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THE EFFECT OF ALCOHOL UPON  
HUMAN COMMUNICATION SKILLS  
AS OBSERVED WITHIN A NON-VERBAL PARADIGM

by Robert P. Heine

Thesis presented to the Faculty of  
Psychology of the University of  
Ottawa as partial fulfillment of  
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of Master of Arts.



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## CURRICULUM STUDIORUM

Robert P. Heine was born January 21, 1947 in New York City, New York. He received the Bachelor of Arts Degree in Psychology from Fairfield University, Fairfield, Connecticut, in 1968.

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## INTRODUCTION

The present study investigates the effects of alcohol on certain aspects of non-verbal communication. More than a study on effects of alcohol, however, it is a pilot study of methodology which may subsequently be used to assess the effects of marijuana or other psychoactive drugs on certain aspects of human communication.

The first portion of this thesis is concerned with a review of the literature of various studies dealing with variables having a relation to communication. Relevant investigations on alcohol and non-verbal communication are reviewed in order to establish the rationale for this study. The cited studies develop a line of reason which concludes with the statement of hypotheses to be studied in the present study.

The formulation of the hypotheses is followed by a description of the experimental design, procedures and techniques used in this project. In particular, the use of the videotape is explained.

The next section presents the results obtained from the analysis of the data. This is followed by a section which discusses the findings of the project. Certain considerations which might have contributed to the non-significant findings as well as the various ratings on the effect of alcohol by the subjects are examined.

In addition, the scoring procedures used in this study are discussed with particular regard to the findings on scorer reliability.

Finally, the implications for subsequent research are indicated.

## CHAPTER I

### REVIEW OF THE LITERATURE

This study deals with the effects of alcohol upon human communication skills as measured within a non-verbal paradigm. Further, it is intended as a pilot study in which a research design is employed which may be useful in subsequent investigations dealing with the effects of other drugs, such as marijuana, on certain aspects of human communication. In order to develop the rationale for this study, relevant literature will be discussed in two major areas; Alcohol and its effects, and Non-Verbal Communication.

In this section, studies are reviewed concerning the effects of alcohol on subjective variables, on attention and recall, and on communication. The writer wishes to note that the findings from many studies must be interpreted with caution. In this regard, Nash<sup>1</sup> points out that it is difficult to separate in research the true behavioural effects of alcohol ingestion from effects due to autosuggestion, that is, to the expectations of the alcohol user. The author stresses the need, in this context, for minimizing experimenter and subject bias. He concludes that valid

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<sup>1</sup> H. Nash, "The Double Blind Procedure, Rationale and Empirical Evaluation," Journal of Nervous and Mental Disease, Vol. 134, 1962, p. 34-47.

research in this area must carefully avoid the effects of autosuggestion or subject expectations.

The following studies on the effects of alcohol are considered relevant for the purposes of this study. They deal with the effect of alcohol on variables relevant to the study of the effects of alcohol upon communication.

1. Effects of Alcohol on Subjective Variables.

Ekman, Frankenhaeser, Goldberg, Bjerver, Jarpe and Myrsten<sup>2</sup> in an often quoted work attempted to measure the effect of alcohol on certain subjective and objective variables. In this study each subject estimated his degree of intoxication at different periods after being given an amount (1,6 ml. per kg. body weight) of alcohol. In addition, each subject made self estimates with regard to the following variables: talkative, elated, happy, hazy, subjective working capacity, tense, tired, restless. Measures on objective performance tests of memory and arithmetic were also obtained.

The authors concluded that subjective estimates were more affected by alcohol than objective test performance. It is of interest to the present study that the subjects indicated, among mood ratings, an increase in talkativeness

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<sup>2</sup> Gosta Ekman, Marianne Frankenhaeser, Leonard Goldberg, Kjell Bjerver, Gundla Jarpe and Anna-Lisa Myrsten, "Effects of Alcohol Intake on Subjective and Objective Variables over a Five Hour Period," Psychopharmacologia, Vol. 4, 1963, p. 28-38.

and elation as a function of alcohol. Since mood and affect are closely related to communication, any drug which has an effect on mood and affect may be expected to have an effect on communication.

A later study by Ekman, Frankenhaeser, Goldberg, Hagdahl and Myrsten<sup>3</sup> substantiated the above study when it replicated the findings. Hurst, Radlow, Chubb and Bagley<sup>4</sup> have also studied mood variables and report findings consistent with the above.

## 2. Effects of Alcohol on Attention and Recall.

Hutchinson, Tutchie, Gray and Steinberg<sup>5</sup> investigated the effect of alcohol on certain mental functions. They report that on performance tests of attention and recall, alcohol had an adverse effect. Similarly Rybach, Wernert, and Fozard<sup>6</sup> found a short-term memory deficit following consumption of alcohol.

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<sup>3</sup> Gosta Ekman, Marianne Frankenhaeser, Leonard Goldberg, Ragnar Hagdahl and Anna-Lisa Myrsten, "Subjective and Objective Effects of Alcohol as Functions of Dosage and Time," Psychopharmacologia, Vol. 6, 1964, p. 399-409.

<sup>4</sup> P. M. Hurst, R. Radlow, N.C. Chubb and S.K. Bagley, "Effects of Alcohol and D-amphetamine upon Mood and Volition," Psychological Reports, Vol. 24, 1969, p. 975-987.

<sup>5</sup> H.C. Hutchison, M. Tuchtie, K.G. Gray and D. Steinberg, "A Study of the Effects of Alcohol on Mental Functions," Canadian Psychiatric Association Journal, Vol. 9, no. 1, 1964, p. 33-42.

<sup>6</sup> R. Rybach, Jane Wernert and J. Fozard, "Disruption of Short Term Memory in Man Following Consumption of Ethanol," Psychonomic Science, Vol. 20, No. 6, 1970, p. 353-354.

Although communication is a complex process, it requires the ability to perceive cues and signals, as well as the ability to sort them out into meaningful patterns. Hence attention, recall and short-term memory may be expected to affect communication.

### 3. Effects of Alcohol on Communication.

This section deals with the studies considered most relevant to the present investigation. These studies will be examined more extensively.

In spite of vast research on the effects of alcohol, its effects on communication have not been widely investigated. A perusal of all index listings of Psychological Abstracts reveals no studies cited under the headings Alcohol and Communication, Alcohol and Non-Verbal Communication and Drinking of Alcohol and Communication. This suggests scarcity of research in this area. Published studies are reviewed below.

Forney and Hughes<sup>7</sup> studied the effects of ethanol and delayed auditory feedback on verbal performance, on seven male and three female paid volunteers. Each subject drank a grapefruit beverage containing 45 ml. of 200

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<sup>7</sup> R. B. Forney and F. W. Hughes, "Delayed Auditory Feedback and Ethanol: Effect on Verbal and Arithmetic Performance," Journal of Psychology, Vol. 52, 1961, p. 185-192.

proof alcohol per 150 pounds body weight. The subjects were then given a test requiring verbal output, which consisted of a passage from Aristotle's Selections. The participants were told to read aloud as rapidly but distinctively as possible for a two minute period. This reading was timed and taped and later scored for errors.

The data obtained generally indicated that verbalization was not significantly impaired in subjects after consuming the alcohol. The introduction of a distortion in verbalization by use of auditory feedback did produce a deficit in verbalization but this was not enhanced by alcohol. The overall conclusion was that verbalization was unaffected by alcohol.

Two points merit mentioning concerning this study. The first is the tentativeness with which the authors report their findings. They state: "Either increased verbalization or decreased efficiency of speech may occur after alcohol is ingested but these are not predictable criteria of shades of inebriation."<sup>8</sup> Further, this indicates an expectancy not warranted by the data. Forney and Hughes<sup>9</sup> conducted another study similar to the one above. Eight subjects,

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8 Ibid., p. 191.

9 R.B.Forney and F.W. Hughes, "Effects of Caffeine and Alcohol on Performance under Stress of Audiofeedback," Quarterly Journal of Studies on Alcohol, Vol. 26, 1965, p. 206-212.

four female and four male students, were used. The treatments used included alcoholic beverage plus caffeine, alcoholic beverage plus placebo caffeine, placebo beverage plus caffeine, and placebo beverage plus placebo caffeine. The dosage of alcohol was identical to the dosage used in the earlier study.

In the alcoholic beverage plus placebo caffeine condition, there was a reduction in verbal output, significant at the five percent level by Tukey's criterion. The scores analyzed in both this and the earlier study reflect the number of errors made while reading a selection. Error scores may not adequately reflect whether verbal production actually increased or decreased.

Hurst et al., in 1969, conducted an experiment dealing with verbal production. The authors indicate the scarcity of research in this area when they state "The effects of these drugs, alcohol and D-amphetamine, upon verbal production have not to our knowledge been quantitatively assessed (...)"<sup>10</sup> They then describe their efforts to objectively assess the effects of alcohol on verbal production.

Male college students were recruited as paid volunteers. Four treatments were administered to the subjects

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<sup>10</sup> Hurst et al., Op. Cit., p. 975.

in the course of the experiment. One of these conditions was alcohol only, given in a dosage equal to 45g. per 70 kg. of body weight. The subjects drank the alcohol in three partial dosages, at 0, 15 and 30 minutes into the experimental session, so as to produce a rising blood alcohol concentration. The subjects were required to play a card game, red dog, immediately after consuming the first third of the dosage and continued playing through consumption of the other two thirds of the dosage.

Among the different measures obtained, the measures of verbal production are of interest to the present study. Verbal production was measured by counting the words written during a 20 minute period on an assigned topic. Verbal production yielded an F Ratio of 7.29 for drug treatments which is significant at the 0.001 level of probability. However this effect was due primarily to D-amphetamine which increased verbal production 19 percent over the placebo level. The effects of alcohol alone yielded a non-significant 6 percent increase. The findings point to the fact that alcohol did not significantly increase verbal production.

