THE RECOGNITION OF FACIAL EXPRESSIONS 
OF EMOTION: A CROSS-CULTURAL
STUDY.

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td></td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td></td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td></td>
</tr>
<tr>
<td>ABSTRACT</td>
<td></td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td></td>
</tr>
<tr>
<td>1 Nonverbal Communication Across Cultures.</td>
<td>2</td>
</tr>
<tr>
<td>2 Theoretical Issues in the Cross-Cultural Study of Facial Expressions of Emotion.</td>
<td>4</td>
</tr>
<tr>
<td>3 The Neuro-Cultural Theory.</td>
<td>5</td>
</tr>
<tr>
<td>4 Cross-Cultural Studies on facial expressions of emotion.</td>
<td>6</td>
</tr>
<tr>
<td>5 Methodological Issues in Cross-Cultural Studies of Facial Expressions of Emotion.</td>
<td>14</td>
</tr>
<tr>
<td>5-1 Types of Studies.</td>
<td>15</td>
</tr>
<tr>
<td>The Judgement Study.</td>
<td>15</td>
</tr>
<tr>
<td>The Component Study</td>
<td>18</td>
</tr>
<tr>
<td>5-2 Design Issues.</td>
<td>21</td>
</tr>
<tr>
<td>The Cross-Over Design.</td>
<td>21</td>
</tr>
<tr>
<td>Posed verses Spontaneous Stimuli.</td>
<td>21</td>
</tr>
<tr>
<td>6 The Influence of Display Rules.</td>
<td>23</td>
</tr>
<tr>
<td>7 Rationale.</td>
<td>28</td>
</tr>
<tr>
<td>METHOD</td>
<td>32</td>
</tr>
<tr>
<td>RESULTS</td>
<td>38</td>
</tr>
</tbody>
</table>
DISCUSSION

Overview of results. 49

Limitations of the present studies. 55

Implications of results of study one and two. 57

REFERENCES 59

APPENDICES 66
LIST OF TABLES

Table 1. Number of Pakeha and Maori subjects in each group. 36
Table 2. Correct responses of emotional expressions for each model and subject group. 41
Table 3. Binomial test of the correct responses made by subjects. 42
Table 4. Binomial test for the matching of basic or display rule expressions to emotional situations. 45
Table 5. Z scores for differences between the proportion of choices of basic and display rule expressions for each emotional situation. 47
LIST OF FIGURES.

Figure 1. Pictorial representation of the Neuro-cultural theory of emotional expression. 7
Figure 2. Correct number of responses in each group. 38
Figure 3. Correct responses for each model group. 39
Figure 4. Correct identification by Pakeha and Maori subjects of emotional expressions. 40
Figure 5. Matching of basic and display rule expressions to emotional situations. 46
Abstract

Cross-cultural research on the recognition of facial expressions of emotions have shown that the primary emotions of happiness, surprise, sadness, anger, disgust, contempt and fear can be identified between different cultures. Few investigators, however, have managed to successfully study the influence of display rules. Study One tested Maori and Pakeha subjects with facial expressions of the primary emotions and an expression of neutrality, posed by Maori and Pakeha models. It was hypothesized that the recognition accuracy scores would be above chance for all the emotional expressions. Furthermore, the accuracy scores and the confidence ratings should be greater when subjects judged expressions of members of their own culture, than of the other culture. Study Two investigated the influence of display rules when subjects were asked to match expressions to emotional situations. The hypotheses tested were that the overall matching accuracy of the display rule expressions would be above chance, for all the subjects and that the confidence and accuracy scores would be higher when subjects were tested with expressions posed by members of their own culture, than from the other culture. The results of Study One indicated that agreements between cultures, regarding the correct interpretation of expressions, were low. The Pakeha subjects were found to be better interpreters of the facial expressions; however the Maori models were more effective at sending the emotional information. The second Study failed to find evidence of cultural display rules, however, cultural-general display rules were evident. It was discovered that negative emotions were under more social control than positive emotions. Several limitations are noted in the present study. The implications of this study on future research are mainly methodological and a strategy for researching display-rules is suggested.
Introduction.

"The human face - in repose and in movement, at the moment of death as in life, in silence and in speech, when seen or sensed from within, in actuality or as represented in art or recorded by the camera - is a commanding, complicated, and at times confusing source of information." (Ekman, Friesen & Ellsworth, 1982a, p.1).

Social and behavioural psychologists have, with the advent of Behaviourism and the emphasis on observable quantifiable research, become interested in the study of nonverbal behaviours, such as body movements, gestures, gaze, facial and vocal expressions. Research on nonverbal behaviour has tended to concentrate on the communicative functions of such behaviours. Interactions between individuals not only involve the common form of verbal communication, represented by speech, but also the use of gestures, facial expressions and other such forms of nonverbal communication.

In most social situations, the interactors tend to pay more attention to the words being spoken than to the nonverbal behaviour being transmitted. It seems that language is considered the primary form of communication and thus commands more attention. Nonverbal communication is considered as a less important source of communication, and even as "inferior and primitive" (Morris, Collett, Marsh, & O'Shaughnessy, 1979).

However, social interaction does involve the various facets of nonverbal behaviours such as the orientation of the body, physical actions, and facial expressions. Furthermore, the nonverbal behaviours communicate information which has an important impact on interaction, giving the recipient an indication of how the sender feels about the interaction. Unfortunately the messages sent are often misunderstood. This frequently occurs when the interactors are from different cultures and assign different meanings to the nonverbal behaviour. Therefore, comparison of the occurrence of nonverbal behaviour within and across cultural contexts, should allow for a better understanding of the effects of cultural factors and the significance of nonverbal behaviour for communication.
1. Nonverbal Communication Across Cultures.

According to Argyle (1972) there are three main functions of nonverbal communication: firstly, to manage the immediate social situation by communicating interpersonal attitudes and emotions; secondly, to sustain verbal communication and thirdly, to replace verbal communication. The study of nonverbal communication has generally concentrated on the cues presented by visual sources, facial expressions and body movements.

Gaze plays an important role in social communication. It carries out four major functions: (1) initiates and maintains the flow of conversation; (2) communicates interest and attention; (3) expresses emotion and (4) communicates the nature of the interpersonal relationship. However, the rules which guide and regulate the use of gaze can vary across cultures. For example, La France and Mayo (1976) found cultural differences in the manner in which gaze regulated the flow of conversation between American Blacks and Whites. Subjects often misinterpreted the cues that others provided, so that both talked at the same time or waited for the other to begin talking. Such differences between cultures can easily lead to errors in judgements regarding the intentions and motives of the communicators.

The body movements involving the head, hands, torso, legs and feet all communicate information, either by illustrators or emblems. Illustrators accompany speech by illustrating nonverbally, usually with hand movements, the spoken language (Hager, 1982). Emblems refer to the gestures that substitute verbal communication, for example raising the eyebrows to greet people. Emblems are learned symbolic gestures which are culture bound and capable of causing confusion in intercultural communication. By carrying out cross-cultural studies, Ekman (1975) and Johnson, Ekman and Friesen (1975), were able to establish the "repertoire of a couple of hundred emblems, some shared with other cultures and some unique" (Rosenfield, 1982, p.269). It is not surprising, therefore, that confusion or miscommunication occurs between cultures.

In their extensive study of gestures across 40 countries, Morris et al. (1979) noted many differences and similarities in the communication of gestures. They found that certain gestures were used to convey similar information across a number of countries but were not limited to a specific country. Other gestures, however, did appear to be culture bound, either
to the country as a whole or to a culture within the country; for example the head toss was found to be common in South Italy but absent in North Italy (Morris et al., 1979). Often the meaning of a gesture changes across countries and even within the country; for instance, the ring gesture in Northern France means O.K., but in the South of France it signifies a zero. Thus, even within a country, there is plenty of scope for misunderstandings when nonverbal behaviours are used for communication.

Interpersonal distance also communicates a range of information including attraction and status of the participants. When a number of people are interacting, the distance that they keep between themselves communicates the relationship between them. Thus a shorter distance conveys the information that the other person is liked, while dislike is communicated by increasing the distance between oneself and others. Furthermore, status becomes apparent from the distance participants stand from each other. The further the distance the larger the difference in status, and conversely, less distance signifies similar status relationships.

Hall (1963) noted that interpersonal distance between people can communicate a number of messages and that members of different cultures would use different forms of proximic (the use of interpersonal space) behaviour. Watson and Graves (1966) found that Arabs and Americans differed in their proximic behaviours. Arabs tended to move closer together, touch each other more often, and look at each other more while conversing, compared to Americans interacting with each other. Such differences make an impression in intercultural communication, especially when the interactors are not accustomed to each others spatial behaviours and thus misinterpret the information.

Mehrabian (1969) stated that interpersonal attraction was communicated by touching, decreasing distance between the individuals involved, by leaning towards the other person, and by maintaining eye contact. However, these nonverbal cues may communicate attraction in some cultures but in other cultures they may communicate different messages. Maoris and Samoans for example, avoid direct eye contact when conversing. For them maintaining eye contact signals hostility and encourages the development of conflict and confrontation (Metge and Kinloch, 1978). Therefore one has to be aware of such differences in nonverbal
communication. Communication between cultures is facilitated if the nonverbal language is clearly understood.

Despite a variety of sources of nonverbal communication, when encoding these messages, the receiver tends to focus more on the face than the other areas of the body. Thus the facial expression is a specialized communication area (Argyle, 1972). Its most important communicative function seems to be the conveyor of emotional information. While emotional messages can also be sent by language, by gestures and by facial expressions, the face tends to be the most clear and precise communicator of emotion (Graham, Ricci Bitti & Argyle 1975).

This chapter is concerned with the facial expression of emotion which serves as a nonverbal form of intercultural communication. Although the present study rests, to some extent, on relevant background work carried out by the early researchers and the cross-cultural scholars in the investigation of universality and innateness of facial expressions of emotion, this study investigates the effectiveness of facial expressions of emotion in intercultural communication. While the Universal and Cultural arguments are summarized, emphasis is placed on Ekman and Friesen's neuro-cultural theory, which integrates the two positions and serves as a major impetus for the study of facial expressions of emotion across cultures. The relevant cross-cultural studies of emotional recognition and intercultural communication of emotion are then revised. Methodological issues in the study of facial expressions of emotion are raised and the importance of display rules in intercultural communication is discussed. The final section consists of the rationale and hypotheses for the present study.


Nonverbal behaviour was first empirically investigated by Charles Darwin, in his study of the emotional expression in man and animals (1872/1965, cited in Scherer and Ekman, 1982). Darwin's work on facial expressions led him to conclude that the facial expression was an effective communicator of emotional messages; it also provided support for the hypothesis that facial expressions were innate.

Researchers of nonverbal behaviour have tended to pursue the issue of innateness, by testing the universality of facial expressions of emotion across cultures. The Universalists,
such as Allport (1924), Tomkins (cited in Ekman et al., 1979) and Izard (1971, 1980), agreed with Darwin that facial expressions were not learned, but were biologically determined. They therefore argued against the view, held by Culturalists such as Klineberg, LeBarre and Birdwhistle (cited in Ekman 1973b), that facial expressions of emotion are the product of cultural learning.

An intermediate position has been advanced by Ekman and Friesen, who acknowledge the existence of universal expressions of emotion, but also insist that cultural variability of expression occurs. When Ekman and Friesen started researching facial expressions they were influenced by the predominant view within psychology which favoured the cultural argument against the universal. However, when examining films of two preliterate cultures in New Guinea they found that they could recognize some of the facial expressions and these expressions were similar in both the cultures. They also found that some facial expressions were specific to one culture only, or that the same expressions occurred in very different contexts. Therefore, they began to realize that both universal and culture-specific facial expressions exist (Ekman 1972).

This led them to consider that aspects of both the universalist and culturalist arguments could be combined to form a theory on facial expressions of emotion. The theory proposed could account for the variation between cultures, variation which had been declared as evidence to substantiate the cultural argument. Their theory is of obvious importance to research on nonverbal communication across cultures.

3. The Neuro-Cultural Theory.

Ekman and Friesen's neuro-cultural theory emphasizes two sets of determinants of facial expressions. The neuro part of the label refers to the innate determinants of facial expressions and therefore, to their facial affect program which rests on the assumption that there is a relationship between a particular emotion and the firing of a particular pattern of facial muscles. The cultural refers to the cultural differences and their determining effects on facial expressions. These effects include "the events which elicit emotion, the rules about controlling the appearance of emotions and most of the consequences of emotion" (Ekman, 1972,
p. 212). The cultural determinants are learned and so vary with culture. For a pictorial representation refer to figure 1. The neuro-cultural theory provided a framework, from which Ekman and Friesen isolated the Universal expressions of emotion, by conducting cross-cultural research.


