This is to certify that the

thesis entitled

INDIVIDUAL DIFFERENCES IN TASK PERFORMANCE
BASED ON PERSONAL SPACE AND ATTRIBUTION THEORY

presented by

SCOTT ALAN COHEN

has been accepted towards fulfillment
of the requirements for

M.A. degree in PSYCHOLOGY

Major professor

Date FEBRUARY 23, 1987

INDIVIDUAL DIFFERENCES IN TASK PERFORMANCE BASED ON PERSONAL SPACE AND ATTRIBUTION THEORY

By

Scott Alan Cohen

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Psychology

1987

ABSTRACT

INDIVIDUAL DIFFERENCES IN TASK PERFORMACE BASED ON PERSONAL SPACE AND ATTRIBUTION THEORY

By

Scott Alan Cohen

This study attempted to replicate Worchel and Yohai's (1979) findings utilizing an individual level of analysis. Specifically, it was predicted that subjects who were aroused by having their personal space violated would experience less crowding and exhibit fewer performance decrements if they were led to believe that some other factor was responsible for the arousal. After individual measures of personal space were collected, groups of subjects were placed in a room in which they sat either close together or far apart. Some subjects were told that the reading task they would be conducting should create much eyestrain. Other subjects were told nothing. While subjects seated close together reported feeling crowded, neither the seating positions nor the eyestrain manipulation had the predicted effects on task performance. Suggested explanations included the noninteractive nature of the utilized task, the level of perceived task difficulty, and the limitations of influencing subjects' attributions in the laboratory. (Worchel, S. &

Yohai, S. (1979). The role of attribution in the experience of crowding. Journal of Experimental Social Psychology, 15, 91-104.)

FOR ADAM, JASON

AND JESSICA

May you strive for your wildest dreams ...

and reach them!

ACKNOWLEDGMENTS

Many students acknowledge few after the completion of a thesis and render most of their acknowledgements after completing the dissertation. I just love breaking traditions!

I would like to thank my Committee Members, Drs. Neal Schmitt, Steve Kozlowski, and Dan Ilgen for helping me learn how to analyze and critique my own work and the work of others. I am most grateful to them for allowing me the freedom to follow my research interests so I could begin exploring and developing my career goals.

I feel indebted and especially grateful to the Chairperson of my Committee, the all-too-modest Dr. Neal Schmitt. Throughout the past year and a half, Neal has often put his own work aside as I barged into his office asking questions related to this or any other project on which I was working. This is only a small example of his genuine love for his students' quest for knowledge. Thank you for all you have taught and given to me, Neal! I hope that learning process can continue long into the future.

Thank you to all my Michigan State colleagues who were most helpful in offering advice and suggestions to strengthen my study. I'd like to single out Sue, Mike (IIIIke), Mary, and MaryBeth for occasionally serving as confederates in

pilot studies and offering insightful comments. Four undergraduate students, Amy, Laurie, Mark, and Pat, diligently served as confederates in the final study and did a good job of pretending to be interested.

Loving family and friends in Boston and New York were always offering moral support when my spirits were low, and sharing in my excitement when my spirits were high. While I can't possibly acknowledge all of them here ... on second thought, sure I can! The closest members of my Brandeis University family, Denise, Lewis, Michele, Mike, Joe, Martin, and Dave, will be an important part of my life "for the longest time." A small Syracuse contingency, Marc and Jill, also are always in my thoughts. Mark, Len, Joy and Sharman have showered their "baby brother" with love for many years. All I can say is thanks, and I love and care for you very much! I feel a special love for my parents. I don't think I've ever met two people who are more successful in all aspects of life (and without any fancy college degree letters following their names). Mom and dad, although my pen has written the words in this thesis, you supplied me with the ink. Thank you for years of love and support.

Finally, last but not least I want to offer a special thanks to Sue. Far beyond any suggestions you have given me, Sue, you were always there for me. You have made life in East Lansing much more enjoyable and bearable than it would have been without you. Aside from a simple thanks, I want to take this opportunity to publicly express my love for you!

Maybe someday we'll get to collaborate .....

.....

..... on a study (I just know you're going to kill me for writing this).

If I've left you, the reader, thinking I'll have no one left to acknowledge in a dissertation, you obviously do not know me well. I'm sure I'll find something to say. Therefore, these acknowledgements are ...

TO BE CONTINUED
(in a couple of years)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Several researchers have demonstrated that subjects exhibit poorer performance on various tasks when they are working in very close proximity than when they are more distant from each other (Paulus & Matthews, 1980); Worchel & Teddlie, 1976; Worchel & Yohai, 1979). One explanation for this effect is that people experience increased levels of stress when they are crowded together. The increased stress is accompanied by a reduction of energy devoted to conducting their tasks. This results in a reduced level of successful performance.

Although feelings of crowding generally result in poor task performance, the degree to which performance levels decrease under increasingly crowded conditions can be curtailed. Studies have demonstrated that this is accomplished by providing subjects with a plausible explanation for the cause of the stress which they experience under crowded conditions (Langer & Saegert, 1977; Paulus & Matthews, 1980; Worchel & Teddlie, 1976; Worchel & Yohai, 1979).

This paper describes an attempt to replicate and extend this previous research in order to answer two questions: 1) Can we identify those individuals who are most easily stressed under crowded conditions, and 2) Are there differences in individuals' level of task performance when an attributional explanation for the cause of their stress is offered as opposed to instances when no attributional explanation is offered.

Distinguishing Between Crowding, Density, and Proximity

Throughout the literature, there have been ambiguities in the concept of crowding. These ambiguities have prevented researchers from developing a unified theory from which they could predict the effects of crowding. Much of the equivocacy centers around a failure to distinguish between the concepts of **density** and **crowding**. For instance, Lawrence (1974) defines crowding as a spatial limitation and Freedman (1975) defines crowding as high population density. Both of these researchers have defined social density (the number of people in a particular area) and spatial density (the amount of space per person) as synonymous with crowding. However, other researchers have determined that high social and spatial density do not always produce the feelings of stress associated with feelings of crowding (Altman, 1975; Freedman, 1975; Stokols, 1975; Sundstrom, 1975). It is more appropriate to view density as an antecedent condition that may, in certain situations, precipitate feelings of crowding.

While density is a spatial limitation, crowding is the subjective and experiential state of perceived limitation of space (Stokols, 1972).

The subjective state of crowding appears to arise only when one experiences excess or undesirable contact with others and a perceived loss of control over these interactions (Desor, 1972; Rapoport, 1975; Valins and Baum, 1973). One would be more likely to experience these feelings under conditions of high density. However, this may only be true if one is engaging in a task where s/he cannot avoid the presence of others (e.g., the presence of others disrupts his/her concentration) or is not pleased by their presence (e.g., they are not his/her friends). Density only precipitates feelings of crowding when it is associated with perceived excess or undesirable contact with others and a perceived loss of control over this contact.

Proximity more appropriately describes the spatial limitations associated with feelings of crowding (Knowles, 1978). Proximity is the interpersonal closeness of people. Density has been loosely defined as the number of people in a given amount of space. Density alone may not be an appropriate measure because unequal spacing usually does occur when people congregate. For instance, at a social gathering (e.g., a cocktail party), various groups of people gather in a room. People do not congregate in one large group, but break off into many smaller groups differing in size. Greater physical distance is often maintained between

these groups than is maintained between individuals standing in any one group. Close friends speaking to one another may stand closer together than acquaintances or strangers (e.g., Little, 1965). Furthermore, some people in the room may stand apart from everyone else, preferring to be alone. It is obvious that everyone does not maintain the same degree of contact with each other. Proximity provides a vehicle in which density can be described in terms of each individual's interactions with all the others present. Increasing the number of people in a given room does not necessarily lead one to feel stressed since the people can spread out provided that the room is not small (Worchel & Teddlie, 1976). Increasing the number of people may even reduce feelings of stress if these other people are friends (Evans & Howard, 1973; Edney & Grundman, 1979). More people may make an event more exciting and enjoyable (e.g., a football game, a concert). Not everyone would necessarily feel crowded in a particular environment -- only those whose excess or undesirable proximity lead to feelings of uncontrollable contact with others.

Crowding can be described within an attributional framework. Worchel & Teddlie (1976) proposed that crowding is a function of arousal and the attribution that the arousal is caused by other people in an individual's environment. The arousal state results from a limitation of space caused by the excess or undesirable proximity of others. In order for crowding to be experienced, an attribution must be made

that this perceived arousal is caused by the close presence of others. This relationship is demonstrated in Figure 1. Also illustrated in this figure is the notion that excess or undesirable proximity (i.e., a violation of personal space) can increase one's level of arousal. This proposition is discussed in the next section.

Conceptualizing Crowding in Terms of Personal Space Violations

Individual differences in preference for personal space may affect whether or not a particular degree of interpersonal contact (proximity) will be desirable or undesirable for a given individual. Several researchers have defined personal space as an invisible bubble which surrounds people wherever they go and provides a boundary of their most comfortable interaction distances with others. Once a person approaches someone close enough to penetrate this boundary, the person being approached begins to feel uncomfortable (Hall, 1963; Little, 1965; Sommer, 1959). The specific size of this invisible boundary is determined by individual and situational variables. The individual variables (e.g., cultural background, personal background, personality traits) are stable across different situations. The situational variables (e.g., actual interpersonal distance, expectations of encountering limited resources, social appropriateness, one's relationships with the others

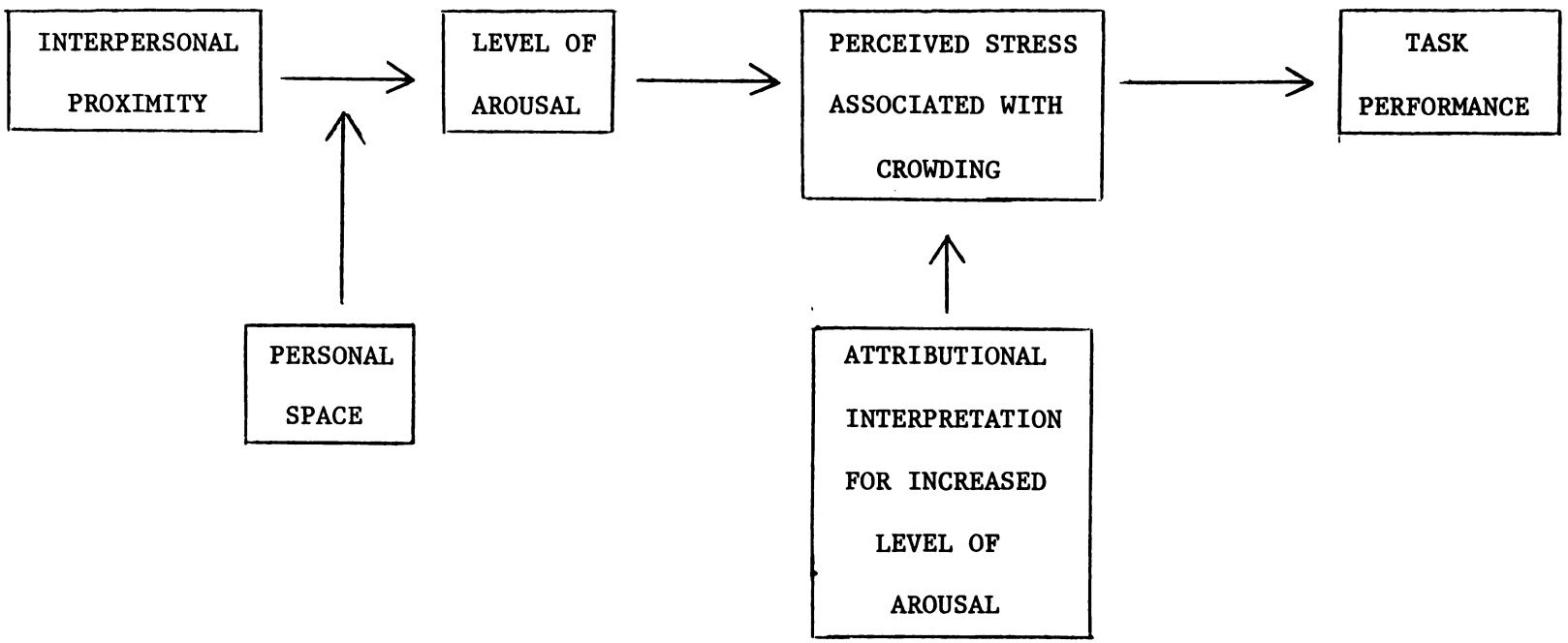


Figure 1. The conceptual model.

present) will vary across different situations. Therefore, small variations in the size of one's personal space "bubble" are due solely to variances across the situational variables.

It is probable that in a given situation everyone's personal space will be different due to variations across both the individual (e.g., different background experiences and personality traits) and situational variables (e.g., different relationships with the others present). In some environments (e.g., school, workplace) people are placed in a physical location where they may have a fairly stable interaction distance with others. These people have highly limited mobility and are not free to change their physical location, the amount of interaction with others, nor with whom they interact. If their comfortable interaction distance (personal space) is smaller than the actual interpersonal distance to which they are subjected in that situation, they would suffer a <u>personal space violation</u>. This violation would create a feeling of stress (Hall, 1966) -- the stress that is associated with feelings of crowding.

Including the consideration of personal space preference as a moderator of the relationship between interpersonal proximity and level of arousal in Figure 1 allows one to conceive of crowding as a subjective and experiential state since one's personal space is determined by individual subjectivity and previous experiences. Personal space violations represent a loss of control over one's interactions and undesirable or excess contact with others.

Once again, preference for personal space is dependent upon various individual variables. Cultural background (e.g., Hall, 1966), personal background (e.g., Cozby, 1972), and several personality traits (e.g., Eberts, 1972) have been found to be significantly related to one's preference for personal space. In this study, preference for personal space is measured directly rather than through its personality or demographic proxies.

Situational Variables Which Affect One's Personal Space

The research literature suggests that there are four situational variables which create some variation in an individual's feelings about personal space. These variables are actual interpersonal distance, necessity for interpersonal interaction, expectation of encountering limited resources, and degree of interpersonal liking. The levels of each of these variables were manipulated by the experimenter in this study to maximize the probability that those subjects experiencing high interpersonal proximity would also experience the stress associated with crowding.

Actual Interpersonal Distance. Personal space violations occur when preferred interpersonal distance exceeds actual interpersonal distance in a given situation. Many researchers have also demonstrated that excessive interpersonal proximity leads to feelings of stress associated with feelings of crowding (e.g., Hall, 1966). However, much of the previous research which has examined crowding has manipulated room size but has not manipulated

interpersonal distance. A movement from a large to a small room does not necessarily imply a decrease in interpersonal distance (Knowles, 1978; 1980). Subjects can actually move further away from each other in a small room if they were previously close to each other in a large room. When subjects have high interpersonal distance in very small rooms, they will not feel stress from high interpersonal proximity. However, they may feel stress as they move closer to physical constraints in the environment such as walls (Worchel & Teddlie, 1976) or partitions (Desor, 1972). This stress results because these constraints limit freedom of movement (Stokols, Smith, & Proster, 1975; Stokols, 1976).

It is difficult to determine just why subjects felt stressed in many previous studies examining crowding because of three major limitations of these studies (which also explain many equivocal findings in this area). First, most researchers have not published descriptions of the experimental rooms which were used (e.g., the presence or absence of walls, partitions, doors, and windows, etc. and how far each subject was positioned from these environmental variables). Second, most researchers have not even examined actual interpersonal distance when only room size was manipulated. Therefore, subjects were not necessarily seated at the same interpersonal distances within rooms of different sizes. Third, no one has examined actual interpersonal distances when only social density -- number of people present in the room -- was manipulated. In this research

there has been no way of knowing whether or not an increase in social density decreased actual interpersonal distances between subjects. Therefore, any attempt to accurately explain the source of variance (or lack there of) of perceived stress in these studies is impossible. The source could have been room size, proximity to environmental constraints, interpersonal proximity, or some combination of these variables. Furthermore, in studies reporting to be "replications of previous studies", there is no way of assessing the degree to which the environmental conditions have been accurately replicated since the experimental designs of many of these studies have been insufficiently reported. If one wishes to study the effects of interpersonal proximity on perceived crowding, it is important to realize that the room be large enough so that subjects who are interpersonally distant will not experience stress from close physical proximity to environmental constraints.