Jones and Stone<sup>11</sup> conducted an experiment dealing

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<sup>11</sup> Reese T. Jones and George C. Stone, "Psychological Studies of Marijuana and Alcohol in Man," Psychopharmacologia, Vol. 13, 1970, p. 108-117.

with certain effects of alcohol and marijuana. One of the treatments administered to the subjects consisted of alcohol only. It is this treatment which is relevant to the present study. The dosage given was in the author's words " (...) sufficient to produce impaired judgement and increased accidents."<sup>12</sup> The subjects were required to perform a number of tasks. It is of interest to the present study that during and after these tasks the subjects were slightly more talkative when under the influence of alcohol.

Although this indicates an increase in communication, it is not a conclusive finding. Disturbing is the fact that the measure was not an objective one but a subjective estimate on the part of the experimenters. Further, the authors do not specify the meaning of "(...) slightly more talkative (...)"<sup>13</sup>

The studies reviewed in this section on communication provide a number of considerations which prompted the present study.

The first consideration was the number of studies cited. As can be seen there are relatively few studies available on the effects of alcohol on communication. This is surprising in view of the popular belief that alcohol

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12 Ibid., p. 116.

13 Ibid., p. 114.

and social drinking break down barriers to communication and increase the willingness to participate in interpersonal encounters. There is a wealth of folklore<sup>14 15</sup> on the behavioural phenomena associated with the use of alcohol. Alcohol is said to loosen up people; alcohol makes communication easier; alcohol increases communication. While qualitative and subjective reports are valuable, questions such as these should be subjected to experimental research. However, few controlled findings are available related to such phenomena. The present study thus hopes to contribute to this much neglected area of research.

A second consideration deals with the findings of the studies reviewed. Most of the results reported are tentative and inconclusive. No clear statement with regard to the effects of alcohol upon communication can be made. The present study by employing a double blind design, hopes to add some relevant data to this area.

A final consideration concerns the situations employed in the studies reviewed. Perhaps the situations encountered by the subjects were not optimal with respect to the more 'natural' settings encountered in most communication. As such it would appear important to investigate the

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<sup>14</sup> Hurst et al., Op. Cit., p. 975.

<sup>15</sup> Jones and Stone, Op. Cit., p. 109.

effects of alcohol on communication in more everyday or socially conducive situations. This concern was another prompt for this study. The present study attempts to examine the effects of alcohol on communication in a situation deemed more appropriate for eliciting communication.

The moving of hands, slump of a shoulder, raising of the eyebrow, direction of gaze and posture of the body are all examples of non-verbal behavior. They can occur separately or together, when speaking or when listening, when an individual is alone or when he is with other people. The concern of this study is with the communicative aspects of this class of behavior, when actions are emitted during an interpersonal exchange as defined within a charade paradigm.

Schefflen<sup>16</sup> in talking on communication and meaning, states "(...) any member of a culture recognizes the behavioural configurations common to his own background." This implies that the behavior of a culture has meaning within its traditions. The mere performance, then, of traditional non-verbal behaviour appears to be communicative without necessarily requiring specific signals or use of speech. Essentially this study accepts the proposition that

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16 Albert E. Schefflen, "On the Structuring of Human Communication," The American Behavioural Scientist, Vol. 10, No. 8, p. 9.

information can be communicated by non-verbal behavior. A perusal of the research done in the following paragraphs will attempt to provide empirical validation for this proposition.

#### 4. Nonverbal Communication

A popular subject of research has been the contention that emotions are expressed through non-verbal behavior. One of the earlier studies on this was Dunlap's.<sup>17</sup> The study analyzed how the interpretation of emotion by an observer might be related to some of the components of facial expression, and concluded that the context provided for the observations was more significant than facial expression per se. Recently Ekman<sup>18 19</sup> compared head and body cues and found that they provide differential information about apparent emotion to an observer. The head is more informative about the nature of an emotion while the body is more informative about the intensity of an emotion.

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17 K. Dunlap, "Role of Eye Muscles and Mouth Muscles in the Expression of Emotions," Genetic Psychology Monographs, Vol. 68, 1927, p. 197-233.

18 Paul Ekman, "Body Position, Facial Expression, and Verbal Behavior during Interviews," Journal of Abnormal and Social Psychology, Vol. 68, 1964, p. 295-301.

19 Paul Ekman, "Communication through Non-verbal Behavior: a Source of Information about an Interpersonal Relationship," in Affect, Cognition and Personalities, New York, Springer, 1965, p. 390-442.

Dittman, Stein and Shakow<sup>20</sup> counted the frequency of movements in three body areas for one patient in each of five different moods. He found that moods were differentiated by frequency of movement, and also that different body areas were active for different moods.

Ekman and Friesen<sup>21</sup> in addition to replicating the earlier works, also emphasize the importance of body position and movement in regards to communicating emotion. They were able to differentiate four types of body motion cues: body acts (clear movements), body positions (no movement of a body part), facial expressions, and head orientations. These four types of cues convey differential information about the nature and intensity of emotion. The authors further report that observers are able to infer the presence of a specific emotion from observing a body act. Facial expression, the movements and still positions of the facial features, usually convey information about specific emotion. Whereas information about the more gross affective states is conveyed by head orientation and the position or movement of the total head in an up-down and/or left-right axis.

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20 Allen T. Dittman, Seymour N. Stein, and David Shakow, "The Relationship between Body Movements and Moods in Interviews," Journal of Consulting Psychology, Vol. 26, 1962, p. 480.

21 Paul Ekman and Wallace V. Friesen, "Head and Body Cues in the Judgement of Emotion: A Reformulation," Perceptual and Motor Skills, Vol. 24, 1967, p. 711-724.

The above studies support the contention that information and cues are transmitted non-verbally. From this the proposition may be stated that the amount and type of communication between two people is reflected in the amount and type of non-verbal behaviour. Based on this, it was decided in the present investigation to assess communication using as a research paradigm a non-verbal charade situation, and to study the effect of the drug alcohol upon charade playing.

#### 5. Visual Interaction

From among non-verbal behaviours the specific non-verbal behaviour of visual interaction was chosen as the main variable to be studied. Visual interaction seems an appropriate choice in the sense that it appears to be situated high in the hierarchy of non-verbal behaviours in terms of communicative value.<sup>22</sup> A perusal of other research in this area will further substantiate this choice.

Exline and Winters<sup>23</sup> believe that the movement or lack of movement of the eyes can communicate involvement and affect. They further indicate that the incidence of

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<sup>22</sup> Albert Mehrabran, "A Semantic Space for Non-verbal Behavior," Journal of Consulting and Clinical Psychology, Vol. 35, No. 2, 1970, p. 248-257.

<sup>23</sup> Ralph V. Exline and Lewis C. Winters, "Affective Relations and Mutual Glances in Dyads," in Affect, Cognition and Personalities, New York, Springer, 1965, p. 319-350.

the exchange of mutual glances reflect the willingness to enter into an interpersonal relationship. Exline<sup>24</sup> has reported differences among men and women in the exchange of mutual glances and has also found that affiliative need and competitive conditions interact to determine the incidence of such glances. This would indicate that looks and glances can be related to meaningful social and psychological variables.

Exline, Gray and Schuette<sup>25</sup> replicated the earlier study and also explored some aspects of the phenomenon of the mutual gaze, in an effort to sort out, through experiments, the factors that are associated with amount of mutual gaze among pairs of individuals. Their findings suggest that individuals whose composure is threatened by the nature of their interaction with another, may, perhaps unconsciously, attempt to withdraw from the other by not looking into the line of regard of the other.

Exline, Thibaut, Brannon and Gumpert<sup>26</sup> showed that

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<sup>24</sup> Ralph V. Exline, "Explorations in the Process of Person Perception: Visual Interaction in Relation to Competition, Sex, and Need for Affiliation," Journal of Personality, Vol. 31, 1963, p. 1-20.

<sup>25</sup> Ralph Exline, David Gray and Dorothy Schuette, "Visual Behavior in a Dyad as Affected by Interview Content and Sex of Respondent," Journal of Personality and Social Psychology, Vol. 1, No. 3, 1965, p. 201-209.

<sup>26</sup> R. Exline, J. Thibaut, C. Brannon and P. Gumpert, "Visual Interaction in Relation to Machiavellianism and an Unethical Act," American Psychologist, Vol. 16, 1961, p. 396.

when a subject was interrogated about performing an unethical act his visual interaction decreased. Argyle, Lalljee and Cook<sup>27</sup> showed that comfort and ease of interaction fell off rapidly when the visibility of the other person decreased. Evidence was obtained which showed that visual feedback on the other's reactions is necessary if the interaction is to continue. They also found that the face was the most useful area to see. LeCompte and Rosenfeld<sup>28</sup> showed that aspects concerning the emotional tone of the experimenter's relationship with subjects may be communicated through the withholding or providing of visual contact. They suggest that the information coded in the visual contact provides a message to the subject about the situation which he finds himself in.

Kendon reports that analysis of the performance of individuals in dyadic interaction present data " (...) which suggest that where a person is looking during interaction may function as a signal regulating the exchange and maintenance of speaker role."<sup>29</sup> It appears that when

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27 M. Argyle, M. Lalljee and M. Cook, "The Effects of Visibility on Interaction in a Dyad," Human Relations, Vol. 21, 1968, p. 3-17.