Izard’s early studies of nonverbal communication in a cross-cultural context, "were based on the assumption that the fundamental emotions are represented by discrete patterns of facial activity, which provide information or meaning of an emotional nature to interacting persons and the behaving person" (Izard, 1971, p.247). Facial expressions were tested by having subjects, from nine cultures, label the emotions expressed in a set of photographs. Izard (1971) used photographs that he had developed and selected according to a set criterion. He asked people (mainly American actors and actresses) to pose each of the emotions required, then judges classified their photographs into the emotional categories. Only those photographs that met the criterion, in which 70 percent of the judges had to agree that a given photograph was representative of a particular emotional category, were kept. Using this process 32 photographs were selected (Izard,1971).

The emotional categories were derived from the work of previous researchers and from Tomkins and Izards' own work. The subjects were given eight emotional categories: interest-excitement, enjoyment-joy, surprise-startle, distress-anguish, disgust-contempt, anger-rage, shame-humiliation and fear-terror. Each emotion pair represented the milder and stronger intensities of the emotion.

Izard's research instrument was the 'Emotion Recognition Tool'. This involved subjects matching pictures or photographs with one of the fundamental emotion categories (Ekman and associates use a similar approach). Subjects from the United States, England, Germany,
Figure 1. A pictorial representation of the universal and cultural determinants of facial expressions. From Ekman 1972.
Sweden, France, Switzerland, Greece, Japan and Africa, were asked to select the emotion that best described the expression viewed. Izard found that all the observers interpreted the expressions similarly. Thus, a high degree of agreement across all the cultures was obtained, even when the culture of the model did not represent the cultures tested (Izard 1971, Ekman, 1973a).

However, Izard did find some cultural differences in recognition accuracy. The African subjects recognized the expressions significantly less accurately compared to the subjects from the other cultures (Kilbride & Yarczower, 1983). Izard (1971) attributed these differences to language difficulties, as the Africans were tested in a foreign country and in a foreign language. However, an alternative interpretation concerns the influence of ethnic bias, which affects recognition accuracy when the culture of the model differs from the culture of the subject.

One of the first experiments undertaken by Ekman and Friesen involved showing a set of stress inducing films to Japanese and American subjects (cited in Ekman, 1973b and Ekman et al, 1982d). The experiment set out to test the ability of subjects to recognize the facial expressions of members of their own cultural group and compare this with the ability to recognize expressions in the other cultural group (Ekman, 1972).

Subjects' facial behaviour was videotaped while viewing a stress inducing film and a film containing neutral material. Observers were shown excerpts from both situations and asked if the subject under observation was watching a stressful film or a neutral film. Using a cross over design each subject group was divided, so that half of each group observed Japanese subjects and the other half of each group observed the American subjects. Both observer groups were able to significantly judge whether the facial expression observed had occurred during the stress or neutral film. Results tentatively support the universality hypotheses, as neither the cultures of the subjects nor of the observers affected the judgements (Ekman, 1972).

Unfortunately there were no data available to examine how observers made their judgments. They may have inferred specific emotions to be present in each situation. The inferred emotions could themselves have differed with the culture of the observer. For
example, one group may have noted a given facial expression to be expressing anger while the other group, for the same face, may have thought that disgust was shown (Ekman, 1972). Both, however, would have realized that the expression was of an unpleasant emotion.

Furthermore, the experiment involved spontaneous facial behaviour, which limits the experimenters knowledge of which emotions are expressed. The only information available to the experimenter is that which determines whether the expression represents unpleasant or pleasant emotions (Ekman, 1972). This experiment showed that observers from two different cultures could make global distinctions between negative, positive and neutral states. The second study to be discussed tested specific emotional states.

Ekman, Friesen and Tomkins (1971) tested the judgement of emotional expressions across five literate cultures, Argentina, Brazil, Chile, Japan and the United States. From their theory and the research on facial muscles and the distinct facial components specific to each emotion, the investigators chose only the photographs with expressions that showed the distinct muscular patterns associated with the primary emotions. Their choices were based on the work that was concurrently being carried out on the scoring of facial components associated with emotions, which was still in its developmental stage (completed and published in 1971) (Ekman, 1973a, 1973b, Ekman et al., 1982).

By using their strict criterion, Ekman et al. gathered 30 photographs of 14 different stimulus persons, expressing the six primary emotions of anger, disgust, surprise, sadness, fear and happiness, which had been consistently reported as being accurately judged in previous studies. Observers in the five different countries were shown the photographs and asked to choose the emotion expressed, from the list of primary emotions which had been translated into the observer's language.

Ekman et al.'s hypotheses assumed that a particular facial expression would be judged as showing the same emotion regardless of culture (Ekman, 1972). However, the accuracy scores did differ slightly across-cultural groups, for different emotional expressions. The results supported the hypothesis as across all five cultures the observers chose the same emotional label for the same expression (Ekman, 1973a). These results seem to verify the existence of a neurally based facial affect program, as this program predicts universality in
the communication of information by facial expressions, when a facial expression is associated with its emotional label across all cultures (Ekman, 1972).

The results of both Ekman and Izard together seem to prove that facial expressions of the primary or fundamental emotions can be recognized across cultures. However, the studies suffered from certain limitations relating specifically to subject samples. To further investigate the existence of an innate form of communication, by way of emotional expressions, Ekman and Friesen extended their studies to preliterate cultures. Ekman and Friesen (1971) tested their photographs of facial expressions (which had been positively identified by the literate cultures) on members of the Fore linguistic-cultural group of New Guinea. These people had little contact with Westerners, thus minimizing any opportunity to learn to imitate or recognize facial behaviours unique to the Western culture.

Ekman and Friesen first had to solve the problems of language translation and subject illiteracy. A new approach was adopted based on the work of Dashiell (1927, cited in Ekman et al. 1982g), which involved the telling of stories of single emotions to children, who could not read or write. The New Guinean subjects were told a story involving a single emotion and were shown three photographs. They were instructed to match one of the expressions to the story. The results showed that the subjects from both the preliterate and the literate cultures preformed above chance, when recognizing the facial expressions. Furthermore these results were replicated by K and E Heider when they also tested a preliterate group of New Guineans (Ekman et al. 1982g).

In a further attempt to validate the effectiveness of facial expressions as cross-cultural communicators, Ekman and Friesen (1971) tested American subjects with the facial expressions of the New Guineans. Videotapes of the Fore people expressing the emotions presented in each of the stories were shown to the Americans, who had not had any contact with the Fore people. The subjects were able to accurately judge the expressions, though the fear and surprise expressions were often confused. However this also occurred when the New Guineans were tested (Ekman, 1973a, 1973b, Ekman, et al. 1982g). From the results of the studies of Ekman and his associates, interest in the function of facial expressions as communicators grew quickly. Researchers attempted to test different cultures with facial
expressions of emotions, to investigate further their effectiveness as cross-cultural communicators.

Graham et al. (1975), carried out a cross-cultural study of the communication of emotion, comparing facial and gestural cues with subjects from England, Northern Italy and Southern Italy. The encoders from each culture, were videotaped while role playing expressions of happiness, sadness, anger, fear/anxiety, surprise, interest and disgust. The video was then shown to decoders, from the same culture as the encoders, in three conditions of visibility; 1) full visibility, 2) face only and 3) body only. They were asked to identify the emotion expressed in each of the situations. The Italian subjects were expected to rely more on the cues presented by the body than the English subjects. However the results showed that the condition presenting facial cues only, provided the most accurate recognition of emotions, across cultures.

A similar study was carried out by Giovannini and Ricci Bitti (1981), where subjects from the Southern Italian and Northern Italian cultures were tested for accuracy of judgements of emotion in two conditions of visibility; 1) face only, 2) body only. Their study was based on the knowledge that even within the same national group, differences in the expression of emotion may occur. Therefore, it was hypothesized that the Southerners would be more accurate at recognizing nonverbal body behaviour due to their reliance on nonverbal forms of communication. The results provided some support for the hypothesis as Southern decoders were found to be more accurate only when the body without the face was shown. However the face only condition provided the highest recognition rates in both cultures. This verified the communicative functions of the face and its superiority over the body as a conveyer of emotional information. Furthermore, the study showed that facial expressions of emotion were recognized by both cultural groups.

Boucher and Carlson (1980) were critical of many of the studies of cross-cultural expressions of emotion. This was mainly regarding the use of American facial expressions in cultures which tended to have media contact with Americans and shared aspects of the American culture. Testing this type of culture would increase the likelihood of finding cross-cultural agreement regarding the information conveyed by facial expressions and decrease the
chances of finding cultural variation in the communication of emotion.

To avoid the above shortcomings, Boucher and Carlson (1980) tested for Universality in a culture which had little cultural contact with Americans. They were able to demonstrate universality of facial expressions of emotion when an Aboriginal (Temuan) culture in Malaysia were tested with American stimuli. The subjects had little if any contact with Americans or their culture, yet they were able to accurately recognize the emotions expressed by the American posers, providing further support for the effectiveness of facial expressions as cross-cultural communicators.

In a further study, Malaysians were tested with American facial expressions, showing anger, happiness, sadness, surprise and fear. The expressions were verified by the Facial Affect Scoring Technique (FAST) and by pretesting with American subjects. Expressions of Malaysians posing the same emotions were shown to American subjects. The expressions were verified by the poser and the experimenter as showing the required emotion. From their results, Boucher et al. (1980), were able to demonstrate "that accuracy of judgement extends to the case where the persons posing for the stimuli represent both cultures of the observers" (p.271). However, it should be noted that Malaysia does have contact with Britain. Therefore they should be familiar with the facial expressions of the British, which would not differ too much from the American expression considering the similarities between the two cultures, such as the sharing of the English language, and the dominant influence of the European culture.

However, there were differences in the levels of accuracy between the two cultures. The American subjects were more accurate in their interpretations of the facial expressions compared to the Malaysian subjects. When Kilbride and Yarczower (1983) reanalysed the data they found that the Americans were more accurate when judging facial expressions of Americans rather than the expressions of the Malaysians. These results seem to point to ethnic bias in the recognition of facial expressions.

Kilbride and Yarczower's (1980) cross-cultural comparison of Zambians and Americans, revealed a significantly lower rate of recognition accuracy in judgements for Zambians judging American facial expressions. The subjects were tested in their own country
and in their own language, thus, the difference in recognition accuracy was not due to testing in a foreign country nor in a foreign language (Kilbride & Yarczower, 1983). The difference may have been due to ethnic bias, where the recognition of expressions posed by members of one's own cultural group may be more accurate than those posed by individuals belonging to a different cultural group.

Kilbride and Yarczower's (1983) study set out to determine the influence of ethnicity of the poser and the subject, on the recognition of facial expressions. Using a cross-over design, subjects from Zambia and the United States were divided into two groups. One group viewed slides of members of their own culture and the other group viewed expressions posed by members of the other culture. The raters' judgements were assessed for recognition accuracy and for uncertainty, which measured the uniformity with which raters classified the facial expressions. For example, minimal uncertainty would occur when all the raters placed an expression into the same category, whereas maximal uncertainty would occur if each rater had used a different category (Kilbride & Yarczower, 1983).

The results failed to find ethnic bias in recognition accuracy. However, the measure of uncertainty revealed ethnic bias; Zambian subjects were not as certain about their responses for expressions posed by Americans, as they were for expressions posed by other Zambians. Furthermore, the American subjects judged facial expressions posed by Americans with more certainty than those expressions posed by Zambians. This study shows that "cultural or ethnic bias can be in evidence even when agreement in the recognition of facial expressions by different ethnic groups exceeds chance levels" (Kilbride and Yarczower, 1983, p.40).

Ekman and Friesen (1986) examined the effectiveness of facial expressions as a universal communicator of emotion in ten countries, including the Westernized and non Westernized countries. Subjects (from Estonia, Greece, Hong Kong, Italy, Japan, Scotland, Turkey, United States, West Germany and West Sumatra) were tested by experimenters from their own country and in their native tongue.

The investigators were also interested in finding other universal emotions. With this in mind they assessed the emotion of contempt, which in previous studies had been ignored or combined with disgust, by asking subjects to identify the expression of contempt. They were
also shown expressions of happiness, surprise, fear, sadness, anger, and disgust. Models were asked to produce the expressions by moving the facial muscles associated with each emotion. However, the model's ethnicity was not stated, it is assumed that they were Americans. The results showed that the emotional expressions, including the expression for contempt, were accurately recognized by subjects from all ten countries. Ekman and Friesen were able to validate further the universality of facial expressions as communicators when the seventh universal emotion, contempt, was identified.