Social Interference/Necessity for Personal Interaction. Some researchers (Freedman, Klevansky, & Ehrlich, 1971; Rawls, Trego, McGaffrey, & Rawls, 1972) have found no ill effects of crowding even when subjects are all placed close together. This was probably because of the noninteractive nature of the tasks which the subjects were conducting. For instance, in Freedman, et al.'s research, subjects placed within groups worked on many individualistic tasks in conditions that appeared to the researcher to be

crowded and uncrowded. However, subjects never had to interact with others in their respective groups, so the crowding did not directly interfere with their performance. In contrast, other studies have required participants to conduct interactive tasks that are more difficult to solve under crowded conditions (e.g., Heller, Groff, & Solomon, 1977; Paulus, Annis, Seta, Schkade, & Matthews, 1976). Heller, et al. conducted a study where a collating task was conducted under low or high interactive conditions. In the low interactive condition, subjects did not interact with each other at all. In the high interactive condition, subjects had to move around a room and frequently bumped into each other. Pronounced decrements in task performance were exhibited in this condition.

Interaction would not likely have these effects if it were necessary in order to complete the task. For example, one cannot carry on a group conversation without input from the group members. It appears that a feeling of stress from a personal space violation would most likely be felt by an individual in this situation when: 1) there were <u>too</u> <u>many</u> group members trying to talk at once so that the task could not be accomplished, or 2) a particular member of this group did not like the other members.

Subjects should have a smaller personal space (or a smaller likelihood of experiencing a personal space violation) in situations where greater interaction with others is appropriate and/or necessary. It appears that

social interaction only leads to a personal space violation and creates stress when this interaction interferes with an activity, or leads to "goal-blocking." This is readily apparent when there is competition over limited resources (McCallum, Rusbult, Hong, Walder, & Schopler, 1979; Sundstrom, 1975).

Expectation of Encountering Limited Resources. Some studies have examined the stress a subject experiences when a stranger approaches an adjacent seat in the library (Felipe & Sommer, 1966; Patterson, Mullens, & Romano, 1971) or an adjacent urinal in a men's room (Middlemist, Knowles, & Matter, 1976). The experienced stress should be moderated by the number of people with whom the subject expects to interact in the situation. For example, a student would probably not feel stressed if a stranger approached an adjacent seat in a university library during Final Examination Week since there are few vacant seats available. However, if the library is virtually empty, this same student might feel uncomfortable if this stranger selected an adjacent seat. In this latter case, the student is likely to expect or prefer more personal space because of what s/he believes is "socially appropriate" given the nature of the task and the environment in which s/he is conducting this activity. Most researchers fail to provide accurate descriptions of the environments in which they conduct their

studies. These descriptions may explain differences across studies in reference to personal space preferences in various situations.

Degree of Interpersonal Liking/Familiarity. The more people like each other, the closer their preferred interpersonal distance. This has been demonstrated for children (King, 1966), college students (Kleck, 1967; Little, 1965), and for males (King, 1966) as well as females (Little, 1965). It also is true for people who are attracted to members of the opposite sex, even if they are not acquaintances (Allgeier & Byrne, 1973; Byrne, Ervin, & Lamberth, 1970). In general, friends exhibit smaller personal space zones than those who are strangers or not considered friends (Gottheil, Corey, & Paredes, 1968; Guado & Meisels, 1971; Kuethe, 1962; Little, 1965; Seguin, 1967; Willis, 1966).

There are then both individual and situational determinants of crowding. However, some research has suggested that feelings of overcrowding may be minimized if the subject is provided an alternate explanation for his/her discomfort. In the next section, the manner in which acceptance of such an explanation can affect one's level of task performance is discussed.

A Cognitive Explanation of Why Feelings of Increased Arousal From a Personal Space Violation Lead to Performance Decrements

Attribution Theory. Schacter and Singer (1962) theorized that emotions are comprised of two components -- a physiological or arousal component and a cognitive component in which an attribution is made about the cause of that arousal. Once the individual becomes aroused, s/he searches for an explanation for the arousal. The explanation or interpretation of the arousal determines the particular emotion s/he will experience. Schacter and Singer were able to demonstrate that mild levels of arousal could be experienced either as a positive state (euphoria) or a negative state (anger).

Worchel (1978) describes how this process can be related to crowding. An individual would first be aroused by violations of his/her personal space. S/he then seeks to explain this arousal. If this arousal is properly attributed to the close presence of other people, s/he will experience "crowding." Once an individual determines that s/he is feeling crowded, s/he becomes motivated to reduce this uncomfortable state. His/her attention and efforts become mobilized in this endeavor. The quality of performance on tasks on which the individual is working should suffer since s/he will not be able to give as much attention to these tasks. Worchel has obtained support for this proposal in several studies in which the presence of pictures and chimes

or "subliminal" noise reduced the negative impact that high proximity of others has on a subject's task performance (Worchel & Teddlie, 1976; Worchel & Yohai, 1979).

Apparently, when a subject expects to feel aroused from a distractor (e.g., chimes) or from a perceived source of stress (e.g., "subliminal" noise), the negative effects that crowding has on one's task performance are reduced. In such a situation, an individual is motivated to reduce his/her uncomfortable state by avoiding its plausible source. Even if an individual experiences a personal space violation, the plausible source to which s/he more readily attributes his/her source of stress is the distractor or the perceived source of stress. The individual then attempts to avoid and/or ignore these stimuli. However, if either of these stimuli are not available in the individual's environment, s/he is forced to attribute any stress s/he might experience to a personal space violation, which is much more difficult to avoid.

Individual Differences in Perceived Crowding and Task Performance: Hypotheses

Worchel & Yohai (1979) examined the effects of interpersonal distance and attributional determinants of arousal on task performance. Interpersonal distance was manipulated by varying the distance between the front legs of adjacent chairs. In the Far Interpersonal Distance condition the front legs of adjacent chairs were spaced 20 inches apart. In the Close Interpersonal Distance condition the

front legs of each chair touched those of the two adjacent chairs. One of three attributional explanations were given to the group of subjects once they were seated. In the Arousing Explanation condition the experimenter told subjects that subliminal noise would be played into the room while they worked on the assigned task. This noise would be undetectable to the naked ear but previous studies had shown that this noise may cause individuals to feel somewhat stressed and uncomfortable. In the Relaxing Explanation condition subjects were also told that undetectable noise would be played into the room but that previous research had shown that this noise tended to relax and calm individuals. A No Explanation condition was run in which subjects were told nothing about subliminal noise or its effects on individuals. They were simply told that the experimenter was studying group performance and intragroup interactions. Actually, there was no subliminal noise in any of the conditions. Before the experiment began, subjects spent a minimum of five minutes in a waiting room filled with chairs and a large table covered with electronic amplifiers and recording equipment in order to add face validity to the explanations. The adjacent laboratory where they were eventually seated was bare except for a small "transmitter" in a corner.

Group performance was measured on a task that required subjects to derive as many words as possible from the master word "observationally." The group members worked on a single group list in the allocated time (10 minutes).

This thesis replicated Worchel & Yohai's study with a few modifications. First, each subject's comfortable personal space was measured. Second, in order to measure individual differences in task performance, an individual task was utilized. Although the amount of interaction required for an individual task is less than the amount required for a group task, interaction with others and competition over a limited resource (i.e., a lottery prize for the best two performers in each group) was built into this task to create "social interference and goal blocking". This should have increased the probability of obtaining personal space violations in the experimental manipulations. Third, the number of attributional manipulations was reduced. There were no significant differences between the Relaxing and No Explanation conditions in Worchel & Yohai's study so the Relaxing condition was not replicated.

Since the major manipulations of the Worchel & Yohai study were reproduced in the present study, support for the following hypotheses were expected:

Hypothesis 1: Subjects should perceive more stress associated with crowding and exhibit poorer performance in the close interpersonal distance condition than in the far interpersonal distance condition.

Hypothesis 2: Subjects should perceive less stress associated with crowding and exhibit better performance when an attributional explanation is offered than when one is not offered.

The higher personal space violations in the close condition should create greater stress which will have negative effects on task performance. An attributional explanation should alleviate most of the stress associated with feelings of crowding.

Hypothesis 3: An attribution by interpersonal distance interaction is expected such that those subjects in the close interpersonal distance condition who are not given an attributional explanation should perceive more stress associated with crowding and exhibit poorer performance than those subjects who are given an attributional explanation (see Figures 2 & 3). No similar difference between attributional conditions is expected in the far interpersonal distance condition.

Since all subjects' personal space will be violated in the close distance condition, all should perceive more stress associated with crowding and exhibit poorer performance. However, those who receive a reasonable explanation for their arousal should perceive less stress associated with crowding and should perform better.

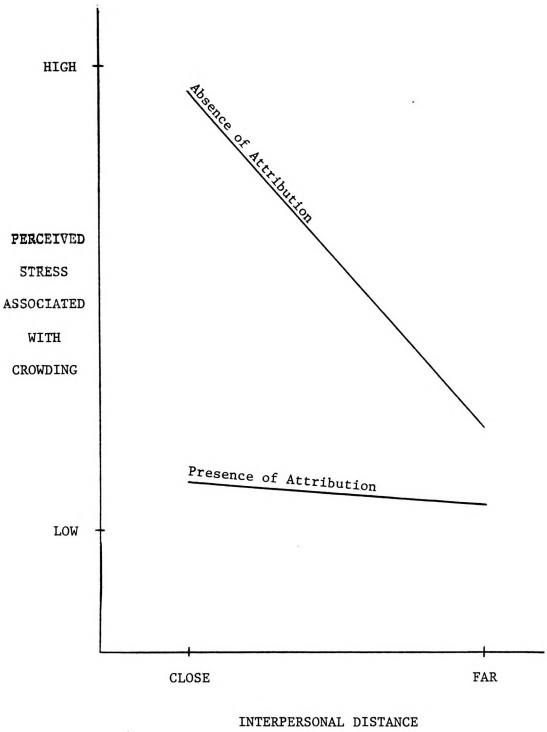


Figure 2. Hypothesized relationship between interpersonal distance and perceived stress associated with crowding.

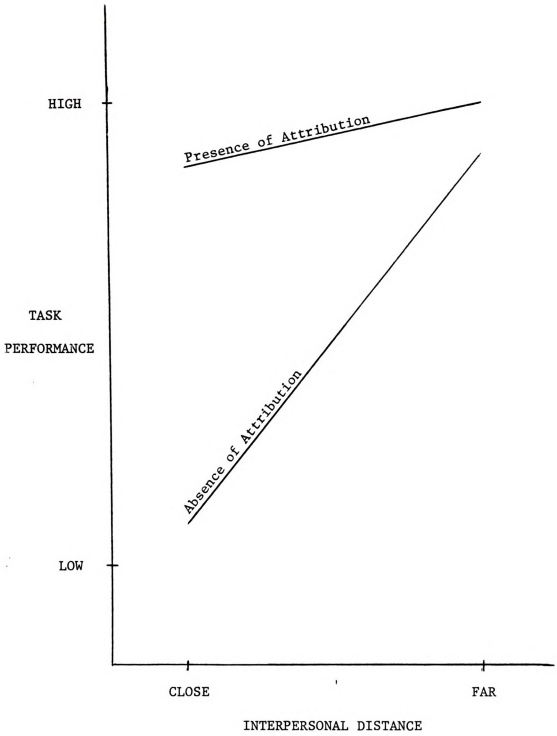


Figure 3. Hypothesized relationship between interpersonal distance and task performance.

An additional hypothesis based on research indicating individual differences in tolerance for personal space violations that is investigated in this study reads as follows:

Hypothesis 4: Personal space preferences will serve as a significant moderator of the relationship between interpersonal proximity and the two major dependent variables: perceptions of stress associated with crowding and task performance.

METHOD

Subjects

Seventy-eight (40 male, 38 female) undergraduate psychology students participated in this study. The study was conducted with a group of ten same sex, unacquainted subjects at a time. The groups were composed of same sex subjects in an attempt to minimize any confounding due to perceived attractiveness between subjects. Unacquainted subjects were used to maximize the probability that many of the subjects experiencing high interpersonal proximity would also experience the stress associated with crowding. To satisfy this criterion, subjects were asked not to sign up with friends. Furthermore, subjects were seated randomly so they did not choose whom they sat beside during the experiment. In order to ensure a group size of ten, two experimental confederates attended each session. These confederates were instructed to sit through the study and complete all the measures if any of the expected subjects did not arrive. If all the subjects did arrive, the experimenter asked if anyone forgot to sign up for the study. The confederates were told to sign up for another time, and dismissed. Therefore, four confederates (two males and two

females) were available for participation. Two female confederates were used on one occasion. Therefore, the number of males and females in this study are not equivalent.

Setting

Two conference rooms in a Psychological Research Building on a university campus were used in this study. Subjects were brought into the first conference room to complete a consent form and the Comfortable Interaction Distance Measure described below. When they had completed this measure, the experimenter brought them to a second conference room that had been arranged for this study. Ten chairs were lined up in the middle of the room with all the remaining tables and chairs stacked against the wall. The layout and dimensions of this room, to ease any future replications, are diagrammed in Appendix A. Ergonomic data pertaining to the type of chair the subjects used can be found in Appendix B. The chairs did not possess a desktop or armrest which could offer structural (and psychological) barriors between oneself and others.

Independent Variables

Interpersonal Distance Manipulation. The Interpersonal Distance (ID) manipulation was satisfied through a replication of Worchel & Yohai's (1979) study. In the far ID condition the chairs were arranged in a circle facing the middle of the room so that the front legs of adjacent chairs were spaced 20 inches (50.8 cm.) apart. In the close ID condition, the front legs of adjacent chairs were touching.

Subjects in the close ID condition were given an oral explanation for their seating arrangement to reduce any demand effects created by the physical environment. This explanation is printed in Appendix C. Two groups of males and two groups of females were placed in the close ID condition, while the remaining subjects were placed in the far ID condition. The experimenter checked the subjects' chair placement periodically (i.e., every seven minutes) throughout the procedure to ensure that the subjects remained seated in their original positions. Subjects had to be reminded not to move their chairs on only four occasions.

Attribution Manipulation. The attribution manipulation consisted of an oral scenario delivered by the experimenter explaining why the subjects might experience feelings of stress during the experiment. The complete scenario is printed in Appendix D. It suggested that an optical scanning device was used to select pages of newspaper that have a high potential of creating much eyestrain. The subjects were led to believe that these were the same pages they would be reading during the experimental task. Two groups of males (one high ID and one low ID) and two groups of females (one high ID and one low ID) received this attributional explanation. The remaining subjects received no explanation.

After several pilot studies utilizing different attributional explanations failed, the oral scenario described in this section was piloted on twenty students (ten females in the close ID - attribution condition and 10

females in the far ID - no attribution condition). Although the manipulation was not significant on the whole sample, it was significant when the subjects who claimed that their eyes had been exhausted before they began the experiment were eliminated from the analysis ($t = 2.50$, $p \leq .05$). Therefore, at the end of the study, subjects were asked if they were suffering from a great deal of eyestrain before they began the study (see Appendix E) with the intent of eliminating these subjects from the final data analysis.

Measures

Dependent Variables

Task Performance Measure. Three pages from a national newspaper (Business, Career Opportunities, and Weather) and two pages from a university newspaper (Classified and Sports) were used as task stimuli. Since there were ten subjects in each group, two copies of each of the pages were available. A list of forty questions which required a search for information printed somewhere on the page was developed for each page. Therefore, each subject was confronted with two hundred questions spanning information printed across the five pages of newspaper. A subject's measure of performance on this task was equal to the total number of questions answered correctly. Since this measure was developed for this study, no previous data concerning its internal consistency reliability was available. A copy of the task stimuli and the accompanying questions is in Appendix F.

In a pilot study consisting of twenty females, this measure's internal consistency reliability was sufficient (coefficient alpha = .84).

Perceived Stress Associated with Crowding. A six item questionnaire was developed asking the subjects how confined, comfortable, crowded, ill at ease, stressed, and aware they were of the presence of other people during the course of the experiment. The first four questions were adapted from a four-item questionnaire developed by Worchel & Teddlie (1979). They did not provide any data regarding its internal consistency reliability, so two questions possessing face validity were added to increase the measure's length and, hopefully, its reliability. Responses to each of these items were made on a 7-point Likert scale. Half of the items were reverse scored to eliminate errors associated with a subject's response style (Anastasi, 1980). A summed total score could range from six (low perceived stress) to forty-two (high perceived stress). A copy of this measure is in Appendix G. To minimize any potential demand effects the measure was simply titled, Attitudes Toward the Experiment.

The pilot study confirmed that this measure was internally consistent (coefficient alpha = .83). The measures of task performance and perceived stress were not negatively correlated as Figure 1 suggests, but they were sufficiently uncorrelated to be treated as independent measures in the analyses (r = .27; corrected for attenuation, r = .32).

