	3	2.87	0.96	3.39	<.05
Error	51	14.38	0.28		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	0.37	0.45	A
Violent Off.	6	0.35	0.64	A
Sex Off.	9	0.13	0.53	A
Arsonists	10	0.27	0.55	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	13.42			
Group	3	0.40	0.13	0.52	N.S.
Error	51	13.02	0.26		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	-0.03	0.41	A
Violent Off.	6	-0.26	0.44	A
Sex Off.	9	0.03	0.48	A
Arsonists	10	0.11	0.40	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	9.60			
Group	3	0.54	0.18	1.02	N.S.
Error	51	9.05	0.18		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	-0.37	0.29	A
Violent Off.	6	-0.11	0.34	A
Sex Off.	9	-0.29	0.25	A
Arsonists	10	-0.40	0.40	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	5.35			
Group	3	0.39	0.13	1.33	N.S.
Error	51	4.96	0.10		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	-0.11	0.33	A
Violent Off.	6	-0.18	0.37	A
Sex Off.	9	0.06	0.50	A
Arsonists	10	-0.14	0.37	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	7.39			
Group	3	0.30	0.10	0.72	N.S.
Error	51	7.09	0.14		

Table iv.3.
Mean Transformed Score: Fear Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	-0.55	0.15	A
Violent Off.	6	-0.46	0.06	A
Sex Off.	9	-0.46	0.18	A
Arsonists	10	-0.46	0.13	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	1.14			
Group	3	0.11	0.04	1.76	N.S.
Error	51	1.04	0.02		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	0.06	0.42	AB
Violent Off.	6	0.60	0.41	C
Sex Off.	9	-0.14	0.32	A
Arsonists	10	0.41	0.47	BC

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	11.59			
Group	3	2.84	0.95	5.51	<.01
Error	51	8.75	0.17		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	1.43	0.41	A
Violent Off.	6	1.42	0.53	A
Sex Off.	9	1.16	0.63	A
Arsonists	10	1.10	0.64	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	14.33			
Group	3	1.16	0.39	1.49	N.S.
Error	51	13.17	0.26		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	0.07	0.35	AB
Violent Off.	6	-0.21	0.26	A
Sex Off.	9	0.23	0.50	B
Arsonists	10	0.34	0.47	B

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	9.26			
Group	3	1.34	0.45	2.87	<.05
Error	51	7.93	0.16		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	0.77	0.40	B
Violent Off.	6	0.57	0.36	AB
Sex Off.	9	0.26	0.52	A
Arsonists	10	0.22	0.68	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	14.96			
Group	3	3.29	1.10	4.79	<.01
Error	51	11.67	0.23		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	0.38	0.41	A
Violent Off.	6	-0.28	0.30	A
Sex Off.	9	0.06	0.49	A
Arsonists	10	0.34	0.65	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.56			
Group	3	1.50	0.50	2.31	N.S.
Error	51	11.06	0.22		

Table iv.4.
Mean Transformed Score: Anger Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	-0.48	0.16	A
Violent Off.	6	-0.33	0.22	A
Sex Off.	9	-0.45	0.16	A
Arsonists	10	-0.51	0.12	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	1.48			
Group	3	0.14	0.05	1.79	N.S.
Error	51	1.34	0.03		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	-0.05	0.32	B
Violent Off.	6	-0.53	0.08	A
Sex Off.	9	0.22	0.53	B
Arsonists	10	0.01	0.27	B