New evidence for the universally effective communication of facial expressions of emotion was presented in a study by Ekman et al. (1987). Subjects from ten different cultures were asked to judge facial expressions of happiness, surprise, sadness, fear, disgust, and anger. Subjects were allowed to indicate the presence of more than one emotion in each expression, as well as the intensity of each emotion represented in an expression. The expressions, posed by Caucasian adults, were checked with the Facial Affect Coding System (FACS) to ensure the appropriate emotion was represented in each expression. The results indicated consistent agreement across cultures, in the interpretation of the expressions. Agreement on the most prominent emotion expressed in each expression was high for all subjects, this was also the case for the second most prominent emotion observed. Thus accurate recognitions found across cultures when judging emotional expressions is not dependent on limiting the subjects to just one emotional label for each expression.

Cross-cultural studies of nonverbal communication, prove the effectiveness of facial expressions as conveyors of emotional information across Westernized as well as non-Westernized cultures and across literate and preliterate cultures. The next section highlights problems that have concerned investigators studying facial expressions of emotion across cultures.


Within the field of facial expressions of emotion, researchers have had to solve a variety of methodological problems. The researcher has had to decide which responses to use, what type of stimulus material would be appropriate for his/her study, and how to
measure the facial behaviour under investigation. These decisions are important for an accurate and meaningful interpretation of the results and to provide a framework for future investigations of facial behaviour studying inter-cultural communication.

5.1. Types of Studies.

The Judgement Study

The judgement study requires observers from different cultures, to view facial expressions and judge the emotion expressed with the aid of an emotion vocabulary (Ekman, 1973, Ekman et al, 1982c). This form of study asks "whether observers from different cultures interpret facial expressions differently" (Ekman & Friesen, 1982, p.178) This approach assumes that people can recognize emotional expressions even with no contextual information available. When identifying expressions, the observer uses his/her past experiences and knowledge of that facial expression. If some emotions are universal, then the experience and knowledge associated with those emotions should be similar across cultures. Furthermore, the expression should effectively communicate the emotional information to the observer, regardless of his/her cultural origin. Therefore, the observers should, regardless of culture, judge the expression as showing the same emotion (Ekman, 1973a).

This approach has been employed by most investigators. Researchers have either used a category approach or a dimensional approach, though most studies have relied more on the categorical approach. The category task involves the selection of an emotional category for each facial expression viewed. Using the dimension task, observers rate each expression on a series of scales, or dimensions which underlie emotion categories.

Category Approach.

From their review of judgement studies Ekman et al. (1982c) proposed seven primary categories of emotion: happiness, surprise, fear, anger, sadness, disgust and contempt. The main drawback in selecting these categories, comes from the use of posed facial behaviour. The question of whether to use posed or spontaneous expressions will be examined later. However, these seven emotions have been utilized by most investigators, especially in cross-
cultural studies.

Izard (1971), independently developed his own set of emotional categories, similar in many ways to the above categories. His categories overlap with those of previous researchers, though their form and definition differ due to Tomkins and Izard's own personal input. Izard (1971) selected definition terms by asking judges to find synonyms of the main emotion category names. He based the set of definition terms on the agreement of eight out of ten judges. Other terms were derived from free responses made by subjects viewing photographs developed by Tomkins and McCarter (1964).

Thus, Izard formed eight emotional categories; interest-excitement, enjoyment-joy, surprise-startle, distress-anguish, disgust-contempt, anger-rage, shame-humiliation and fear-terror. Each category represents the milder and stronger intensities of the emotions. He has demonstrated that these categories do represent universal facial expressions, by showing that subjects in different cultures perform at above chance levels when judging facial expressions with his emotional categories.

However, the categorical study does not tend to be a sensitive measure of the subjects response, it does measure the subjects ability to recognize the emotion expressed, but any hint of cultural differences in the way the subjects accurately respond is not measured. The approach does not seem to be receptive to variation within the accurate responses made by subjects.

Ekman et al. (1987), were able to take the categorical approach a step further by allowing subjects to indicate the presence of a number of emotions and order the emotions according to the intensity with which they appeared. This approach allows for the possibility of variation in the order of emotions chosen according to the intensity in expression. As reported in previous sections, the investigators found high agreement across cultures regarding the most intense and the second most intense emotions expressed in the expressions shown. However, cultural differences were found in the judgements of the absolute level of emotion intensity.

Kilbride and Yarczower (1983), found that though both cultural groups tested could accurately recognize the emotional expressions, there were still differences between them
regarding the level of accuracy with which each expression was judged. They assume that
"To conclude that emotional expressions, more specifically facial expressions, of one cultural
group are recognized by members of a different culture requires that the level of agreement in
judgement be significantly greater than would be expected by chance. The demonstration that
the agreement is significantly greater than would be expected by chance factors, however,
does not suggest, by itself, that specific cultural effects are absent in these very same

This suggests that judgement studies need to be more sensitive to possible cultural
differences in the interpretation of facial expressions. A simple right or wrong response does
not in itself give away much information, other than the recognition accuracy of the response.
An additional measure needs to be incorporated which allows researchers to gather more
information concerning the cultural differences which may affect the success of the facial
expression as a cross-cultural communicator.

**Dimensional Approach.**

The investigators using a category approach consider emotions to have separate,
distinguishable status and so provide lists of emotions for judges to choose from when labeling
expressions of emotion. The investigator utilizing a dimensional approach has a different
theoretical outlook, s/he considers emotions to be represented on a set of continuous scales or
dimensions (Ekman et.al, 1982c). The judge is therefore, presented with a scale on which s/he
rates where the particular expression may be located, for example the judge will rate how
pleasant or unpleasant a particular facial expression is (Ekman et al.1982c, Rosenthal, 1982).

Using scales for facial expressions of emotions, allows the investigator to find the
smallest number of dimensions needed to describe emotional expression. Scholsberg (1941),
proposed three nine point scales: pleasant-unpleasant, attention-rejection and sleep-tension
which subjects could use with some degree of accuracy (Saral 1972). Furthermore,
investigators using the dimensional approach tend to get more valid measures of agreement
among observers as they obtain ordinal or interval data, rather than nominal data gathered
with the category approach (Ekman et al.1982c).

From their review of dimensional studies Ekman et al. (1982c), pointed out the
methodological flaws apparent in each study that limited the power of their results. The studies tend to use very few people as stimuli, which does not give a representative sample of stimuli and brings in the factor of individual differences in the ability to pose and express the emotions. Ekman et al. (1982c), also draw attention to the problem of ambiguity, inherent in the dimension studies, regarding what the investigator is trying to study or represent with his/her dimensions and with the labeling of scales.

Saha (1973) conducted a study testing the positions of facial expressions observed by Indian subjects in Scholesberg's three dimensions. Furthermore, he compared his results with that of Engen, Levy and Schlosberg (1958, cited in Saha 1973), who used a different cultural group, but the same stimuli. He found the highest agreement across subjects, with the intensive dimension of sleep-tension. Thus subjects from different cultures could interpret degrees of intensity in the same facial expressions. Similar trends were found for the other two dimensions. The results therefore substantiate the three dimensions proposed and provide evidence of universality in the recognition of these dimensions across cultures. Whether the researcher follows the category or dimensional approach is probably dependent upon his/her preferred method and theoretical background. Ekman et al. (1982c) conclude that one can not definitely say which is the better approach.

The Component Study.

This approach involves the systematic sampling of facial behaviour from photographs or videotapes and the measuring of the facial muscular movements shown. Using this the similarities and differences of expressions can be assessed across subjects and cultures, but within similar settings (Ekman, 1973a). In Judgement studies the expression is treated as a stimulus but in Component studies it is studied as a response, as the movement or position of the face may be related to some sort of change in the subjects emotional state (Ekman et al., 1982b).

Investigators have tended to avoid the component study, because of the problems associated with it. The investigator needs to know that a particular situation elicits an emotion in the cultures to be studied and that the same emotion is aroused across the cultures
(Ekman, 1973a). If the emotion aroused differed then the facial expressions would also differ, thus an eliciting situation has to produce the same emotion for comparison across cultures.

Another problem associated with the choice of situation is the interference caused by display rules (Ekman, 1973a). Once display rules are in effect recognition is hindered. Therefore, the situation chosen has to be free of display rules, in all the cultures studied. Furthermore, the investigator has to know what facial behaviour has to be recorded and how to record behaviour without the subject becoming self-conscious (Ekman et.al, 1982b).

The main problem facing investigators concerned the measurement of facial behaviour. In the past, investigators relied on their own methods of measuring facial expressions, thus complicating attempts at comparing studies, hindering the standardizing of the stimuli to be used and providing inaccurate descriptions of expressions. An adequate measuring technique would allow the investigator to determine the muscle movements associated with each emotion and the aspects of facial behaviour related to the observers judgement.

The Facial Affect Scoring Technique.

Ekman, Friesen and Tomkins (1971) made a major contribution to the methodology of the study of facial behaviours with their Facial Action Scoring Technique, (FAST). FAST was designed to measure the facial movements relevant to emotion (Ekman & Friesen, 1976). This technique isolates each observable movement of the face and examines the parts of the face that can move independently, as well as measuring the actual length of each facial movement (Ekman, 1973a).

The movements, which are photographed, are theoretically associated with each of the six primary emotions: happiness, anger, surprise, sadness, fear and disgust. The photographs act as an atlas, put together to represent the facial movements associated with each of the primary emotions (Ekman & Friesen 1982).

However, FAST was limited to measuring facial movement relevant to emotion, it could not distinguish the facial muscles involved in other visible facial behaviours, it was not a general purpose tool (Ekman & Oster, 1979 Ekman et.al, 1982c). A measurement technique free of any theoretical bias about the possible meaning of facial behaviour, was developed by Ekman and Friesen.
The Facial Action Coding System.

The Facial Action Coding System (FACS) was designed to be a general purpose tool, measuring all visible facial behaviour, in any context (Ekman & Oster, 1979). FACS was assembled from the analysis of the anatomical basis of facial movement. The measurement units rely on the knowledge of how each muscle acts to produce a change in appearance, therefore allowing a complex facial movement to be scored analytically in terms of the minimal muscle actions which collectively produce the movement (Ekman & Oster, 1979, Ekman et al. 1982c).

Studies which have used FACS to measure a poser's facial behaviour, have been able to successfully verify the utility of this measurement system (Ekman et al. 1982c). Ekman, Friesen and Ancoli (1980), in their study of facial signs of emotional experience, used the FACS to successfully obtain evidence of the relationship between spontaneous facial actions and the subjects' subjective experience of emotion. The FACS is not only being used by investigators to verify the emotional representation of facial expressions in nonverbal communication studies, but also to study a range of topics concerning the face. Thus, serving as a general purpose tool for the measurement of facial action.

With the availability of research tools such as the FACS, investigators are now able to describe facial behaviour in terms of the components involved in behaviour. The investigator can ensure that the expression posed does convey the intended emotion. This can be achieved by utilizing measuring devices such as the FACS to measure spontaneous facial behaviour, providing information regarding the specific facial actions represented and the emotions expressed, a task which has caused problems in the past. Furthermore, these techniques provide the opportunity for stimuli to be standardized and by combining the component and judgement approach the accuracy and reliability of results are encouraged, allowing comparison across cultures and studies.
5.2. Design Issues.

The cross-over design

Although recognition accuracy of facial expressions has been established by cross-cultural studies, the majority of judgement studies failed to adopt a cross-over design. Instead the investigators tested either a) one culture with expressions posed by members of that culture or from a different culture (usually from the United States) or b) tested a number of cultures but with facial expressions posed by members of one culture only, instead of having a representative sample of expressions from each culture tested. The cross-over design allows the investigator to assess the communicative value of each cultures' facial expressions with members of each culture tested. Thus members of culture A would be tested with facial expressions posed by people from their culture and with expressions posed by members from culture B, the subjects from culture B would be tested in a similar manner. This allows for a true test of the effectiveness of facial expressions as communicators across cultures.

Posed verses spontaneous stimuli.

Investigators choosing to study facial behaviour have to consider which type of stimuli to use; spontaneous or posed facial expressions. This has been an issue of controversy for several decades (Zuckerman, Larrance, Hall, DeFrank & Rosenthal, 1979). Spontaneous expressions can be obtained from the natural setting and from the laboratory, while posed expressions can only be obtained within the laboratory.

Most emotion theorists have argued that for true expressions of emotion the investigator should use stimuli composed of spontaneous facial expressions (O'Sullivan, 1982). Spontaneous expressions are thought to be more natural and therefore appropriate for studying emotional expressions. Obtaining expressions in the natural setting can be problematic as one has no control over the timing or type of expression displayed. However, spontaneous expressions obtained in a contrived laboratory situation can often be controlled and masked by display rules.

