DOCUMENT RESUME

ED 290 122 CG 020 495

AUTHOR Buck, Ross; Teng, Wan-Cheng
TITLE Spontaneous Emotional Communication and Social Biofeedback: A Cross-Cultural Study of Emotional Expression and Communication in Chinese and Taiwanese Students.
PUB DATE 30 Aug 87
NOTE 31p.; Paper presented at the Annual Convention of the American Psychological Association (95th, New York, NY, August 28-September 1, 1987).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Affective Behavior; *Body Language; College Students; *Cultural Differences; *Emotional Response; *Facial Expressions; Foreign Students; Higher Education; Nonverbal Communication; Sex Differences
IDENTIFIERS *Chinese People; *Taiwanese

ABSTRACT

Different cultures develop different rules of emotional expression and communication which may have important consequences within the culture and which may impose barriers to communication between cultures. A study was conducted to examine this issue. Emotionally-loaded color slides were shown to 44 college students from Taiwan and the People's Republic of China (PRC) who were attending college in the United States. Subjects' facial and gestural responses were videotaped. Later, and with their permission, the videotaped sequences were observed by the same Chinese students and also by 20 American students who attempted to determine the kind of slide presented from the facial/gestural reactions. Results indicated that the sex difference in sending accuracy usually found in Western students (with females being more expressive) did not occur in Chinese students. The usual finding of female superiority in receiving ability was, however, also found in the Chinese subjects. The students from Taiwan showed significantly greater sending accuracy than did students from the PRC, but there was no difference in receiving ability between these groups. There was no evidence that communication within a culture or group is more efficient than communication between cultures or groups in this data, and there was no evidence that cultural contact enhances spontaneous communication. (Author/NB)

Spontaneous emotional communication and social biofeedback: A cross-cultural study of emotional expression and communication in Chinese and Taiwanese students

Ross Buck and Wan-Cheng Teng

University of Connecticut

Symposium on Social and Biological Influences on Expressivity

American Psychological Association Convention, New York,

August 30, 1987.

ABSTRACT

Spontaneous emotional communication was measured in

Emotionally-loaded color slides were shown to 44 students from Taiwan (24) and the People's Republic of China (20) while, unknown to them, their facial and gestural responses were recorded by a hidden video camera. Later and with their permission, the videotaped sequences were observed by the same Chinese students and also by 20 American students, who attempted to guess the kind of slide presented from the facial/gestural reactions. Results indicated that the sex difference in sending accuracy usually found in Western students (with females more expressive) did not occur in Chinese students. The usual finding of female superiority in receiving ability was, however, also found in the Chinese. The students from Taiwan showed significantly greater sending accuracy than did students from the PRC, but there was no difference in receiving ability between these groups. There was no evidence that communication within a culture or group is more efficient than communication between cultures or groups in this data, and there was no evidence that cultural contact enhances spontaneous communication.

INTRODUCTION

Different cultures develop different rules of emotional expression and communication which both may have important consequences within the culture and impose important barriers to communication between cultures. On one hand, there is evidence that the encouragement or inhibition of spontaneous emotional expression may have consequences for the ability of the individual to adapt to stress (Buck, 1984). Persons who spontaneously express their feelings (within limits) are able to deal with emotionally-laden situations openly and with the knowledge and potential support of others, while persons who are not expressive are denied such outlets. Perhaps as a consequence, nonexpressive persons often show evidence of an "internalizing" pattern of expression with greater evidence of physiological stress responses. Also, the particular pattern of emotional expression encouraged within one culture may differ from that encouraged within another. Edward Hall (1966) suggested the example of a conversation between a person used to close personal spacing and one used to greater distances. The former may repeatedly advance toward the latter, who repeatedly retreats, so that the two proceed unknowingly across the room. Such a situation may produce negative attributions in persons of good will which have no basis in fact: the first individual may leave the conversation furious at the coldness of the second, while the second may think the first pushy and intrusive. Each attribution may be accurate if applied within tne respective cultures, but mistaken when applied between cultures. The bases of such attributions are so subtle

that they are often overlooked, even though the negative emotional reaction may be strong.

The Social Biofeedback Process.

A consideration of the process by which cultural rules of emotional expression and communication are fostered and maintained suggests that these rules may be critical both to the bioregulation of the individual and to the very nature and quality of a culture. At the individual level, rules which allow the spontaneous expression of emotion should encourage a process of learning to understand and label subjectively experienced feelings and desires (emotions and motives) in a natural social biofeedback process in which the subject learns about the subjective aspects of his or her own feelings and desires via feedback from other persons. In biofeedback, "the subject discovers the relationship of some aspect of his (or her) consciousness or subjective awareness to that aspect of his (or her) physiological activity indicated by the feedback signal" (Kamiya, 1971). I suggest that much of the importance of spontaneous emotional expression in the life of the individual revolves around the fact that such expression makes certain physiologically-based activities accessible to other persons. It therefore makes possible a natural social biofeedback process, and such feedback may foster ways of coping with emotional events in an overt and open manner.