28 W. LeCompte and H. Rosenfeld, "Effects of Minimal Eye Contact in the Instruction Period on Impressions of the Experimenter," Journal of Experimental Social Psychology, Vol. 7, No. 2, 1971, p. 211-220.

29 Adam Kendon, "Some Functions of Gaze Direction in Social Interaction," Acta Psychologica, Vol. 26, 1967, p. 22-63.

the speaker and receiver are about to change roles, a fairly characteristic pattern of gaze behaviour emerges. The speaker ends his utterance by looking at the receiver with a sustained gaze. The receiver, on the other hand, looks away when he begins to speak. Kendon suggests that the speaker looking at the receiver is a signal for the receiver to start speaking. He also suggests that the looking away by the receiver is a signal to the speaker that the receiver accepts the change of role.

These studies point to the importance of gaze direction and interaction in social encounters. Precise meaning of the exchange or avoidance of mutual glances remains to be determined. However the studies do support the general hypothesis that a continued exchange of glances may signal willingness or desire to become involved with one another, or to maintain an ongoing interaction. Avoidance, on the other hand, seems to indicate lack of interest in initiating a relationship or, in the case of an ongoing interaction, that one or both parties wish to break away. Within a communicative process the amount of visual interaction, i.e. mutual gazes, appears to indicate the amount of communication that the participants wish to engage in.

For this reason, the writer has chosen visual interaction as an indication of the amount of communication taking place between two participants.

After reviewing the literature on non-verbal communication Duncan states;

Considered together, the studies of visual interaction demonstrate a remarkable consistency of findings. Despite the newness of the area, there is virtually none of the confusion of conflicting results or failures of replication so often encountered in psychological literature. Instead, the typical case with visual interaction has been mutual verification and extension of results.<sup>30</sup>

The methodological validity apparent in visual interaction studies suggested by Duncan presents another reason for its choice as the dependent variable for the present investigator.

In sum, this research seeks to study the effect of alcohol on human non-verbal communication. Non-verbal communication will be studied by limiting the research to measurements within a charade paradigm. More specifically the effect of alcohol on visual interaction will be studied.

#### 6. Statement of Hypotheses

Studies have been reviewed which show the effect of alcohol on certain variables. Alcohol significantly affects self-ratings of mood and affect; alcohol adversely affects performance on tasks of attention, recall and short term memory; alcohol increases verbal production. The

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<sup>30</sup> Starkey Duncan Jr., "Non-verbal Communication," Psychological Bulletin, Vol. 46, No. 2, 1969, p. 118-135.

relation between these variables and the communication process suggests that alcohol would affect communication. In an attempt to study this, the following null hypotheses are formulated:

1. When non-verbal communication between partners in a series of charade paradigms is assessed in terms of the time it takes to act out the words, there are no significant differences among the five experimental conditions of: Actor on drug, Receiver on placebo; Actor on placebo, Receiver on drug; Actor on drug, Receiver on drug; Actor on placebo, Receiver on placebo; Actor in the control condition, Receiver in the control condition.
2. When non-verbal communication between partners in a series of charade paradigms is assessed in terms of amount of time spent in mutual gaze, there are no significant differences among the five experimental conditions of: Actor on drug, Receiver on placebo; Actor on placebo, Receiver on drug; Actor on drug, Receiver on drug; Actor on placebo, Receiver on placebo; Actor in the control condition, Receiver in the control condition.
3. When non-verbal communication between partners in a series of charade paradigms is assessed in terms of amount of time spent in gaze behavior directed toward the receiver by the actor, there are no significant differences among the five experimental conditions of: Actor on drug, Receiver on placebo; Actor on placebo, Receiver on drug; Actor on drug, Receiver on drug; Actor on placebo, Receiver on placebo; Actor in the control condition, Receiver in the control condition.
4. When non-verbal communication between partners in a series of charade paradigms is assessed in terms of the number of times the receiver turns her gaze toward the actor, there are no significant differences among the five experimental conditions of: Actor on drug, Receiver on placebo; Actor on placebo, Receiver on drug;

Actor on drug, Receiver on drug; Actor on placebo, Receiver on placebo; Actor in the control condition, Receiver in the control condition.

When non-verbal communication between partners in a series of charade paradigms is assessed in terms of the number of times the actor turns her gaze toward the receiver, there are no significant differences among the five experimental conditions of: Actor on drug, Receiver on placebo; Actor on placebo, Receiver on drug; Actor on drug, Receiver on drug; Actor on placebo, Receiver on placebo; Actor in the control condition, Receiver in the control condition.

## CHAPTER II

### EXPERIMENTAL DESIGN

The design of this project is presented in this chapter in five sections. The first section deals with a description of the subjects and how they were chosen. Following this there is a section on the Test and Apparatus used in the study. This includes a discussion of the Charade game that the subjects participated in as well as a description of the various equipment used to record the experimental sessions. The third section describes the drug and placebo administered to the subjects and the fourth section outlines the procedure followed in the experimental sessions. Finally, the fifth section describes the scoring procedures and statistical methods used to analyse the data.

#### 1. Subjects

The subjects were ten adult females between the ages of twenty one and thirty years. They were required to have at least one year of University. They were also required to have previous experience in the use of alcohol. They were selected on a volunteer basis among students of the University of Ottawa and their acquaintances.

The subjects were divided into five teams of two subjects each. The teams were chosen by picking names out

of a hat. For each team one member was randomly chosen as the actor, the other becoming the receiver. Of the original subjects, one dropped out during experimentation leaving four teams of two subjects each.

The choice of the female sex was based both on availability of subjects and on evidence that women may be more appropriate subjects when studying visual interaction.<sup>1 2 3</sup>

## 2. Test and Apparatus.

a) Test.- The test devised to measure non-verbal communication was entitled Scrabble Charades. The charade paradigm required acting<sup>4</sup> an eight-letter word (five consonants and three vowels), formed by the actor from letters provided by the experimenter. There were twenty sets of eight letters, numbered from one to twenty, the letters for each set being drawn randomly from the letters provided in an ordinary Scrabble game.<sup>5</sup> Each team received the twenty

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1 Ralph V. Exline, "Explorations in the Process of Person Perception: Visual Interaction in Relation to Competition, Sex, and Need for Affiliation," Journal of Personality, Vol. 31, 1963, p. 1-20.

2 Ralph V. Exline and Lewis C. Winters, "Affective Relations and Mutual Glances in Dyads," in Affect, Cognition and Personalities, New York, Springer, 1965, p. 319-350.

3 Ralph Exline, David Gray and Dorothy Schuette, "Visual Behavior in a Dyad as Affected by Interview Content and Sex of Respondent," Journal of Personality and Social Psychology, Vol. 1, No. 3, 1965, p. 201-209.

sets in an order that was determined by using a table of random numbers. Since there were five experimental conditions each team received four sets of letters for each condition.

b) Apparatus.- Two rooms were employed in the study. The first room, measuring fourteen feet by ten feet, was an intake and recovery room, decorated so as to induce a relaxed social atmosphere. There was a chesterfield and two easy chairs to sit on. Subdued light was allowed into the room through the use of curtains. There was a fish net hung from the ceiling and posters on the walls. At all times that the subjects were in this room there was music, soft rock at a moderate volume, playing in the hopes of further adding to this atmosphere. In this room the participants received and drank the drug or placebo solutions used in the study. It also served as a recovery room for those who wished to use it after each experimental session.

The other room, measuring thirty feet by twelve feet, was used for the experiment proper. It was air conditioned, and divided into two areas by a large curtain. In one area, measuring twenty two feet by twelve feet, two chairs were arranged facing each other at a distance of ten feet. One chair, used for the actor, was hardbacked. Beside it was a

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<sup>4</sup> See Appendix A.

<sup>5</sup> Produced and Copyrighted by Parker Brothers Inc.

desk, with a pencil and pad. This desk was used for placing the scrabble letters and for recording the words used. The actor's chair was circumscribed by an area marked out with black tape, which was to serve as a limit to the movement of the actor. This limitation was needed primarily for the sake of camera range. The other chair, a lounge chair, was designated for the receiver.

In order to record the experimental session an Ampex Video Recorder No. 701 7500 was used. Two GBC View finder TV cameras with Fujinon ITV Zoom Lens, No. 841238, were so situated in reference to each of the chairs, that a frontal view of each participant was attained, on a split-screen. A Shure Brothers' Dynamic Lavalier Microphone, Model 560, was placed in the room for pick-up and recording of any verbal behaviour.

The other area of the room, measuring twelve feet by eight feet, was darkened and contained the rest of the equipment. The equipment in this section consisted of an ITC Picture Monitor, Model PM-91T; a Panasonic Special Effects Generator, Model WV-000P, which produced a split screen effect; a Panasonic STNC Converter, Model WV-617P; an Ampex Videorecorder machine, No. 701 7500 and an Admiral Classroom Television Set, Model E 8108, to monitor the picture being recorded on the tape. This equipment allowed the investigators and raters to employ the split-screen

technique, so as to view on the half-screens both participants at the same time, as if they were both facing the same camera, sitting side by side.

### 3. Drug and Placebo.

a) The Drug.- The drug used was 165 proof ethyl alcohol obtained from the Quebec Liquor Control Board. The dosage of drug administered was 1.10 ml. per kg. of body weight, mixed in a solution of orange juice and peppermint oil. A drug condition consisted of two glasses made up as follows:

205 ml. orange juice, three drops peppermint oil, and one-half of the dosage of alcohol according to the subject's body weight. This mixture was chilled before serving so that it was cold when drunk by the subjects.

The placebo condition consisted of two glasses made up as follows:

First glass: 3 ml. alcohol, three drops peppermint oil, 190 ml. orange juice, and 35 ml. water.