The majority of researchers have relied on photographs of posed facial expressions for
their stimuli. The advantage of posed stimuli tends to be the ease with which it can be gathered and processed. Furthermore, the experimenter can specify which emotion is being expressed, (substantiated by knowledge of the poser's intended expression) and be assured that the expression will be free of display rules.

Posed expressions are usually obtained by involving the models in role plays, acting out scenes, imitating facial expressions or by asking them to remember or imagine feeling an emotion, which then leads to the expression of the emotion. Often the expressions are obtained by filming responses to emotionally arousing films, however this technique does not allow precise definition of the emotional expression. From the work by Ekman and Friesen, on facial muscle movements and their association with emotional expressions, researchers have been able to ask models to move specified facial muscles to obtain posed expressions. However, using this technique implies that the expression will be universal as the neurocultural theory states that muscle movements associated with facial expressions are universal. Using this method of deriving expressions seems to conclude universality from the onset, rather than allowing for the opportunity of cultural differences to exist in expressions of emotion. It therefore seems that the best methods of deriving facial expressions include the above procedures of role playing, memory and imagination.

The investigator who relies solely on posed expressions may run into problems if more then one poser is not used. Posers tend to differ in their ability to simulate emotions, therefore the investigator should allow for this by recruiting a larger and thus more representative sample of posers (Ekman, et al., 1982b).

However the most pressing problem to arise out of the literature is that of relevance; does posed behaviour have any relevance to spontaneously occurring emotion? Hunt (1941 cited in Ekman et al., 1982b) considered posed facial behaviour to be similar to a specialized, conventionalized language. Posed cues therefore form a socially learned code, unrelated to spontaneously occurring cues (Zuckerman et al., 1979). Cross-cultural studies provided evidence of the recognition of posed facial expressions of emotion across cultures, proving that posed facial cues are not an arbitrary learned code. Furthermore, studies which show how preliterate cultures judge correctly posed expressions of Westernized models, imply that there
must be some similarity with spontaneous facial behaviour.

Ekman et al. (1982d), have suggested that posed expressions may in some way be based on the repertoire of spontaneous facial behaviours, associated with emotion. By asking the poser to express an emotion, without any reference to social situations, an uncontrolled facial expression is provided. However, when the poser is asked to provide a facial expression appropriate to a given emotional situation, the expression becomes controlled by display rules (Ekman et al., 1982d). In this way, one can obtain posed expressions, with or without display rules, which are similar to the nonverbal behaviour obtained in a spontaneous situation.

Several studies have compared the ability to encode posed cues with spontaneous cues finding a positive correlation between the two modes (Buck, 1975; Zuckerman, Hall, DeFrank & Rosenthal, 1976). Zuckerman et al. (1976) also found positive correlations between the decoding of posed cues and spontaneous cues. This was further supported by Zuckerman et al. (1979) in their study of posed and spontaneous communication of emotion using facial cues. They conclude that the positive relationship suggests that research using posed expressions of emotion may be generalized to spontaneous facial behaviour.

The investigator can rely on posed facial expressions for greater control over the stimulus material and for accurate results which also tend to be generalizable. However, both the posed and spontaneous facial expression may become contaminated by display rules, which in turn effect the accuracy of emotional recognition. The investigator needs to be aware of display rules and their effects on the design and results of the study of facial expressions of emotion across cultures.


With the background of the neuro-cultural theory, emphasizing the importance of display rules, the concept of display rules and their influence in the universal-cultural argument will be discussed.

"Given the central function of non-verbal expression as the major medium of communication of emotional feeling (Darwin, 1982/1965) one would expect well elaborated social prescriptions for what is allowable or desirable in terms of emotional expression under

Display rules provide the social prescriptions, governing and regulating the expression of emotions within their contexts by socially learned norms. These rules apply not only to the face but also to vocal behaviour, body language and interpersonal behaviour (Babad & Wallbott, 1986).

The social rules are acquired early, so that by late childhood one knows how to control and manage facial expressions. S/he learns how to display emotions that will be appropriate to the social setting regardless of the actual felt emotion (Buck, 1984, Saarni, 1979). It soon becomes habitual, occurring with little hesitation or deliberation, almost automatically. Only when display rules have been violated, by not being applied properly, is it possible to notice their operation (Ekman, 1972, 1973b).

Display rules usually control faces through the use of management techniques. The particular emotional state may be expressed in a less intense form; so a person may not look as sad as s/he really feels. Or the person may over-intensify the emotion, feeling happy but looking happier for example. Another management technique involves hiding the feeling by showing a neutral expression, and so displaying no emotion. The last technique suggested involves masking the felt emotion, by showing a different emotion and so hiding the felt emotion from others (Ekman, Friesen & Ellsworth, 1982a).

Social factors play an important role in the type of control that needs to be exerted to cope with emotional states. The number of people interacting, the level of familiarity we have with them, their roles and attitudes and the setting of the social interaction influence the type of management techniques required (Ekman, 1973b). The display rules govern the application of these techniques. They manage the facial behaviour accordingly and with reference to the situational circumstances.

When the management techniques are successful, the sender is often not aware of the processes involved. However, when the control has been unsuccessful the sender leaks unintended affective information (Scherer, 1986). In a situation which does not require social interaction, when a person is alone for example, display rules may not have a strong influence (Buck, 1984). In this situation there is little need to control the facial behaviour, therefore
the expression may reflect the felt emotion.

Despite Ekman and Friesen's contentions, there has been little research on display rules, mainly due to the difficulties in studying repressed or controlled emotions (Scherer, 1986). The difficulty becomes apparent when one considers the almost automatic application of display rules, making it more of an unconscious process than a carefully mediated conscious act. Furthermore studying display rules in the laboratory is hampered by the fact that "the laboratory situation is a rather special situation with a large number of very specific normative constraints. Thus, it is highly unlikely that the operation of normal social rules concerning both feeling and expression can be expected to occur in such a context" (Scherer, 1986, p.14).

Many studies have compared the judgements of facial expression by observers from different cultures, but few, due to problems associated with the study of display rules, have compared the facial expressions actually produced by members of different cultures in similar situations. Boucher (1979) suggests that display rules can be investigated when certain guidelines are set. Firstly, the emotion that is being experienced has to be specified, as does the context, that is age, sex, and status of the individual and the nature of the setting, in which the emotion is experienced and most importantly, the management technique applied should be specified.

Friesen (1972) was one of the first investigators to successfully study display rules using a replicable data based methodology (Boucher, 1979). American and Japanese subjects individually viewed stressful films, after which they were interviewed in two different conditions by a member of their own race. During the viewing of the film and during both interviews, the subjects facial behaviour was filmed without the subjects' knowledge. The first interview involved questions regarding the film, the second interview involved questions that were asked as the film was replayed.

Friesen (1972) found that when subjects were alone viewing the film, their facial responses to the stressful scenes were similar. There was no difference between the American and Japanese facial expressions. This outcome supports the universality hypotheses. However, when the recordings of the interviews were examined, it became evident that
display rules were operating. The Japanese subjects showed more positive emotional expressions than the Americans, who showed more negative expressions (Friesen, 1972). When a person of authority was present, the Japanese showed more control of their facial expressions and they smiled more than the American subjects. The Japanese subjects may have been employing the management technique of masking, to hide the negative emotions with facial expressions of positive emotions (Ekman, 1973, 1974, Ekman, Friesen & Ellsworth, 1982e).

Thus facial expressions differed in a social context for both groups but not when the subjects were isolated; confirming the view that socially learned display rules, for the management of facial behaviour according to the situation, do vary with culture.

Nitt and Valsiner (1977) investigated the influence of display rules in the Estonian and Kirghizian cultures. Subjects, 12 Kirghizians and 14 Estonians, were first presented with photographs (derived from Ekman & Friesen, 1975) of facial expression and then the same facial expressions were presented with verbal descriptions of situations, in which the photograph could have been taken. The subjects were asked to judge the emotion expressed, to rate its intensity, and on a ten point scale rate whether it was possible that the facial expression had been photographed in the situation described.

Of the eight situations used, three were specific to the Kirghizian cultural background and were used by this group, they were: 1) Kidnapping of the bride, 2) He meets an acquaintance in the street, and 3) He meets his mother and father in the street. The three situations given to the Estonian group were: 1) He is being attacked in the street, 2) Returning home from a lengthy vacation, he sees his dog, tail wagging, running to greet him, 3) He sees a group of boys smashing up his new car. The fourth situation was described to both groups as, 'He has lost someone dear to him.' Thus each group received four situations and were randomly presented with all the photographs.

Nitt and Valsiner's (1977) study provides complicated results, which by their own admission are difficult to interpret. They had difficulty in concluding that there are differences in display rules between the two cultures, due to the lack of a representative sample of subjects. Furthermore the use of and comparison of only one situation in which
display rules are thought to operate, limits the extent of the results. With more comparable situations, the likelihood of seeing different display rules in operation increases.

However, the investigators did acknowledge that the concept of display rules, though logical, is quite difficult to study. Their attempts to study display rules has provided us with the beginnings of a method of studying this concept, by using situational information. This, as discussed previously, occurs when the same situation provides different facial behaviours across cultures, as culture specific display rules become active.

Saha, Palchoudhury and Mandala (1982) attempted to investigate the influence of culture on the association between the emotional context and the emotional facial expression. From Ekman and Friesen's (1973, cited in Saha et al., 1982) study it was shown that subjects were able to accurately match the six fundamental emotions to the facial expressions presented in the Lightfoot series of photographs (developed by Engen & Scholsberg in 1957). Saha et al. (1982), wanted to know if the Lightfoot series of photographs could be judged in terms of contextual information, in comparison to emotional labels usually provided for subjects. Indian subjects were shown 13 photographs, they were asked to quickly look at each facial expression presented and match it with one of the 13 situations provided. Each situation represented the context of one of the photographs in the series. Using the percentage of agreement by all the subjects that a particular expression matched a particular context, Saha et al. found that only five of the matches were highly agreed upon (above 50 percent agreement).

Saha et al. (1982) concluded that cultural variation, by way of display rules, was the major cause for the mismatching, as the context tends to elicit different facial expressions across cultures. Saha et al.(1982) also attributed the variation to the level of familiarity or unfamiliarity of the contexts provided. They noted that statements such as 'very pleasant surprise', 'maternal love-baby in arms' and 'extreme pain' are universally accepted and thus have a high agreement value for matching with expressions, across subjects. They conclude that "when the statements accompany basic or pure emotions, there is a tendency toward approaching universality. But when the emotions are combinational or became contaminated following a culture specific event, there is a lesser chance of becoming so" (Saha et.al, 1982, p.
Thus they seem to be substantiating Ekman and Friesens' theory which supports the universality stance but allows for cultural variation, due to differences in display rules, which dictate the appropriateness of expressions in given contexts.

The area of facial expressions of emotion can now be studied with standardized equipment and stimuli, and with a theoretical framework which provides a rationale for the study of facial behaviour. Researchers can continue to investigate the communicative functions of facial expression across cultures using a more sensitive judgement approach, which could incorporate aspects of the component approach, for a more advanced methodology. Further work on the effects of display rules should also enhance our understandings of their mechanisms within the cultural context and in the area of cross-cultural communication. Therefore, with the development of efficient and accurate measures and standards the researcher is able to assess the capacity for intercultural communication.

7. Rationale For The Current Study.

The work of past researchers has suggested that facial expressions can communicate emotional messages effectively across cultures. The ability of the face to communicate emotional information has been assessed in a number of cultures. However, the ability to communicate and interpret emotional expressions has not been tested in New Zealand.

New Zealand is increasingly becoming a multi-cultural society. With this change there arises problems in communication, not only in language difficulties but also in the less obvious non-verbal forms of communication. Facial expressions of emotion, serve as an important source of communication, in all social interactions. If the receiver misinterprets or has difficulty interpreting the information sent, then the interaction between the sender and receiver becomes difficult. These problems increase when members of different cultures attempt to interact, within social situations.

The two prominent cultures in New Zealand are that of the Pakeha (European) and the Maori. The Maori constitute the minority race in New Zealand, with the Pakeha making
up the majority. Besides the obvious cultural differences, the Maori and Pakeha differ with respect to forms of communication. The Pakeha define communication in terms of verbal expression, while the Maori acknowledge the verbal form of communication but also emphasises the importance of nonverbal communication (Metge & Kinloch, 1978).

The forms of nonverbal communication between the two cultures differ, as do the meanings assigned to nonverbal behaviours, for example eye contact conveys different messages, as mentioned previously. The different meanings may lead to confusion and misunderstanding between interactors from each of the cultures, which in turn effect their interpersonal relationships. Therefore knowledge of the differences in nonverbal communication may avoid misunderstandings between the two cultures and increase interpersonal attraction.