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	8.03			
Group	3	2.06	0.69	5.86	<.01
Error	51	5.97	0.12		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	-0.18	0.36	A
Violent Off.	6	-0.39	0.26	A
Sex Off.	9	-0.15	0.25	A
Arsonists	10	-0.15	0.30	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	5.68			
Group	3	0.27	0.09	0.83	N.S.
Error	51	5.41	0.11		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	1.45	0.44	B
Violent Off.	6	1.08	0.69	AB
Sex Off.	9	0.83	0.65	A
Arsonists	10	0.95	0.48	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	17.22			
Group	3	3.86	1.29	4.91	<.01
Error	51	13.36	0.26		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	-0.38	0.25	A
Violent Off.	6	-0.01	0.25	B
Sex Off.	9	-0.12	0.39	AB
Arsonists	10	-0.34	0.39	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	5.76			
Group	3	1.02	0.34	3.66	<.05
Error	51	4.74	0.09		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	0.53	0.48	A
Violent Off.	6	0.69	0.53	A
Sex Off.	9	0.44	0.62	A
Arsonists	10	0.28	0.46	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	13.91			
Group	3	0.73	0.24	0.93	N.S.
Error	51	13.19	0.26		

Table iv.5.
Mean Transformed Score: Surprise Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.01	0.31	A
Violent Off.	6	-0.22	0.35	A
Sex Off.	9	-0.06	0.36	A
Arsonists	10	-0.07	0.27	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	5.34			
Group	3	0.27	0.09	0.91	N.S.
Error	51	5.07	0.10		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	-0.43	0.29	A
Violent Off.	6	-0.53	0.07	A
Sex Off.	9	-0.37	0.34	A
Arsonists	10	-0.42	0.33	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	4.50			
Group	3	0.10	0.03	0.39	N.S.
Error	51	4.40	0.09		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	0.20	0.43	A
Violent Off.	6	0.08	0.42	A
Sex Off.	9	0.19	0.76	A
Arsonists	10	0.07	0.48	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	13.05			
Group	3	0.19	0.06	0.26	N.S.
Error	51	12.86	0.25		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	-0.55	0.16	A
Violent Off.	6	-0.43	0.18	A
Sex Off.	9	-0.52	0.25	A
Arsonists	10	-0.66	0.18	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	1.90			
Group	3	0.21	0.07	2.12	N.S.
Error	51	1.69	0.03		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	1.63	0.28	B
Violent Off.	6	0.98	0.51	A
Sex Off.	9	1.17	0.66	A
Arsonists	10	1.29	0.63	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	13.89			
Group	3	3.19	1.06	5.07	<.01
Error	51	10.70	0.21		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	-0.47	0.22	A
Violent Off.	6	-0.34	0.35	A
Sex Off.	9	-0.43	0.37	A
Arsonists	10	-0.49	0.20	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	3.65			
Group	3	0.10	0.03	0.50	N.S.
Error	51	3.55	0.07		

Table iv.6.
Mean Transformed Score: Disgust Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	-0.38	0.14	A
Violent Off.	6	-0.40	0.13	A
Sex Off.	9	-0.28	0.34	A
Arsonists	10	-0.44	0.09	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	1.79			
Group	3	0.12	0.04	1.27	N.S.
Error	51	1.66	0.03		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	-0.35	0.33	A
Violent Off.	6	-0.20	0.40	A
Sex Off.	9	-0.00	0.56	A
Arsonists	10	-0.25	0.40	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	8.80			
Group	3	0.88	0.29	1.88	N.S.
Error	51	7.92	0.16		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	-0.58	0.19	A
Violent Off.	6	-0.40	0.21	AB
Sex Off.	9	-0.37	0.35	AB
Arsonists	10	-0.28	0.42	B

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	4.65			
Group	3	0.85	0.28	3.79	<.05
Error	51	3.80	0.07		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	0.24	0.46	A
Violent Off.	6	0.62	0.72	A
Sex Off.	9	0.40	0.37	A
Arsonists	10	0.40	0.60	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	13.82			
Group	3	0.82	0.27	1.06	N.S.
Error	51	13.01	0.26		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	-0.57	0.19	A
Violent Off.	6	-0.58	0.35	A
Sex Off.	9	-0.45	0.24	AB
Arsonists	10	-0.30	0.36	B

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	3.89			
Group	3	0.63	0.21	3.26	<.05
Error	51	3.27	0.06		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	1.39	0.58	A
Violent Off.	6	1.25	0.68	A
Sex Off.	9	0.78	0.84	A
Arsonists	10	1.17	0.78	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	25.74			
Group	3	2.60	0.87	1.91	N.S.
Error	51	23.14	0.45		