There is evidence from many sources that the spontaneous expressiveness of an individual has important social and personal consequences (see for example Sabatelli, Buck & Kenny, 1987). The

nature of these consequences depends of course in great part upon the specific sort of emotion that is being openly expressed: i.e. whether it is prosocial or antisocial; affiliative or aggressive. At the personal level, Friedman, Hall & Harris (1985) have discussed the complex relationships between emotional expressiveness, hostility, and cardiovascular disease. At the social level, the nature of the feelings and desires allowed expression within a culture as opposed to those inhibited by the culture must determine much about the quality and ambiance of that culture. Both by the social biofeedback process and by the provision of social models (Bandura & Walters, 1963), a given culture tends to emphasize the importance of some feelings and desires and deny the importance or even the existence of others. Thus, a society may teach its young people to discriminate many sorts of anger and aggressive behavior just as Eskimos are taught to differentiate many sorts of snow; and such a culture would likely encourage the open expression of aggression. In one of the very few studies done in this area, McClelland (1961) presented evidence that the encouragement of achievement in a culture is followed in time by increased economic activity in that culture.

Despite its undeniable importance, the nature of the differences between cultures in their rules of emotional expression have been little studied. There are many difficulties with such research, not the least of which are the very definitions of "culture" and "emotion." The relationship between cultural rules and the behavior of an individual are unclear, as is the relationship between the emotional state of a person and

his or her expressive behavior. If some members of a given culture are relatively inexpressive in a certain situation, does that mean that they are following a cultural rule specifying a lack of expression or is their behavior specific to that situation? Also, is it because they are less expressive or simply less emotionally responsive in that particular emotional situation? Perhaps most important, just who can be considered to constitute a reliable sample of persons from a "culture"?

The Present Study.

Despite the difficulties, the importance of cultural differences in the rules of emotional expression dictates that we must begin somewhere in the study of this issue. The present paper reports the results of a study of students from Taiwan and the People's Republic of China (PRC) who were pursuing studies at the University of Connecticut. Emotional expression and communication were measured with a slide-viewing paradigm in which "sender" subjects view a series of emotionally-loaded color slides while (unknown to them) their facial/gestural responses are videotaped. Other subjects ("receivers") later view the senders and attempt to guess what kind of slide the sender was watching on each trial. The ability correctly to guess the slide-type depends both on the expressiveness of the sender ("sending accuracy") and the receiver's ability to respond correctly to such expressions ("receiving ability").

The choice of the People's Republic of China and of Taiwan for the cultures in this study were dictated partly by circumstance:

the large number (over 200) of students from these cultures at the time of the study and the interest of an researcher from Taiwan (Wan-Cheng Teng) in the project. However, there are reasons why these groups are particularly interesting in a study of cross-cultural communication. These students come from a common culture in the sense that they both are affected by the ancient 5000-year-old Chinese culture, but they are from groups that have been politically divided throughout the lives of virtually all of the students and that have followed very different patterns of national development. As a consequence, any difference that is found in common between these groups and persons from other cultures (i.e. Western cultures) may be tentatively attributed to the rules of the Chinese culture itself; while differences between these groups may be tentatively attributed to the differences in national policy between the People's Republic and Taiwan since their division in 1948. It is important to stress the term tentatively here, because there are many factors that might affect the results of the present study that cannot be attributed to these factors. Among these is the fact that the individuals from both of these groups, being students in the United States, differ in many ways from their compatriots at home. Another is the fact that the two nations have had very different histories in their relationships with the United States, and that the experimenter is from Taiwan.

The Slide-Viewing Technique.

The slide-viewing technique has been employed in many studies

using Western samples, and a general pattern of emotional response and communication has emerged (see Buck, 1979 and 1984 for reviews). First, there are substantial individual differences in expressiveness to the slides in both adults and preschool children. Tiffany Field's studies of the expressiveness of newborns suggests that these individual differences in expressiveness are present at birth, and may reflect a basic dimension of temperament (Field & Walden, 1981). Second, all studies suggest that adult females are substantially more expressive than adult males, resulting in higher communication scores for female than male senders. The communication scores include both the Percent Correct measure (involving the percent of slides correctly categorized) and the Pleasantness measure (involving the correlation between the sender's rating of how pleasant she or he felt about each slide, and the receiver's rating of how pleasant the sender felt). Third, there is evidence that females are also better receivers than males (Hall, 1978; Rosenthal et al., 1972), although with spontaneous expression this difference is not as large as the sex difference in sending accuracy and it does not always reach statistical significance. Fourth, relative to poor senders, more expressive senders show evidence of having <u>smaller</u> sympathetic nervous system responses to the slides (measured by the number of skin conductance responses and heart rate acceleration in response to the slides). The latter finding is also consistent with Field's observations of newborns, and with the distinction between "externalizing" and "internalizing" modes of response to emotion (Jones, 1935; 1960).

Adult females tend to show externalizing modes of response to the slides, while males tend to show internalizing patterns of reaction.

Design.

The present study attempted to compensate in part for the acknowledged difficulties in gathering large samples of persons from the Peoples' Republic and Taiwan by a "round-robin" design in which each sender also serves as a receiver (Kenny, 19xx). Thus one can directly compare the ability of the same group of (for example) Taiwanese senders to communicate with Taiwanese, PRC, and American receivers. This allows the comparison of the communication accuracy of students from Taiwan and the Peoples' Republic not only to their compatriots, but also vis a vis one another and to a third, non-Chinese, group.

Hypotheses.