The first study tests the recognition of seven emotional expressions by members of the Maori and Pakeha culture. The subjects were selected on the basis of their contact with members of their own culture and involvement in cultural activities. Each group viewed a neutral expression as well as expressions of the primary emotions; anger, contempt, disgust, fear, sadness, and surprise, reported by Ekman and Friesen to be the most often used and recognized emotions in the literature.

Kilbride and Yarczower (1983), report finding bi-directional ethnic bias in the level of certainty with which judgements of emotion were made. It seems that there is more certainty or confidence in the labeling of facial expressions which are posed by members of the subjects own ethnic group. Ethnic bias in the perception of emotions was investigated with a cross over design in which half of each subject group was provided with photographs of members of their own culture and the other half with photographs of members of the other culture.

To test for further cultural differences, a new approach was taken; confidence ratings were incorporated into the judgement task to obtain a more sensitive measure of emotional recognition. Should the accuracy data be equivalent for both subject groups, the ratings would then detect the more subtle differences in recognition.

Few investigators have considered the possibility of cultural differences in accurate recognitions. Kilbride and Yarczower have shown the effects of ethnic bias in accurate
recognitions of Zambians and Americans, but few researchers have investigated this effect in other cultures. Thus the aim of the first study is to test for cross-cultural recognition of facial expressions of emotion, in the Maori and Pakeha cultures and to test for ethnic bias by utilizing confidence ratings.

Few studies have investigated the concept of display rules, mainly due to the nature of the subject and its elusiveness, as a research topic. The second study attempted to investigate display rules, within each culture. It may be possible to find certain situations eliciting different display rules for different cultures, that is the Maoris and Pakehas may experience or express different emotions in the same situations. Thus, misunderstandings could occur between the two cultures, if each culture expects the members of the other culture to behave similarly or have similar facial expressions. Metge and Kinloch (1978) found that misunderstandings between cultures occurred due to the assumption by members of each culture that the meanings of words and actions were the same across cultures. Such examples show how less obvious cultural differences are not recognized.

Furthermore, each culture may have stereotypes of the emotions the other culture would tend to express, in most situations. For example, Maori people have been characterized as being 'happy-go-lucky', therefore the Pakeha person may expect the Maori person to show a happy expression in any situation regardless of the actual emotion felt. The Pakeha is applying his stereotype of Maori display rules when interpreting the Maori expressions. The Maori people would use their stereotypes of the Pakeha display rules, in a similar manner.

The application of such stereotypes can cause confusion between the participants, however "knowledge of how individuals from different cultures control the expression of emotion and the principles governing the display of emotion across cultures should enhance intercultural communication" (Brein and David, 1971; cited in Boucher, 1979, p.170). This study therefore attempts to investigate the occurrence of display rules within a culture and the application of display rules, either of ones own culture or of those based on stereotypes, to the other culture.

Both groups of subjects were given six situations, which had to be matched to a facial expression. Again half of each subject group were given photographs of members of their own
culture and the other half looked at expressions of members of the other cultural group. The matching of a situation with an expression was compared for each subject group according to the model group. It was hypothesized that the choices would differ according to the model's cultural group and the subject's cultural group. Thus providing some insight in the use of appropriate display rules within each situation by each culture.

In addition to the matching of each expression to a given situation, the subject had to rate how confident s/he was that a correct match had been made. For each situation the subject's confidence rating was included to provide information on the subject's race and the race of the model and the effect this has on the correct match.

**Hypotheses.**

**Study One.**

**Hypothesis One**  The recognition accuracy should be above chance on all emotions, for all subjects.

**Hypothesis Two**  The accuracy scores of subjects should be greater when judging expressions posed by models from the same culture, than when judging the expressions of models from the other culture.

**Hypothesis Three**  The subjects will be more confident judging expressions posed by models from their own culture, than models from the other culture.

**Study Two.**

**Hypothesis One**  The overall matching accuracy of display rule expressions to situations should be above chance, for all subjects.

**Hypothesis Two**  The accurate display rule matching scores of subjects should be greater when tested with expressions posed by models from the same culture, than when tested with models from the other culture.

**Hypothesis Three**  The subjects will be more confident matching expressions posed by models from their own culture, than models from the other culture.
Method

Subjects

Sixty three subjects, 29 females and 34 males, aged from 15-51, from two Government Access\(^1\) groups, and a hostel for students attending the Christchurch Polytechnical Institute volunteered to participate in the study.

The majority of the Maori subjects, 15, were from the Christchurch Academy access scheme. The remaining Maori subjects, seven females and five males, lived at Te Kaihanga hostel and attended the Christchurch Polytechnical Institute.

All the Pakeha subjects were members of the Access group "Department of Special Programs" run at the Christchurch Polytechnic.

Only the subjects that labeled themselves as Maori or Pakeha were selected, and only the results from those subjects that completed both the experimental tasks were analysed, leaving 54 subjects.

Materials.

The materials used by the subjects consisted of four books, test book one and its corresponding answer book and test book two and its corresponding answer book.

Description.

Book 1

Test book one consisted of eight photographs of one particular model only, posing the expressions of happiness, anger, fear, disgust, sadness, surprise, contempt and neutral. The experimenter mounted the photographs of each model's eight facial expressions onto separate booklets, in random order. Six master booklets were made, one for each model, and equal numbers of copies of the master books were printed.

The answer booklet for the first test book included instructions and a list of eleven emotional labels. For each photograph the list of emotions was provided from which the subject could choose the emotion that was expressed in the photograph. The list consisted of

\(^1\) Access is a state funded training scheme to help unemployed people gain working skills.
the eight emotions that were expressed by the models and three extra emotions; humiliation, exhaustion and pity. This allowed more of a choice for the subject, and ensured that the task was more of a recognition task than a matching one.

Book 2

Test booklet two consisted of 15 photographs. For each model a booklet was made up with photographs from study one and photographs from the present study. The photographs of study one are referred to as "basic" to represent the expressions of each of the universal emotions. The expressions in the photographs for this study are referred to as "display rules" in reference to situations depicting each of the seven universal emotions.

All the 15 photographs were randomly placed in the book. Six master booklets were made up, by the author, one for each model. An equal number of copies were printed of each booklet.

An answer booklet was constructed in which the instructions to the task were given and the seven situations were presented. The main character who was used for each of the situations, was labeled with letters from the alphabet, to avoid the use of names which could be associated with either the Maori or Pakeha culture.

Preparation.

Both the Maori and Pakeha stimuli were selected from a set of photographs of eight male students, four Maori and four Pakeha, attending the University of Canterbury².

Study 1.

The models were asked to pose a neutral facial expression and seven emotional expressions: happiness, anger, fear, disgust, sadness, surprise and contempt. Ekman et.al (1982) have made up a list of seven emotions derived from a search of the cross-cultural literature. This search implied that the above emotions were well established as universal across cultures. For this reason it was appropriate to use the same emotions, to test whether

² Male models were used as the subject population originally consisted of males only. However due to uncontrollable circumstances a mixed sex subject population was studied to make up a larger sample.
the emotions could be accurately recognized by the two cultures.

For each emotional expression the model was asked to imagine or remember a situation in which he had felt that particular emotion, and then he was asked to express the emotion so that his facial expression conveyed his feelings. A photograph was then taken of the facial expression. This procedure was carried out for all the models with all the emotions.

Photographs were taken, using a black and white film, and developed by the Psychology Department photographic technician at the University of Canterbury.

Once the photographs were developed, the model had to identify his own facial expressions for all the emotions posed. He was given a list (similar to the one given to the subjects) of emotions to choose from. If he was unable to correctly identify a facial expression then the model was required to pose again for that particular emotional expression.

To ensure that the facial expression was showing the correct emotion, a further check was made using Ekman and Friesen's (1976,1978) Facial Affect Coding System (FACS). A minimum criterion of 66 percent of FACS defined muscle movements was set for the inclusion of each photographed emotional expression. If there were less than 66 percent of the muscle movements required, the model posed again for that particular expression.

All the models had to pose again for some of the emotional expressions. The photographs, once more, were evaluated by the model concerned and by the experimenter using the FACS. Again only those expressions recognized by the model and which met the FACS criterion set were selected.

In summary, six male models, three from each cultural group, each posed for one photograph of expressions of happiness, anger, fear, disgust, sadness, surprise, contempt and neutral.

\[^3\] One of the models was unavailable for the second evaluation of his expression and therefore had to be dropped, along with a randomly selected counterpart from the other cultural group, from the experiment.
The models were each given cards on which a situation was proposed in which the central character, due to the circumstances depicted felt a given emotion. For example: C was going to town, his teacher was also going and offered him a lift, however the teacher was late and so C was late for his appointment in town. C feels angry. The model was asked to place himself in the position of the character and then asked what he would show in his facial expression. Because the emotional expression was affected by display rules this allowed the model the choice of showing the expected emotion, expressing a less or more intense version of the felt emotion, masking what he was feeling and showing another emotion, or showing nothing, and having a neutral facial expression. A photograph was then taken of the facial expression given. All photographs were taken and developed by the same photographer, as in the first study.

Seven situations were presented to the models, each one representing a different emotion. The universal emotions were again used, that is the emotion of happiness, surprise, sadness, disgust, fear, contempt, and anger. The situations, which were composed by the author, had to involve only one emotion, have no cultural connotations, and be simple enough for the models to relate to a natural setting.

Once the photographs were developed, the models were asked to match up each situation with a photograph. Photographs from study one were also included in the selection of photographs from which the model could choose. Each model only matched up his expressions with the given situation. If the model had not matched up the situations with the expressions he had posed (when putting himself in the situation) then those mismatched photographs were replaced with re-posed photographs. The model had to again put himself into the character's position for the mismatched situation(s) and express the emotion he would show. Again the model then had to match the photograph up with the situation. This was continued until all the models correctly matched their display rule expressions with the corresponding situation.

In summary, three Maori and three Pakcha males each presented seven emotional expressions that they believed they would show in the seven given situations, i.e. as
influenced by display rules.

**Experimenter.**

The author, who in this context was of neutral ethnicity as she did not belong to either of the two cultural groups tested, acted as the experimenter.

**Procedure.**

**Study 1**

The books were randomly distributed to each subject group by the experimenter, however half the subjects (of each group) received books with photographs of Maori models and the other half received books with Pakeha models (refer to table 1). Each subject was only shown one model’s expressions.

**Table 1**

<table>
<thead>
<tr>
<th>GROUP(^a)</th>
<th>PAKEHA</th>
<th>MAORI</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>total</td>
<td>27</td>
<td>27</td>
<td>54</td>
</tr>
</tbody>
</table>

\(^a\)Groups 1-3 looked at Maori models and groups 4-6 looked at Pakeha models.

**Instructions:** The subjects were asked to select the emotion expressed in each of the
photographs, from a list of eleven emotions in the answer book. Subjects were told to tick the emotional label that s/he thought was correct, if s/he could not recognize the expression, or the expression represented an emotion not given, then s/he had to choose the emotion that the expression most resembled.

Subjects were also asked to rate, on a five point scale, how confident they were that the emotional label chosen was correct. If they were very confident they could circle five, if they were unsure of their choice then they could circle one. This was carried out for each of the photographs.

Once all the subjects had finished they carried on with study two.

Study 2.

The subjects were given a test booklet, in which the model was the same as the model in the first test booklet given, and the answer booklet.

Instructions: The subjects were told to read each situation carefully and then look through all the photographs and pick the facial expression that the character in each situation would show.

Subjects also had to rate how confident they were that the expression chosen was the correct match for each situation, on a 1 (not at all confident) to 5 (very confident) scale.

Once all the subjects had finished the task they were asked to write their names, ethnic group and age on to the answer book. The study was then explained to them and any questions that they had were answered.
Results

Study 1

When the subjects response for each expression matched that of the model’s label, than the response was judged to be accurate. The frequency distributions of choices were examined and from the information provided a Binomial test was conducted to see if correct responses occurred with a frequency greater than chance. An analysis of variance was carried out on the total number of correct responses, to investigate the effects of subject and model ethnicity. A further analysis of variance was used to investigate the relationship between subject and model ethnicity and their effects on the confidence ratings given for the correct responses to each of the facial expressions.

Figure 2 shows the pattern of responses across subjects for the eight expressions tested.

![Bar chart showing the percentage of correct responses for different emotions.

FIGURE 2 Correct number of responses for each emotional expression.]
Frequency distribution of correct recognition.