Table iv.7.
Mean Transformed Score: Neutral Slides

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	-0.03	0.31	A
Violent Off.	6	-0.03	0.44	A
Sex Off.	9	0.08	0.42	A
Arsonists	10	-0.10	0.29	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	6.12			
Group	3	0.16	0.05	0.44	N.S.
Error	51	5.96	0.12		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	0.03	0.40	A
Violent Off.	6	-0.30	0.23	A
Sex Off.	9	-0.22	0.48	A
Arsonists	10	-0.08	0.38	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	8.81			
Group	3	0.84	0.28	1.80	N.S.
Error	51	7.97	0.16		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	-0.44	0.23	A
Violent Off.	6	-0.53	0.15	A
Sex Off.	9	-0.50	0.19	A
Arsonists	10	-0.35	0.24	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	2.65			
Group	3	0.17	0.06	1.16	N.S.
Error	51	2.49	0.05		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	-0.39	0.28	A
Violent Off.	6	-0.26	0.42	A
Sex Off.	9	-0.48	0.29	A
Arsonists	10	-0.37	0.24	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	4.64			
Group	3	0.17	0.06	0.67	N.S.
Error	51	4.46	0.09		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	-0.60	0.18	A
Violent Off.	6	-0.18	0.65	B
Sex Off.	9	-0.28	0.38	B
Arsonists	10	-0.35	0.19	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	5.97			
Group	3	1.48	0.49	5.61	<.01
Error	51	4.49	0.09		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	-0.53	0.30	A
Violent Off.	6	-0.49	0.24	A
Sex Off.	9	-0.33	0.41	A
Arsonists	10	-0.42	0.25	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	5.16			
Group	3	0.30	0.10	1.04	N.S.
Error	51	4.86	0.10		

APPENDIX V

ANALYSES OF VARIANCE: COMPONENT SCORES

Table v.1.
Mean Component Score: Happiness Slides

Component 1

Group	N	Mean	S.D.	Separation
Controls	30	3.08	0.52	B
Violent Off.	6	2.46	0.57	AB
Sex Off.	9	2.07	1.30	A
Arsonists	10	2.95	0.88	B

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	378.99			
Group	3	8.16	2.72	4.65	<.01
Error	51	29.84	0.59		

Component 2

Group	N	Mean	S.D.	Separation
Controls	30	-0.79	0.24	A
Violent Off.	6	-0.87	0.36	A
Sex Off.	9	-0.46	0.57	B
Arsonists	10	-0.45	0.44	B

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	8.25			
Group	3	1.57	0.53	4.01	<.05
Error	51	6.68	0.13		

Component 3

Group	N	Mean	S.D.	Separation
Controls	30	0.24	0.29	AB
Violent Off.	6	0.46	0.27	B
Sex Off.	9	0.22	0.36	AB
Arsonists	10	-0.03	0.42	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	6.41			
Group	3	0.98	0.33	3.13	<.05
Error	51	5.42	0.11		

Table v.2.Mean Component Score: Sadness SlidesComponent 1

Group	N	Mean	S.D.	Separation
Controls	30	-1.25	0.45	A
Violent Off.	6	-0.93	0.54	A
Sex Off.	9	-0.83	0.79	A
Arsonists	10	-0.97	0.51	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	16.41			
Group	3	1.62	0.54	1.86	N.S.
Error	51	14.79	0.29		

Component 2

Group	N	Mean	S.D.	Separation
Controls	30	0.48	0.37	AB
Violent Off.	6	0.76	0.38	B
Sex Off.	9	0.09	0.54	A
Arsonists	10	0.22	0.63	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.90			
Group	3	2.20	0.73	3.49	<.05
Error	51	10.71	0.21		

Component 3

Group	N	Mean	S.D.	Separation
Controls	30	1.82	0.73	A
Violent Off.	6	1.73	0.48	A
Sex Off.	9	1.10	0.98	A
Arsonists	10	1.42	0.98	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	37.16			
Group	3	4.12	1.37	2.12	N.S.
Error	51	33.05	0.65		