There are a number of tentative hypotheses that can be explored in the present study. One concerns the generality of the sex difference in sending accuracy and receiving ability found in Western samples. There is some evidence that Chinese females may not be as encouraged as are Western females to be expressive relative to males. In the old Chinese book of advice, Required Studies for Women, there appear such warnings as "Do not show your unhappiness easily and do not smile easily," and "Do not show your teeth when you smile" (Klineberg, 1938). In contrast, there appears to be no reason to expect that Chinese females would be

less competent in receiving ability vis a vis males.

Another tentative hypothesis concerns the difference between the expressiveness of subjects from Taiwan vs. the People's Republic of China: due to political differences over the past 40 years, the People's Republic has remained a relatively closed society with, for example, much less access to information from the outside world and less access to electronic media in general. Also, persons growing up in the People's Republic of China have likely experienced a greater emphasis upon conformity and a lessened allowance of individual expression compared with persons growing up on Taiwan These constitute reasons why one might expect lessened expressiveness on the part of students from the People's Republic compared with those from Taiwan.

A third source of hypotheses concerns the difference between within-group and between-group communication. One would expect that, everything being equal, communication between members of the same group would be more efficient than that between members of different groups. Also, one would expect that a person with more experience with a group other than his or her own would be more efficient in communicating with that group In this regard, it should be noted that the Chinese students at the University of Connecticut do tend to know one another, and this familiarity might alter the expected pattern of within- and between-group differences. Nevertheless, one would still expect that the American students should have more difficulty as receivers, both because of the cultural difference and because the American

students are not normally familiar with the Chinese students.

METHODS

Subjects.

A total of 68 subjects participated in this experiment, including 24 (12 males and 12 females) from Taiwan, 24 (12 males and 12 females) from the People's Republic of China, and 20 (10 males and 10 females) from the United States. All subjects were students at the University of Connecticut in Storrs. Three female and one male subject from the People's Republic did not approve the use of their videotapes images in the study, and were dropped from subsequent analysis. The remaining Chinese subjects served as both senders and receivers and were paid $10.00 for participation. American subjects were given course credit and $2.00 for participation.

Procedure.

Sending session. Subjects were called by the experimenter (Wan-Cheng Teng) to schedule laboratory appointments. The call and all instructions were presented in the Chinese language. Upon arrival at the laboratory the subject was asked to sit in a chair facing a 30X30 cm. back-lighted projection screen and a Carousel slide projector. Directly under the screen was a box built to resemble a loudspeaker cabinet concealing (in addition to the speaker) a television camera linked to a Sony U-Matic 3/4" video cassette recorder.

The experimenter explained that instructions would be presented over the loudspeaker, entered a separate room, closed the door, and activated a tape recorder containing standard instructions. Subjects were told that the purpose of the study was to measure their subjective report of their emotional experience: that they would see a series of slides, and that after each was presented they should look at it until a signal light came on. At that point they should describe the emotional experience they had while looking at the slide. After the light and slide were turned off, the subjects were instructed to rate their emotional experience to the slide along a series of scales derived from Ekman and Friesen's (1975) primary affects and Izard's (1977) differential emotions scale. The verbal description of the scales ranged from "not at all" to "very" happy, sad, afraid, angry, surprised, and disgusted; and they were supplemented by cartoon-like drawings of faces that illustrated the facial configurations found by Ekman and Friesen (1975) to be universally associated with these affects.

From the other room, the experimenter then presented a series of ten emotionally-loaded color slides to the subject by remote control. The slides included two in each of the following content categories: sexual slides showing nude males with females, scenic slides showing pleasant landscapes, unpleasant slides depicting severe burns and facial injuries, unusual slides showing strange photographic effects, and familiar people slides showing persons familiar to the subjects. The latter were happy scenes including the experimenter herself, a female graduate student from Taiwan

who was the President of the Chinese Association on campus, and a female graduate student from the People's Republic of China. (1) Two orderings of slides were used, both based upon randomly selected Latin Squares.

After a slide came on, the subject watched silently for 10 seconds. After this, the signal light came on and the subject verbally described his or her emotional experience to the slide for approximately 15 seconds. The light and slide were then turned off, and the subject rated his or her reaction. After the ten slides, the subjects filled out a questionnaire (in English) relating to their experience with the other Chinese group as well as with the American culture.

Unknown to the subject, his or her facial/gestural responses to the slide were videotaped. The videotapes were then edited so that the initial silent period of five of the slides for each subject was reproduced on a new videocassette. The two slide orderings were used so that a single ordering--which might become apparent to receivers--was avoided. After all subjects were run, each was contacted by the experimenter, the presence of the camera revealed and the experiment explained in full, and permission to use the videotaped images was secured. As related previously, four subjects refused to give their permission.

Receiving session. The two receiving sessions were conducted in a large room in the University library designed for group presentations. In all, 44 Chinese and 20 American receivers viewed the initial (10-second) silent portion of the responses to

five slides on the part of the 44 Chinese senders: 220 sequences in all. For each, they attempted to guess which of the five slide categories had been presented. There was necessarily little time between sequences to think about an answer, and the number of each sequence was called out loudly so that subjects did not become lost. (2)

Following this, the receivers viewed the Communication of Affect Receiving Ability Test (CARAT) which includes 32 sequences showing the reactions of American students to Sexual, Scenic, Unpleasant, and Unusual slides (Buck, 1976). The CARAT sequences include a 10-second period when the sender is discussing his or her response to the slide (albeit without audio), and they therefore are longer (23 seconds). Also, there is more time between sequences on the CARAT test than could be allowed between the sequences showing the Chinese senders. (3)

Measures.