Second glass: 3 ml. alcohol, three drops peppermint oil, 180 ml. orange juice, and 35 ml. water.

The placebo used in this experiment was designed by the experimenters after pilot tests using several mixtures. The placebo finally chosen was administered to eight self-admitted knowledgeable drinkers, and found by them not to be distinguishable from the alcohol mixture in appearance or taste.

#### 4. Procedure.

During the introductory session,<sup>6</sup> the subjects were administered the Otis Self-Administering Tests of Mental Ability, Higher Form A, and the Eysenck Personality Inventory for possible future research. They were also asked to complete an individual information sheet, which consisted of questions concerning name, address, birthdate and occupation. An explanation of the test rules was given and any questions were answered. Following this, the subjects were contacted by phone, and five appointments were made.

a) Experimental Procedure.- Each team was to enact four sets of scrabble charades under each of five conditions:

1. Actor on drug, Receiver on drug.
2. Actor on placebo, Receiver on placebo.
3. Actor on alcohol, Receiver on placebo.
4. Actor on placebo, Receiver on drug.
5. Control, no drug, no placebo.

The above conditions were counterbalanced in five different orders. Counterbalanced orders were then given to the research director, who randomly assigned each team to one order of conditions. Thus, the experimenters and raters were ignorant of the actual testing conditions, resulting in a full blind experiment. The counterbalancing used, revealed after the experiment had been run and the obtained

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<sup>6</sup> See Appendix B.

data scored, is shown below:

<u>TEAM</u>	<u>CONDITION</u>
I	2 3 4 5 1
II	4 5 1 2 3
III	1 2 3 4 5
IV	3 4 5 1 2
V	5 1 2 3 4

Five times were scheduled for experimentation during the day; 9:30 A.M., 11:30 A.M., 1:30 P.M., 3:30 P.M., and 5:30 P.M.. Each team came once at each time to counteract possible confounding results due to a time factor.

The first time that each team came, the subjects were first taken into the experimental room to be familiarized with the surroundings and also with the mechanics of the charade playing. This was followed by the same procedures for all subsequent occasions, as described in the following paragraphs.

Each team was met by the experimenters and escorted to the intake room. The subjects were given two glasses of fluid to drink, which had been prepared by the research director in accordance with a master schedule available only to him. They were instructed that they had fifteen minutes in which to drink the mixture provided. After the instructions both experimenters left the room. One experimenter came back ten minutes later to check the subjects' progress in drinking the fluid. If they were having difficulty, encouragement and prompting was given. After fifteen minutes, a paper and pencil self-rating of the perceived effect of the

of the drink was administered.<sup>7</sup> It required the subjects to rate the intoxicating effect of the drink by circling a number on a five point scale. Its purpose was to verify the perceived effect of the alcohol or placebo and to permit comparison with subjective effects described in previous studies. Forty minutes after the first self-rating, during which time the subjects relaxed, they were again asked to do a self-rating, and then they proceeded to the experimental room.

When both participants were seated, one experimenter provided a set of letters, signalling the beginning of the charades. For this set of letters, the actor, who was not allowed to talk, attempted to act out as many words as possible, the words being made by the actor from the letters provided. For each set of letters four minutes was allowed. For each experimental condition four sets of letters were given to the actor. In total, then, each experimental condition lasted sixteen minutes.

While the subjects were engaged in the charades, the experimenters monitored the proceedings on a television screen. Initial ratings on time and response correctness were done during the actual experiment as an aid to future scoring.

After each session, the subjects were driven home or permitted to rest in the recovery room while waiting for a

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<sup>7</sup> See Appendix C.

ride home. Subjects were not permitted to drive their own car after taking part in the experiment.

#### 5. Scoring and Statistical Analysis.

For each of the five experimental conditions four different sets of letters were given. Performance on these was the basic scoring unit. For each of these four sets of letters an average response was obtained for the following variables: Time per word; time spent in mutual gaze by the actor and receiver; time spent in gaze behavior by the actor alone; number of times the actor turned her gaze towards the receiver; and number of times the receiver turned her gaze towards the actor.

a) Time per word.- This represents the time taken by the receiver to interpret each word acted out by her partner. For each set of letters the teams acted out a number of words, which varied from five to thirteen. From the video tapes, the scorers recorded the time taken to interpret each word. The average time per word was the total time spent on words for one set of letters divided by the number of words acted out. This was used as the team's score for one set of letters.

b) Time spent in mutual gaze by the Actor and Receiver.- Mutual gaze was defined as the time spent by actor and receiver looking at each other. Mutual gaze was

scored only when there was simultaneous eye contact between actor and receiver.

Mutual gaze was scored by a rater from videotape, using the split-screen technique. The actor and the receiver were represented on two halves of a television screen. The rater sat facing the television screen, three feet from it. In this set-up, when the partners gazed at each other, they were perceived by the rater as gazing directly at him. His task was thus to record, using a stop-watch, the time during which both faces on the screen appeared to gaze simultaneously at him. Difficult charades were re-checked, and spot replays were scored by a second rater to obtain an estimate of scorer reliability.

An index of mutual gaze was obtained by dividing the total number of seconds of mutual gaze per set of letters by the number of words acted out in that set of letters. Such an index does not describe the pattern of mutual gazes (whether they are long and steady or brief and frequent) but it does reflect the relative amount of time spent by the actor and receiver in mutual gaze behavior.

c) Time spent in gaze behavior by the actor alone.- This was defined as the amount of time that the actor spent looking into the line of regard of the receiver. For it to be scored it was sufficient that the actor maintain eye contact with the receiver.

The scores for this variable were obtained by a rater, who sat three feet in front of a television set, which showed the actor and receiver facing him on a split-screen. In this set-up, when the actor gazed at the receiver, she was perceived by the rater as gazing directly at him.

Using a stopwatch, the rater recorded the amount of time that the actor spent looking into the line of regard of the receiver.

By taking the total time spent in gaze behavior by the actor per set of letters and dividing this by the number of words acted out in that set of letters a score representing the amount of time spent in gaze behavior by the actor was derived.

d) Number of times the Receiver turned her gaze towards the Actor.- This variable was scored by counting the number of times the receiver turned her gaze towards the actor for a set of letters and then dividing this by the number of words in that set of letters. This counting was done by a rater who faced a television screen as described above, and who concentrated only on that half of the screen which contained the receiver. The rater's task was to record the number of times that the receiver appeared to turn her gaze towards him.

e) Number of times the Actor turned her gaze towards the Receiver.- This variable is identical to the one above

except that it refers to the actor rather than the receiver.

The scores obtained as described in the above paragraphs were analyzed using a two-factor, repeated measures Analysis of Variance.<sup>8</sup>

In sum; there are five analysis of variances, one for each of the five variables outlined above. For each team in each analysis there are twenty scores. These twenty scores represent an average response for the subjects on the twenty different sets of letters that were given to them.

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<sup>8</sup> This statistical analysis was performed by the Soupac Balanced Analysis of Variance Program as contained at the Computing Centre of the University of Ottawa.

## CHAPTER III

### PRESENTATION OF RESULTS

The results are divided into three sections. The first section deals with the scores obtained along the five variables and with the analysis of variance table for each. The second section deals with the scorer reliability data. The third section deals with the ratings obtained from the subjects on the effect of the alcohol upon them.

#### 1. Measurements on the Dependent Variables.

a) Time per word.- The scores for this variable are presented in Table I; the corresponding analysis of variance functions are presented in Table II.

With respect to the time taken to act out words, no significant differences were found. Since there were no significant differences among teams under the five experimental conditions in time to act out words the first null hypothesis of this study could not be rejected.

b) Time spent in mutual gaze by the Actor and Receiver.- The scores for this variable are presented in Table III; the corresponding analysis of variance functions are presented in Table IV.

The statistical analysis of time spent in mutual gaze did not yield significant results, and thus the second

Table I.-

Time<sup>a</sup> Per Word Scores  
 Obtained by Four Teams in  
 Each of Five Conditions on a Charades Paradigm.

Condition <sup>b</sup>	Team I	Team II	Team III	Team IV
I. Actor on Drug Receiver on Drug	50.45	39.36	14.64	53.26
	22.76	24.83	21.38	73.00
	26.85	32.61	25.34	42.06
	18.30	52.45	33.06	32.02
II. Actor on Placebo Receiver on Placebo	15.50	24.57	16.75	45.00
	16.58	27.48	9.47	18.32
	30.92	7.37	23.66	29.76
	46.32	15.38	18.32	25.25
III. Actor on Drug Receiver on Placebo	48.70	22.31	27.75	102.40
	19.40	26.92	15.91	67.76
	12.25	21.62	6.90	24.68
	25.11	15.91	52.40	42.07
IV. Actor on Placebo Receiver on Drug	20.45	41.90	28.68	20.85
	26.98	36.92	24.60	53.86
	12.28	37.40	28.26	39.46
	48.70	41.04	25.64	15.66
V. Control, No Drug No Placebo	21.26	15.93	16.85	13.42
	35.36	17.43	26.15	31.27
	17.34	11.82	18.30	25.48
	21.63	47.40	24.24	9.68

a Time is expressed in seconds.

b For the purpose of identification, the Charade  
 Players are designated as Actor and Receiver.

Table II.-

Analysis of Variance Table for Time<sup>a</sup> Per Word  
 Scores Obtained by Four Charade Teams on  
 Each of Five Occasions, Using a Two  
 Factor, Repeated Measure Design.