Table v.3.
Mean Component Score: Fear Slides

Component 1

Group	N	Mean	S.D.	Separation
Controls	30	-1.04	0.48	A
Violent Off.	6	-0.89	0.29	A
Sex Off.	9	-0.90	0.50	A
Arsonists	10	-1.39	0.73	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	14.53			
Group	3	1.51	0.50	1.97	N.S.
Error	51	13.02	0.26		

Component 2

Group	N	Mean	S.D.	Separation
Controls	30	1.79	0.62	B
Violent Off.	6	1.99	0.57	B
Sex Off.	9	1.03	1.15	A
Arsonists	10	0.89	0.82	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	38.75			
Group	3	9.65	3.22	5.64	<.01
Error	51	29.10	0.57		

Component 3

Group	N	Mean	S.D.	Separation
Controls	30	-0.50	0.45	A
Violent Off.	6	0.42	0.69	C
Sex Off.	9	-0.43	0.23	AB
Arsonists	10	-0.02	0.65	BC

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	17.73			
Group	3	5.22	1.74	7.10	<.01
Error	51	12.51	0.26		

Table v.4.Mean Component Score: Anger SlidesComponent 1

Group	N	Mean	S.D.	Separation
Controls	30	-1.50	0.47	A
Violent Off.	6	-0.90	0.38	B
Sex Off.	9	-1.15	0.84	AB
Arsonists	10	-1.08	0.39	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	16.97			
Group	3	2.82	0.94	3.39	<.05
Error	51	14.15	0.28		

Component 2

Group	N	Mean	S.D.	Separation
Controls	30	-1.25	0.64	A
Violent Off.	6	-1.15	0.36	A
Sex Off.	9	-0.65	0.55	A
Arsonists	10	-0.84	0.65	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	21.72			
Group	3	3.06	1.02	2.79	N.S.
Error	51	18.66	0.37		

Component 3

Group	N	Mean	S.D.	Separation
Controls	30	-0.52	0.42	B
Violent Off.	6	-1.21	0.36	A
Sex Off.	9	-0.19	0.72	B
Arsonists	10	-0.22	0.51	B

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	16.70			
Group	3	4.68	1.56	6.62	<.01
Error	51	12.02	0.24		

Table v.5.
Mean Component Score: Surprise Slides

Component 1

Group	N	Mean	S.D.	Separation
Controls	30	0.83	0.40	A
Violent Off.	6	0.61	0.28	A
Sex Off.	9	0.71	0.64	A
Arsonists	10	0.90	0.34	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	9.70			
Group	3	0.43	0.14	0.79	N.S.
Error	51	9.27	0.18		

Component 2

Group	N	Mean	S.D.	Separation
Controls	30	1.83	0.47	A
Violent Off.	6	1.12	0.69	A
Sex Off.	9	1.49	1.00	A
Arsonists	10	1.52	0.64	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	23.64			
Group	3	3.22	1.07	2.68	N.S.
Error	51	20.42	0.40		

Component 3

Group	N	Mean	S.D.	Separation
Controls	30	-1.09	0.35	A
Violent Off.	6	-0.89	0.33	A
Sex Off.	9	-0.76	0.55	A
Arsonists	10	-0.83	0.64	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	11.24			
Group	3	1.07	0.36	1.79	N.S.
Error	51	10.17	0.20		

Table v.6.Mean Component Score: Disgust SlidesComponent 1

Group	N	Mean	S.D.	Separation
Controls	30	-0.82	0.54	A
Violent Off.	6	-1.15	0.64	A
Sex Off.	9	-0.76	0.73	A
Arsonists	10	-1.00	0.47	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	17.67			
Group	3	0.83	0.28	0.83	N.S.
Error	51	16.84	0.33		

Component 2

Group	N	Mean	S.D.	Separation
Controls	30	-1.67	0.39	A
Violent Off.	6	-1.60	0.51	AB
Sex Off.	9	-1.15	0.82	B
Arsonists	10	-1.15	0.75	B