Sending accuracy. In this study, the expressions of 44 Chinese and 32 American (on CARAT) senders were judged by the same group of 44 Chinese and a different group of 20 American receivers. Sending accuracy is the communication accuracy of a given sender averaged across receivers, as measured by the proportion of slides that the receivers are able to correctly categorize. This can be expressed as a percentage and evaluated by Chi-square tests. Because the meaning of the percentage varies according to whether four or five slide categories are used (chance is 25% in the former case and 20% in the latter), it is often useful to express

communication accuracy in terms of z scores, which directly express the significance of the accuracy of a single sender, or group of senders, as evaluated by Binomial tests. In this way, every sender including Taiwanese females (TF) and males (TM), females and males from the People's Republic of China (PF and PM respectively), and females and males from the United States (USF and USM respectively) has six percentages and z scores corresponding to the accuracy of the six groups in judging his or her expressions. From this, the mean percentage and z score for each group (TF, TM, PF, PM, USF, USM) were computed.

Receiving ability. The measures of receiving ability are the same as the measures of sending accuracy, except that they are computed for each receiver across senders.

Cross-cultural experience. A 33-item questionnaire was constructed to assess the amount of experience the subject has had with the American culture and the Chinese group other than his or her own. The questionnaire assessed several factors, including experience with the other culture (E), language ability (LA), media exposure (M), living style (LS), social life (S), and understanding of American popular culture (A).

RESULTS

Sending Accuracy.

The mean sending accuracy in the Chinese groups is given in Table 1. Chi-square tests indicated significant overall sending accuracy in all groups, although the level of significance for the

PRC females was relatively low.

Insert Table 1 about here.

Figure 1 presents communication accuracy expressed in z scores, collapsed over sex of receiver. With Table 1, it shows a tendency for males to be more accurate senders, although this did not attain statistical significance (t = 0.842, p = 0.404). Figure 1 also illustrates that the Taiwanese subjects showed a higher level of sending accuracy than did subjects from the PRC (t = 2.546, p = 0.015).

Insert Figure 1 about here.

Receiving ability.

The mean receiving ability scores, collapsed over sex of sender, are given in Figure 2. It illustrates a significant sex difference, with females from all cultures showing greater receiving ability (overall t = 2.223, p =.032). There was no significant difference between subjects from Taiwan and the PRC in receiving ability (t = 0.529, p = .600).

Insert Figure 2 about here.

Culture and Spontaneous Communication.

There was no evidence that communication within cultures was

superior to communication between cultures. The percent of slides correctly categorized for the Taiwanese senders by Taiwanese, PRC, and American receivers respectively was 26.92%, 27.36%, and 27.20%. The corresponding figures for PRC senders was 22.53%, 22.00%, and 23.78%. Inspection of the relationships between self-reported cultural contact and communication scores revealed no evidence that cultural experience was related to communication accuracy.

DISCUSSION

Sending Accuracy.

Sex differences. In studies with Western subjects, there has been a strong tendency for females to be more accurate senders than males (Buck, 1984). This was not the case in the present study: in contrast, the percent correct measure of communication accuracy was higher for males than for females, albeit not significantly so. This suggests that the basis of gender differences in sending accuracy lies in culturally variable social learning rather than biological differences between the sexes. This is consistent with the finding that the greater sending accuracy of Western females tends to be weaker in preschoolers than in adults (Buck, 1975); and with the notion that there is a relatively greater emphasis upon the control of emotional expression in females than males in Chinese culture as compared with Western culture.

It should however be noted that, as stated in Footnote 2, the measure of communication accuracy used in this study was not as

direct as the Pleasantness Measure or its primary affect equivalents. It is possible therefore that the female subjects in this study were more expressive than they appeared, but that receivers misidentified the slides that caused their expressions. For example, it is possible that Chinese receivers expected females to have negative reactions to sexual slides; but that in fact they generally had positive, amused responses. If the receiver correctly saw that a female had a negative reaction to a slide, he or she could have chosen the sexual category when in fact the slide was unpleasant. Accurate communication would have taken place in that the receiver did indeed know that the sender's reaction was negative, but it would appear as incorrect on the Percent Correct measure. This issue will be addressed in future analyses investigating the patterns of communication accuracy across slide categories, and showing the videotaped expressions to new groups of receivers who will make Primary Affect as well as Slide Category judgements.

Group differences. The students from Taiwan were significantly higher in sending accuracy than the students from the People's Republic of China. This difference persisted regardless of the cultural or group membership of the receiver.

This is an interesting and theoretically significant finding, for one of the goals of this study was to examine the expressiveness on individuals from the same basic culture, but who have lived their lives in nations which are separated from one another politically and ideologically and which emphasize quite

different life-styles and values. A possible explanation for the present finding therefore is that the life style on Taiwan encourages greater spontaneous emotional expressiveness than the life style in the People's Republic. For example, the greater access to the worldwide mass media and/or the greater emphasis upon individuality and lesser emphasis upon conformity may encourage greater spontaneous expressiveness in Taiwan as compared to the People's Republic of China.

It should be noted however that there are alternative explanations for the greater expressiveness of the Taiwanese in this study. Specifically, there are aspects of this experimental situation--the experimenter was from Taiwan, and relations between Taiwan and the United States have always been cordial--that might have acted to make the Taiwanese students less defensive and inhibited in this situation. More research is needed to examine the basis of the group difference in spontaneous expression found in this study.