Source	df	SS	MS	F Ratio	Prob.
A: Condition	4	2294.99	573.74	1.93	N.S.
A×C Interaction	12	3564.44	297.03		
B: Time Sequence	3	798.31	266.10	0.95	N.S.
B×C Interaction	9	2515.20	279.46		
A×B Interaction	12	2286.15	190.51	1.08	N.S.
A×B×C Interaction	36	6339.28	176.09		
C: Team	3	2567.15	855.71		

<sup>a</sup> Time is expressed in seconds.

Table III.-

Time<sup>a</sup> Spent in Mutual Gaze  
by Four Teams in Each of  
Five Conditions on a Charades Paradigm.

Condition <sup>b</sup>	Team I	Team II	Team III	Team IV
I. Actor on Drug Receiver on Drug	40.72	19.86	9.84	23.46
	17.26	14.65	12.22	12.40
	18.25	25.46	16.96	15.73
	12.33	32.67	17.28	4.72
II. Actor on Placebo Receiver on Placebo	14.17	15.68	8.88	27.12
	13.06	16.05	6.40	8.32
	26.18	3.32	17.20	12.55
	38.25	8.71	11.60	12.43
III. Actor on Drug Receiver on Placebo	43.07	12.18	16.40	70.05
	17.22	16.25	8.42	44.40
	10.43	14.16	41.51	16.88
	20.08	7.95	24.90	24.32
IV. Actor on Placebo Receiver on Drug	16.60	21.32	21.70	13.47
	22.10	22.46	14.38	36.40
	9.77	22.72	21.04	30.14
	37.47	20.32	16.55	9.98
V. Control, No Drug No Placebo	19.23	7.83	9.92	10.03
	32.24	8.43	19.07	25.25
	9.32	5.94	10.10	12.68
	17.51	28.67	16.12	6.41

a Time is expressed in seconds.

b The Charade Players are designated as Actor and Receiver.

Table IV.-

Analysis of Variance for Time<sup>a</sup> Spent in Mutual  
Gaze by Four Charade Teams on Each of Five  
Occasions, Using a Two Factor,  
Repeated Measure Design.

Source	df	SS	MS	F Ratio	Prob.
A: Condition	4	682.84	170.71	1.13	N.S.
A×C Interaction	12	1812.66	151.05		
B: Time Sequence	3	350.84	116.94	0.93	N.S.
B×C Interaction	9	1152.08	128.00		
A×B Interaction	12	1546.36	128.86	1.51	N.S.
A×B×C Interaction	36	3061.36	85.03		
C: Team	3	799.56	266.52		

<sup>a</sup> Time is expressed in seconds.

Table V.

Time<sup>a</sup> Spent by the  
Charade Actors Gazing at the  
Receivers on Each of Five Conditions.

Condition <sup>b</sup>	Actor I	Actor II	Actor III	Actor IV
I. Actor on Drug Receiver on Drug	41.07	21.26	10.32	20.73
	17.73	18.67	12.38	7.53
	19.63	24.36	18.14	15.26
	13.40	27.56	17.68	3.92
II. Actor on Placebo Receiver on Placebo	13.57	16.75	7.98	26.27
	13.05	15.45	6.52	7.71
	26.86	3.84	16.46	12.55
	39.15	8.97	13.16	11.68
III. Actor on Drug Receiver on Placebo	42.75	14.02	16.76	74.70
	17.65	17.10	6.75	42.20
	10.40	16.38	5.05	16.96
	22.03	8.90	26.43	24.15
IV. Actor on Placebo Receiver on Drug	15.57	23.37	23.40	12.14
	24.11	22.32	14.68	34.00
	9.94	23.32	22.94	27.50
	38.90	20.28	18.30	9.61
V. Control, No Drug No Placebo	19.28	8.17	10.51	10.02
	34.46	7.88	19.88	26.00
	12.40	5.68	10.50	12.68
	18.63	29.97	17.45	6.08

a Time is expressed in seconds.

b The Charade Players are designated as Actor and Receiver.

Table VI.-

Analysis of Variance Comparing the Time<sup>a</sup> Spent by the Charade Actors Gazing at their Receivers under Five Conditions Using a Two Factor, Repeated Measure Design.

Source	df	SS	MS	F Ratio	Prob.
A: Condition	4	1270.47	317.61	1.63	N.S.
A×C Interaction	12	2330.76	194.23		
B: Time Sequence	3	860.34	286.78	1.14	N.S.
B×C Interaction	9	2249.60	249.95		
A×B Interaction	12	1577.09	131.42	1.34	N.S.
A×B×C Interaction	36	3520.05	97.77		
C: Actor	3	1059.99	353.33		

<sup>a</sup> Time is expressed in seconds.

null hypothesis of this study could not be rejected.

c) Time spent in gaze behavior by the actor alone.- The scores for time spent in gaze behavior by the actor are presented in Table V, and the corresponding analysis of variance functions are presented in Table VI.

The analysis of variance did not yield any significant differences, and thus the third null hypothesis of this study could not be rejected.

d) Number of times the Receiver turned her gaze towards the Actor.- Scores are presented in Table VII, and corresponding analysis of variance functions are listed in Table VIII.

The number of times the receiver turns her gaze towards the actor did not yield any significant differences. Thus the fourth null hypothesis of the study could not be rejected.

e) Number of times the Actor turned her gaze towards the Receiver.- The scores for this variable are presented in Table IX, and the corresponding analysis of variance functions are listed in Table X.

No significant differences were found and thus the fifth null hypothesis of this study could not be rejected.

## 2. Scorer Reliability Data.

Reliability indices were calculated for time spent (measured by the raters using a stopwatch as described above)

Table VII.-

Average Number of Times that  
the Receiver Turned her Gaze  
Toward the Actor in Each of Five Conditions.

Condition <sup>a</sup>	Receiver	Receiver	Receiver	Receiver
	I	II	III	IV
I. Actor on Drug Receiver on Drug	5.50	2.00	1.00	3.00
	3.16	1.66	1.00	3.66
	2.66	2.16	1.60	2.00
	2.12	3.00	2.00	2.40
II. Actor on Placebo Receiver on Placebo	2.25	1.85	1.00	2.50
	1.62	1.14	1.11	1.28
	4.20	1.00	1.20	1.33
	5.00	1.20	1.28	1.28
III. Actor on Drug Receiver on Placebo	7.25	1.85	1.50	5.50
	2.00	1.57	1.14	4.00
	1.00	1.87	1.00	2.40
	4.66	1.00	1.66	3.00
IV. Actor on Placebo Receiver on Drug	2.14	1.75	1.33	1.28
	3.16	1.80	1.14	2.33
	2.22	1.40	2.20	2.40
	4.25	1.00	1.42	1.50
V. Control, No Drug No Placebo	1.66	1.13	1.00	1.25
	5.40	1.12	1.42	2.25
	2.12	1.14	1.44	1.50
	2.50	1.50	1.71	1.16

<sup>a</sup> The Charade Players are designated as Actor and Receiver.

Table VIII.-

Analysis of Variance Comparing the Number of Times that  
the Receivers Turned their Gaze Toward the Actors  
in Each of Five Conditions, Using a Two  
Factor, Repeated Measure Design.

Source	df	SS	MS	F Ratio	Prob.
A: Condition	4	178.13	44.53	1.13	N.S.
A×C Interaction	12	471.36	39.28		
B: Time Sequence	3	116.45	38.81	1.15	N.S.
B×C Interaction	9	301.20	33.46		
A×B Interaction	12	505.63	42.13	1.31	N.S.
A×B×C Interaction	36	1153.80	32.05		
C: Receiver	3	154.18	51.39		

a Time is expressed in seconds.

Table IX.-

Average Number of Times that  
the Actor Turned her Gaze  
Toward the Receiver in Each of Five Conditions.

Condition <sup>a</sup>	Actor I	Actor II	Actor III	Actor IV
I. Actor on Drug Receiver on Drug	6.00	7.60	2.42	5.33
	3.66	4.00	3.33	4.00
	5.16	3.16	3.80	4.00
	3.50	9.25	5.40	1.80
II. Actor on Placebo Receiver on Placebo	3.12	3.85	4.00	5.75
	2.87	4.00	2.66	3.00
	4.80	2.14	4.20	3.83
	5.75	3.00	4.00	3.33
III. Actor on Drug Receiver on Placebo	3.75	3.42	4.16	14.50
	2.75	3.42	3.14	10.33
	2.37	3.25	2.11	3.00
	2.16	4.11	7.33	6.25
IV. Actor on Placebo Receiver on Drug	3.57	10.25	4.83	3.14
	3.66	5.60	4.00	7.00
	3.00	6.00	4.20	5.20
	7.25	8.40	4.28	2.50
V. Control, No Drug No Placebo	3.66	3.33	3.37	2.25
	2.20	4.00	4.71	3.50
	3.71	3.57	3.66	3.00
	3.50	9.50	4.71	1.83

<sup>a</sup> The Charade Players are designated as Actor and Receiver.

Table X.-

Analysis of Variance Comparing the Number of Times that  
the Actors Turned their Gaze Toward the Receivers  
in Each of Five Conditions, Using a Two  
Factor, Repeated Measure Design.

Source	df	SS	MS	F Ratio	Prob.
A: Condition	4	24.48	6.12	0.62	N.S.
A $\times$ C Interaction	12	118.16	9.84		
B: Time Sequence	3	21.63	7.21	1.17	N.S.
B $\times$ C Interaction	9	55.19	6.13		
A $\times$ B Interaction	12	26.20	2.18	0.74	N.S.
A $\times$ B $\times$ C Interaction	36	112.66	3.12		
C: Actor	3	20.76	6.92		

in mutual gaze, and time spent in gaze behavior by the actor. For the other dependent variables reliability was not statistically assessed. It was decided to assess the reliability of time judgements because such judgements would probably be, in the opinion of the author, the least reliable data studied. Should these judgements prove sufficiently reliable, it was felt that reliability might be assumed with respect to other dependent variables under study.