When only the correct responses for each of the emotional expressions were analysed, the emotion happy was found to be the most accurately recognized (86.8% of the total responses), with surprise being the next most accurately recognized (74.1%) and the neutral expression the third most accurately recognized expression. The least accurately recognized emotional expressions were that of anger (19.2%) and fear (15.1%).

The percentage of correct choices given to expressions posed by either Pakeha or Maori models, by both groups of subjects are represented in figure 3.

FIGURE 3 Subjects correct identifications of expressions posed by Pakeha or Maori models.
The accurate recognition of emotional expressions by Pakeha and Maori subjects are shown in figure 4.

![Bar chart](image)

*Figure 4* Correct Identification of expressions by Pakeha and Maori subjects.

**Confusion in labeling expressions.**

The expressions of neutral, happy and surprise were not confused with other emotional labels to the same extent as anger, fear, disgust, and contempt were. For the fear expression few subjects identified the emotion correctly, however 30.2% of the subjects selected surprise as the emotion expressed. Very few subjects misjudged the surprise expression, only 5.6% labeled it as fear. The anger expression was misjudged by 17.3% to be
contempt, and the disgust expression was also judged as contempt by 23.1% of the subjects. The contempt expression was judged to be showing disgust by 28.8% of the subjects.

Table 2 shows the percentages of accurate judgements of each of the emotional expressions for both the model groups, made by each of the subject groups.

Table 2

Percentage of correct responses of emotional expressions for each model and subject ethnic group.

<table>
<thead>
<tr>
<th></th>
<th>PAKEHA STIMULI</th>
<th>MAORI STIMULI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PAKEHA SUBJECTS</td>
<td>MAORI SUBJECTS</td>
</tr>
<tr>
<td>NEUTRAL</td>
<td>22.2</td>
<td>9.3</td>
</tr>
<tr>
<td>HAPPY</td>
<td>25.9</td>
<td>24.0</td>
</tr>
<tr>
<td>ANGER</td>
<td>3.7</td>
<td>1.9</td>
</tr>
<tr>
<td>FEAR</td>
<td>5.5</td>
<td>1.8</td>
</tr>
<tr>
<td>DISGUST</td>
<td>5.5</td>
<td>5.5</td>
</tr>
<tr>
<td>SADNESS</td>
<td>5.5</td>
<td>3.7</td>
</tr>
<tr>
<td>SURPRISE</td>
<td>22.2</td>
<td>20.4</td>
</tr>
<tr>
<td>CONTEMPT</td>
<td>11.1</td>
<td>3.7</td>
</tr>
</tbody>
</table>
Binomial Test.

To test whether the identification of the correct emotional label was greater than chance, Binomial tests, with a probability of being accurate by chance of 1/11, were used. Overall the expressions of; neutral, happiness, disgust, sadness, surprise, anger and contempt were accurately recognized, above chance; however, the fear expression was not significantly recognized (refer to table 3).

Table 3

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Number</th>
<th>P(x)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correct</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>34</td>
<td>1.36E-22 **</td>
</tr>
<tr>
<td>Happy</td>
<td>46</td>
<td>3.84E-40 **</td>
</tr>
<tr>
<td>Anger</td>
<td>10</td>
<td>0.013 *</td>
</tr>
<tr>
<td>Fear</td>
<td>8</td>
<td>0.06</td>
</tr>
<tr>
<td>Disgust</td>
<td>16</td>
<td>1.09E-5 **</td>
</tr>
<tr>
<td>Sad</td>
<td>17</td>
<td>2.4E-6 **</td>
</tr>
<tr>
<td>Surprise</td>
<td>40</td>
<td>1.2E-20 **</td>
</tr>
<tr>
<td>Contempt</td>
<td>17</td>
<td>2.4E-6 **</td>
</tr>
</tbody>
</table>

* Significant at 0.05 level.

** Significant at 0.001 level.

Analysis of Variance.

An analysis of variance was conducted on the total correct recognition score (0-8), over all of the emotions. There were significant main effects for the subjects' ethnic group and the model ethnic group. The significant subject group effect ($F(1,50)=6.459, p < 0.01$) found
Pakeha subjects to be more accurate in their judgements of emotional expressions ($M = 4.00$) than the Maori subjects ($M = 2.96$). The model ethnic group was also significant ($F (1,50) = 7.595, p < 0.008$) indicating that the facial expressions of the Maori models were more often accurately identified ($M = 4.13$) than the expressions of the Pakeha models ($M = 3.00$).

However a 2-way interaction of subject ethnic group and model ethnic group failed to find any significant effects.\(^4\)

When subjects labeled an expression they also rated how confident they were of their answer for each emotion, an analysis of variance was conducted on the relationship between the model and subject ethnicity and their effect on the confidence levels. Significant main effects, for the neutral expression were found for the model group ($F (1,25) = 8.492, p < 0.01$), the subjects were more confident of their choices with the Maori models ($M = 4.50$) than the subjects with the Pakeha models were ($M = 3.82$) (despite the fact that recognition accuracy was the same).

The sadness expression had a significant borderline main effect for the subject ethnic group, ($F (1,13) = 4.339, p < 0.058$). The Pakeha subjects were not as confident about their judgements ($M = 3.50$) as the Maori subjects ($M = 4.43$) were for the response to the sadness expression.

Finally, the contempt expression had a significant main effect for model ethnic group, ($F (1,9) = 4.889, p < 0.05$), implying that subjects that looked at Pakeha models were more confident of their responses ($M = 4.25$) than those subjects looking at Maori models ($M = 3.11$). However figure 3 indicates that the subjects looking at Maori models were more accurate in the labeling of expressions than those subjects looking at Pakeha models.

There were no significant findings for the expressions of anger, fear, happiness, surprise and disgust.

\(^4\) Initially sex difference in recognition were tested using the t-test, but no significant effects were found, therefore gender was not included in the analysis of variance tests.
Study 2.

The subjects responses to each of the seven emotion eliciting situations were analysed. A binomial test was then carried out on the choices made to each situation, in order to assess whether the display rule expressions were significantly chosen. However, as the corresponding basic emotion was generally selected more often that the display rule expression a test for significance of difference between two proportions was carried out for each situation.

An analysis of variance was conducted on the total number of basic and display rule expressions, which corresponded to each of the situations, to investigate the overall effects of subject and model ethnicity. Another analysis of variance test was used to assess the relationship between subject and model ethnicity and its effect on the confidence ratings given for the matching of an expression (a basic or a display rule expression) to each of the situations.

Binomial Test

When a Binomial test was conducted (with the probability of chance matching being 1/15), the happiness, surprise, anger, fear and sadness display rule facial expressions were significant choices for the situations matching each of the above basic expressions. However, the disgust and contempt display rule expressions were not significant choices for their corresponding situations.

The basic emotional expressions, including disgust and contempt but excluding fear, were chosen with greater frequency than the display rule expressions (To investigate this further, a test for significant differences between two proportions was conducted, refer to the next section).

The fear situation was matched with both the basic expression of fear and its display rule counterpart, but only the latter was found to represent a significant match. The disgust situation was also significantly matched to the basic expression given in response to the situation, but the display rule disgust expression was not a significant match, and in its
place the choice of the basic expression of contempt was found to be significant (refer to Table 4).

Table 4

Binomial test for the matching of a basic or a display rule expression to each emotional situation.

<table>
<thead>
<tr>
<th>Emotion</th>
<th>Expression</th>
<th>Number</th>
<th>( P(x) )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correct</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surprise</td>
<td>Basic</td>
<td>22</td>
<td>( 1.3 \times 10^{-12} ) **</td>
</tr>
<tr>
<td></td>
<td>Display rule</td>
<td>10</td>
<td>( 2.0 \times 10^{-3} ) *</td>
</tr>
<tr>
<td>Fear</td>
<td>Basic</td>
<td>5</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>Display rule</td>
<td>7</td>
<td>0.04 *</td>
</tr>
<tr>
<td>Sadness</td>
<td>Basic</td>
<td>17</td>
<td>( 4.0 \times 10^{-8} ) **</td>
</tr>
<tr>
<td></td>
<td>Display rule</td>
<td>8</td>
<td>0.01 *</td>
</tr>
<tr>
<td>Happiness</td>
<td>Basic</td>
<td>24</td>
<td>( 1.2 \times 10^{-14} ) **</td>
</tr>
<tr>
<td></td>
<td>Display rule</td>
<td>15</td>
<td>( 1.4 \times 10^{-6} ) **</td>
</tr>
<tr>
<td>Disgust</td>
<td>Basic</td>
<td>9</td>
<td>( 6.4 \times 10^{-3} ) *</td>
</tr>
<tr>
<td></td>
<td>Display rule</td>
<td>3</td>
<td>0.22</td>
</tr>
<tr>
<td>Anger</td>
<td>Basic</td>
<td>8</td>
<td>0.01 *</td>
</tr>
<tr>
<td></td>
<td>Display rule</td>
<td>8</td>
<td>0.01 *</td>
</tr>
<tr>
<td>Contempt</td>
<td>Basic</td>
<td>12</td>
<td>( 1.5 \times 10^{-4} ) **</td>
</tr>
<tr>
<td></td>
<td>Display rule</td>
<td>2</td>
<td>0.17</td>
</tr>
</tbody>
</table>

* Significant at 0.05 level.

** Significant at 0.001 level.

The percentage of choices of the basic emotional expression and its display rule counterpart, which match each emotional situation, are given in figure 5.
Figure 5 Basic and display rule expressions and their matched situations

Test for significance of difference between two proportions.

A test for significant differences between two proportions was conducted for each situation using the proportion of responses that indicated a basic match and the proportion that indicated a display rules match. The chosen proportion was significantly greater for the basic than the display rule facial expressions for the situations of surprise, sadness, and contempt. However the happiness, disgust, fear and anger situations had no significant differences in the choices of their basic expressions and their corresponding display rule expressions (refer to table 5).
Table 5.

Z scores for differences between the proportion of choices of basic and display rule expressions for each emotional situation.

<table>
<thead>
<tr>
<th>Emotional Situation</th>
<th>Z score</th>
</tr>
</thead>
<tbody>
<tr>
<td>surprise</td>
<td>2.53 *</td>
</tr>
<tr>
<td>fear</td>
<td>0.61</td>
</tr>
<tr>
<td>sadness</td>
<td>2.06 *</td>
</tr>
<tr>
<td>happiness</td>
<td>1.80</td>
</tr>
<tr>
<td>disgust</td>
<td>1.83</td>
</tr>
<tr>
<td>anger</td>
<td>0</td>
</tr>
<tr>
<td>contempt</td>
<td>2.86 *</td>
</tr>
</tbody>
</table>

* significant at 0.05 level.

Matching situations with expressions.

The fear situation was matched with its basic emotion by 9.6% of the subjects and its display rules counterpart made up 13.5% of the responses. However 15.4% of the subjects tended to match the situation with the contempt display rules facial expression.

The responses to the disgust situation indicated the use of masking, as 26.6% of the subjects chose the contempt expression to match up with the situation, only 17% chose the disgust expression and 5.7% chose the display rules expression for disgust. Similarly the anger situation had a low response for the anger expression and its display rule expression, 14.8% each. However both the contempt and sad display rule expression were chosen by 16.7% of the subjects.

Lastly the contempt situation was matched to the contempt facial expression by 22%
of the subjects, though the display rule expression was only chosen by 3.8%. Both the
disgust display rule and anger display rules expressions were chosen to match the contempt
situation by 11.3% (each) of the subjects.

**Analysis of Variance.**

The results of an analysis of variance on the total target matching score for study 2
found no significant effects for subject ethnic group ($F (1,50) = 0.359, \text{ns}$ ) nor for model ethnic
group ($F (1,50) = 0.149, \text{ns}$ ) nor for a 2-way interaction ($F (1,50) = 0.007, \text{ns}$ ).

When subjects matched an expression to a situation they also had to rate how
confident they were that the expression was the best match for that situation. An analysis
of variance was carried out to see if there was any impact of the model and subject ethnicity
on the confidence levels for the correct choice for each situation.

In the sad situation a significant main effect for model ethnic group was found, ($F
(1,17) = 8.122, p < 0.01$). The subjects were more confident with the facial expressions of the
Maori models ($M = 4.47$) than those of the Pakeha models ($M = 3.29$). A significant 2nd
level effect indicated that this was particularly true for the Pakeha subjects ($F (1,17) =
9.205, p < 0.01$), ($M = 4.67, M = 2.35$).
Discussion

Overview of Results.

Study One.