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	19.38			
Group	3	3.26	1.09	3.44	N.S.
Error	51	16.12	0.32		

Component 3

Group	N	Mean	S.D.	Separation
Controls	30	-0.74	0.46	A
Violent Off.	6	-0.64	0.74	A
Sex Off.	9	-0.21	0.81	A
Arsonists	10	-0.77	0.56	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	19.15			
Group	3	2.13	0.71	2.13	N.S.
Error	51	17.02	0.33		

Table v.7.
Mean Component Score: Neutral Slides

Component 1

Group	N	Mean	S.D.	Separation
Controls	30	0.69	0.58	A
Violent Off.	6	0.80	0.14	A
Sex Off.	9	0.88	0.54	A
Arsonists	10	0.59	0.52	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	14.93			
Group	3	0.45	0.15	0.53	N.S.
Error	51	14.48			

Component 2

Group	N	Mean	S.D.	Separation
Controls	30	-0.40	0.30	A
Violent Off.	6	-0.27	0.47	A
Sex Off.	9	-0.31	0.28	A
Arsonists	10	-0.20	0.20	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	4.93			
Group	3	0.32	0.11	1.17	N.S.
Error	51	4.61	0.09		

Component 3

Group	N	Mean	S.D.	Separation
Controls	30	0.79	0.35	B
Violent Off.	6	0.12	0.59	A
Sex Off.	9	0.27	0.56	A
Arsonists	10	0.45	0.44	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	13.11			
Group	3	3.65	1.22	6.56	<.01
Error	51	9.46	0.19		

APPENDIX VI

ANALYSES OF VARIANCE: LOG. RESPONSE TIMES

Table vi.1.
Mean Log. Response Time: All Slides (Seconds)

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.71	0.34	A
Violent Off.	6	0.70	0.50	A
Sex Off.	9	1.14	0.39	A
Arsonists	10	0.78	0.53	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	9.63			
Group	3	1.30	0.43	2.66	N.S.
Error	51	8.33	0.16		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	0.87	0.33	A
Violent Off.	6	1.00	0.46	A
Sex Off.	9	1.24	0.37	A
Arsonists	10	1.24	0.37	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	8.97			
Group	3	1.00	0.33	2.13	N.S.
Error	51	7.97	0.16		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	0.80	0.34	A
Violent Off.	6	0.73	0.55	A
Sex Off.	9	1.12	0.34	A
Arsonists	10	0.95	0.58	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	9.76			
Group	3	0.88	0.29	1.69	N.S.
Error	51	8.88	0.17		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	0.81	0.35	A
Violent Off.	6	0.80	0.45	A
Sex Off.	9	1.15	0.33	A
Arsonists	10	1.00	0.55	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	9.18			
Group	3	0.98	0.33	2.03	N.S.
Error	51	8.20	0.16		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	0.85	0.36	A
Violent Off.	6	1.01	0.50	A
Sex Off.	9	1.17	0.46	A
Arsonists	10	0.93	0.58	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	10.51			
Group	3	0.73	0.24	1.27	N.S.
Error	51	9.78	0.19		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	0.80	0.29	A
Violent Off.	6	0.92	0.49	AB
Sex Off.	9	1.21	0.36	B
Arsonists	10	1.11	0.57	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	9.26			
Group	3	1.57	0.52	3.48	<.05
Error	51	7.69	0.15		

Table vi.2.
Mean Log. Response Time: Happiness Slides (Seconds)