Manipulation Check for Attribution. Twelve 7-point Likert scale items were developed to rate twelve plausible explanations for perceived stress during the experiment. Once again, half of the items were reverse scored. However, only item four, the manipulation check for attribution, was scored in the final analysis. A high score on this item meant that the individual perceived the attributional explanation offered earlier by the experimenter to be a plausible reason for perceiving stress during the experiment. A low score meant that the attribution was not perceived to be stressful. A copy of this measure is in Appendix H.

Moderator

Comfortable Interaction Distance Measure. Comfortable Interaction Distance (CID) is a measure of personal space developed by Duke & Nowicki (1972). A copy of this measure and the oral instructions given to complete it are in Appendix I.

The measure is comprised of four, 160 millimeter lines intersecting at a common, central point. The lines are equidistant from each other and resemble the spokes of a wheel. The measure is scored by summing the distance (in millimeters) between the central point and markings a subject makes on each of the eight radii. Since the length of each radius is 80 millimeters, the potential total score can range from 8 to 640 millimeters. A high score typifies an

individual with high personal space (i.e., a need for a lot of space) while a low score typifies an individual with low personal space (i.e., a need for little space).

Duke and Nowicki (1972) assessed the test-retest reliability of this measure and determined it was .86 for males and .84 for females using same sex stimuli. Despite these high reliability coefficients, the measure is in need of further development. More specifically, Hayduk (1978) commented that it is cognitively demanding for subjects to "...determine a scaling transformation that relates the size of figures to a real-life stop distance." Therefore, the measure was redeveloped for this study with three adaptations. First, measurement references of one to six feet were added on each of the eight radii to help the subject make this scaling transformation on paper. Second, the experimenter described some reference distances in the room (e.g., while the subjects were completing the measure, the experimenter told them how far they were standing apart from each other so they could develop a better understanding of the actual distances they were required to use for the transformations required by the measure). Third, subjects were given a photograph of a same sex stranger. It was believed such a photograph may not only make the completion of this measure (see instructions in Appendix I) less cognitively demanding, but would also ensure that all subjects completed the measure with the same "same sex person" in mind. The head and shoulders color photographs of

the male and female were equally attractive and approximately the same age. They were models cut out of a larger picture in an advertising supplement in a university newspaper.

Procedure

Subjects were told to wait for the experimenter to meet them at the outside doorway of an academic building. At a scheduled time, the experimenter met the subjects at this location and brought them into a conference room. The experimenter counted the number of subjects present and, if more than ten were present, he unobtrusively dismissed his confederate(s).

All the subjects completed a consent form and included their phone numbers. This latter information was needed so winners of two $25 lotteries could be contacted. This form was then passed forward to the experimenter.

Each subject was administered the CID measure and given a photograph depicting an individual of the same sex. All the subjects were asked to stand in place, and given the oral instructions (see Appendix I).

Subjects were then shown how to map their preference for personal space on the top spoke of the measure, using the provided foot-increment lines as a guide. The oral instructions were then repeated seven more times for each of the other spokes, with the direction of the pictured person's approach corresponding to the radius' orientation toward the center. For example, the bottom spoke (i.e., facing south) corresponds with the pictured person's approach from behind,

while the subject is imagining him/herself facing forward, never turning around or glancing over his/her shoulders. Rather, the subject is supposed to imagine feeling the presence of someone approaching from behind. The order of directions from which the subject was told to imagine the pictured person's approach (while the subject was always imagining him/herself facing forward) was north (front), south (behind), east (right side), west (left side), northeast, northwest, southeast, southwest. After this measure was completed, subjects were asked to pass their pictures forward to the experimenter. Then they took the completed CID measure and followed the experimenter to a second conference room.

When they entered this room, ten chairs had been lined in a row in the middle of the room. They each sat down, and the experimenter proceeded to deliver the attributional explanation to those subjects in the attribution condition (see Appendix D for a copy of this manipulation) and the explanation for the circular seating arrangement in both the high and low ID conditions (see Appendix C). He then told all the subjects about the task. They were told that they would have seven minutes to look at a particular page of newspaper and answer as many questions regarding information printed on that page as they could. At the conclusion of seven minutes, the experimenter would stop them, ask them to trade newspapers, and begin working on a new page for seven minutes. This procedure would continue three more times

until all the subjects had an opportunity to examine each of the five pages. Furthermore, in order to create a competitive atmosphere (see McCallum, et al, 1979; Sundstrom, 1975) subjects were told that the highest two scorers (i.e., total number of questions answered correctly) in the group would have their names entered into two $25 lotteries.

All the subjects were then moved into position for the rest of the study. The experimenter called their code numbers in a random order and asked them to bring their chairs forward and position the front legs of their chairs on tape markings which were previously placed on the carpet. When a subject's code number was called, s/he gave the experimenter his/her CID measure which s/he had previously completed. These measures were not collected earlier because the subject's code number was printed at the top of the measure. The subject had to reference this number so the experimenter could seat him/her in the proper positon. Diagrams of the seating positions in the close and far ID conditions are presented in Figures 4 and 5, respectively.

When all the subjects were seated in a circular arrangement facing each other in the middle of the room, the experimenter offered lapboards to anyone who wanted one. These lapboards measured approximately 17" X 25". The experimenter distributed packets to each subject which contained the five sets of questions (40 questions/page). Each set of questions was numbered in a different order for each subject, corresponding to the order of pages on which

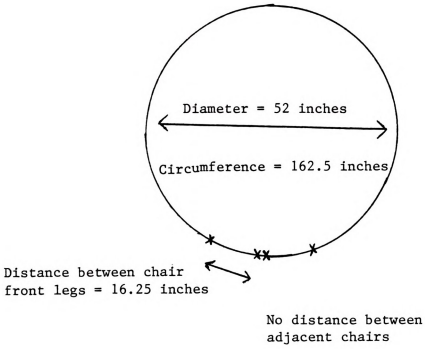


Figure 4. Seating position in the close interpersonal distance condition.

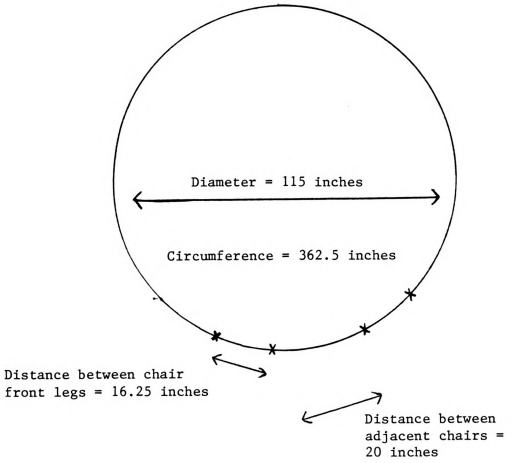


Figure 5. Seating position in the far interpersonal distance condition.

they should work during the five, seven minute sessions. This order was different for each subject so that they would not be fighting over the same page. By specifying the order in which each subject should work through the pages, the experimenter was ensuring that all ten pages of newspaper (two copies of each of the five previously described pages) would be used during each seven minute session.

The experimenter summarized the instructions and explained that given a particular set of forty questions, the subjects could work on the questions in any order they wished. He also explained that the answers could only be found on one side of each page of newspaper. This side of each page was clearly marked. When the subjects did not have any further questions pertaining to the task they were about to begin, the experimenter placed the ten pages of newspaper face down in the middle of the circle. Subjects were asked to retrieve the first page they needed from the pile and to place it face down on their lapboards with its corresponding answer sheet. When they had all done this, the experimenter told them to begin. At the end of seven minutes, he asked them to retrieve their second answer sheet and to trade newspapers until they got the corresponding page that was needed. When they had accomplished this, he once again asked them to begin and timed them for seven minutes. This procedure continued three more times.

When the subjects had completed the five sections of this task, they were told to put the newspaper back on the floor and to put their answer sheets back into their original test packets. The experimenter distributed the Manipulation Check measure. Before subjects completed this measure, the experimenter gave oral instructions pertaining to the proper manner in which Likert Scale items are completed. He also forewarned them to read each item carefully since half of the items were reverse scored. When the subjects had finished completing this measure, the experimenter asked them to place it back in their test packets.

Next, the experimenter distributed the Perceived Stress Associated with Crowding Measure. Subjects were once again forewarned to carefully read all the items. After they had completed this measure and placed it in their test packets, they were fully debriefed by the experimenter.

Analysis

The means, standard deviations, and internal consistency reliabilities for all the measures were computed. An analysis of variance was conducted on the attributional manipulation check to determine if the subjects believed that the attributional explanation was plausible. Analysis of variance was used to examine the first three hypotheses. These analyses incorporated the use of two independent variables, Interpersonal Proximity (close or far) and Attribution (presence or absence), as well as two dependent measures, Perception of Stress Associated with Crowding and

Task Performance. The effect of the moderator, Comfortable Interaction Distance Measure, was examined using a multiple regression analysis. A significance test for the product of Interpersonal Proximity and Comfortable Interaction Distance in this regression analysis represented the test of the moderator hypothesis. Preliminary analysis was conducted to examine the assumption that the two dependent measures were negatively correlated (i.e., when perceived stress was high, performance would be low; when perceived stress was low, performance would be high). A test of gender effect was conducted to determine if the data obtained from males and females should be analyzed independently. Furthermore, a test of a previous exposure to eyestrain effect (see Appendix E) was conducted to see if the data obtained from those subjects previously experiencing a great deal of eyestrain should be withheld from the analyses.

RESULTS

Tables 1, 2, and 3 display the means, standard deviations, and item intercorrelations for the CID, Task Performance, and Perceived Stress Measures, respectively. Each measure was highly internally consistent (coefficient alpha of CID = .93; coefficient alpha of Task Performance = .82; coefficient alpha of Perceived Stress Associated with Crowding = .88). Table 4 displays the correlations between all the independent and dependent variables. The two dependent measures (Task Performance and Perceived Stress Associated with Crowding) were not negatively correlated (r = .03) as Figure 1 suggests.

There were no significant effects for gender or previous exposure to eyestrain on the manipulation check, or either of the dependent measures. Therefore, all the data was combined in order to test each of the hypotheses.

Manipulation Check

The results of an analysis of variance conducted on the manipulation check of the acceptance of the attributional explanation are in Table 5. Those subjects given the attributional explanation did indeed find the attribution a more likely cause of perceived stress than those subjects

Table 1

Item Intercorrelations and Reliability of Personal Space Measure

Item	Mean	Stnd. Dev.	Intercorrelations							
			PS1	PS2	PS3	PS4	PS5	PS6	PS7	PS8
PS1	33.53	18.91	1.00							
PS2	32.91	14.82	.76	1.00						
PS3	36.87	16.31	.68	.73	1.00					
PS4	45.27	16.70	.39	.56	.68	1.00				
PS5	52.15	20.23	.32	.44	.50	.72	1.00			
PS6	44.26	16.20	.40	.55	.66	.99	.73	1.00		
PS7	36.74	16.10	.69	.71	.99	.67	.48	.67	1.00	
PS8	32.97	14.61	.81	.97	.76	.58	.45	.58	.76	1.00

Note. Scale mean = 314.71. Scale standard deviation = 110.75. Coefficient alpha = .93. N = 78.

Table 2

Item Intercorrelations and Reliability of Task Performance Measure

Item	Mean	Standard Deviation	Intercorrelations				
			Bus.	Career	Classfd.	Sports	Weath.
Bus.	5.00	2.28	1.00				
Career	6.78	2.58	.58	1.00			
Classfd.	7.24	2.83	.51	.49	1.00		
Sports	11.60	3.55	.52	.47	.50	1.00	
Weath.	7.24	2.68	.59	.42	.37	.50	1.00

Note. Scale mean = 37.87. Scale standard deviation = 10.72. Coefficient alpha = .82. N = 78.

Table 3

Item Intercorrelations and Reliability of Perceived Stress Associated with Crowding Measure

Item	Mean	Standard Deviation	Intercorrelations 1	2	3	4	5	6
1[a]	3.90	2.08	1.00					
2[b]	4.21	1.71	.49	1.00				
3[c]	3.82	2.29	.76	.50	1.00			
4[d]	3.54	1.70	.54	.61	.60	1.00		
5[e]	3.64	1.68	.49	.55	.54	.72	1.00	
6[f]	4.50	2.11	.62	.31	.65	.48	.37	1.00

Note. Scale mean = 23.60. Scale standard deviation = 9.18. Coefficient alpha = .88. N = 78.

[a] How confined did you feel? [b] How comfortable did you feel? [c] How crowded did you feel? [d] How ill at ease did you feel? [e] How stressed were you? [f] How aware were you of the presence of others?

Table 4

Intercorrelations of All Variables

Variables	Intercorrelations 1	2	3	4	5	6
1. Interpersonal Distance[a]	1.00					
2. Comfortable Interaction Distance Measure	.25*	(.93)[b]				
3. Comfortable Interaction Distance Measure (as moderator)	.76**	.79**	1.00			
4. Attribution[c]	.03	-.09	.002	1.00		
5. Perceived Stress Assoc. with Crowding	-.55**	-.05	-.39**	-.04	(.88)[d]	
6. Task Performance	-.17	-.08	-.12	-.05	.03	(.82)[e]

Note. N = 78.

[a] Close = 1, Far = 2. [b] Internal consistency of Comfortable Interaction Distance Measure. [c] Present = 1, Absent = 2. [d] Internal consistency of Perceived Stress Associated with Crowding Measure. [e] Internal consistency of Task Performance Measure.

* $p \leq .05$. ** $p \leq .01$.

Table 5

Manipulation Check for Attribution

SOURCE	SS	df	MS	F	ω^2
Attribution	15.51	1	15.51	4.52*	.04
Error	260.45	76	3.43		
Total	275.96	77			

Note. N = 78.

*$p \leq .05$.

not given this explanation ($F(1,76) = 4.52$, $p \leq .05$, omega squared = .04). The mean and standard deviation of the attribution condition were 4.55 and 1.60. The mean and standard deviation of the no attribution condition were 3.66 and 2.08.

Hypothesis 1

It was hypothesized that subjects in the close ID condition should perceive more stress associated with crowding and exhibit poorer performance than subjects in the far ID condition. The results presented in Tables 6 and 7 show support for this hypothesis only for the crowding measure. Table 6 displays a significant main effect for interpersonal distance (ID) on the Perceived Stress Measure ($F(1,74) = 31.41$, $p \leq .05$, $\omega^2 = .29$). Furthermore, the effect is in the hypothesized direction (mean and standard deviation of close interpersonal distance -- attribution condition = 29.20 and 8.05; mean and standard deviaton of far interpersonal distance -- attribution condition = 18.65 and 7.08; mean and standard deviation of close interpersonal distance -- no attribution condition = 28.17 and 11.02; mean of far interpersonal distance -- no attribution condition = 18.85 and 7.26).

Table 7 does not depict a significant effect for interpersonal distance on the Task Performance Measure. Therefore, although subjects did perceive more stress, they did not exhibit poorer performance in the close ID condition

Table 6

Analysis of Variance on Perceived Stress Associated with Crowding Measure

SOURCE	SS	df	MS	F	ω^2
Interpersonal Distance	1927.94	1	1927.94	31.41*	.29
Attribution	3.12	1	3.12	.05	-.01
ID x Attrib. Interaction	7.40	1	7.40	.12	-.01
Error	4542.80	74	61.39		
Total	6486.68	77			

Note. N = 78.

* $p \leq .05$.

Table 7

Analysis of Variance on Task Performance Measure

SOURCE	SS	df	MS	F	ω^2
Interpersonal Distance	256.54	1	256.54	2.15	.02
Attribution	21.14	1	21.14	.19	-.01
ID x Attrib. Interaction	107.97	1	107.97	.94	.00
Error	8475.08	74	114.53		
Total	8854.72	77			

Note. N = 78.

than in the far ID condition (mean and standard deviation of close interpersonal distance -- attribution condition = 41.35 and 10.72; mean and standard deviation of far interpersonal distance -- attribution condition = 35.50 and 11.30; mean and standard deviation of close interpersonal distance -- no attribution condition = 37.89 and 11.02; mean and standard deviation of far interpersonal distance -- no attribution condition = 36.75 and 9.74).

Hypothesis 2

The failure to find a significant main effect for attribution in either Table 6 or 7 represents a failure to find support for Hypothesis 2. Therefore, subjects perceived the same amount of stress and performed equally well whether or not an attributional explanation was offered for their situation.

Hypothesis 3

Since a significant attribution by interpersonal distance interaction is not present in either Table 6 or 7, there is no support for Hypothesis 3. Therefore, those subjects in the close ID condition who heard the attributional explanation did not perceive more stress or exhibit poorer performance than those subjects who did not hear the explanation in the far ID condition.