The first hypothesis suggested that the recognition accuracy for subjects on all emotions should be above chance. The results show that all expressions, with the exception of fear, were recognized above chance levels. The expression of happiness and surprise were most often accurately recognized, with no differences between the subject groups. The literature (for example; Brunnori, Ladavas & Ricci Bitti 1979, Chan, 1985, Ekman et al., 1972, 1987; Ekman & Friesen, 1986, Izard, 1971, and Salzen, 1981) provides further evidence of high recognition rates of the expressions of happiness and surprise compared to the other primary emotional expressions. The neutral expression was the third most accurately recognized emotion, followed by the expressions of: contempt, sadness, disgust, anger, and fear. The fear expression has been reported to be judged with less accuracy than other emotions by many researchers. For example, Boucher and Carlson (1980) found that fear was judged with the least amount of accuracy; they also noted the difficulty the posers had in expressing fear.

In a study of emotional recognition of male prisoners in New Zealand, Wales (1988) found a pattern in recognition accuracy, similar to the present study. He reported the expression of happiness to be the most accurately recognized, followed by surprise, sadness, disgust, anger and fear. Unfortunately Wales did not analyse the effects of culture on recognition accuracy, furthermore, he used slides of emotional expressions posed by Americans. Therefore, few comparisons with the present study can be made. However, it is relevant to note the similarity in the order of accurate recognitions as this indicates a stable factor in the subjects ability to recognize specific emotions. Overall the pattern of recognition rates in this study was consistent with other investigators although the accuracy rates were somewhat lower.

Although each emotional expression was recognized accurately, there was substantial disagreement among subjects. The majority of subjects in each cultural group did not agree on
the emotion label for each expression. Agreements among subjects tended to remain below 50 percent for each expression. This shows that within as well as between subject groups, there was only moderate agreement on the correct emotion expressed in each photograph.

These results contradict those of Ekman and Friesen's (1986) study, in which facial expressions were found to be effective intercultural communicators. They found high agreement across subjects from ten different cultures, for the expressions of happiness (90 percent), surprise (85.8 percent), sadness (85.8 percent), fear (80.4 percent), contempt (75 percent), disgust (73.8 percent) and anger (73.8 percent). Boucher (1973), Ekman, (1972), and Izard (1971) also found high agreement, in the interpretations of emotional expressions, between and across subjects from different cultures.

Hypothesis two suggested that subjects would be more accurate when judging the expressions posed by models from the same culture, than the expressions posed by models from the other culture. Kilbridge and Yarcowzer (1983) found evidence of ethnic bias in the recognition of facial expressions by American and Zambian subjects. Although there was no evidence of ethnic bias in the analysis of total recognition scores, a bias trend was observed in the recognition of specific emotions. The expressions of sadness and disgust were judged correctly more often by Maori subjects judging Maori models than any other subject-model group. Maori subjects were also more accurate at recognizing the neutral expression, posed by Maori models. Ethnic bias was also observed when the Pakeha subjects accurately interpreted the expressions of neutrality, happiness, sadness, and surprise, when posed by Pakeha models. These data lend partial support to hypothesis two.

The Pakeha subjects were the most accurate judges of emotional expressions, overall. This could suggest that they are better interpreters of nonverbal information conveyed by facial expressions. However, the Pakeha models were not as able to communicate the emotions as effectively as the Maori models. Whose emotional expressions were accurately recognized most often by both subject groups. This trend was also reflected in the confidence ratings for the expression of neutrality. Subjects were more confident of the accuracy of their choices when tested with Maori models. The confidence ratings were able to detect this difference in recognition even though there was no difference in recognition accuracy between the two model
groups, for the neutral expression.

Hypothesis three stated that the subjects would be more confident judging expressions posed by members of their own culture and less confident of judging accurately the expressions posed by members of the other culture. However, the results failed to find an increase in confidence when accurate judgements were made of facial expressions posed by members of the same culture. Thus hypothesis three was not supported.

Only when the confidence ratings for individual emotional expressions were analysed did the model's or the subject's ethnicity have an effect. As mentioned previously, the subjects were more confident of judging the expression of neutrality when it was posed by Maori models, but were more confident of judging contempt when posed by Pakeha models. These results imply that the Maoris were better at communicating the neutral expression, while the Pakehas were better at communicating the contempt emotion. Other than the two effects described it seems that the confidence level was not determined by the models ethnic group.

The subject's ethnicity influenced the confidence with which the sad expression was accurately judged. The Maori subjects were, regardless of the model ethnicity, more confident of their interpretation of the sad expression, compared to the Pakeha subjects. The results suggest that the confidence ratings were sensitive measures of recognition for three expressions: neutral, contempt, and sadness. Relying solely on the judgement approach the differences observed in accuracy between subject and model ethnicity, would not have been evident. Thus there is evidence for the usefulness of confidence ratings at enhancing the sensitivity of judgement studies; however, further investigation is necessary to fully assess the usefulness of this approach.

In summary, the results for study one indicate that Pakeha subjects are better than Maori subjects at interpreting nonverbal information conveyed by facial expressions. Furthermore, the expressions posed by Maori models were more often interpreted correctly, implying that Maoris are better communicators of nonverbal emotional information.

At this stage one can not posit an explanation for the higher accuracy scores of Pakeha subject when interpreting facial expressions. However, from the results one might assume that Maori people are more expressive. Metge and Kinloch (1978) have noted the importance of
nonverbal communication within the Maori culture and the ability of the Maori people to effectively communicate and interpret nonverbal information. The facial expression has played (and still does) an important role in the traditional Maori customs, such as the welcoming ceremony. Thus the role of the facial expression as a communicator has remained salient within the culture.

Study Two

Hypothesis one puts forward the suggestion that the accurate matches of display rule expressions to the emotional situations should be above chance. The results showed the display rule expressions of happiness, surprise, anger, fear and sadness to be accurately selected at an above chance level. However, the situations of surprise, sadness, and contempt were matched more often with their own basic expressions, than with the display rule counterparts. Thus display rules did not appear to exert any consistent control over the subjects selection of emotional expressions. This may be due to a methodological problem; as all subjects were exposed to the display rules task after the basic recognition task, it is possible that a carry-over effect occurred. Subsequently, subjects may have concentrated more on recognition of emotional expressions, rather than considering the social context of the situation, including the operation of display rules.

When subjects matched the emotional situations of happiness, disgust, fear, and anger, differences in the choices of basic and display rule expressions were not found; both types of expressions were being assigned to the situations. It, therefore, can not be established, whether display rules were affecting the choice of expressions for the above situations or whether the basic emotion (indicated by the situation) had governed the choice of the facial expression.

Another problem in interpreting the influence of display rules relates to the issues of confusion and masking. Masking refers to the hiding of emotional feelings by showing different emotional facial expressions. Therefore when subjects chose a different emotional expression, from the stated emotion, masking was assumed to have occurred. Confusion occurs as a result of incorrect recognition of basic emotional expressions in study one. When subjects
had misjudged an expression in study one, the mislabelled expression was often used in study two, incorrectly. It could be suggested that masking effects were in operation, however the results of study one would show that the expression had been incorrectly labeled. For example, the results suggested that display rule management techniques were influencing the situations portraying the emotions of disgust and anger, as they were matched more often with the expression of contempt. However, when the results of study one were considered it was realized that the basic contempt expression had been confused with the emotional expressions for disgust and anger. It seems that the error in study one was carried into study two, so that subjects may have been matching the situations of disgust and anger with their corresponding expressions not with the contempt expression as implied by the results.

The fear and anger situations seemed to produce the greatest amount of social regulation. Both situations was matched more with display rule expressions, which deintensified and masked the basic emotion. However, the issues of confusion and masking must also be considered in thesetwo situations, as the subjects tended to match the situations with expressions of other emotions more, than with the respective basic expressions. The fear situation was matched with the contempt expression. Since recognition errors were not evident in study one, for the fear and contempt expressions it can be assumed that masking techniques affected the matching decision. The anger situation was matched with the sadness expression, which may have been chosen as a mask, this is supported by the lack of recognition errors associated with the anger and sad faces. Therefore it can be assumed that the matches were not a result of confusion in recognition, carried over from study one, but were instead affected by display rule techniques.

From the above observations it can be tentatively concluded that the negative emotional eliciting situations, impose more control over peoples expressions, than the positive emotional situations. For example the situation of happiness indicated that both the basic expression and the display rule expression, posed by the model for this situation, were chosen as appropriate expressions to show. Therefore it may be assumed that situations of happiness do not need to be controlled by display rules.

Friesen was one of the first researchers to observe the control exerted over negative
emotions, when he studied the effects of display rules in the Japanese and Americans. He found the Japanese subjects controlled their expressions more than the Americans, often by masking the negative expression with positive emotions. Scherer, Wallbott and Summerfield (1986) noted that the expressions of sadness, fear and anger were controlled more often than the expression of joy. Matsumoto, Kudoh, Scherer and Wallbott (1988) also found, with their questionnaire study, that the negative emotional expressions were controlled more than the positive expressions. Sadness, shame and guilt were associated with the greatest amount of social control, while expressions of fear, anger and disgust were controlled less and joy was the least controlled emotion (Matsumoto et al., 1988).

Hypothesis two stated that the subjects tested with models from their own culture should be more accurate at matching display rule expressions with their corresponding situations, than when tested with models from the other culture. The results do not support the hypothesis, there were no differences between subject groups nor were there differences associated with the ethnicity of the model. Matsumoto, et al. (1988) also found, a lack of cultural differences in the conscious regulation or control of emotional expressions by Japanese and American subjects. They suggested that the subjects may have lost conscious awareness of the operation of display rules, as they are usually learned early in life and therefore work automatically in adulthood. Nitt et al. (1981) also found difficulty in locating culturally based display rules, they noted that though the concept of display rules seems simple, the study of display rules can be complicated and at times elusive.

The present research has demonstrated few if any cultural differences in the perception of socially controlled facial expressions. However, this study has tested two cultures within the same country, other display rule studies have tended to compare the effect of display rules across countries, many of which are geographically isolated from each other. Furthermore, an important consideration with respect to this study, is the integration of the two racial groups.

Hypothesis three indicated that subjects would be more confident of the accurate matches of display rule expressions, posed by models from their own culture, with the corresponding situation than with models from the other culture. There were no significant
findings to support this hypothesis. Generally the use of confidence ratings were not able to provide any information regarding the effect of subject and model ethnicity upon the responses. However, an effect was found for the sadness situation, in which Pakeha subjects were more confident that they had matched the correct expression to the situation when the expression was posed by a Maori model. This suggests that the Pakeha subjects did not expect Maoris to control their facial expressions or mask their feelings. Unfortunately, this was the only significant finding, which refrains one from making conclusions regarding the presence of display rules and their effects.

The results of study two are difficult to interpret, mainly due to the number of choices of facial expressions available and due to carry-over effects. Subjects were able to choose from 15 photographs of facial expressions, an expression that would best match an emotional situation. Each situation had two corresponding emotional expressions, a basic expression which expressed the felt emotion and a display rule expression which showed a deintensified or intensified expression of the felt emotion. Therefore subjects could choose a facial expression which expressed the felt emotion or changed the intensity of the felt emotion. In addition subjects could choose expressions that masked the basic emotion by choosing a different emotional expression. Unfortunately this may have allowed errors from study one to be carried over to study two, which created some confusion. Furthermore, it was also possible that subjects were not making errors in recognition but were masking. The choice of different emotional expressions, from the two expressions (the basic and the display rule expressions) corresponding to each situation, were not statistically analysed, therefore it was not possible to assess whether display rule masking techniques did influence the subject's choice.

In summary, the results indicate that display rules are operating for certain emotional situations, however the lack of clear examples of display rule effects in the two cultures, suggests that further investigation is required.

Limitations of the present studies.

The small number of subjects detracted from the statistical significance of any trends in the data and limited the extent to which one could confidently generalize the findings.
Unfortunately a few of the subjects had difficulty with the tasks involved, especially the verbal components. Some subjects were therefore having problems comprehending the emotional categories in study one and the emotional situations in study two. Consequently, it was sometimes necessary for the category labels as well as the situations, to be read to the subjects. However, difficulty with the verbal requirements could still have affected the responses made. It is possible that the subjects who were most accurate, were better able to understand the task involved and the emotional labels and situation used. The results were not analysed to assess the verbal abilities of the subjects and the effect on accuracy.

A further limiting factor concerns the number of models and their ability to express emotions effectively. Only three models from each cultural group were used, therefore individual differences, as opposed to cultural differences, in the ability to express emotions could have affected the results. This might also account for the generally lower recognition rates reported in this study compared to the high rates observed in the literature.