The procedure for assessing the reliability of time estimates was as follows; One of the measurements taken was the number of times the receiver looked away from the actor. A score of zero meant that the receiver had gazed at the actor all the time during the acting out of the word. In such a case, mutual gaze would be determined by the amount of gaze behavior towards the receiver by the actor, and if the scoring was reliable, a high correlation would be expected between scores for time spent in mutual gaze and time spent by the actor gazing at the receiver. The Pearson coefficient for these comparisons by team are given in Table XI. These coefficients indicate a high correlation between the scores of the two variables.

### 3. Subjective Rating on the Effects of Alcohol.

As mentioned earlier, three ratings were obtained from the subjects concerning their subjective judgement

Table XI.-

Relationships Between Time Spent in Mutual Gaze  
and Time Spent in Gaze Behavior by the  
Actor, for Each of Four Teams.

	Team I	Team II	Team III	Team IV
Pearson r	.9890	.9904	.9357	.9885

of degree of intoxication. Subjects were asked to rate the effects of alcohol based on the following scale;

- 0- no effect
- 5- slight effect
- 10- somewhat high
- 15- quite high(sociable high)
- 20- very high(losing control of normally controlled actions).

The subjects were given a sheet of paper with the above scale and definitions on it. They were asked to write in the number, in the appropriate place, indicating their choice with regards to the effect of the alcohol as perceived by themselves. The ratings were taken at three different times; immediately after they finished drinking the alcohol, forty minutes after this rating, and immediately after the experimental session which was approximately twenty minutes later. The results of these ratings are contained in Table XII.

Table XII.-

Subjective Ratings of Alcohol and Placebo Administrations at Three Time Intervals During the Four Conditions Studied.

	Conditions <sup>a</sup>								Rating <sup>c</sup> Period
	I		II		III		IV		
	A on Drug <sup>b</sup> R on Drug		A on Plac. R on Plac.		A on Drug R on Plac.		A on Plac. R on Drug		
	A.	R.	A.	R.	A.	R.	A.	R.	
Team I	10	10	5	5	5	0	5	15	A
	15	10	5	5	15	0	5	15	B
	15	10	0	0	15	0	0	10	C
Team II	5	10	0	0	0	0	0	5	A
	10	15	0	0	5	0	0	10	B
	15	15	0	0	5	0	0	10	C
Team III	5	5	0	0	0	0	0	5	A
	5	10	0	0	5	0	0	10	B
	0	10	0	0	5	0	0	15	C
Team IV	10	5	0	0	0	5	0	0	A
	20	10	0	0	0	10	0	20	B
	20+	15	0	0	0	0	0	20+	C

a For Condition I a rating of an alcohol effect (5, 10, 15) was expected from both the actor and the receiver. For Condition II a rating of no alcohol effect(0) was expected from both the actor and the receiver. For Condition III a rating of alcohol effect(5, 10, 15) was expected from the Actor and a rating of no alcohol effect(0) was expected from the receiver. For Condition IV a rating of no alcohol effect(0) was expected from the actor and a rating of alcohol effect(5, 10, 15) was expected from the receiver.

b A designates the Actor from each team and R designates the Receiver from each team.

c This is the time during the running of the experimental sessions that the subjective ratings were made. A was immediately after the subjects consumed the beverage; B was forty minutes after A; and C was given after the finish of the charades, approximately 25 minutes after B.

## CHAPTER IV

### DISCUSSION OF RESULTS

The discussion of the results will be divided into three sections. The first section will deal with the main dependent variables. The second section will discuss the findings pertaining to the subjective ratings obtained. The third section will discuss the contributions and implications of this study.

#### 1. Discussion on the Main Dependent Variables.

As mentioned in the previous chapter, no significant differences were obtained relative to the hypotheses of the present study. The results do not then support the contention that alcohol has a significant effect on the variables studied. Although this limits the scope of the discussion, there are certain points worth examining.

Although the study was conceived primarily in the area of communication, the tasks performed by the subjects involved attention, recall and learning efficiency. Attention appears to play a key part in determining the results obtained on some of the dependent variables, especially time per word. The finding of an adverse effect of alcohol on attention by Hutchison, Tuchtie, Gray and Steinberg<sup>1</sup> suggests a decline in performance on the part of the subjects studied.

The finding of a short term memory deficit under alcohol by Ryback, Wernert and Fozard<sup>2</sup> may also indicate an expected effect of alcohol. The results of the present study then seem to conflict with some of the reported findings, and this warrants some discussion.

Of primary concern was the sample. Although the source from which the subjects were drawn could be considered satisfactory, sample size was small. At the finish of the experiment, because one subject could not continue for health reasons, the total sample size was eight, divided into four teams. Realizing the restriction placed on variance by using just four teams, it is probable that sample size diminished the likelihood of obtaining significant findings. Calculations to determine the power of the F-test yielded a power of approximately .10. In order to raise the power of the F-test in this study to .70 a sample size of approximately fifty two subject<sup>5</sup>; divided into twenty six teams, would have to be used.

The alcohol dosage used in this study is also relevant to a discussion of results. Some of the previous studies

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1 H.C. Hutchison, M. Tuchtie, K.G. Gray and D. Steinberg, "A Study of the Effects of Alcohol on Mental Functions," Canadian Psychiatric Association Journal, Vol. 9, No. 1, 1964, p. 33-42.

2 R. Rybach, Jane Wernert and J. Fozard, "Disruption of Short Term Memory in Man Following Consumption of Ethanol," Psychonomic Science, Vol. 20, No. 6, 1970, p. 353-354.

are vague about dosage in the sense that the proof of the alcohol is not clearly stated. This led to certain difficulties in choosing the experimental dosage. Previous studies and dosages were used as a broad base for choosing the amount of alcohol administered, but with the restriction that the authors wished to study the effects of a moderate dose. In the end 1.1 ml./kg. body weight was used. Pre-testing with this dosage suggested that it led to moderate intoxication. This dosage was somewhat lower than dosages used in some of the studies reviewed.

Ekman, Frankenhaeswe, Goldberg, Hagdahl and Myrsten<sup>3</sup> used dosages of .96 ml./kg. body weight, 1.28ml./kg. and 1.92 ml./kg.. The effect of the 1.92 ml./kg. dosage on performance measures and subjective ratings was consistent while the effect of the other two dosages was small and inconsistent. Hurst, Radlow, Chubb and Bagley<sup>4</sup> showed consistent effects using a dosage of roughly 1.86 ml./kg. body weight. Idestrom and Cadenius<sup>5</sup> used four different dosages of

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<sup>3</sup> Gosta Ekman, Marianne Frankenhaeser, Leonard Goldberg, Ragnar Hagdahl and Anna-Lisa Myrsten, "Subjective and Objective Effects of Alcohol as Functions of Dosage and Time," Psychopharmacologia, Vol. 6, 1964. p. 399-409.

<sup>4</sup> P.M. Hurst, R. Radlow, N.C. Chubb and S.K. Bagley, "Effects of Alcohol and D-amphetamine upon Mood and Volition," Psychological Reports, Vol. 24, 1969, p. 975-987.

<sup>5</sup> Carl-Magnus Idestrom and Bjorn Cadenius, "Time Relations of the Effect of Alcohol Compared to Placebo," Psychopharmacologia, Vol. 13, 1968, p. 189-200.

alcohol: .58 ml./kg. body weight, 1.16 ml./kg. body weight, 1.74 ml./kg. body weight and 2.32 ml./kg. body weight.

They found that the highest dosage produced a marked and consistent impairment in most of the measures used in their study. The dosages, 1.16 ml./kg. body weight and 1.74 ml./kg. body weight produced inconsistent but usually slightly negative effects. Of particular interest is that their dosage of 1.16 ml./kg. body weight is almost identical to the dosage used in the present study. Ekman, Frankenhaeser, Goldgerb, Bjerner, Jarpe and Myrsten<sup>6</sup> used a dosage of 1.6 ml./kg. body weight and reported overall subjective ratings of 15; 10 being defined as a 'little high'. In that study there was much variability and inconsistency between subjects, with some rating as high as twenty five and others as low as fifteen.

Since the purpose of this study called for a small effect, the dosage of 1.1 ml./kg. body weight was indicated. This dosage did have an intoxicating effect. For example, in one session the subject appeared observably drunk, with little motor control and preponderant giddiness. However, the effect of such a dosage was not consistent. It varied across subjects, and probably across such variables as time

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<sup>6</sup> Gösta Ekman, Marianne Frankenhaeser, Leonard Goldgerb, Kjell Bjerner, Gundlo Jarpe and Anna-Lisa Myrsten, "Effects of Alcohol Intake on Subjective and Objective Variables over a Five Hour Period," Psychopharmacologia, Vol.4, 1963, p. 28-38.

of day. In general, the higher the dosage, the more consistent and directional the effects are. Therefore if one wishes to limit the effect measured to alcohol and not to other variables a higher dosage, 1.8 ml./kg. body weight to 2.3 ml./kg. body weight, seems to be indicated. Although it is interesting to study the effect of a smaller dosage of alcohol perhaps the smaller dosages allow extraneous variables to exert influence to the detriment of a consistent effect.