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.74	0.36	A
Violent Off.	6	0.75	0.44	A
Sex Off.	9	1.00	0.38	A
Arsonists	10	0.87	0.40	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	7.96			
Group	3	0.54	0.18	1.23	N.S.
Error	51	7.42	0.15		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	0.49	0.51	A
Violent Off.	6	0.66	0.67	A
Sex Off.	9	0.99	0.32	A
Arsonists	10	0.66	0.71	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	16.78			
Group	3	1.72	0.58	1.94	N.S.
Error	51	15.06	0.30		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	0.44	0.41	A
Violent Off.	6	0.28	0.58	A
Sex Off.	9	0.75	0.40	A
Arsonists	10	0.56	0.75	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	13.87			
Group	3	0.98	0.33	1.30	N.S.
Error	51	12.89	0.25		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	0.39	0.51	A
Violent Off.	6	0.45	0.38	A
Sex Off.	9	0.75	0.43	A
Arsonists	10	0.70	0.71	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	15.48			
Group	3	1.30	0.43	1.56	N.S.
Error	51	14.18	0.28		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	0.74	0.44	A
Violent Off.	6	0.67	0.53	A
Sex Off.	9	1.13	0.46	A
Arsonists	10	0.95	0.59	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	13.23			
Group	3	1.36	0.45	1.95	N.S.
Error	51	11.87	0.23		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	0.39	0.45	AB
Violent Off.	6	0.33	0.71	A
Sex Off.	9	0.97	0.40	C
Arsonists	10	0.84	0.69	BC

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	17.26			
Group	3	3.45	1.15	4.24	<.01
Error	51	13.81	0.27		

Table vi.3.
Mean Log. Response Time: Sadness Slides (Seconds)

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.56	0.44	A
Violent Off.	6	0.64	0.67	A
Sex Off.	9	1.17	0.39	B
Arsonists	10	0.44	0.75	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	17.26			
Group	3	3.12	1.04	3.76	<.05
Error	51	14.13	0.28		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	0.87	0.34	A
Violent Off.	6	1.05	0.46	A
Sex Off.	9	1.15	0.60	A
Arsonists	10	0.98	0.48	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	10.02			
Group	3	0.63	0.21	1.14	N.S.
Error	51	9.39	0.18		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	0.89	0.41	A
Violent Off.	6	0.78	0.78	A
Sex Off.	9	1.14	0.49	A
Arsonists	10	0.97	0.53	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.95			
Group	3	0.61	0.20	0.84	N.S.
Error	51	12.34	0.24		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	0.92	0.37	A
Violent Off.	6	0.67	0.49	A
Sex Off.	9	1.21	0.39	A
Arsonists	10	1.12	0.55	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	10.45			
Group	3	1.34	0.45	2.51	N.S.
Error	51	9.11	0.18		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	0.91	0.48	A
Violent Off.	6	1.20	0.59	A
Sex Off.	9	1.25	0.57	A
Arsonists	10	0.73	0.66	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	16.51			
Group	3	1.76	0.59	2.02	N.S.
Error	51	14.75	0.29		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	0.91	0.32	A
Violent Off.	6	0.76	0.50	A
Sex Off.	9	1.26	0.56	A
Arsonists	10	1.14	0.61	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	11.39			
Group	3	1.36	0.45	2.30	N.S.
Error	51	10.04	0.20		

Table vi.4.
Mean Log. Response Time: Fear Slides (Seconds)

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.84	0.36	A
Violent Off.	6	0.96	0.70	AB
Sex Off.	9	1.35	0.37	B
Arsonists	10	0.93	0.56	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.14			
Group	3	1.87	0.62	3.09	<.05
Error	51	10.28	0.20		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	1.09	0.44	A
Violent Off.	6	1.46	0.46	A
Sex Off.	9	1.42	0.34	A
Arsonists	10	1.22	0.54	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	11.36			
Group	3	1.22	0.41	2.05	N.S.
Error	51	10.14	0.20		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	1.06	0.31	A
Violent Off.	6	1.04	0.53	A
Sex Off.	9	1.53	0.46	B
Arsonists	10	1.31	0.61	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	11.03			
Group	3	1.78	0.59	3.28	<.05
Error	51	9.24	0.18		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	1.10	0.41	A
Violent Off.	6	1.14	0.70	A
Sex Off.	9	1.52	0.39	A
Arsonists	10	1.37	0.48	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.18			
Group	3	1.51	0.50	2.40	N.S.
Error	51	10.68	0.21		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	1.07	0.44	A
Violent Off.	6	1.45	0.48	A
Sex Off.	9	1.48	0.48	A
Arsonists	10	1.24	0.52	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.86			
Group	3	1.63	0.54	2.47	N.S.
Error	51	11.22	0.22		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	1.08	0.40	A
Violent Off.	6	1.30	0.53	A
Sex Off.	9	1.43	0.49	A
Arsonists	10	1.43	0.49	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	11.53			
Group	3	1.45	0.48	2.45	N.S.
Error	51	10.08	0.20		