Because of the low accuracy scores in study one, one can not be sure that the apparent choice of display rule expressions was due to the incorporation of display rules in the subjects decision or simply due to poor recognition. Subjects completed study one first and then immediately afterwards proceeded with study two. This procedure may have allowed responses in recognition from study one to be transferred to study two. If the subjects had misjudged the expressions in study one then this expression (which also appears in study two) may be mislabelled in study two, when it is used for matching with a particular situation. Errors, such as these, may account for some of the results in study two, for example, the misinterpretation of the expression of contempt as disgust could have affected the use of these expressions in study two.

Furthermore there may have been a carry over effect with regards to task orientation. When starting study two, after completing study one, subjects may have become primed for a recognition task. They would, therefore, have chosen the basic expressions more frequently than the display rule expressions, ignoring the social context of the situations. Future investigations may resolve this problem by increasing the time period between study one and two or by varying the presentation order of the two tasks.
The lack of display rule effects across cultures could have been due to the situations presented to both models and subjects. The emotional situations used may not have been able to elicit cultural display rules. Therefore future investigators of display rules should first pretest the situations used by asking subjects, from the cultures to be tested, what emotion they would feel in the particular situation and what emotional expression would be appropriate for the given situation. From this information they can ensure that the situations would be able to elicit different emotional expressions. This would be an important factor when testing two cultures that are as closely integrated as the Maori and Pakeha cultures.

Implications of Results of Study One and Two.

The results of the present studies found cultural differences in the accurate recognitions of facial expressions. Investigators have generally concentrated on the accuracy or lack of accuracy in recognition of expressions across cultures. Few have studied the variation between cultures in accuracy scores. Differences in accurate identifications have been ignored, even though they can provide information regarding the ability of expressions to communicate emotions in social interactions between cultures. For example, culture A may not be able to recognize the expressions of happiness in culture B as accurately as they can in their own culture, this could lead to problems in social interactions between the two cultures. Thus, the area of cultural variation in accurate recognition needs additional investigation, not only to identify the differences between cultures but also the reasons for these differences.

Both studies were able to show the importance of using a cross-over design to test each culture with models from the two cultures. This is an important methodological aspect of the study as it enables direct comparisons between the cultures - for the models as well as the subjects. Furthermore the design allowed for a realistic approach to the study of facial recognition, as often studies in the past have tested cultures with expressions posed by models from a different culture, as noted in the introduction.

The incorporation of confidence scales in the judgement study enabled subjects to rate how confident they were that their responses were accurate. By adding confidence ratings to the category task, it was shown that a more precise and sensitive measure of the effectiveness
of facial expressions, as cross-cultural communicators, was obtained. The measure allowed cultural variation to be assessed in accuracy scores of subjects according to the ethnicity of both the subject and model.

Conclusions.

Due to the nature of the experimental findings few general conclusions can be drawn. However a significant accomplishment has been to highlight the importance of an experimental design that allows direct comparisons between subject and model groups. Also the inclusion of confidence ratings allowed for a more sensitive measure of subtle cultural differences that previously may not have been tapped.

The results indicate the need for an awareness of cultural differences in nonverbal communication. Further research is necessary to point out the differences as well as the similarities between cultures in their use of nonverbal behaviour for communication. From there it may be possible to acknowledge and solve problems in intercultural communication.
References.


evidence for a theory. Perceptual and Motor Skills. 18 (1), 119-158.


LIST OF APPENDICES

APPENDIX A  Book One
APPENDIX B  Book One Answer Sheet
APPENDIX C  Book Two
APPENDIX D  Book Two Instructions and Answer Sheet
INSTRUCTIONS.

Read this handout right through; making sure you understand the instructions, then look through the photographs of male students expressing different emotions.

Your task is to identify the emotion that is expressed on the face of each student. To do this you will first look at each of the photographs, and then for each one find an emotional term that best represents the expression shown, by choosing from the list of emotions on the Answer sheet.

There are more emotional terms than there are photographs, so don't worry if you can not match all of the emotional terms to all of the photographs. Furthermore, you may use the same emotional term more than once.

When you have made your choice, indicate it by ticking the appropriate box. Then on the scale below rate how confident you are that you have made the right choice. Choose a number from 1 to 5. 1 indicating a lack of confidence and 5 indicating a high degree of confidence.

Please complete all of the questions.

**Example only:**

Face A.

What emotion is expressed by face A?
Please select from the list of emotions given.

- anger
- contempt
- disgust
exhaustion  
fear 
happiness  
sadness  
surprise  
humiliation  
neutral  
pity  

(If you make a mistake and want to change your choice, then cross out the wrong answer and tick the correct box.)

Using the scale below indicate the level of confidence with which you made the choice of emotion for the above facial expression.

1 2 3 4 5
very little a lot of confidence.

1 indicates no confidence or very little confidence, 5 indicates a lot of or a high degree of confidence.
1) What emotion is expressed by face No. 1?
   Please select from the list of emotions given below.
   anger  ☐
   contempt  ☐
   disgust  ☐
   exhaustion  ☐
   fear  ☐
   happiness  ☐
   sadness  ☐
   surprise  ☐
   humiliation  ☐
   neutral  ☐
   pity  ☐

   Using the scale below indicate the level of confidence with which
   you made the choice of emotion for the above facial expression.

   1  2  3  4  5
   very little confidence  a lot of confidence

   1 indicates no confidence or very little confidence,
   5 indicates a lot of or a high degree of confidence.

2) What emotion is expressed by face No. 2?
   Please select from the list of emotions given below.
   anger  ☐
   contempt  ☐
   disgust  ☐
   exhaustion  ☐
   fear  ☐
   happiness  ☐
   sadness  ☐
surprise
humiliation
neutral
pity

Using the scale below indicate the level of confidence with which you made the choice of emotion for the above facial expression.

1 2 3 4 5
very little confidence a lot of confidence

1 indicates no confidence or very little confidence,
5 indicates a lot of or a high degree of confidence.

3) What emotion is expressed by face No. 3?
Please select from the list of emotions given below.

anger
contempt
disgust
exhaustion
fear
happiness
sadness
surprise
humiliation
neutral
pity

Using the scale below indicate the level of confidence with which you made the choice of emotion for the above facial expression.

1 2 3 4 5
very little confidence a lot of confidence
4) What emotion is expressed by face No. 4?
Please select from the list of emotions given below.

anger
contempt
disgust
exhaustion
fear
happiness
sadness
surprise
humiliation
neutral
pity

Using the scale below indicate the level of confidence with which you made the choice of emotion for the above facial expression.

\[
\begin{array}{c c c c c}
1 & 2 & 3 & 4 & 5 \\
very little & a lot of & confidence & confidence \\
\end{array}
\]

1 indicates no confidence or very little confidence, 5 indicates a lot of or a high degree of confidence.

5) What emotion is expressed by face No. 5?
Please select from the list of emotions given below.

anger
contempt
disgust
exhaustion
fear
happiness
sadness
surprise
humiliation
neutral
pity

Using the scale below indicate the level of confidence with which you made the choice of emotion for the above facial expression.

1  2  3  4  5
very little confidence  a lot of confidence

1 indicates no confidence or very little confidence, 5 indicates a lot of or a high degree of confidence.

6) What emotion is expressed by face No. 6?
Please select from the list of emotions given below.

anger
contempt
disgust
exhaustion
fear
happiness
sadness
surprise
humiliation
neutral
pity

Using the scale below indicate the level of confidence with which you made the choice of emotion for the above facial expression.
7) What emotion is expressed by face No. 7?
Please select from the list of emotions given below.

anger
contempt
disgust
exhaustion
fear
happiness
sadness
surprise
humiliation
neutral
pity

Using the scale below indicate the level of confidence with which you made the choice of emotion for the above facial expression.

very little 1 2 3 4 5 a lot of confidence

1 indicates no confidence or very little confidence, 5 indicates a lot of or a high degree of confidence.

8) What emotion is expressed by face No. 8?
Please select from the list of emotions given below.

anger
contempt
disgust
exhaustion
fear
happiness
sadness
surprise
humiliation
neutral
pity

Using the scale below indicate the level of confidence with which you made the choice of emotion for the above facial expression.

1 2 3 4 5
very little confidence a lot of confidence

1 indicates no confidence or very little confidence, 5 indicates a lot of or a high degree of confidence.
APPENDIX D

BOOK TWO
INSTRUCTIONS
AND
ANSWER SHEET
INSTRUCTIONS

In this book you will find photographs of male students, posing facial expressions of various emotions. Look through this book so that you are familiar with the photographs. Then read all of the stories that are presented in the answer sheet. When you have finished reading the stories, see if you can match up each story with a photograph.

Imagine the main character in the story, decide which facial expression that character would show in that particular situation. Then pick a photograph, that best represents the facial expression that you think the character in the story would show. Once this is done, fill in the confidence scale below each story, this will show how confident you are that the facial expression chosen best matches the story.

You may use the same photograph more than once.

Please note that the characters in the stories are labelled with letters from the alphabet.

For example,

T was working at the local hamburger bar when, in front of everyone, his boss yelled at him for serving sloppy burgers. He feels embarrassed, as all the customers and the staff heard the boss yelling at him.

What facial expression would T show towards his fellow staff members and to the customers. Find the photograph with the facial expression that best fits with this story.

Please write in the space provided the number of the photograph, which has the best emotional expression for this story.

No. ________

Using the scale below indicate the level of confidence with which you made the choice of the facial expression represented in the above photograph.

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Please complete all the questions. Thank you for participating in this study.

T was having a good time at the night club, however when he saw his teacher there, also having fun, he was surprised.

What facial expression do you think T would show to his teacher, at the nightclub? Find the photograph with the facial expression that would be appropriate for this story.

Please write (in the space provided) the number of the photograph, which has the best emotional expression for this story.

No. _____

How confident are you that this is the most appropriate facial expression for this story? Using the scale below, indicate your confidence level.

| 1 | 2 | 3 | 4 | 5 |

The local hospital has come to tech. to collect blood, T’s class has to donate blood, but while T is waiting for his turn to give blood he begins to feel frightened as he watches the nurse taking some blood from a friend. T is next in line, he feels frightened.

What facial expression would T show towards his classmates? Find the photograph with the facial expression that would be appropriate for this story.

Please write (in the space provided) the number of the photograph, which has the best emotional expression for this story.

No. _____
How confident are you that this is the most appropriate facial expression for this story? Using the scale below, indicate your confidence level.

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_T has just asked the most "attractive" girl in polytech out to the pictures. When she says yes he feels happy._

What facial expression would T show the girl? Find the photograph with the facial expression that would be appropriate for this story.

Please write (in the space provided) the number of the photograph, which has the best emotional expression for this story.

No. _____

How confident are you that this is the most appropriate facial expression for this story? Using the scale below, indicate your confidence level.

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_T is in wellington, at his best friends funeral, there are a lot of relations and close friends there. T does not know anyone there as he met his friend in Christchurch. T is feeling sad._

What facial expression would T show in front of the family? Find the photograph with the facial expression that would be appropriate for this story.

Please write (in the space provided) the number of the photograph, which has the best emotional expression for this story.

No. _____
How confident are you that this is the most appropriate facial expression for this story? Using the scale below, indicate your confidence level.

\[
\begin{array}{cccccc}
1 & 2 & 3 & 4 & 5
\end{array}
\]

T is having a meal with his girlfriend's family, for the first time, but he feels disgusted when he finds out that the main course happens to be a dish made up of over cooked cabbage. T hates cabbage and usually avoids eating it. T feels disgusted.

What facial expression would T show towards his girlfriend's family? Find the photograph with the facial expression that would be appropriate for this story.

Please write (in the space provided) the number of the photograph, which has the best emotional expression for this story.

No. ____

How confident are you that this is the most appropriate facial expression for this story? Using the scale below, indicate your confidence level.

\[
\begin{array}{cccccc}
1 & 2 & 3 & 4 & 5
\end{array}
\]

T's teacher is about to go to town, when she finds out that T wants to go to town too, she offers to give him a lift. However T has to wait for 20 minutes before the teacher is finally ready, so that T is now late for an appointment. T feels angry.

What facial expression would T show his teacher? Find the photograph with the facial expression that would be appropriate for this story.

Please write (in the space provided) the number of the photograph, which has the best emotional expression for this story.

No. ____
How confident are you that this is the most appropriate facial expression for this story? Using the scale below, indicate your confidence level.

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_T and his friend are talking about what they will do now that they have finished their polytech courses. T is going to start looking for a job, his friend been offered a job, but he has decided not to work and instead is quite content to go on the dole. T thinks that he is doing the right thing by looking for a job but he feels contempt for his friend for not wanting to work._

What facial expression would T show his friend? Find the photograph with the facial expression that would be appropriate for this story.

Please write (in the space provided) the number of the photograph, which has the best emotional expression for this story.

No. _____

How confident are you that this is the most appropriate facial expression for this story? Using the scale below, indicate your confidence level.

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