Finally the structure that the charades paradigm places on the visual interaction of the participants warrants mentioning. It became increasingly apparent that the rules and nature of the game placed an inherent structure on mutual gaze. Almost by definition, the receiver must always look at the actor. Because of the position of the receiver both physically, and in terms of her role in the charade interaction, her gaze was virtually fixed and not subject to fluctuation. Kendon<sup>7</sup> has found that in terms of how long at a time A looks at B and B at A, it seems as if each dyad comes to a kind of agreement whereby each looks at the other for a particular length of time. On the average, though, for how long at a time each looks at the other depends on the dyad. Although people usually interact in a characteristic

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<sup>7</sup> Adam Kendon, "Some Functions of Gaze Direction in Social Interaction, Acta Psychologica, Vol. 26, 1967, p. 22-63.

way, there still remains the fact that people adjust their looking behavior in accord with situationally specific factors. The important point here is that in the present study the subjects, especially the receiver, were exposed to a design that possibly, situationally determined mutual gaze in a way as to rule out fluctuations normally found. In a sense this would not affect the actor as much as the receiver. However, even when the actor was measured alone no significant differences were found. Perhaps the design of the study placed too strict a structure on gaze behavior thereby producing results reflecting more the paradigm than the effect of alcohol.

## 2. Discussion of the Subjective Ratings Obtained.

Ekman, Frankenhaeser, Goldberg, Bjerner, Jarpe and Myrsten<sup>8</sup> concluded that subjective variables were more affected by alcohol than objective test performance. In another study, Ekman, Frankenhaeser, Goldberg, Hagdahl and Myrsten<sup>9</sup> replicated this finding. The ratings obtained from the present study are compatible with the findings of the above studies. It appears that although the performance variables of the present study were not greatly affected, the subjective ratings given were. The ratings are of interest

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<sup>8</sup> Ekman et al., Op. Cit., p. 28-38.

<sup>9</sup> Ekman et al., Op. Cit., p.399-409.

also to the extent that the scale used in this study is very similar to those used in the above studies both in construction and in definition of the actual numbers and what they signify. If one remembers the relatively higher dosages used in the above cited studies as compared to the dosages used in this study then lower ratings would be expected here. However, Table XII shows a number of ratings which are considered high in terms of the scale. In fact, the ratings seen in that Table are comparable to the ratings given in the above two studies.

Table XII also shows different ratings for the same dosage among conditions. In Team I there is a rating of effects due to alcohol when the subject did not receive any alcohol. In Team IV one subject rated the effect of alcohol at 20+ one time while another time she received alcohol she rated it 0 in terms of its effects on her. Overall the teams show differential ratings eventhough they received the same dosage of alcohol throughout.

The placebo effect may perhaps be explained in terms of autosuggestion. Since the expectations of the experiment were that one is drinking alcohol it seems judgements were made in consideration of this expectation. The differential ratings obtained could relate to time of day, food intake as well as fatigue or other subject variables. Generally the ratings show the inconsistency from individual to

individual observed in other studies.

### 3. Contributions and Implications for Future Research.

The present study was intended as a pilot study when originally conceived. Within its function as a pilot study certain contributions, with particular regard to implications for future research, were made. These will be discussed below.

a) Size of Sample.- Any further investigation using this paradigm must consider the small size of the sample. Statistical Calculations, i.e., the power of the F-test, indicate that a more appropriate sample size to be used would be one of approximately twenty six teams..

b) Dosage of Alcohol.- Although the study of the effect of moderate doses of alcohol is appropriate, the findings of the present study suggest that future research should probably use either a higher dosage of alcohol or else include an extreme dosage of alcohol along with the more moderate dosage.

c) Study of Gaze Behavior.- With respect to future research with gaze behavior the findings of the present study suggests that a paradigm which systematically structures type and amount of gaze behavior is inappropriate when studying gaze behavior. The paradigm should allow for the fluctuation of gaze behavior in a free manner. An inherent

structure should not be placed on the gaze behavior of the subjects.

d) Studying Human Communication by use of the Videotape.- The technique used in this study employed real time recording and playback in analysis of the communicative process. That is, the full performance of the subjects were analyzed not just part or sections of their behavior as when still pictures or just certain frames from moving pictures are used as basic data. The use of the videotape in analyzing communication is a relatively new technique. It allows the experimenter to observe and analyze the full scope of the communicative process. It emphasizes the ongoing nature of the communicative process since the experimenter is forced to view the interaction in a more complete fashion. The nuances, the shifts, the give and take between participants come into full focus when their behavior is analysed by use of the videotape. It places the laboratory study of communication a few steps closer to the more natural situation. As such, analysis of the data gained from videotape produces interpretations which correspond more closely to the occurrence of communication as it is normally conceived.

Since the use of the videotape is so recent, new scoring procedures and categories had to be defined for the present study. By identifying and establishing certain scoring procedures as well as showing their reliability, this study has helped establish the use of the videotape as an appropriate experimental procedure. The present study has shown that, methodologically, the use of videorecording and scoring is possible. Needless to say more studies should be performed to further clarify whether the use of the videotape as a methodological procedure to study communication is appropriate.

## SUMMARY AND CONCLUSIONS

This study attempted to investigate the effects of alcohol on non-verbal communication. The specific parameter of non-verbal communication chosen was visual interaction. This was chosen for reasons which were indicated.

The present study did not prove conclusively that alcohol does or does not influence the behaviors studied. There were no significant differences found; none of the five null hypotheses were rejected.

This study has however set down valuable groundwork by using full-time 'live' videotapes instead of stills or partial sequence analysis. This represents an approach rarely used. Since it has been emphasized by many authors that research on communication must come as close as possible to normal interactions this is a valuable contribution. It may represent an approach of increasing usefulness in the future.

This study has also shown that scoring procedures developed in earlier studies lend themselves to the use of full-time video tape.

## BIBLIOGRAPHY

Argyle, M., M. Lalljee and M. Cook, "The Effects of Visibility on Interaction in a Dyad," Human Relations, Vol. 21, 1968, n. 3-17.

Investigated the phenomenon of how visual feedback and comfort and ease of interaction are related. Along with many other studies a good source for aspects of visual interaction.

Dittman, Allen T., Seymour N. Stein, and David Shakow, "The Relationship between Body Movements and Moods in Interviews," Journal of Consulting Psychology, Vol. 26, 1962, p. 480.

One of the earlier works and as such is an exploratory venture.

Duncan, Starkey, Jr., "Non-verbal Communication," Psychological Bulletin, Vol. 46, No. 2, 1969, p. 118-135.

Extremely useful and excellent review of the topic of non-verbal communication. Classifies the areas in terms of parameters as well as in terms of individual studies. Primary source for anyone beginning in the topic of non-verbal communication.

Dunlap, K., "Role of Eye Muscles and Mouth Muscles in the Expression of Emotions," Genetic Psychology Monographs, Vol. 68, 1927, p. 197-233.

One of the earliest works in the area, an often quoted study. Its usefulness is in terms of historical interest mainly.

Ekman, Paul, "Body Position, Facial Expression, and Verbal Behavior during Interviews," Journal of Abnormal and Social Psychology, Vol. 68, 1964, p. 295-301.

One of the earlier works which presents a strong experimental basis for studying non-verbal behavior. This source in conjunction with his later ones offers the base from which many studies in the area arise. For any one wishing to investigate the area of nonverbal behavior this and his later works are essential reading.

Ekman, Paul, "Communication through Non-verbal Behavior: a Source of Information about an Interpersonal Relationship," in Affect, Cognition and Personalities, New York, Springer, 1965, p. 390-442.

A very valuable source for the area of non-verbal behavior. Primarily theoretical in nature it offers a conceptual rationale for understanding non-verbal behavior.

It also contains a series of experiments considered classical in the field of non-verbal research.

Ekman, Paul, and Wallace V. Friesen, "Head and Body Cues in the Judgement of Emotion: A Reformulation," Perceptual and Motor Skills, Vol. 24, 1967, p. 711-724.

Part of the principal author's continuing work. Should be read in conjunction with other works for in this article the author extends his methodology but more importantly offers new explanations of phenomena which he has studied previously. Its age allows it to shed necessary re-evaluation on his earlier works.

Ekman, Gosta, Marianne Frankenhaeser, Leonard Goldberg, Kjell Bjerver, Gundla Jarpe and Anna-lisa Myrsten, "Effects of Alcohol Intake on Subjective and Objective Variables over a Five Hour Period," Psychopharmacologia, Vol. 4, 1963, p. 28-38.

Part of a series of studies. It is an often quoted work. Provides a useful introduction to alcohol studies and in particular is helpful for methodological considerations.

Ekman, Gosta, Marianne Frankenhaeser, Leonard Goldberg, Ragnar Hagdahl and Anna-Lisa Myrsten, "Subjective and Objective Effects of Alcohol as Functions of Dosage and Time," Psychopharmacologia, Vol. 6, 1964, p. 399-409.

Replication of the earlier work. Useful for information in planning a design using alcohol.

Exline, Ralph V., "Explorations in the Process of Person Perception: Visual Interaction in Relation to Competition, Sex, and Need for Affiliation," Journal of Personality, Vol. 31, 1963, p. 1-20.

This is the first in a series of studies. These works along with those of Paul Ekman are considered the basic sources in this area. Although the first work was greatly added to by the following works it still contains theory and methodological designs considered valid today.

Exline, Ralph, David Gray and Dorothy Schuette, "Visual Behavior in a Dyad as Affected by Interview Content and Sex of Respondent," Journal of Personality and Social Psychology, Vol. 1, No. 3, 1965, p. 201-209.

Extension of the earlier work with welcome methodological advances.

Exline, R., J. Thibaut, C. Brannon, and P. Gumpert, "Visual Interaction in Relation to Machiavellianism and an Unethical Act," American Psychologist, Vol. 16, 1961, p. 396.

It is of interest in that it extends the areas in which visual interaction had been studied to the new dimension called Machiavellianism.