Receiving ability.

Receiving ability was higher in females than males, regardless of group or culture. This is in agreement with the general finding or higher receiving ability in females as compared to males (Hall, 1978). In contrast with the data on sending accuracy, there is no evidence in this data that the sex difference in receiving ability might be based upon social learning.

Culture and Spontaneous Communication.

This study found no evidence that spontaneous communication is more accurate within one's cultural group than it is between cultures, even when, as in this case, the sender is personally acquainted with receivers from his or her own culture and a stranger to those (the American students) from the other culture. Although it is risky to draw conclusions from findings of no difference, this is consistent with the notion derived from Gibsonian perceptual theory that spontaneous communication is based upon sending and receiving tendencies that are innate to the human species (Buck, 1983, 1984, in press). The spontaneous displays in this view constitute social affordances: simply by observing the display, the receiver is directly aware of the emotional state of the sender because the sender has been biologically prepared to spontaneously display the emotional state and the receiver has been biologically prepared know directly its meaning. This knowledge is conferred by inheritance, and is universal to the human species (Buck, 1984, in press).

Implications.

The results of this study have important implications regarding the nature of social and biological influences upon emotional expression and communication. First, in regard to the common finding that females are more expressive than males, these results suggest that this phenomenon may be culturally bound and therefore caused by social learning influences. It is important to caution however that this should be considered to be tentative until other

kinds of communication measures are explored. The relatively low communication accuracy among females in this study may be in the judgments of the receivers rather than the expressions of the senders.

The substantial difference in expressiveness between the students from Taiwan and the PRC must also be treated with caution, but if found to be reliable it has very important implications. It suggests the possibility that political and social changes taking place within a few generations can profoundly affect the spontaneous emotional expressiveness of the population of a nation, with far-reaching personal and cultural consequences.

Whereas sending accuracy appeared to be quite subject to social influence in the results of this study, receiving ability did not. The patterns of receiving ability for subjects from Taiwan, the PRC, and the US were remarkably similar, with a female advantage in each case. Also, communication accuracy seemed little affected by culture or cultural contact. Communication accuracy thus appeared to be largely stimulus-driven, so that if the sender was expressive, receivers could "pick up" the appropriate affect regardless of their own culture, cultural experience, or even personal knowledge of the sender. This is consistent with a Gibsonian view of receiving ability, in which the display is considered to be automatically "decodable" if one attends to it (Buck, 1983; 1984; in press).

Finally, a plea must be made for more cross-cultural studies of emotional communication. Despite the acknowledged difficulties of sampling and definition, such studies cast a light on the process of emotional communication from a unique perspective, providing a kind of illumination that cannot be duplicated in other sorts of designs.

FOOTNOTES

1. The authors thank Grace Chang and Wang Jue for their cooperation in this and other aspects of this study.

2. Because of the short time between sequences, it was possible only to use the Percent Correct measure of communication accuracy. However, as noted in previous studies, this is a less direct index of communication than the Pleasantness measure (Buck, Savin, Miller, & Caul, 1972). With the Percent Correct measure, the receiver must first correctly judge the sender's emotional reaction, and then must decide what sort of slide would produce such an emotional response. With the Pleasantness measure, the receiver need only judge how pleasant or unpleasant the sender's reaction was. Since the senders rated not only how pleasant or unpleasant they felt to each slide, but also how happy, sad, afraid, angry, surprised, and disgusted they felt about each, it will be possible in future studies with different sets of receivers to analyze the senders' expressiveness in more detail. Specifically, receivers will be asked how pleasant, happy, sad, etc., the sender felt and each of these ratings will be correlated with the relevant rating on the part of the sender.

3. The CARAT data will not be considered in this paper.

TABLES AND FIGURES

Table 1. Mean percent correct scores (chance=20%).