Hypothesis 4

No support was found for hypothesis 4. The data displayed in Table 8 demonstrate that the moderator (CID Measure) was not significantly related to perceived stress

associated with crowding ($F(3,74) = 2.06$, multiple R squared = .32, multiple R squared change = .02, N.S.) nor to task performance ($F(3,74) = 1.93$, multiple R squared = .05, multiple R squared change = .02, N.S.).

Table 8

Moderator Analysis for Perceived Stress and Task Performance

Dependent Variable	Independent Variable	R^2	R^2 Change	F	df
Perceived Stress Associated With Crowding	Interpersonal Distance	.30	.30	32.27*	1,76
	Comfortable Interaction Distance Measure	.31	.01	.83	2,75
	Interpersonal Distance X CID Measure	.32	.02	2.06	3,74
Task Performance	Interpersonal Distance	.03	.03	2.21	1,76
	Comfortable Interaction Distance Measure	.03	.001	.09	2,75
	Interpersonal Distance X CID Measure	.05	.02	1.93	3,74

* $p \leq .05$

DISCUSSION

This study tested several hypotheses. First, it was hypothesized that subjects should perceive more stress and exhibit poorer performance on a task in a close interpersonal distance condition than in a far interpersonal distance condition. Second, it was hypothesized that subjects would perceive more stress and exhibit higher task performance when an attributional explanation was offered than when one was not offered. Third, an attribution by interpersonal distance interaction was expected where those subjects who were not given an attributional explanation should have perceived more stress and exhibited poorer task performance than those subjects who were given an attributional explanation in the close interpersonal distance condition. Fourth, personal space was expected to serve as a significant moderator in the analyses of both the perceived stress and task performance dependent variables.

The results presented earlier only suggested that subjects perceived more stress in the close interpersonal distance condition than in the far interpersonal distance condition. This finding, in and of itself, is of little interest. Without any support for a relationship between interpersonal distance and task performance, this finding

only appears to be a valid manipulation check for the interpersonal distance independent variable. It suggests that subjects placed physically close to one another perceive more stress associated with crowding than subjects placed further away from each other. Therefore, there is little utility in discussing this finding. Rather, explanations are offered for a failure to obtain support for the other hypotheses. The discussion which follows provides two conceptual models which could guide further research.

Several pilot studies were conducted in an attempt to closely replicate Worchel & Yohai's (1979) attributional explanation (i.e., subliminal noise). Subjects were shown an electronic modulator that had needles vibrating back and forth. The modulator was connected to loudspeakers and produced tones of different frequencies. The experimenter would lower the frequency of the tone by turning two knobs (actually increasing the wavelength of the sound and turning the volume down). When the volume was turned down in such a manner, the modulator gave no output. However, the needles continued to vibrate. The subjects were told that the modulator was generating extremely low frequency radio waves, similar to the type used by naval submarines for communication. The subjects were given some factual data demonstrating that brief exposure to the radiation associated with these waves often creates feelings of perceived stress, while prolonged exposure (i.e., several months) may lead to physiological changes. Although some subjects accepted this

attributional explanation (e.g., one pregnant student decided to withdraw from the study for fear of exposing her fetus to these conditions), the manipulation check demonstrated that most did not. During the debriefing period following the experiment many subjects expressed the view that they did not think "...they [Human Subject Committee] would have allowed this to take place." In an attempt to eliminate this disbelief, the attributional explanation was changed and radio <u>waves</u> were mentioned in place of radiation. However, the manipulation check still demonstrated that this new explanation was not accepted. Some students claimed that they did not think the small modulator was capable of producing strong waves. Therefore, the modulator was no longer used.

An open-ended question was used in the pilot studies to determine what the subjects believed to be the prime cause of stress during the experiment. Many mentioned the time constraint on the task as quite stressful. However, since subjects in both the attribution and no attribution conditions found this stressful, it was not a successful explanation.

Despite the fact that Worchel & Yohai's attributional explanation could not be replicated, the use of a manipulation check is considered one of this study's strengths. None of the reviewed studies which examined the use of attribution theory reported the use of a manipulation check. Therefore, only this study can confidently state that

the attributional explanation used here was accepted by the subjects. Furthermore, this study provides a realistic view of the difficulty one encounters when s/he attempts to study attribution theory in the laboratory.

All of the measures used were sufficiently reliable, and great care was taken to minimize response set biases and demand characteristics which may have existed. Response set biases were eliminated by reverse scoring half of the items on the Manipulation Check for Attribution and the Perceived Stress Associated with Crowding Measures. Furthermore, the Comfortable Interaction Distance Measure was completed in a separate room prior to the Interpersonal Distance Manipulation to minimize the extent to which subjects' responses on this measure would be affected by this manipulation (i.e., observing the close placement of chairs before this measure was completed could have affected one's responses to items in the close interpersonal distance condition). As an added experimental control, the eight sessions were always conducted at the same physical location during the same time of day. This procedure was followed to eliminate any differences the physical layout of different rooms and/or different levels of arousal related to different times of day may have upon the subjects' perceived stress and level of task performance.

Failure to support most of the hypotheses in this study might be due to the difference between the task used by Worchel & Yohai (1979) and the task utilized in this study.

This difference is observable in the type and level of intragroup interactions that occur when subjects engage in a group task as opposed to an individual task. In a group task, subjects are continuously aware of each other's presence through the ongoing interactions. While some subjects may become more involved in the task, all group members interact with each other constantly. Therefore, an individual's performance is not only dependent upon his/her knowledge, skills, and abilities, but also largely a function of the existing group processes. For instance, one group member may be more likely to find a solution to a problem with the help and input from other group members. However, when a group of people are conducting individual tasks, input from other group members may be nonexistent. Individuals may be aware of the presence of others, but only through limited interactions with them. Performance is only a function of individuals' efforts.

Perhaps the limited amount of intragroup interactions required for completing the task in this study best accounts for the failure to replicate Worchel & Yohai's (1979) findings. Although subjects in both studies perceived more stress associated with crowding when they were sitting closer together, only Worchel & Yohai demonstrated the negative relationship between perceived stress and performance. In their group task, this stress hindered the behaviors (i.e., appropriate intragroup interactions) which were required for performing successfully on the task.

It is interesting to note that task performance in the Close ID condition (mean = 39.71, standard deviation = 10.86) was actually better than that of the Far ID condition (mean = 36.82, standard deviation = 10.43), though this difference was not significant ($F(1,74) = 2.15$, N.S.). The direction of this trend is opposite from that hypothesized. The use of lapboards may partly explain this finding. When the lapboards were used in the far interpersonal distance condition, they were large and cumbersome. The subjects had to keep the boards carefully balanced. However, in the close interpersonal proximity condition, adjacent subjects' lapboards overlapped. This simulated a round table surface for the whole group. Like sections of a bridge, the overlapping boards helped support each other with little effort. Therefore, in this condition, it was apparent that subjects did not have to exert as much effort balancing their work surface.

It may be useful to determine if there is a theoretical explanation for findings which contradict those hypothesized. Given there is some support for the model presented in Figure 1 in the literature, an attempt will be made to incorporate an additional theoretical construct in this model which may provide an explanation for these unexpected findings.

The high interpersonal distance condition was meant to create a stressful distraction for the subjects exposed to that condition. This distraction was expected to impair performance by decreasing the amount of time and/or attention

one could comfortably devote to the task. However, Spence, Taylor, and Ketchel (1956) have suggested that distraction can increase one's drive level. It does so through overcompensation, as described by Allport (1924) in his classic work on social facilitation: "We work so hard to overcome the distraction incident to group activity that we actually accomplish more than we would without these hindrances" (pg. 284). Previous research has suggested that an increase in drive, resulting from distraction, facilitates a dominant response on a task. The dominant response for a simple, well-learned task is the correct response, while the dominant response for a complex, poorly-learned task is the incorrect response (Sanders & Baron, 1975; Zajonc, Heingartner, & Herman, 1969). It is quite possible that the task employed in this study was a simple task for all the subjects. They were all university students, and had undoubtedly been exposed to similar types of tasks throughout their studies. For example, conducting research for term papers and studying for examinations often entails the need to rapidly skim literature in order to access pertinent information. Therefore, subjects experiencing the most distraction (i.e., stress) during the experiment may have been facilitated in producing the dominant response on the task (i.e., a more rapid search across the newspaper to locate answers). This is only true if the subjects believed that the task was simple. Since this information is not available, one can only speculate whether the subjects

perceived the task as simple or complex. This may be a useful variable to add to the conceptual model for future research.

Two new models are suggested, since it is not clear where the level of task difficulty would have an impact on task performance. Figure 6 is the simpler of the two models. It suggests that level of task difficulty may moderate the relationship between perceived level of arousal and task performance. Figure 7 suggests the same type of relationship, but introduces the importance of the attributional interpretation that is made for one's perceived level of arousal. At this time, it is not clear whether an attributional interpretation has an important effect on task performance. Figure 6 suggests that it is not important. This would be most consistent with the findings of this study, where no main or interaction effects for attribution were found. However, the noninteractive nature of the type of task utilized in this study may have impeded these findings. Theoretically, the attributional interpretation should directly affect the level of perceived stress one associates with the increased level of arousal (Worchel & Yohai, 1979). If the attributional interpretation can succeed in lowering perceived stress, then it is important to keep this in the model. Both conceptual models are presented here as potential guides for future research.

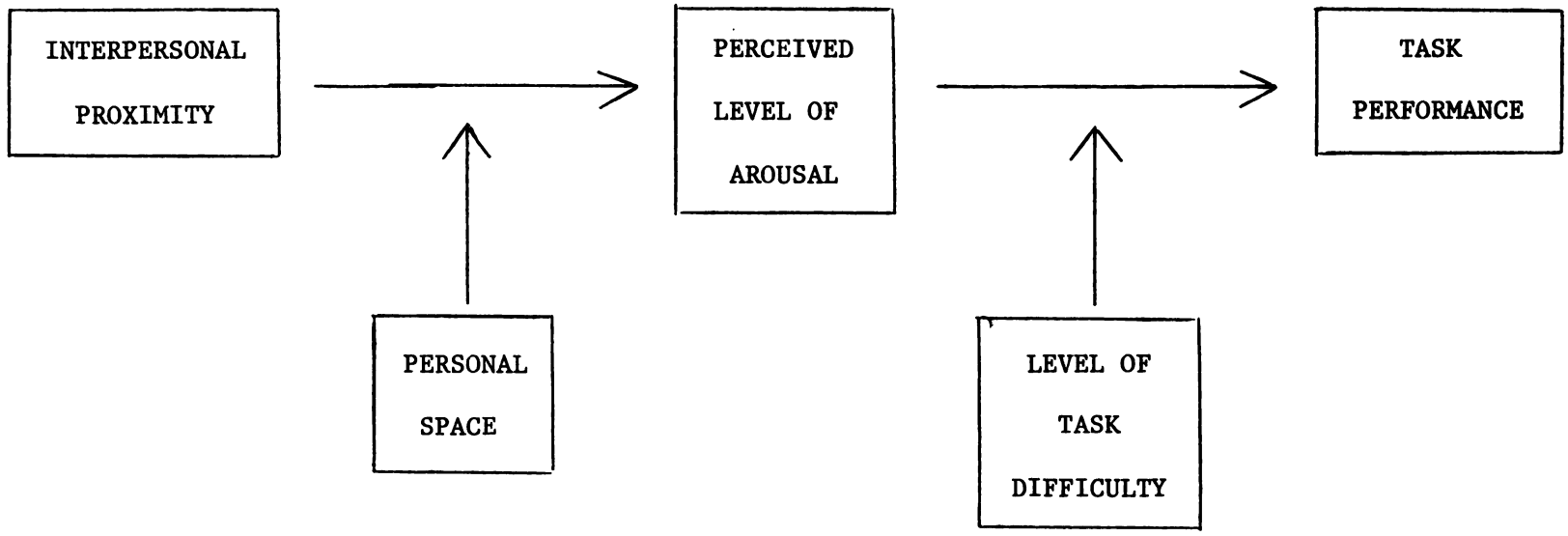


Figure 6. Proposed new conceptual model (without attributional interpretation).

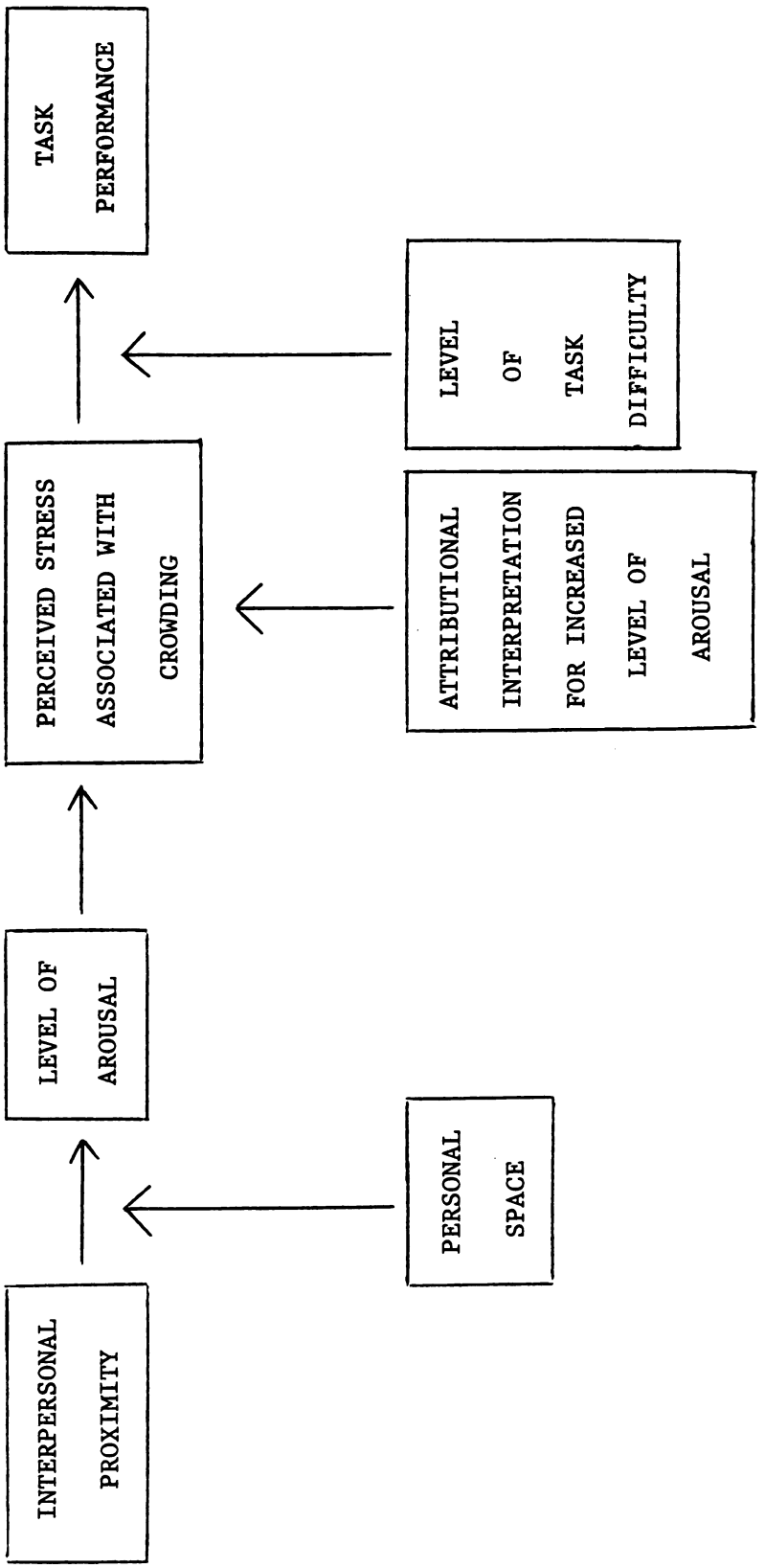


Figure 7. Proposed new conceptual model (with attributional interpretation).

The failure to obtain any significant findings for the attribution may largely be a function of the attributional explanation that was used. Although the manipulation check was significant (see Table 5), a closer examination of the means and standard deviations of this variable offer evidence that most of the subjects believed the interpretation was plausible (mean and standard deviation of Attribution condition = 4.55 and 1.60; mean and standard deviation of No Attribution condition = 3.66 and 2.08). This variable, the degree to which one believed the attributional explanation could have served as a potential source of stress, was measured on a 7-point scale ranging from not at all stressful to very stressful. Therefore, even those subjects not provided with the attributional explanation believed it was plausible. Although a significant difference was found between the two groups, only 4% of the total variance in the scores was explained by this difference. Given this small difference between the two groups, the presence or absence of the attributional explanation may have had little impact on the perceived stress and task performance scores of the subjects.