Exline, Ralph V. and Lewis C. Winters, "Affective Relations and Mutual Glances in Dyads," in Affect, Cognition and Personalities, New York, Springer, 1965, p. 319-350.

More general in nature than the earlier works in the sense that the theory is explored more. It also takes into account a broader spectrum of variables and as such serves as a review of earlier works.

Forney, R.B. and R.W. Hughes, "Delayed Auditory Feedback and Ethanol: Effect on Verbal and Arithmetic Performance," Journal of Psychology, Vol. 52, 1961, p. 185-192.

Part of a series of studies. It bears a certain relationship to the present study because one of its dependent variables is verbal output. In that sense it is somewhat specific in nature but does provide methodological introduction.

Forney, R.B., and F.W. Hughes, "Effects of Caffeine and Alcohol on Performance under Stress of Audiofeedback," Quarterly Journal of Studies on Alcohol, Vol. 26, 1965 p. 206-212.

Primarily a replication of the earlier work but it does contain some new elements in its investigation.

Hurst, P.M., R. Radlow, N.C. Chubb, and S.K. Bagley, "Effects of Alcohol and D-amphetamine upon Mood and Volition," Psychological Reports, Vol. 24, 1969, p. 975-987.

A sound study examining the relationship among the above drugs. It is of interest with respect to this study because of the investigation of subjective ratings and mood variables that it contains.

Hutchison, H.C., M. Tuchtie, K.G. Gray, and D. Steinberg, "A Study of the Effects of Alcohol on Mental Functions," Canadian Psychiatric Association Journal, Vol. 9, No. 1, 1964, p. 33-42.

An informative article which can be used but with some reservation, because of its general nature and its methodological applications could stand improvement.

Idestrom, Carl-Magnus, and Bjorn Cadenius, "Time Relations of the Effect of alcohol Compared to Placebo," Psychopharmacologia, Vol. 13, 1968, p. 189-200.

A good source to consult mainly because it is comprehensive in the investigation of its main variables. It also has an important relation to the present study because one of the dosages of alcohol it uses is identical to the one used here.

Jones, Reese T., and George C. Stone, "Psychological Studies of Marijuana and Alcohol in Man," Psychopharmacologia, Vol. 13, 1970, p. 108-117.

It could serve as a basis for a comparison between the two drugs but it is of limited value in the sense that it does not show significant effects of alcohol.

Kendon, Adam, "Some Functions of Gaze Direction in Social Interaction," Acta Psychologica, Vol. 26, 1967, p. 22-63.

An excellent article both theoretically and experimentally. It can be considered as the basic source for this paper. It was of invaluable assistance both in planning and in understanding the topic. It is of further interest because of the similarity between its findings and those of the present research.

LeCompte, W., and H. Rosenfeld, "Effects of Minimal Eye Contact in the Instruction Period on Impressions of the Experimenter," Journal of Experimental Social Psychology, Vol. 7, No. 2, 1971, p. 211-220.

A valuable article primarily because its date allows it to take cognizance of recent advances and also enables it to build firmly on the studies of the past.

Mehrabian, Albert, "A Semantic Space for Non-verbal Behavior," Journal of Consulting and Clinical Psychology, Vol. 35, No. 2, 1970, p. 248-257.

This article is of limited value. At most it could serve as a broad introduction to some aspects of non-verbal behavior. It is primarily theoretical in nature.

Nash, H., "The Double Blind Procedure, Rationale and Empirical Evaluation," Journal of Nervous and Mental Disease, Vol. 134, 1962, p. 34-47.

A classic which sets down a very desirable experimental procedure. Of particular interest to this study because of the desire for experimental tightness.

Rybach, R., Jane Wernert, and J. Fozard, "Disruption of Short Term Memory in Man Following Consumption of Ethanol," Psychonomic Science, Vol. 20, No. 6, 1970, p. 353-354.

A short article which serves simply as a forum to report the very specific finding they obtained.

Schefflen, Albert E., "On the Structuring of Human Communication," The American Behavioural Scientist, Vol. 10, No. 8, p. 9.

An excellent article which offers an overview of the entire communication process. Its clarity enables one to understand the place of various subsystems including non-verbal parameters within the communication matrix. For overall understanding it should be considered a primary source.

APPENDIX A

COPY OF THE RULES FOR SCRABBLE CHARADES  
AS IT WAS PRESENTED TO THE SUBJECTS

RULES FOR SCRABBLE CHARADESI. PROCEDURE

- A. The actor is given five consonants and three vowels, and is allowed 15 seconds of preparation. On the signal to begin, the actor follows the procedure below
1. Form a word from the given letters, and then write it on the given pad.
  2. Act out the word charade, until the receiver guesses the charade; if the actor considers that too much time is being taken, she may move to step three even though the word is not guessed.
  3. Form another word from the given letters, write it down and act it out.
  4. Act out as many words as possible, within the FOUR MINUTE TIME LIMIT.
- B. Four different sets of letters will be given each sess

II. TECHNIQUES

- A. # of Words- indicate with the correct # of fingers.  
 B. # of Letters in the word- # of fingers, after "A".  
 C. SYLLABLES:  
 1. With two fingers, make a cutting action on the opposite arm.  
 2. Number of fingers shown to indicate # of syllables.  
 D. SOUNDS LIKE - Touch your ear.  
 E. EXTEND an idea, sound, word - move hands out, as if stretching something.  
 F. SHORTEN an idea, sound, word - move hands together.  
 G. CONTROL OF RESPONSES BY THE ACTOR;  
 1. If guessing is poor, thrust hands forward, indicating distance.  
 2. If guessing is close, use a beckoning motion.  
 3. If the guess is wrong, cross hands back and forth.

III. OTHER RULES

- A. Actor may not voice words, nor form words with lips. Receiver however, may question the actor to any length.  
 B. Objects and colours may be pointed to as aids.

IV. SCORING

The objective of the game is to score as many points within the time limit as possible. Points are scores according to the number of words acted out and guessed. The more words that the actor acts out and the receiver guesses the more points earned.

APPENDIX B

INTRODUCTION OF THE SUBJECT TO  
THE EXPERIMENTAL SITUATION

INTRODUCTION<sup>1</sup>

First of all, let us think you for coming, and consenting to help us.

As an introduction, let us tell you about the basic purpose of our research. We are attempting to study the effects of alcohol on certain aspects of human functioning. We cannot be more specific than this.

To do this, we have devised a type of charades, the rules of which will be presented to you. These charades will be videotaped, in order that we may later assess them.

Here is our procedure. During this session, you will be given a battery of psychological tests, so that we may find people who will fit our research purposes. At the end, you will be given a copy of the charade rules, which should be studied, understood, and any questions prepared for our next meeting.

We will, within a few days, call or see those whom we require, and arrange a second meeting. At this time, there will be an opportunity to practice the charades, and a short interview will be given. You will then be divided into teams of two, one person being the actor of the charades, the other the receiver(or guesser).

Following this, you will be contacted, and an appointment schedule will be given you for your experimental sessions. We would ask you to be 10 minutes early for your appointment, so that we may keep a strict schedule.

Once again, I would like to thank all of you for consenting to assist us.

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<sup>1</sup> This is the sheet from which the experimenters' read when they orally presented this introduction to the subjects.

APPENDIX C

SELF-RATING SCALE USED BY THE SUBJECTS  
TO RATE THE EFFECTS OF ALCOHOL

## SELF-RATING SCALE

TEAM:

DATE:

TIME:

Subjectively rate the effects of the alcohol upon yourself based on the following scale.

0- no effect

5- alight effect

10- somewhat high

15- quite high(sociable high)

20- very high(losing control of normally  
controlled actions)I-<sup>2</sup>

II-

III-

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<sup>2</sup> These three Roman numerals stand for the three different time periods that the subjects had to rate themselves. They indicated their ratings by writing the number next to the appropriate Roman numeral.

APPENDIX D

ABSTRACT OF  
THE EFFECT OF ALCOHOL UPON HUMAN COMMUNICATION SKILLS  
AS OBSERVED WITHIN A NON-VERBAL PARADIGM

## ABSTRACT OF

The Effect of Alcohol upon Human Communication Skills  
as Observed within a Non-Verbal Paradigm

The aim of this study was to examine the effects of a moderate dose of alcohol as compared with placebo and control on non-verbal communication. Eight female subjects, aged twenty one to thirty, were divided into three teams. Four experimental conditions were administered. Two of these conditions required the subject to consume 1.1 ml./kg. of alcohol disguised in an orange juice mixture. The placebo was an orange juice beverage which was indistinguishable from the alcohol condition.

After consumption of the beverage the subjects engaged in the playing of a charades game. This was videotaped. The videotape was later scored by two raters in an attempt to measure certain non-verbal behaviors. Self-ratings on the effect of the alcohol were also given by the subjects.

The statistical analysis of the non-verbal behaviors revealed no statistically significant differences. Certain implications for future research were indicated. The study did show that the use of full 'real time' analysis, made possible by the use of the videotape machine, was an appropriate technique for experimental purposes.

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3 Robert P. Heine, Masters' thesis presented to the Faculty of Psychology of the University of Ottawa, Ontario, March, 1972, p. x-73.

## ERRATA

1. On page vi in the sixth line of the second paragraph, the word 'develops' should read 'develop'.

2. On page two in the fourth line of the second paragraph the word 'alsochol' should read 'alcohol'.

3. On page twenty one the following should appear under the third footnote at the bottom of the page;

\* Footnote references 4 and 5 are found on page 22.

4. On page thirty four in the second and third lines of the title of Table II 'on each of Five Occasions' should read 'in each of Five Conditions'.

5. On page thirty six in the second and third lines of the title of Table IV 'on each of Five Occasions' should read 'in each of Five Conditions'.