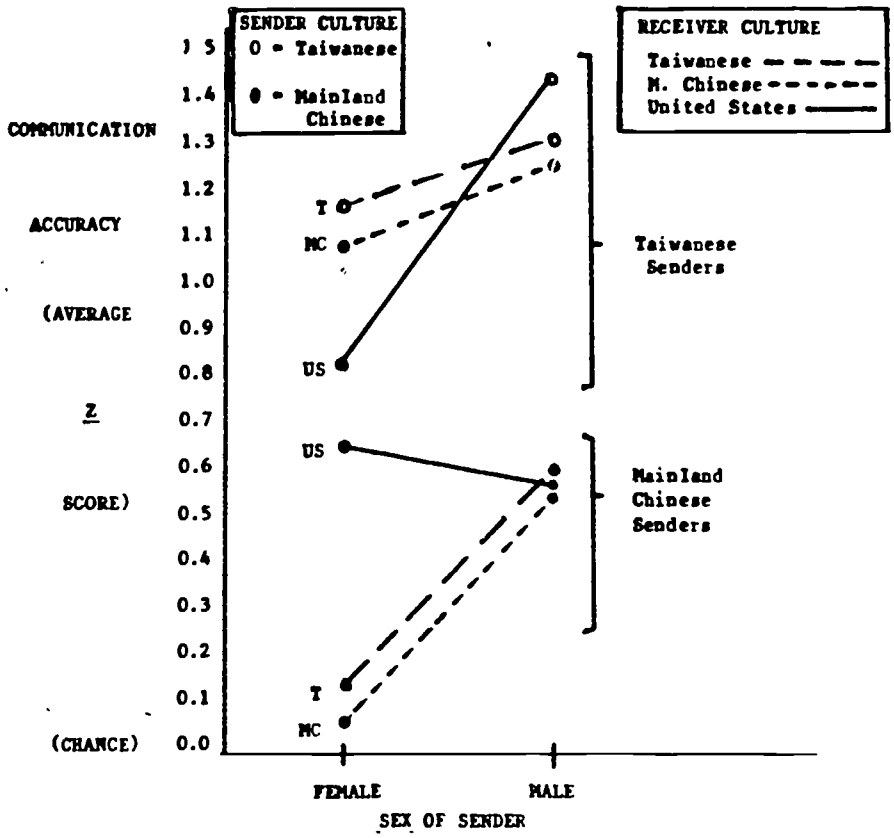
		Receiver group						
		TF	TM	PF	PM	USF	USM	Sending mean
Sender Group	TF	28***	25***	29***	24**	26***	24*	26.02***
	TM	28***	27***	32***	26***	32***	28***	28.57***
	MF	21	22	21	19	27***	22	22.12*
	PM	24**	22	27**	22	26***	21	23.59***
Receiving mean		*** 25.42	*** 24.00	*** 27.32	*** 22.73	*** 27.49	*** 23.51	25.08***

Note: *** p<.001

** p<.01

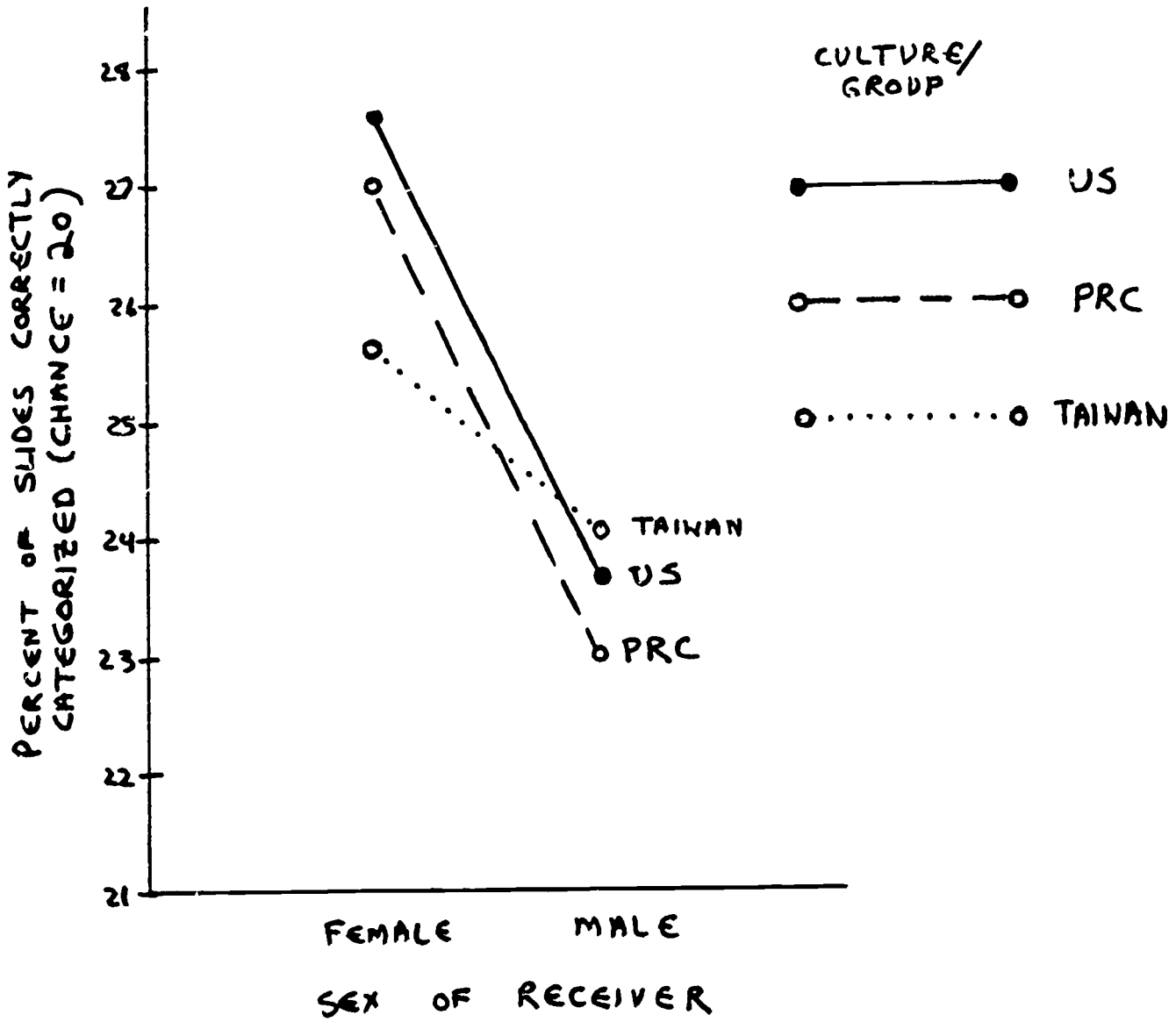
* p<.05

FIGURE 1. COMMUNICATION ACCURACY OF TAIWANESE AND MAINLAND CHINESE SUBJECTS SENDING TO THREE CULTURAL GROUPS.