The attributional explanation which was adopted in this study can also be defended. It was used because previous research has adopted explanations which are costly and/or impossible to replicate. This study did not have the facilities which enabled the experimenter to expose his

subjects to "...a large waiting room filled with chairs and a large table covered with electronic amplifiers and recording equipment...." (Worchel & Yohai, 1979). A university's Human Subject Committee probably would not have allowed a graduate student to administer a drug or placebo to his subjects as Schacter & Singer (1962) had done. Therefore, attributional explanations such as these which offered high face validity were not available in this study. However, the explanation which was adopted here was developed through several pilot studies, which suggests that attributional explanations which are plausible to some subjects (i.e., subjects in the attribution condition) and not plausible to others (i.e., subjects in the no attribution condition) are not easily developed in the laboratory. Previous researchers have not discovered this limitation, or have not chosen to report it. It is quite possible that it has never limited studies conducted previously if more plausible explanations have been used. Even so, these published studies do not report the number or type of pilot studies which had to be conducted before the actual research data was collected, nor do they report the results of manipulation checks. This leads one to question the generalizability of any reported findings. If enough pilot studies are conducted on a theoretically sound construct, one is bound eventually to obtain hypothesized results solely on the basis of chance. The extent to which this is true of previous research in this area needs to be examined through further attempts to replicate the use of

attributional explanations offered in the literature. The only attempt to date was conducted by Marshall & Zimbardo (1979). They failed to replicate the results obtained by Schacter & Singer (1962) in their classic study. Additional replications should be used to question our understanding of attribution theory. However, the theoretical concepts may not be at fault. Instead, the typical undergraduate student who participates in psychology experiments may be less naive and more knowledgable today than s/he was twenty years ago. This would suggest that an experimenter today may have less of an influence on the attributional interpretation a subject adopts during the course of a study. While this notion cannot be tested, it serves as a means to defend the results from many previous studies in the literature, yet limits their generalizability.

In the future it might also be useful to begin examining the attributional process more closely to determine the conditions under which an individual will perceive a particular stimulus as stressful. It may be possible that stimuli are perceived as more stressful during different time periods. For example, a stimulus may become less stressful over the course of time as an individual has the opportunity to adapt to its presence. Measurement which ignores process and focuses only on outcomes impedes our ability to study these issues.

The personal space measure was not a significant moderator in any of the analyses. It is argued that the conceptual development of personal space is not at fault, but the instrument that was used to measure this construct may not be appropriate. The Comfortable Interaction Distance Measure requires one to imagine him/herself standing in the middle of a large, round room as s/he is slowly approached by another person (see Appendix I). This is a difficult scenario to imagine, since few (if anyone) have ever been placed in a similar situation. Therefore, determining how close one would allow someone to approach him/her from different directions may be extremely difficult. While the internal consistency of this measure reported in Table 1 is high, it may simply represent a person's consistent response to items that bear little relationship to their actual behavior in a physically crowded situation. Perhaps a better conceptualized measure may be appropriate. Personal space was earlier described as a function of the social interactions one expects to encounter in a given situation. Therefore, it might be useful to construct a measure which is less abstract and more directly applicable to a given situation (e.g., this study). One might ask how close or far subjects would want other members of a group to sit from them while concentrating on the task. A correlation coefficient could be computed between this proposed measure and the subjects' scores from their Comfortable Interaction Distance measure. The data from these two instruments would need to

be collected at different times to minimize any demand effects that one measure might have on the other. A low correlation between the two would suggest that an abstract instrument like the CID does not generalize to a specific situation. A new measure of personal space would have to be developed with the situational task in mind. A high positive correlation between the two would suggest the need for further conceptualization and development of the personal space construct (i.e., since this study provided no basis for believing that the CID is a useful moderator).

In summary, several areas of future research are suggested. First, a replication of this study should be conducted with a task requiring more intragroup interactions. However, individual contributions to group task performance must be quantifiable in order to hypothesize about individual differences in task performance. Second, the original conceptual model (see Figure 1) should be retested with the inclusion of a measure of "perceived level of task difficulty" moderating the relationship between perceived level of arousal (see Figure 6) or perceived level of stress after an attributional interpretation is adopted (see Figure 7) and task performance. Third, replications of previous attributional explanations offered in the literature need to be conducted to determine the utility of examining attribution theory in the laboratory. These replications should include an accurate account of the ease with which attributional explanations are accepted by subjects (i.e., a

description of the number and type of pilot studies conducted). Fourth, studies of attribution theory should begin focusing on the processes under which various attributions are made, rather than just attributional outcomes. Finally, a situation-specific measure of personal space should be developed and correlated with the instrument used in this study (i.e., CID) to determine the generalizability of this abstract measure to various situations. The results of this analysis would be utilized to determine the role personal space should have in similar future research.

APPENDICES

APPENDIX A

Dimensions of Conference Room

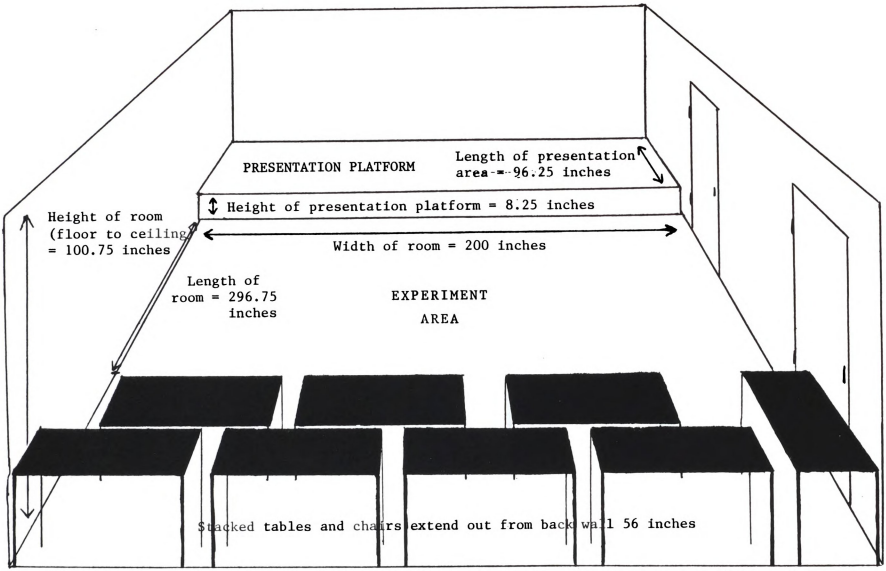


Figure 8. Dimensions of conference room.

APPENDIX B

Ergonomic Data Pertaining to Chair Structure

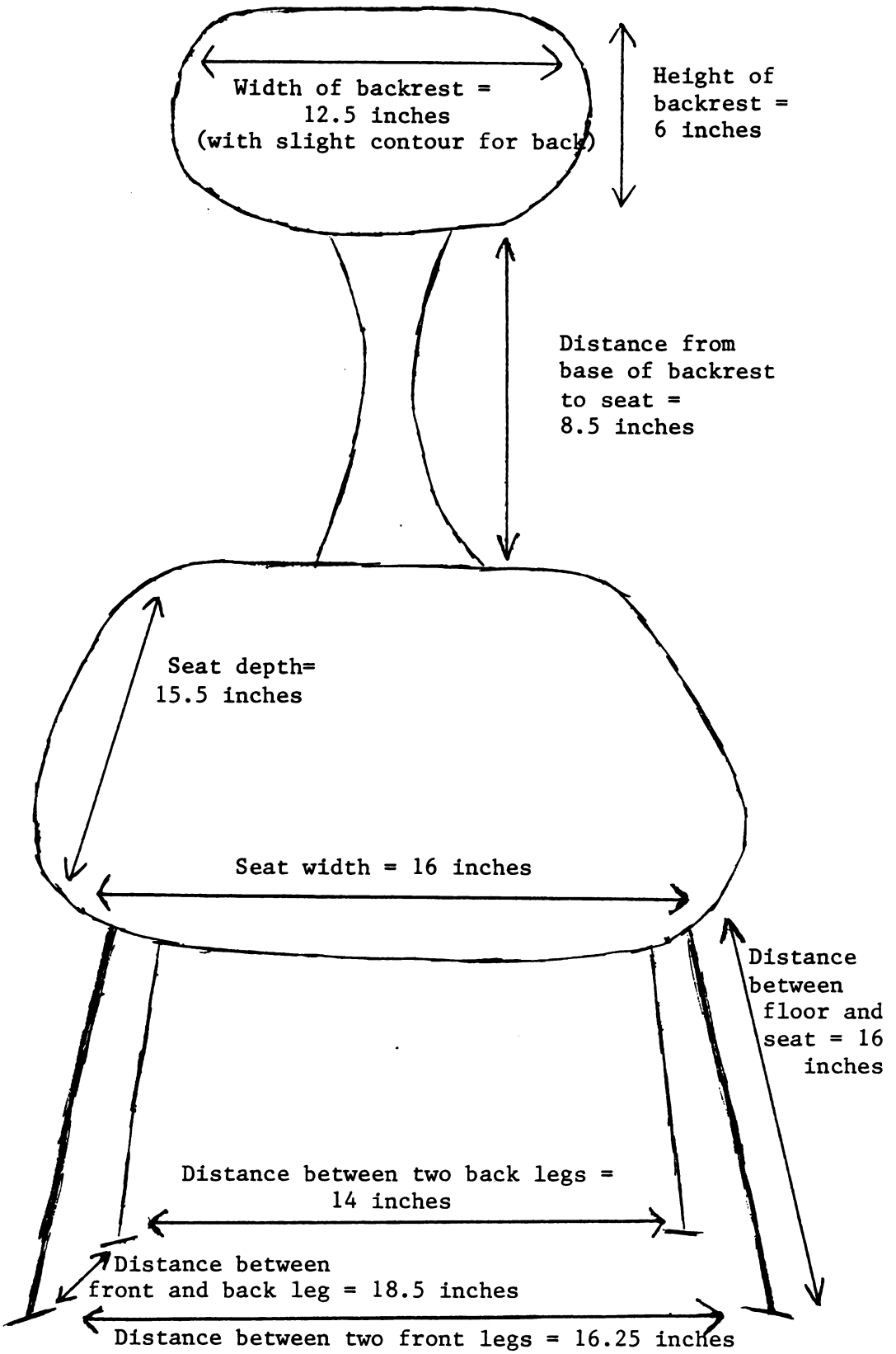


Figure 9. Ergonomic data pertaining to chair structure.

APPENDIX C

Oral Explanation for Seating Position

APPENDIX C

Oral Explanation for Seating Position

Close Interpersonal Distance Condition

Subjects in the high ID condition were told the following:

"During this experiment, we wish to try to control any amount of additional stimulation your eyes could receive from looking around the room. Therefore, you will not be allowed to leave your seat during the experiment. I have seated you close enough so that you may be able to trade pages of newspaper between yourselves during the experiment without ever having to leave your seat."

Far Interpersonal Distance Condition

Subjects in the low ID condition were told the following:

"During this experiment you will be seated in a circle to facilitate trading information among yourselves during the task you are about to begin."

APPENDIX D

Oral Attributional Explanation

APPENDIX D

Oral Attributional Explanation

Subjects in the attribution conditions were told the following:

"Many people must make a careful, daily reading of the newspaper for their jobs. Some examples of such people are newspaper copy editors, business and financial analysts. and newscast writers for television and radio. If the newspaper's format (i.e., clarity of print and layout) is of poor quality, one can suffer from much eyestrain when s/he spends a great deal of time reading the paper. Therefore, this can become a stressful task to perform.

Many people believe that a greater number of pictures, tables, and graphs on a page, as well as the use of colored print, will significantly decrease the amount of eyestrain one experiences when s/he reads the paper. However, recent research has demonstrated that this is not the case. Rather, the average length of words per page, the average number of words on a line per page, and the average column width per page affect the amount of eyestrain. This is because these three factors determine the speed at which your eyes can scan a page and allow you to comprehend what you've read.

We have programmed an optical scanning devise in the Scoring Office of the Computer Center to scan pages of newspaper and provide us with a numerical Eyestrain - Stress Index based on a mathematical function of the three factors I just described. The Scanning Devise scanned an issue of the school newspaper and an issue of U.S.A. Today. We found five pages that have a high potential of leading to eyestrain.

This evening, you'll be asked to search for information printed on these pages. We'll be comparing your performance on this task to students who will be searching for information on pages that have little potential for causing eyestrain. Once again, since there is a great potential that you'll feel eyestrain, I remind you that you may withdraw from this experiment at any time."

APPENDIX E

Previous Exposure to Eyestrain Question

APPENDIX E

Previous Exposure to Eyestrain Question

There is good reason for me to believe that I was suffering from a great deal of eyestrain even before I began this experiment this evening (e.g., I had been sitting in front of a personal computer monitor all day long, my contact lenses have been giving my eyes a lot of trouble lately, etc.)

_____ YES, the above is true

_____ NO, the above is false

APPENDIX F

Task Stimuli (reduced copies), Accompanying Questions, and Answer Keys

APPENDIX F

Task Stimuli (reduced copies)

ASK MONEY

ANSWERS TO READERS' QUESTIONS ABOUT MONEY

Ask Money consults financial experts including Thomas Alto, tax partner with the national accounting firm Ernst & Whinney in Melville, N.Y., and P. Kemp Fain Jr. of Knoxville, Tenn., a certified financial planner and past president of the Institute of Certified Financial Planners.

IRA ACCOUNTS

Can I switch my individual retirement account funds to another account in my wife's name, or both names? My wife is a non-working spouse.

— Thomas Schoenecker, Cambridge, Minn.

No. You are not allowed to switch your IRA funds into someone else's account. The money must stay in the name of the original contributor. An exception to this rule is divorce. IRA accounts can be exchanged tax-free as part of a divorce or separation agreement. Joint IRA accounts are not allowed. For example, if a one-earner couple takes the full $2,250 IRA deduction for a worker and a non-working spouse, the $2,000 annual maximum for one account still applies and each of the two must have separate IRAs totaling $2,250.

TRIPLE WITCHING DAYS

Four times a year, as I understand it, there are likely to be wide swings in the stock market due to the combination of futures trading and some other factor. What is the other factor?

— Vivian Turcott, Portland, Maine

You are thinking of the "triple witching days" when contracts for stock options, stock-index options and stock-index futures expire on the same day. This happens four times a year — on the third Friday of March, June, September and December. Complex buy-sell strategies on these days by big investors can have a dramatic effect on the stock market — especially on blue-chip stocks included in the Standard & Poor's Corp. 500-stock index. Last time around, on March 21, the Dow Jones industrial average lost 35.68 points — 26 points in the last 30 minutes of trading. Your stockbroker might warn you away from the market on these days — especially in the last hour of trading, called the triple witching hour. On the other hand, investors should also be alert to blue-chip stock bargains after a sell-off.

MICKEY MOUSE WATCH

In 1938 my parents gave me a Mickey Mouse watch made by Ingersoll. It is still running. What is it worth and how do I sell it?

— Frank Valdes, Des Moines, Wash.

An original Mickey Mouse watch by Ingersoll Watch Co. is worth $200 to $250 today in good condition, says Kansas City clock and watch historian Roy Ehrhardt. Make sure your watch has Mickey embossed on the back of the case and Mickey on the rotating dial that tells the seconds. Sell the watch through an ad in *The Antique Trader Weekly*. Write P.O. Box 1050, Dubuque, Iowa 52001.

DIRECTOR'S FEES

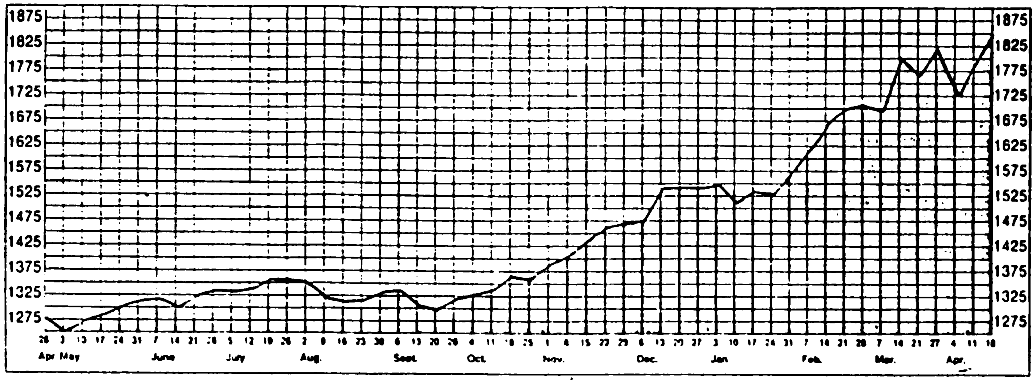
Can I fund an IRA out of bank director's fees? Can I deduct related travel expenses on my income tax?