Table vi.5.
Mean Log. Response Time: Anger Slides (Seconds)

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.50	0.47	A
Violent Off.	6	0.36	0.39	A
Sex Off.	9	1.05	0.51	B
Arsonists	10	0.53	0.68	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	15.99			
Group	3	2.49	0.83	3.13	<.05
Error	51	13.49	0.26		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	0.86	0.36	A
Violent Off.	6	0.91	0.26	A
Sex Off.	9	1.19	0.46	A
Arsonists	10	0.99	0.53	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	9.08			
Group	3	0.78	0.26	1.59	N.S.
Error	51	8.30	0.16		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	0.82	0.48	A
Violent Off.	6	0.66	0.53	A
Sex Off.	9	1.20	0.43	A
Arsonists	10	0.95	0.52	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	13.25			
Group	3	1.36	0.45	1.95	N.S.
Error	51	11.89	0.23		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	0.86	0.39	A
Violent Off.	6	0.86	0.38	A
Sex Off.	9	1.11	0.25	A
Arsonists	10	1.02	0.48	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	8.26			
Group	3	0.56	0.19	1.24	N.S.
Error	51	7.70	0.15		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	0.76	0.39	A
Violent Off.	6	1.01	0.45	A
Sex Off.	9	1.01	0.40	A
Arsonists	10	0.71	0.74	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.44			
Group	3	0.78	0.26	1.13	N.S.
Error	51	11.67	0.23		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	0.83	0.30	A
Violent Off.	6	0.90	0.50	A
Sex Off.	9	1.06	0.48	A
Arsonists	10	1.05	0.60	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	9.51			
Group	3	0.61	0.20	1.16	N.S.
Error	51	8.91	0.17		

Table vi.6.
Mean Log. Response Time: Surprise Slides (Seconds)

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.78	0.39	A
Violent Off.	6	0.66	0.56	A
Sex Off.	9	0.93	0.73	A
Arsonists	10	0.85	0.52	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.92			
Group	3	0.30	0.10	0.41	N.S.
Error	51	12.61	0.25		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	0.84	0.36	A
Violent Off.	6	0.90	0.65	A
Sex Off.	9	1.17	0.41	A
Arsonists	10	0.77	0.74	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	13.40			
Group	3	0.94	0.31	1.29	N.S.
Error	51	12.46	0.24		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	0.86	0.32	A
Violent Off.	6	1.04	0.82	A
Sex Off.	9	0.95	0.55	A
Arsonists	10	0.90	0.64	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.65			
Group	3	0.21	0.07	0.28	N.S.
Error	51	12.44	0.24		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	0.64	0.46	A
Violent Off.	6	0.57	0.63	A
Sex Off.	9	1.11	0.33	A
Arsonists	10	0.87	0.68	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	15.13			
Group	3	1.89	0.63	2.43	N.S.
Error	51	13.24	0.26		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	0.76	0.33	A
Violent Off.	6	0.83	0.56	A
Sex Off.	9	0.97	0.63	A
Arsonists	10	0.97	0.56	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	11.26			
Group	3	0.51	0.17	0.81	N.S.
Error	51	10.75	0.21		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	0.66	0.38	A
Violent Off.	6	0.93	0.46	A
Sex Off.	9	1.02	0.39	A
Arsonists	10	0.95	0.75	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.86			
Group	3	1.39	0.46	2.06	N.S.
Error	51	11.47	0.22		