*Note: Communication accuracy was defined in terms of the proportion of slides correctly categorized expressed in z scores.

FIGURE 2. COMMUNICATION ACCURACY SCORES OF SUBJECTS FROM THREE CULTURES/GROUPS RECEIVING FROM TAIWANESE AND PRC SENDERS



Bandura, A., and Walters, R.H. 1963. Social Learning and Personality Development. New York: Holt, Rinehart, and Winston.

Buck, R. 1975. Nonverbal commuication of affect in children. Journal of Personality and Social Psychology, 31, 644-653.

Buck, R. (1976). A test of nonverbal receiving ability: Preliminary studies. Human Communication Research, 2, 162-171.

Buck, R. (1979) Individual differences in nonverbal sending accuracy and electrodermal responding: The externalizing-internalizing dimension. In R. Rosenthal (Ed.), Skill in nonverbal communication: Individual differences. Cambridge, Mass.: Oelgeschlager, Gunn & Hain.

Buck, R. (1983) Recent approaches to the study of nonverbal receiving ability. In: J. Weimann and R. Harrison (Eds.), Nonverbal Communication: The Social Interaction Sphere. New York: Sage Publications. (b)

Buck, R. (1984) The Communication of Emotion. New York: Guilford Press.

Buck, R. (In Press). Human Motivation and Emotion. (2nd Ed.). New York: John Wiley and Sons.

Buck, R., Savin, V.J., Miller, R.E., and Caul, W.F. 1969. Nonverbal communication of affect in humans. Proceedings, 77th Annual Convention, APA, 367-368.

Ekman, P., and Friesen, W.V. (1975) Unmasking the Face. Englewood Cliffs, NJ: Prentice-Hall.

Field, T.M., and Walden, T.A. (1982) Perception and production of facial expressions in infancy and early childhood. In: H. Reese and L. Lipsett (Eds.), Advances in Child Development and Behavior, Vol. 16, New York: Academic Press. (b)

Friedman, H.S., Harris, M.J., and Hall, J.A. (1985). Type A behavior, nonverbal expressive style, and health. Journal of Personality and Social Psychology, 48, 1299-1315.

Hall, E. 1966. The Hidden Dimension. New York: Doubleday.

Izard, C.E. (1977) Human Emotions. New York: Plenum Press.

Jones, H.E. (1935). The galvanic skin response as related to overt emotional expression. American Journal of Psychology, 47, 241-251.

Jones, H.E. 1950. The study of patterns of emotional expression. In: M. Reymert (Ed.), Feelings and Emotions. New York: McGraw-Hill.

Kamiya, J. 1968. Conscious control of brain waves. Psychology

Today, 1, 56-60.

Kenny, D.A. (1981). Interpersonal perception: A multivariate round robin analysis. In: M. Brewer & B. Colins (Eds.), Scientific inquiry and the social sciences. San Francisco: Jossey-Bass.

Klineberg, O. 1938. Emotion expression in Chinese literature. Journal of Abnormal Social Psychology, 33, 517-520.

McClelland, D.C. 1961. The Achieving Society. Princeton: Van Nostrand.

Rosenthal, R., Hall, J.A., DiMatteo, M.R., Rogers, P.L., & Archer, D. (1979). Sensitivity to nonverbal communication: The PONS test. Baltimore: Johns Hopkins University Press.

Sabatell, R., Buck, R., & Kenny, D. (1986). A social relations analysis of nonverbal communication accuracy in married couples. Journal of Personality, 54:3, 513-525.