— Russell Archbold, Sarasota, Fla.

Director's fees do qualify for an IRA contribution, says certified public accountant Thomas Alto. Your pay for being an independent director is considered self-employment

A SPECIAL MONDAY REPORT ON MARKET TRENDS

DOW JONES INDUSTRIAL AVERAGE



Discount cut might ignite stocks

By Anne Kates
USA TODAY

THE WEEK AHEAD

NEW YORK — The stock market could get a short-lived boost this week from the Federal Reserve Board's cut in the discount rate, experts say.

The cut in the rate banks pay for Fed loans — to 6.5% from 7% — puts the discount rate at its lowest level in eight years.

The Fed's move came after the stock market closed Friday, so it was too late to help stocks: The Dow Jones industrial average fell 14.63 points to 1840.40, shaving its gain for the week to 50.22 points.

But bonds continued trading after the Fed announcement, rallying somewhat from the day's lows. Still, yields on 30-year Treasury bonds finished at 7.19%, vs. 7.13% Thursday.

The Fed's move to ease interest rates was expected on Wall Street. Japan followed Saturday with a discount rate-cut of its own, as part of a coordinated effort to stimulate economic growth worldwide.

"It's a wash" for the bond market now that the Fed has acted, said Raul Nicho, president of Money Market Services Inc. in San Francisco. It's been anticipated for so long. "Much of the gains have already taken place" in bond prices.

You can, however, expect banks to cut their prime lending rates from 9% to 8.5% or even 8%. That will be good news for corporate borrowers, and for consumers with loans pegged to the prime.

The Fed's rate cut could add 10 to 12 points to the Dow today, said Eugene Peroni, analyst at Bateman Eichler, Hill Richards Inc. in Los Angeles.

However, any initial gain would essentially be "emotional," Peroni said. "I don't know that any rally will be sustainable, because the stock market has already rallied smartly in anticipation of a rate cut."

"Now, it's a question of another cut" by the Fed, Nicho said. Some rate-watchers worry that the strong first-quarter USA economic growth reported last week — a 3.2% annual growth rate — will keep the Fed from pushing interest rates lower soon.

Other experts said Friday's Fed cut was merely another in a long line of cuts ushering in a new era of lower interest rates around the globe.

Nicho is betting Wall Street "will be content with what the Fed has done for now and will wait it out" until more data gives a clearer picture of the economy's strength.

Longer-term, a lower interest-rate environment means "a go for 2000 (on the Dow) by Labor Day," said economist Allen Sinai at Shearson Lehman Bros. Inc.

But for now, some analysts say last week's stock market advance to new highs was labored, suggesting it is time for another breather.

"We could get back on the winning track early this week," said George Pirrone, head trader at Dreyfus Corp. But later in the week, the Dow could lose 50 to 60 points as the market consolidates, he said.

INDUSTRY SPOTLIGHT

EACH DAY USA TODAY SPOTLIGHTS DEVELOPMENTS IN A COMPANY, AN INDUSTRY OR A MAJOR MARKET AREA

Company	Exchg	Fri Close	Change Fri	Change Y-to-D	% Change Fri	% Change Y to D	52-week High	52-week Low	P-E Ratio
Amgen	O	24⅝	-1⅛	-10⅞	-4.41	-30.56	27⅝	5⅛	—
Bio-Response	O	3¼	-¼	-1⅛	-7.04	-17.98	[illegible]	5	—
Bio-Tech General	O	13	-1⅛	-12¼	-7.32	-181.5	20⅝	4⅝	—
Biogen	O	[illegible]	-¾	-2⅞	-4.11	-19.66	20⅝	5⅝	—
Calif Biotech	O	23	-⅝	-16¼	-2.65	-127.5	29⅝	8⅝	—
Centocor	O	33⅞	-4⅛	-17⅝	-10.23	-91.61	44⅞	13⅞	—
Cetus	O	37¼	-2⅛	-10⅝	-5.41	-40.09	42⅞	10⅞	—
Chiron	O	27½	-2⅛	-14⅝	-7.56	-115.7	31⅝	5⅞	—
Genentech	O	87	-2½	-52⅞	-2.79	-149.5	97⅝	19⅝	—
Immunex	O	17⅞	-1½	+ 3⅝	-7.89	-28.13	20¼	4	—

INDUSTRY LEADERS LAST WEEK

The top industry groups last week by percent change in share prices

Industry	Market Value Index (1973=100) Last Close	30 days ago	52-wk Avg	% change in index, not actual share prices: Week	30 days	Year To Date
[illegible]	464	369	304	+11.40	+25.97	+36.43
[illegible]	155	146	133	+8.04	+13.22	+25.02
[illegible]	468	416	345	+8.77	+12.54	+30.47
[illegible]	1035	913	827	+8.26	+13.38	+24.13
[illegible]	194	173	138	+7.07	+12.55	+47.24
[illegible]	373	343	272	+6.41	-6.00	+20.46
Banking	266	238	232	+6.20	+11.92	+11.40
[illegible]	31	36	132	+6.13	-5.79	+8.22
Furniture and fixtures	348	309	235	+5.31	+12.73	+30.23
Leather and leather products	1233	1111	923	+4.91	+10.92	+28.53
Security, commodity brokers and services	1723	1525	1154	+4.83	+12.90	+32.50
Apparel and other textile products	404	353	280	+4.81	+14.40	+27.90
Business services	433	380	325	+4.77	+9.06	+21.02
Rubber and miscellaneous plastic products	153	144	117	+4.83	+6.30	+21.00
[illegible]	460	[illegible]	410	[illegible]	[illegible]	[illegible]

LOTTERY WINNINGS

If you won $1 million in a lottery, what would you pay in taxes?

— W.L. Daughtry, Fort Stewart, Ga.

Lottery winnings are taxed as ordinary income, and $1 million would push you into the top tax bracket, so you would owe nearly half the $1 million in taxes. Most winners would get a tax break through income averaging. However, most lottery prizes are paid to winners over time — say, $50,000 a year for 20 years — so in that case the winner would pay taxes on just $50,000 a year.

BURGER KING FRANCHISE

Where can I get Burger King restaurant franchise information?

— Jerry De Leonardis, Maple Shade, N.J.

Of the 4,600 Burger King restaurants in operation, about 80% are owned by franchisees. Patience is a prime requirement for applicants, because there is a two-year wait for a franchise, company officials say. Applicants should have $250,000 in liquid assets. The one-time franchise fee is $40,000. Other non-real estate start-up costs average $307,000; land costs can be from $275,000 to $875,000 and more, Burger King says. For more information, write: Burger King Office of Franchise Affairs, Burger King Corp., 7360 N. Kendall Drive, Miami, Fla. 33156.

NATIONAL DEBT

The U. S. government owes $2 trillion in debt. Who did we borrow this from and what interest rate are we paying?

— Donald Chronister, Biglerville, Pa.

The federal government owes you part of the debt if you hold a U.S. Savings Bond. The national debt, which Treasury officials say stood at $1,979,143,000,000 on Feb. 28, consists mainly of interest-paying Savings Bonds and Treasury bills, notes and bonds sold by the government to investors on the open market. Interest rates are competitive and vary with market conditions. The current annual Savings Bond yield, adjusted every six months, is 8.36% for investors holding the bonds five years or more.

GIFT OF LAND

My mother gave my wife and me some land appraised at $180,000. Gift tax was paid by my mother. Later we netted $129,000 on the sale of the land. Do we owe tax on the $129,000?

— L.G., Utica, N.Y.

You might owe additional tax, depending on what is referred to as your "basis" in the property. Basis, usually the original cost of something plus out-of-pocket expenses, is the value of property for tax purposes and is used to determine gain or loss on sale. If you buy a vacant lot for $5,000 plus a $250 commission, your basis is $5,250. Sell the lot a week later for $6,000 and you have a $750 taxable gain.

The basis rules for gifts are complicated. If, as is likely, your mother's basis in the land was less than the $180,000 fair value at the time of the gift, your basis is the same as your mother's — the original land cost, plus adjustments for other expenses including gift taxes paid. If the $129,000 sale price is more than your basis, you have a taxable gain.

Got a financial question? Each Monday, we'll answer selected readers' questions with the help of financial experts. Include your name, address and daytime phone number. Mail to: Ask Money, USA TODAY, P.O. Box 500, Washington, D.C. 20044.

Compiled by William Giese

Hope, not profit, feeds biotech stock growth

By Kathy Rebello
USA TODAY

Investors eased away from biotechnology stocks Friday, but not before pushing the prices almost into orbit.

Analysts say the 4% to 7% declines in biotech stocks Friday will soon give way to more frenzied buying, as early as today. "This is just a pause," says Jim McCamant, editor of the *Medical Technology Stock Letter*. "They'll go high — then higher," predicts analyst Scott R. King at Montgomery Securities Inc.

Even after a surge that has seen some biotech stocks more than double this year — and quadruple from their 1985 lows — investor demand won't die, experts say. "It's the power of an idea," explains analyst Linda Miller at PaineWebber Group Inc.

There are no products or profits to speak of today, no promises for this year, and even next year is iffy. But investors seem certain biotech will one day pay off — and big.

Thus comes a rally Miller calls "awesome." Industry leader Genentech Inc. soared from $64 a share on March 20 to $96 Wednesday. It rose 11¾ Wednesday alone. Friday, it closed at $97.

Most analysts say the buying binge was triggered by news in mid-March that Genentech is receiving favorable test results on its tissue plasminogen activator (t-PA), a gene-spliced agent that dissolves blood clots in the heart.

Genentech may be only months away from filing for government approval of the activator, meaning t-PA — with a $500 million annual sales potential — could be on the market in 1987.

Even so, Genentech's earnings potential over the next two years still makes the stock super-pricey. Analysts estimate the South San Francisco company will earn 23 cents to 44 cents a share this year, up from 18 cents in 1985. At $87, the stock sells for 198 times the highest 1986 earnings estimate.

For 1987, the estimates rise to between 35 cents and 90 cents a share. But, boosted by t-PA sales, earnings could hit $2.50 in 1988, says analyst Peter Drake at Kidder, Peabody & Co.

Centocor Inc., another Wall Street darling, has risen from $31 to $44½ in recent weeks. It dropped 4½ Friday, closing at $39⅛ — 79 times 1988 estimated earnings of 50 cents a share.

"We're dealing with psychic phenomena at this point," says analyst S. Robert Kupor at Cable Howse & Ragen.

Analysts concede that biotech is such a fledgling field of unknown potential that it is tough to say when a stock is overvalued. Industrywide annual sales now are $300 million, but are projected to reach as much as $3 billion by 1990.

Some experts say half of all new pharmaceutical products will be genetically engineered by 1995. "It's at the stage where these stocks cannot be ignored," says analyst Meisha Petkevich at Hambrecht & Quist Inc.

Some stocks that analysts favor now:

■ Chiron Corp., $27½, lost 31 cents a share in 1985, but analysts say it will make money by 1988. It's expected to get approval of a hepatitis B vaccine.

■ Amgen, $24¾, which lost 72 cents a share in fiscal 1985, is expected to earn 12 cents in fiscal 1987, then 75 cents in 1988, Drake says.

■ The best bargain of the lot, some analysts say, is Bio-Response Inc., $8¼. It lost 30 cents a share last year, but is expected to earn 10 cents in 1986. "It will make some serious money in 1987," thanks to sales of disease-fighting monoclonal antibodies and possible approval of its own t-PA, King says.

[illegible]	72	66	60	+3.79	+9.42	+16.31
Food stores	419	384	359	+3.76	+6.32	+8.87
Apparel and accessory stores	475	387	316	+3.76	+19.40	+40.41
General merchandise stores	379	331	283	+3.74	+14.22	+24.27
Stone, clay and glass products	225	200	163	+3.66	+12.47	+28.46
Wholesale trade — durable goods	315	283	250	+3.39	+7.72	+18.80

INDUSTRY LAGGERS LAST WEEK

The bottom industry groups by percent change in share prices

Industry	Market Value Index (1973=100) Yest. Close	30 days Ago	52-wk. Avg.	% change in index, not actual share prices Yest.	30 days	Year To Date
Miscellaneous manufacturing industries	229	209	180	-2.86	+9.70	+16.38
Petroleum and coal products	87	81	88	-1.81	+6.90	-7.22
Real estate loans and law offices	18	17	96	-1.58	+5.08	+1.84
Communications	245	246	219	-1.18	-0.38	+4.86
Furniture and home furnishings stores	587	528	508	-1.15	+13.00	+22.88
Food and kindred products	204	196	186	-1.04	+4.37	+16.73
Metal mining	38	38	37	-0.98	-0.70	+1.86
Railroad transportation	250	258	234	-0.16	+0.67	+8.38
Insurance carriers	129	127	101	-0.11	+1.66	+28.03
Credit agencies other than banks	0	0	62	+0.00	+0.00	+0.00
Miscellaneous repair services	0	0	0	+0.00	+0.00	+0.00
Agricultural products — livestock	196	206	156	+0.00	-4.88	-2.80
Vehicle, gas and accessory dealers	453	400	356	+0.08	+13.24	+14.81
Miscellaneous services	82	80	73	+0.10	+2.48	+5.13
Textile mill products	320	312	244	+0.23	+2.57	+16.74
Transportation services	330	321	272	+0.28	+5.80	+22.44
Auto repair services and garages	420	386	334	+0.46	+8.90	+17.06
Oil and gas extraction	48	46	53	+0.63	-5.17	-4.15
Local and interurban passenger transit	294	278	246	+0.90	+6.35	+15.44
Personal services	922	869	687	+1.09	-6.13	+17.11
Water transportation	98	90	86	+1.20	-8.38	+8.83
Primary metal industries	145	131	119	+1.23	+11.25	+2.25
Electrical and electronic equipment	308	292	255	+1.24	+4.34	+11.87
Wholesale trade — nondurable goods	749	694	382	+1.32	+7.56	+16.64
Health services	702	678	682	+1.35	-3.63	+7.56

SHARES TRADED LAST WEEK

The top issues by percentage of outstanding shares traded

New York Stock Exchange	Pct.	American Stock Exchange	Pct.	Over-the-counter	Pct.
Blair John & Co	45.31	First Australia Prm	78.71	Great Western Svs inc	104.57
Shoe Town inc	29.43	Resorts Intl Inc	19.77	Barrys Jewelers inc	87.32
National Gypsum Co	24.12	Heritage Entmt inc	17.81	Chartwell Group ltd	71.95
Harris Graphics Corp	20.93	BSN Corp	14.78	Weatron inc	44.00
Rothschild L F Unter	15.72	American Science & E	13.97	ABM Computer Sys	42.20
Claire's Stores inc	15.44	Kappa Networks inc	13.63	Intermark Corp	38.41
Navistar Intl Corp	14.43	Cagle Hldg Co	12.16	California Biotechno	30.21
Suave Shoe Corp	13.37	Alpine Group inc	10.03	North American Fsvg	29.52
Caco Inds inc	12.10	Lionel Corp	9.98	Mast Keystone inc	29.25
Ramada Inns inc	11.38	Emerging Med Technol	9.40	Cetus Corp	27.79
Polaroid Corp	10.30	Countrywide Mtg Inv	9.21	Crossland Svgs Fsb B	27.12
Orion Pictures Corp	10.29	Endevco inc	8.98	Cambridge Analytical	26.92
Centronics Data Comp	10.11	Affiliated Pubns inc	8.84	Microenergy inc	26.31
Chicago Pneumatic To	9.84	Harris Robert Inc	7.22	Immunex Corp	25.16
Cincinnati Gas & Ele	9.63	Scientific Leasing I	7.11	Long Lake Energy Cor	24.94
Countrywide Cr Inds	9.58	Sterling Software In	6.64	Fine Art Acquisitions	24.00
First Bankers Corp F	9.52	Shopwell inc	6.64	Mobile Communication	21.78
PSA inc	9.49	Oppenheimer Inds inc	6.38	Leisure Concepts inc	21.46
Southern Union Co	8.96	Vyquest inc	6.14	MBI Business Ctrs in	21.06
ICN Pharmaceuticals	8.90	Western Digital Corp	5.72	Ford A Chron inc	20.46
Triangle Inds inc	8.78	Frequency Electrs In	5.72	Integrated Genetics	20.24
Transworld Corp Del	8.57	Conchemco inc	5.70	Computone Sys inc	20.23
Cannon Group inc	8.51	Rooney Pace Group In	5.68	Birdfinder Corp	19.88
Eastern Air Lines In	8.16	Bush Inds inc	5.19	Citytel Financial Co	18.90
Walker Hiram Res Ltd	8.01	Wickes Cos Inc New	5.16	International Broadc	18.88

Even without hits, Cannon earnings are sure-fire

By David Craig
USA TODAY

Investors should enjoy watching the profits reel in at **Cannon Group Inc.** ($39 Friday, New York Stock Exchange), the Goldsmith & Harris brokerage firm says.