Table vi.7.
Mean Log. Response Time: Disgust Slides (Seconds)

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.78	0.39	A
Violent Off.	6	0.81	0.59	A
Sex Off.	9	1.14	0.56	A
Arsonists	10	0.90	0.59	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.74			
Group	3	0.90	0.30	1.29	N.S.
Error	51	11.84	0.23		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	0.97	0.38	A
Violent Off.	6	0.96	0.66	A
Sex Off.	9	1.47	0.39	B
Arsonists	10	1.07	0.62	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.95			
Group	3	1.85	0.62	2.84	<.05
Error	51	11.10	0.22		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	0.91	0.41	A
Violent Off.	6	0.74	0.65	A
Sex Off.	9	1.22	0.27	A
Arsonists	10	1.17	0.55	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	11.57			
Group	3	1.36	0.45	2.26	N.S.
Error	51	10.21	0.20		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	1.03	0.38	A
Violent Off.	6	1.09	0.63	A
Sex Off.	9	1.28	0.53	A
Arsonists	10	1.04	0.57	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	11.76			
Group	3	0.42	0.14	0.64	N.S.
Error	51	11.33	0.22		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	0.96	0.53	A
Violent Off.	6	1.08	0.70	A
Sex Off.	9	1.19	0.59	A
Arsonists	10	0.98	0.79	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	19.41			
Group	3	0.42	0.14	0.38	N.S.
Error	51	18.99	0.37		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	0.96	0.38	A
Violent Off.	6	1.16	0.66	AB
Sex Off.	9	1.44	0.41	B
Arsonists	10	1.26	0.53	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	12.17			
Group	3	1.88	0.63	3.11	<.05
Error	51	10.29	0.20		

Table vi.8.
Mean Log. Response Time: Neutral Slides (Seconds)

Rating of Happiness

Group	N	Mean	S.D.	Separation
Controls	30	0.79	0.49	A
Violent Off.	6	0.69	0.40	A
Sex Off.	9	1.31	0.71	A
Arsonists	10	0.93	0.77	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	19.11			
Group	3	2.11	0.70	2.11	N.S.
Error	51	17.01	0.33		

Rating of Sadness

Group	N	Mean	S.D.	Separation
Controls	30	0.94	0.60	A
Violent Off.	6	1.04	0.67	A
Sex Off.	9	1.31	0.45	A
Arsonists	10	1.02	0.69	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	19.47			
Group	3	0.93	0.31	0.85	N.S.
Error	51	18.55	0.36		

Rating of Fear

Group	N	Mean	S.D.	Separation
Controls	30	0.63	0.66	A
Violent Off.	6	0.61	0.45	A
Sex Off.	9	1.06	0.41	A
Arsonists	10	0.79	0.73	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	21.05			
Group	3	1.42	0.47	1.23	N.S.
Error	51	19.63	0.38		

Rating of Anger

Group	N	Mean	S.D.	Separation
Controls	30	0.71	0.63	A
Violent Off.	6	0.84	0.39	A
Sex Off.	9	1.09	0.57	A
Arsonists	10	0.87	0.81	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	21.96			
Group	3	1.04	0.35	0.85	N.S.
Error	51	20.92	0.41		

Rating of Surprise

Group	N	Mean	S.D.	Separation
Controls	30	0.76	0.50	A
Violent Off.	6	0.80	0.51	A
Sex Off.	9	1.13	0.57	A
Arsonists	10	0.93	0.68	A

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	16.30			
Group	3	1.00	0.33	1.11	N.S.
Error	51	15.30	0.30		

Rating of Disgust

Group	N	Mean	S.D.	Separation
Controls	30	0.74	0.49	A
Violent Off.	6	1.03	0.58	AB
Sex Off.	9	1.29	0.45	B
Arsonists	10	1.10	0.53	AB

Analysis of Variance

Source	D.F.	S.S.	M.S.	F-ratio	Sig.
Total	54	15.48			
Group	3	2.63	0.88	3.47	<.05
Error	51	12.86	0.25		