FIGURE 2. COMMUNICATION ACCURACY SCORES OF SUBJECTS FROM THREE CULTURES/GROUPS RECEIVING FROM TAIWANESE AND PRC SENDERS

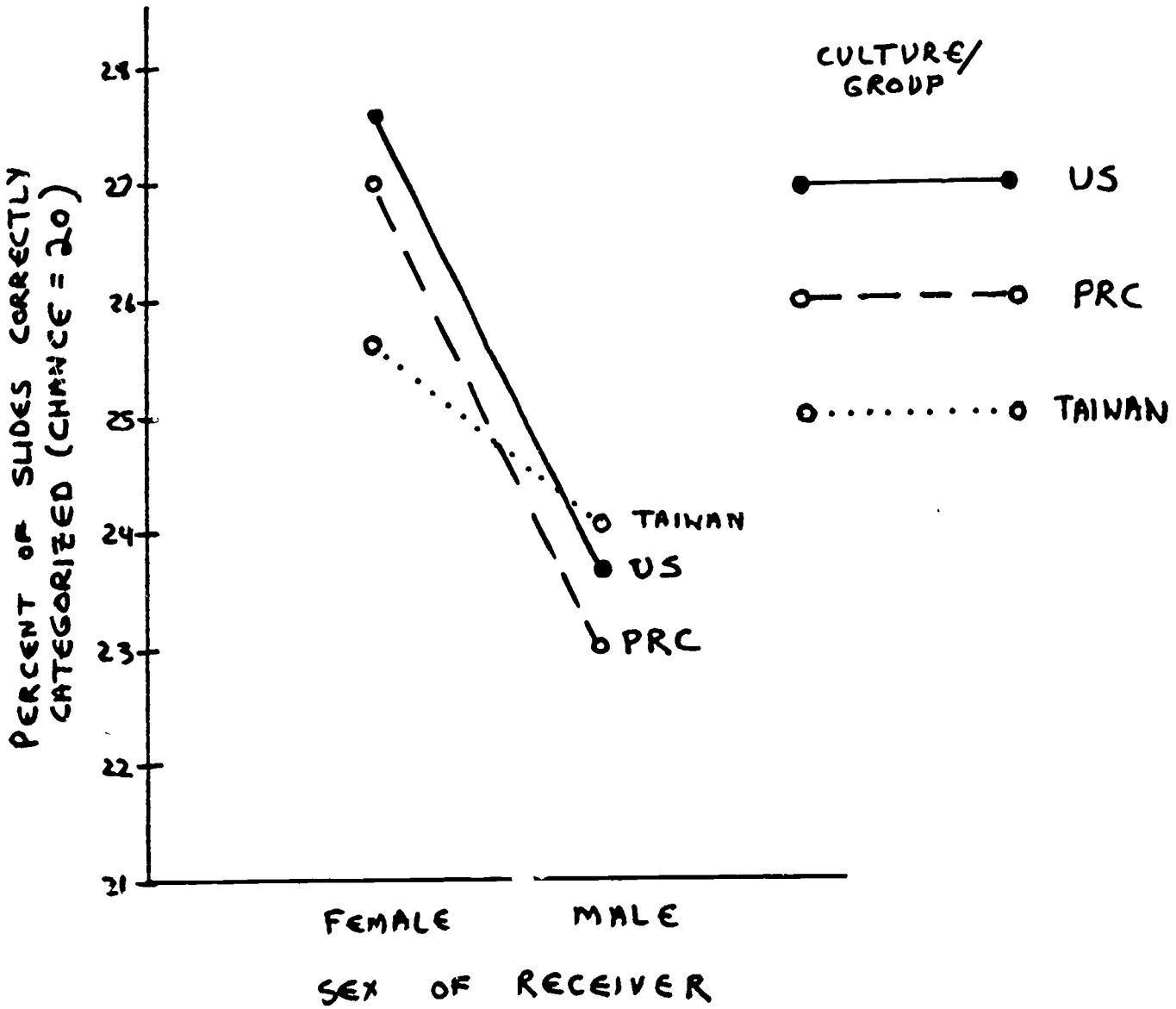
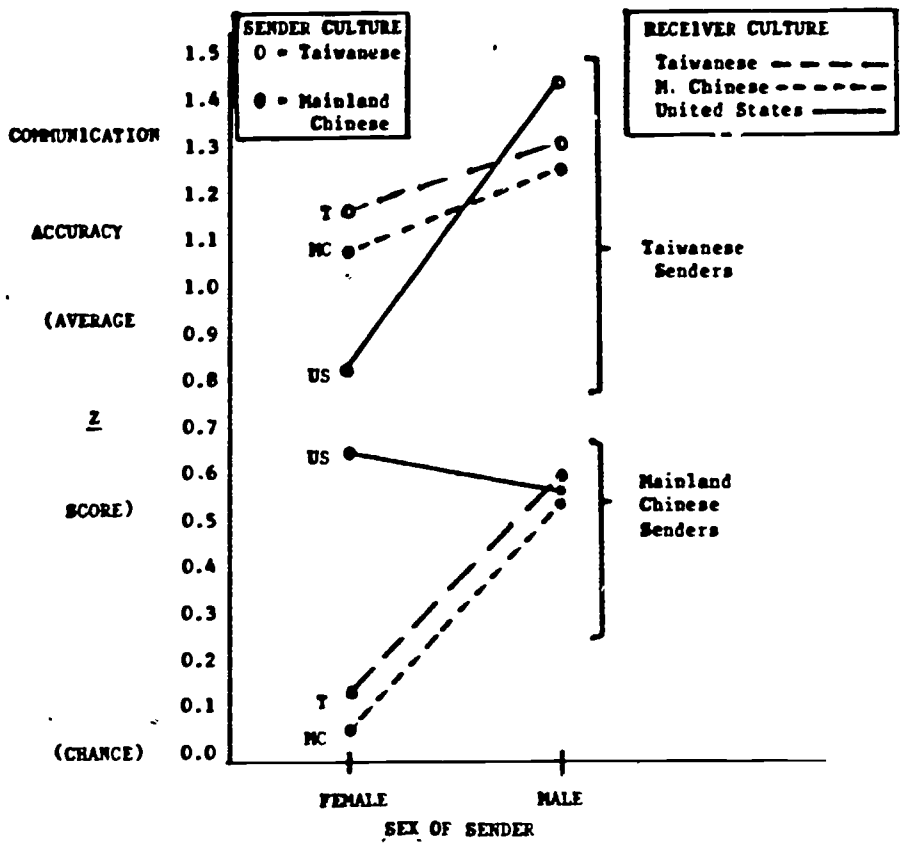


FIGURE 1. COMMUNICATION ACCURACY OF TAIWANESE AND MAINLAND CHINESE SUBJECTS SENDING TO THREE CULTURAL GROUPS.



*Note: Communication accuracy was defined in terms of the proportion of slides correctly categorized expressed in z scores.