Cannon, a maker of low-cost motion pictures for USA and foreign markets, home video and cable TV, is "virtually free" of the risks normally involved in movie production, the brokerage says.

Advances paid for Cannon's movies (recent release: *Death Wish 3*) usually cover their costs before they reach theaters, Goldsmith says. Even some of Cannon's bigger-budget films are profitable before production starts, because of preselling, it says.

The brokerage says a hit movie would have a "substantial impact" on Cannon's earnings, but predicts that even without a major hit, steady earnings growth should push the stock to $50 by 1987.

■ ■ ■

Things should be heating up

INVESTOR ADVICE

ADVICE FROM NEWSLETTERS AND SERVICES

at Combustion Engineering Inc. ($36, NYSE), the *Merrill Lynch Market Letter* says.

This major supplier of power-generation equipment and engineering services should be a "prime beneficiary" of the ongoing recovery in the engineering and construction industries, *Merrill* says.

The company has been slashing expenses, and should benefit as more industrial companies seek to provide their own sources of power, the newsletter says.

It predicts earnings of $2.25 a share this year, vs. $1.38 (from operations) in 1985, and says earnings could top $3 a share in three years.

■ ■ ■

SafeCard Services Inc. ($24¼, over-the-counter) looks like a safe bet for strong growth, *The Cabot Market Letter* says.

SafeCard operates a credit-card loss notification service, and also markets other services to credit-card holders via mail and phone marketing.

Earnings of 21 cents a share in the quarter ended Jan. 31 were up a "healthy" 40% from a year earlier, *Cabot* says.

It says future earnings should benefit from SafeCard's buying exclusive rights to sell LAW — Hyatt Legal Services' prepaid plan that provides unlimited legal consultation for personal matters.

Cabot says SafeCard's earnings should grow at least 35% annually through 1988.

CAREER OPPORTUNITIES

In the face of change, one thing remains constant. The success of ESL.

No matter which means or methods we employ to meet the ever changing needs of tomorrow in programs of national significance, our formula for the future yields consistently successful results. We achieve them, year after year, using the most advanced digital signal processing technologies. Creating the most advanced strategic and tactical reconnaissance and communication systems solutions. And now, with over $300 million in new contract awards, our formula is stronger than ever.

With ESL, you'll also follow a clear and certain path of progress. Regardless of your area of concentration, your successes complement and complete the achievements of others. It's team interaction at its very best.

Engineers

- AI/Computer Vision
- AI/Expert Systems
- Control Systems
- Digital Signal Processing Systems
- Distributed Systems Software/Hardware
- Firmware Design
- Image Processing
- Man-Machine Interface & Graphics Software
- Mechanical Engineering/ Antenna Systems
- Microprocessor Applications Hardware/Software
- Mission Assessment
- Real-Time Imbedded Systems Software
- RF/Microwave Systems
- Software Systems
- Spacecraft Analysis
- Synthetic Aperture Radar

Please direct your resume to Clarence Kastrop.

Management Information Systems (MIS)

- Sr. Administrative Programmer/Analyst (IDMS, ADS/O, CICS)

Please direct your resume to Maria O'Connor

At ESL, you'll find excellent salaries and benefits complemented by a stimulating, health oriented environment. Please send your resume, indicating area of interest, to individual listed above. Professional Employment Dept. USA 662, ESL, 1345 Crossman Ave., P.O. Box 3510, Sunnyvale, CA 94088 3510. An equal opportunity employer.

U.S. CITIZENSHIP REQUIRED FOR ALL POSITIONS

There's a formula for the future. And it's ESL

ESL
A Subsidiary of TRW

TRW

LOOK
OVERSEAS OPPORTUNITY
TAX FREE INCOME
EMPLOYERS WORLDWIDE
A PLACEMENT GUARANTEE

- Engineers
- Drilling Nurses
- Paramedics, Medical Techs
- Construction
- Technicians
- Data Processing
- Executive
- Material Control

Many Many Others

All Skills All Fields

Free Travel Free Housing
Free Food Free Medical
Vacations Rest & Recreation

GUARANTEED IMMEDIATE OVERSEAS EXPOSURE

OVERSEAS OPPORTUNITY

Call Now Or Send Resume To:
305-925-4700
OPEN DAILY 8AM-9PM
OPEN SUNDAY 11AM-7PM

Overseas Opportunity
2450 Hollywood Blvd. Suite 502
Hollywood, Florida 33020
Advance fee

TWA

TRANS WORLD AIRLINES IS HIRING FLIGHT ATTENDANTS

APPLICATIONS ARE NOW BEING ACCEPTED STARTING SALARY NO LESS THAN $1,007.50 PER MONTH BASE PAY PLUS EXPENSES

- Minimum Age, 18 years
- High School Graduate
- Height Between 5'2" and 6'2"
- Weight Proportionate to Height
- Vision not to exceed 20/200 uncorrected; corrected 20/50 or better
- US Citizen or Permanent Resident Visa
- Willing to Relocate
- Possess Excellent Communication Skills
- Able to attend tuition-based training

TWA is looking for dedicated, talented, hard-working individuals. if these words describe you, then . . .

ATTEND A FREE ONE-HOUR SEMINAR AT THE FOLLOWING LOCATIONS AND TIMES:

All Seminars at 7:00 P.M. unless otherwise noted.

4/21 Springfield Marriott
Vernon & Columbus Street
Springfield, MA

Holiday Inn SW
2580 S. Ashland Ave.
Green Bay, WI

La Font Inn
US 90 East
Pascagoula, MS

Holiday Inn
1399 Bench St.
Pocatello, IL

4/22 Holiday Inn Airport
3300 Vista Avenue
Boise, ID

Ramada Inn
854 North Gloster Street
Tupelo, MS

Broadwater Beach Hotel
3600 W. Beach Blvd.
Biloxi, MS

Holdy Inn
3095 Guthrie Hwy.
Clarksville, TN

4/23 Holiday Inn
201 North 17th Avenue

Best Western Canyon Springs
1357 North Blue Lakes Blvd.
Twin Falls, ID

Hyatt Regency at Ridgeway
939 Ridge Lake Blvd.
Memphis, TN

Sheraton Wayfarer Inn
US Route 3 & Hwy 3 & 101
Manchester, NH

Offices open to accomodate those people who wish to apply.
Hours 10am-6pm
Mon-Fri unless otherwise noted.

Boston: Embassy Suites Hotel
400 Soldiers Field Road
Boston, Ma.

Kansas City: Jack Frye Training Center
1307 Baltimore Ave.
Kansas City, Mo. 64105
11am-4pm Mon-Fri

St. Louis: Park Terrace Airport Hilton
10330 Natural Bridge Road
St. Louis, Mo.
10am-4pm Mon-Sat

Los Angeles: Embassy Suites Hotel
1440 East Imperial Ave.
El Segundo, Ca.

San Francisco: Clanon Airport Hotel

★ TAX FREE INCOME ★
GERMANY ★ S. AMERICA ★ S.E. ASIA
MIDEAST ★ EUROPE ★ KOREA
S. PACIFIC ★ EGYPT ★ TURKEY
WE HAVE MORE JOBS AVAILABLE THAN ANY OTHER AGENCY IN THE COUNTRY
11,500 + OPENINGS

JOB HUNTING

Many administrative, professional & executives positions

FINANCIAL INDEPENDENCE

Full Time Positions
$60,000-$100,000 per annum
Part Time positions
$22,000-$35,000 per annum

- We guarantee in writing to match you with existing jobs
- We have 3 times the service staff of any other agency

FREE TRAVEL — FREE HOUSING — FREE FOOD — FREE MEDICAL

Our Clients are hiring NOW

ENGINEERING — MEDICAL/DENTAL — EX-MILITARY
CONSTRUCTION — HVAC — TECHNICIANS
DATA PROCESSING — MATERIAL CONTROL

•MANY, MANY MORE•

OPEN SUNDAY 9-3 PST
Weekdays 8:30-5:30 p.m.

Call or send resume to:

Overseas Unlimited Agency, Inc.
CALL NOW
(213) 739-8080
3460 Wilshire Blvd. Suite U908 Los Angeles, CA 90010

OR CONTACT
(208) 344-0442
290 Bobwhite Ct. Suite U240 Boise, ID 83706
[illegible]

OR CONTACT
(813) 985-7300
7402 N. 56th St. Suite U500 Tampa, FL 33617
[illegible]

OR CONTACT
(201) 624-3700
Gateway One (at Penn Station) Suite U501 Newark, NJ 07102
[illegible]

Advance Fee
•Licensed and Bonded•

... positions just aren't published. Within this unadvertised/unpublished market 44%* of the jobs are created at the time of the interview. The key to finding this market is locked in securing top level often elusive interviews. For 38 years BHA has assisted clients in placing themselves to their best advantage. Call us now for a no-cost obligation interview or send resume to:

*Granovetter, GETTING A JOB: A STUDY OF CONTACTS AND CAREERS, Harvard University Press, Cambridge, 1974

COLORADO SPRINGS, CO — 685 CITADEL DR. E. #510 — 80909 — [illegible]
DENVER, CO — 1777 S. HARRISON #804 — 80210 — [illegible]
NEWPORT BEACH, CA — 1601 DOVE ST. #255 — 92660 — (714) 752-1566
PHOENIX, AZ — 2800 N. CENTRAL AVE. #1000 — 85004 — [illegible]
SAN DIEGO, CA — 591 CAMINO de la REINA #1218 — 92108 — [illegible]
TUCSON, AZ — [illegible] BROADWAY #505 — 85711 — [illegible]
WOODLAND HILLS, CA — [illegible] VENTURA BLVD. #325 — 91364 — [illegible]
RIVERSIDE, CA — 301 Vanderbilt Way San Bernardino 92408 — OPENING SOON
SALT LAKE CITY, UT. — 4001 So. 700 East #200 — 84107 — OPENING SOON

bernard Haldane associates

Since 194[illegible]

713-531-1904
713-556-9955

All interviews strictly confidential

Spectrum International EOE

NUCLEAR POWER PLANT MECHANICAL MAINTENANCE TECHNICIANS

Minimum 3 year's experience required in industrial or power plant maintenance and overhaul. Valve experience a plus. Commercial nuclear experience desired. Rush resume to:

I & E DIVISION NSS, INC.
P.O. Box 3120
Hershey, PA 17033
ATTN:
Dept. 035 Eastern Region
Dept. 036 Central Region
Dept. 037 Western Region

Wausau, WI ... Millbrae, Ca.

If unable to attend a seminar or apply in person, send for application to the Kansas City address above.
PLEASE! NO PHONE CALLS TO THE HOTELS OR TWA.
816-234-8202. RECORDED MESSAGE.

"A Career in the Sky is like Heaven on Earth"

Labor Dispute Exists

Careers appears every Monday in Classified Across the USA

USA TODAY

Job Seekers—Recruiters—Hiring Firms

[illegible]

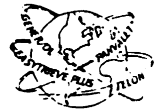
W.I.T.H.
107 Broad St. Suite 777-V
Landmark Square
Stamford, CT 06901

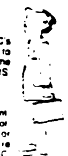
Phone (203) 329-1543

Tell others about us

SOFTWARE SALES/
TECHNICAL CONSULTING

IT'S THE SYSTEMS SOFTWARE THE BIG BLUE WORLD LOOKS UP TO.





You Should Be Selling It.

In sales territories across the country PANSOPHIC's sales pros and technical consultants team up to bring IBM users the utilities and productivity tools the Big blue world respects—EASYTRIEVE PLUS, PANVALET, GENEROL, TELON.

It's time you joined them.

We're looking for your sharp IBM SALES talent, executive-level presentation skills and 100+% of quota achievement in systems software sales or software products. Our TELON sales reps require additional sales experience selling IMS DB/DC CICS software.

We rely on our TECHNICAL CONSULTANTS for expert sales-support, customer support and customer education. These sales specialists need 3 plus years of large-scale IBM systems software experience and knowledge of COBOL, Assembler or PL/1. Experience with Pansophic products will be helpful. TELON Systems Consultants must be knowledgeable in IMS DB/DC CICS.

Openings exist for SALES and TECHNICAL CONSULTANTS in the following offices:

Saddle Brook, NJ	Oak Brook, IL
Lexington, MA	Aurora, CO
Westport, CT	Detroit, MI
Wayne, PA	Dallas, TX
Vienna, VA	El Segundo, CA
Atlanta, GA	San Mateo, CA

Salaries, commissions/bonuses, and benefits are all highly competitive. For immediate consideration, send your resume and compensation history to: Sally Brecht, Pansophic Systems, Incorporated, Dept. PM, 709 Enterprise Drive, Oak Brook, IL 60521. Or call us at 1-800-323-2201. An equal opportunity employer m/f/h. (Principals only please.)

PANSOPHIC
Peak Performance Software

ADVERTISING

Influential, Hard-Hitting, Senior Copywriter

Are you ready for a new challenge with a successful, fast track, growth oriented company?

If you are a take charge, decisive person who can crank out hard-hitting promotional copy, direct and enlighten subordinate copywriters; this successful, fast growth, Minneapolis based company wants to talk to you.

We are anxious to fill this key position. For immediate consideration, please send your resume, salary expectations and some of your best hard-hitting creations to the Human Resources Department:

Financial Timing Publications, Inc.
[illegible] Sheraton Plaza North
Minneapolis, MN 55426

ROOFING SALES REPRESENTATIVE

[illegible]

NORTH AMERICAN ROOFING SYSTEMS, INC.
800-428-6182 317-875-5838

When High Tech Professionals Analyze Fast-Track Success,

BOEING COMES TO MIND.

It's easy to understand why. We're always one step ahead of the competition in the computer service industry. And being a leader means being uncommonly sophisticated, progressive and constantly state-of-the-art. To inquiring high-tech professionals who thrive on new challenges, Boeing Computer Services simply has it all.

Supervisor, Engineering Laboratory

A challenging opportunity for an individual who combines technical ability and administrative talent with the vision to help develop and lead an organization in the application of the latest computer technology. This group supports Boeing engineering structural test, acoustics, wind tunnel, flight controls and avionics organizations. Requires technical background in real time systems (data acquisitions or closed loop) and MIL/SPEC on board computer systems (ADA desirable). Graduate degrees in engineering/mathematics or computer science preferred. U.S. citizenship required.

Supervisor of Artificial Intelligence

Requires an individual who can assume a leadership role in planning the maximization of artificial intelligence in a technical environment. We provide an opportunity to help build and direct an organization to apply this technology at Boeing. A fully equipped laboratory is available, and potential application targets in product development and manufacturing have been identified. Position requires an MS or PhD in computer science plus 2 years of direct experience in artificial intelligence application or research. U.S. citizenship required.

If you would like to become a vital part of our progressive organization and receive the salary and benefits you deserve, please contact Patrick McGuire by calling 1-800-523-7366. PA residents should call (215) 237-5812. Or you may forward your resume and salary requirements to Mr. McGuire at Boeing Computer Services, Dept. USA 421, Scott Plaza II, Philadelphia, PA 19113. Equal opportunity employer m/f/v/h.

BOEING COMPUTER SERVICES
A Division of The Boeing Company

HIRING

NEW OPENINGS $9,041-$87,698

Hiring is now at a record level. In the next 30 days companies in all areas of the country will have over 150,000 career openings—that must be filled.

Until now you would have to search 100's of publications to find these immediate openings. Now there is one complete, single source for positions in all 50 states & overseas—National Job Market newspaper—the only publication that brings you both private & federal career opportunities.

Each issue is 64 pages and features thousands of current jobs in every area of the country—including California, Florida & Texas.

In each issue you'll find more career opportunities than you've ever seen—in every profession & in all salary ranges. And in each job offer you'll find the company that's hiring, the exact location, description, salary range & benefits provided.

Our free Resume Forwarding Service is also available. Upon receiving your first issue, send us your resume & we'll forward your qualifications to our national network of 100's of employment agencies with immediate openings in all 50 states. We are the only publication that provides you with this important career service.

A subscription to National Job Market costs $29, which is tax deductible. This includes 8 bi-weekly issues plus our Resume Writing Kit—which shows you how to turn your experience into a job-winning resume. There is a complete money-back guarantee if you are not totally satisfied—simply return your issues for a full refund.

To order by credit card or COD call toll free or send $29 to: National Job Market, [illegible] Place, Kensington, MD 20895

1-800-323-7702
CALL NOW—24 HOUR/7 DAY

LONG DISTANCE TRUCKING

No Experience Necessary

north American Van Lines needs owner/operators! If you need training, we will train you. You will operate your own tractor. If you don't have one, north American offers a tractor purchase program that puts you into a new truck for $2500 down. If you are 21 or over and think you may qualify, we'd like to talk to you. For a complete information package call:

Toll Free 1-800-348-2191
Ask for Dept. 9
In Indiana 1-800-552-3448

northAmerican VAN LINES

classified

355-8255

347 Student Services Building

355-8255

CLASSIFIED ADVERTISING INFORMATION

REGULAR RATES

1-2 DAYS - $1.05 per line/day
3-5 DAYS - 95¢ per line/day
6-7 DAYS - 90¢ per line/day
8 plus DAYS - 80¢ per line/day
Approx. 21 characters per line 3 line minimum

SPECIAL RATES

ECONOLINE ADS

4 lines, 5 days, $6.00
Applies only to items for sale with price listed in the ad less than $1,000.
$1.00 per line over 4 lines
No adjustment in rate when ad is cancelled
Private party ads only

PERSONAL NOTES ADS

3 lines, $2.50 per insertion
75¢ per line/day over 3 lines
Use this column to send messages to another person

RUMMAGE SALE/ ROUND TOWN ADS

4 line, $3.50 per insertion.
75¢ per line/day over 4 lines.
Your local announcement will reach 39,000 students.

LOST/TRANSPORTATION

3 lines $2.50 per insertion
75¢ per line/day over 3 lines

FOUND ADS

3 lines 3 days FREE

DEADLINES

LINER ADS - 3 pm - 1 class day before publication
CANCELLATION/CHANGE - 3 pm - 1 class day before publication
CLASSIFIED DISPLAY - 3 pm - 2 class days before publication

IMPORTANT—PLEASE NOTE

Changes resulting in any line change will be treated as a new ad

The State News will only be responsible for the 1st day's incorrect insertion. Adjustment claims must be made within 10 days of expiration date.

Bills are due 7 days from ad expiration date. If not paid by due date, a 10% late service charge of total amount will be due.

Auto Services

AUTO USED TIRES. 13", 14", & 15" size tires on sale. $5 and up. GOODYEAR Store, 1309 E. Mich. Lansing, 482-1426

FOREIGN CAR REPAIR MANUALS
Over 120 Titles in stock
Chequered Flag
2605 E. Kalamazoo
487-5055

MASON BODY SHOP 812 E. Kalamazoo since 1940. Auto painting, collision service. 485-0256.

Motorcycles

HONDA SPREE 1985, great cond. black. Low mi. $375. Call Mike at 337-0128

YAMAHA 650 '78. Only 7,900 miles. New battery, fairing, helmet & more. $800 351-5994

Employment

ALL STUDENT ADS MUST BE PREPAID DURING SPRING TERM

ADULT FOSTER care: Mentally ill/ elderly 3-11 p.m. 339-9149 from 9-3

AGENTS LOOKING for people to work in T.V. commercials. For info call, (602) 837-3850 ext. 117

ALCOHOLISM COUNSELOR to work in residential treatment center. Qualifications: Masters Degree in human services or equivalent training and 2 yrs. exp. Send resume, to Clinical Supervisor, 300 Myrtle Recovery House P.O. Box 633, Sturgis, MI 49091 EOE.

ATTENTION COLLEGE STUDENTS
Part Time job available for applicants 17-34 years old. Learn a skill. Up to $5000 in educational assistance. Receive pay for weekend training. Travel oppor-

BABYSITTER NEEDED for 3 boys, 5 days a week in the afternoons. Call 321-6458.

BARTENDERS, WAITPERSONS wanted. Connxtions Comedy Club. Apply after 2:30 M-F. 2900 Northeast St.(US 27), Lansing

BICYCLE MECHANIC shop experience necessary. Inquire at Denny's 351-2000

BOOKKEEPING CLERICAL, female preferred, must be in area for a min. of 2 yrs. 339-2464 after 6

CHILD CARE for 1 child in my E.L. home, must have genuine interest in child development. $3.35 per hr., full or part time. 351-4214 leave message

COUNSELORS CAMP WAYNE, co-ed children's camp northeast Pennsylvania 6/22-8/22. Sign up: Placement Services (Student Services) for On Campus interviews to be held April 30th from 11-5:30 p.m. Sign up begins April 17th. For further information write: 12 Allevard St., Lido Beach NY 11561 or call 516-889-3217

FEMALE COUNSELOR wanted for girls summer camp. Call Meg at 800-327-8287.

FEMALE STUDENTS needed to train medical students interviewing. 23 to 27 years of age. Will start end of May & must be avail. half days. Involves travel to several MI communities. Car necessary. Karen or Carolyn at 353-5153 9-5 Mon.-Fri.

FEMALES (2) needed for housekeeping, babysitting, cooking, etc. at summer home on Mackinac Island. Send resume to Wendy Young, 7109 Maple Rd., Bridgeport, MI 48722.

GAS STATION attendant, part time, all shifts. Call 332-6335.

LUNCH HOUR KITCHEN HELP Food prep. in Mid-East deli. Apply in person 5:30-6:30 Mon.-Thurs., Woody's Oasis, 970 Trowbridge (Next to Domino's).

MANAGEMENT TRAINEE: career opportunity. Rapidly expanding corporation seeks ambitious, career minded individuals for entry level positions. College degree and or previous sales experience preferred, but not necessary. Must be able to start immediately. Excellent starting salary and benefits. Call Turf Pro, 7837 Lonac, Lansing, MI 48917 (517) 322-2285.

Market Media
Ad agency is now accepting applications for EXECUTIVE DIRECTOR, for the 1986-87 school year. This salaried position requires a motivated & responsible indiv. for complete administrative duties. Strong leadership & overall communication skills a must. A general understanding of ASMSU policies is also helpful. Applications are also avail. for spring term staff positions that include art production, typesetting, creative & research areas, Mon.-Fri. 8:00 a.m.-12:00 p.m. at 311B Student Services Building.

McDONALDS RESTAURANTS of E. Lansing are now accepting applications for part time employment for the following hrs.: 6am-4pm, 4pm-close. Apply in person at either campus location.

MOVE TO Texas-get ahead! Exp. of 500+ Co.'s, Apt. - more. Write for info.: MAK TX OPP. Richter, 13110 Kuykendahl #402, Houston, TX 77090.

NOW HIRING part-time or full-time, servers, bartenders & cooks. Applications being accepted between

PRO-CHOICE problem pregnancy counselor and public relations, part-time. BA and experience required. Send resume with hand written cover letter to: Health Care Clinic 815 Coolidge Suite 303, Lansing, MI 48912.

PROGRAMMERS, DBA's and system programmers needed. Send resume to: Scott-Lori, P.O. Box 33111, Bloomfield Hills, 48303-3311 or call (313) 853-7370

SALES: Summer employment. Part-time, must have experience in clothing sales. Apply at Foxtrail Outfitters Frandor.

SECURITY GUARDS immediate positions available. Variable shifts to fit your schedule. Call 641-4562.

SECURITY GUARD part-time, midnite hrs. for Lansing apt. complex. $3.50 to start. Send resume to Security Guard, 3345 -43 Barterville, Lansing, 48906.

SPRING FUNDS need a boost? Sell AVON cosmetics. No experience needed! 482-6893.

STUDENTS SEASONAL employment, counter & shop helpers. May's Candy Shop, write P.O. Box 483, Mackinac Island, Mi. 49757.

SUMMER HELP wanted Murray Hotel, Mackinac Island, MI 49757. Needs cooks, dock porters, house keepers and personnel, for rotation between waitressing, waitering and other hotel jobs. Interviewing at placement services April 30. Sign ups begin April 17 at 1 p.m. or send request for application instead of campus interview. P.O. Box 7706, Ann Arbor, MI 48107. (313)665-3307

WAITERS & Waitresses needed. Part time positions, days & eves. Apply in person at J.J. Winners, 127

TRACHEOSTOMIES, colostomies, suctioning, heart monitors, catheters, feeding tubes, oxygen, wheelchairs. These are households terms of families served through our FAMILY SUPPORT PROGRAM. We need to identify skilled people who are familiar with these terms and interested in providing care to children or adults who are medically, physically, mentally impaired.
Excellent opportunity for college students majoring in nursing, physical therapy, occupational therapy, speech therapy to get hands on experience.
Care is provided in the home of the impaired. Part-time. Hours variable. $4.50 hr. Must have reliable transportation. For more info. Call JOBS HOTLINE, 887-2178. Apply to personal office, Community Mental Health Board 808 Southland, Lansing, MI. Refer to Job #2969 when applying, EOE.

UMPIRES.
E.L. youth softball/ baseball needs umpires to work spring/ summer. Call 332-2636 for application.

Apts For Rent

ALL STUDENT ADS MUST BE PREPAID DURING SPRING TERM.

ACROSS FROM campus, 1 bedroom $310. Clean, quiet, incl. heat water. Avail. 6/15. 323-4787 after 6.

AVAIL. FALL across from MSU. 242 Louis. 1 bedroom. 12 month lease only. No pets. $325 month. 337-9719 after 6 p.m.

BEAUTIFUL ROOMY, 1 bedroom apt. for summer. Pool, nearby track & tennis courts. Karin, 351-6743

EASTSIDE 1 mile from campus. 2 bedrooms, $230 mo. plus util., deposit. 484-1591.

EFFICIENCY APTS. avail. summer and fall. Near downtown East Lansing and campus. Call 351-5180.

E.L. Timberlake North, currently offering 1, 2 & 3 bedroom units. Some with fireplaces. Private entrances. Linda at 351-6789.

Equal Opportunity Housing.

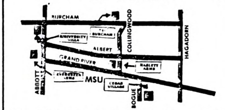
EAST LANSING Sublet. 1 bedroom furn. $265/mo. Heat incl. 332-7341. 351-5168 after 6p.m.

Close to campus
Quiet, 1 Bedroom
heat Paid
351-7553

FURNINSHED 4-man apt. in Okemos. Sublease May through Sept. 12th. Free bus service to and from campus. 349-8165.

BIRTHDAY OR a big anniversary? Announce it in Personal Notes to let everyone know!

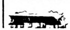
CONVENIENT LOCATIONS OFFERED BY DTN MANAGEMENT FOR SUMMER AND FALL



CEDAR VILLAGE

The Complex for MSU

731 BURCHAM



luxury one

Rates effective Sept 1, 1985

CLASSIFIED INDEX

Automotive

ALL STUDENT ADS MUST BE PREPAID DURING SPRING TERM

BUICK '72 Skylark. 1 owner, cruise, power steering & power brakes 82,000 mi. $400. 332-5173

CASH WE buy late model imported & domestic cars. Bill Burcham Williams Auto World 484-1341

CHEVETTE '77. Runs great, looks good, 4 speed $900 or best offer. 882-2396. Call anytime.

CITATION '80. Excellent cond. New am fm cassette. Great gas mi. 50,000 mi. $2430. 332-8302.

DATSUN F10 '78. 54,000 miles. 25 mpg, regular gas, needs some work but is reliable. $1000. Call 349-3679 after 4 p.m.

DODGE CART '75. 113,000 miles, reliable new snow tires. Asking $400. Call 337-0302 evenings.

FORD FIESTA 1979. Very good cond. 60,000 miles. $1500. 349-2776.

FORD LTD '74. Two tone gray. Excellent cond. Low mileage. Custom. $1800. 1-548-3113.

FORD T-BIRD, 1951. Very good condition. Florida car. $2350 or best offer. 394-4678 after 4.

FORD VAN, '79 $700. 355-8091.

GEMLIN '75. runs well, dependable, must sell, $350 or best offer. 337-1871 after 5:30. Ask for Bill.

HONDA SPREE '84. $325. Low miles like new. Fast, fun and now legal. Call Scott 355-2028.

WHEN IT'S too good to throw away Classified will help you find a buyer.

Automotive

IS IT True You Can Buy Jeeps for $44 through the U.S. government? Call the facts today! Call 1-312-742-1142 Ext. 1289.

MAVERICK 1973. 302 c.i. 3 speed on the floor, runs good. Nice interior, body fair. $500 or best offer. Call 323-3910 after 4:30.

MAZDA 626LX '84. 5 speed, all options. Asking $8100. 682-7646 or 351-2500.

MONZA '78. red, 2 door hatchback, new paint, gd. interior, in good cond. $1100. 337-2207.

PLYMOUTH VALIENT '75. One owner, in excellent cond., Power sterring, new tune-up. $800. 339-2841.

PLYMOUTH Horizon '81. 4 door, 65,000 mi. $1800. '79 Ford Fiesta. $700. Both front wheel drive and in good condition. 339-8086 after 6.

PLYMOUTH Stationwagon '76. runs well. Body fair. $600 or best offer. 353-0957.

RIDE IN Style! Classic 1974 350 Toronado. Black on black loaded. $800. Phone 371-3343 after 6 p.m.

TOYOTA CELICA GT '79. coupe, 5 speed, air, am fm, sport package. Must sell. $2200 or best offer. 332-1627.

TR-6 Triumph 1974. $2500. Good cond. Stored winters. Call 353-5924.

VW RABBIT '79. excellent cond., good tires, brakes, AM FM. Asking $1650. 337-3826 after 5.

VW VAN '78. very good condition, no rust. $3000 or best offer. Leave message at 332-0231.

CHECK THE Auto values advertised in Classified everyday.

Opportunities
CALL NAVAL RESERVE
(517)377-1659 call collect

ARTS & CRAFTS Show Coordinator. The MSU Union Activities Board is now accepting applications for the 1986/87 Arts & Craft Show Coordinator(s). Pick up applications from 9 a.m. to 5 p.m. Monday through Friday in room 322 MSU Union or call 355-3354 for more info.

ASSIST w/ handicap son. Room, board, & cash. Private entrance & bath, 10 min. from MSU. car required. Begin fall. Phone 349-4084 after 5.

BABYSITTER my home, 6 mo. old. Mon and Wed 8am-4pm or 2pm-4pm. Through 6/11. 484-1606.

GOVERNMENT JOBS. $16,040 - $59,230 yr. Now Hiring. Call 805-687-6000 Ext. R-9440 for current federal list.

HANDYMAN-PARTTIME. Repair skills & experience required. Mr. Hall 339-9500.

HOUSE KEEPER. Child care, non-smoker. 20-40 hrs. per wk. Permanent. 332-5220, 332-0426.

HOUSE MANAGER for battered womens shelter. 15 hours per week in exchange for room and board. 372-5572.

JANITOR MORNINGS, general cleaning, some physical work required. 5 days. Call Jim, 332-6960.

WHEN IT'S too good to throw away, Classified will help you find a buyer.

2-4pm Mon.-Fri. at the Ground Round 3224 E. Saginaw 351-8083.

OFFICE HELP phone solicitors, highest paid in town. Only best need to apply. Call 482-9278.

PART-TIME delivery help. Mon.-Fri., 1-5 p.m. Must be dependable w/good driving record. 882-0208.

PART-TIME church secretary wanted. Inquire at 339-1706.

PARTTIME & SUMMER student positions. 15-20 hrs. weekly. Office & field positions. 339-9500.

PHONE REPS, hourly wage plus bonus incentive, no experience necessary, full or part time, flexible hours. Turf Pro 322-2285.

PLACING AN ad is easy, just give us a call.

W. Washtenaw at Capital, 1 block S. from State Capitol Bldg.

WAITPERSONS FULL & part time. Experience preferred. Apply in person, no phone calls. Ramon's, 718 E. Grand River, Lansing & 1146 S. Washington.

WANTED PART-time, clerk/cashiers, for convenient store, no experience necessary. Call any time, 694-4906.

WATERFRONT DIRECTOR, must be 21 and have W.S.I., and ARCHERY DIRECTOR, must be 18 and familiar with sport. For application and interview, contact Scenic Trails Council - B.S.A. at 616-938-2200.

WORK STUDY Volunteer coordinator. Tenants Resource Center 332-2897.

The State News, East Lansing, Michigan Monday, April 21, 1986 9

Sports

Laxers lose 13-5 to Ohio-Wesleyan

By GREG LAPINSKI
State News Sports Writer

So much for deja vu.

MSU lacrosse Coach Rich Kimball was hoping history would repeat itself Saturday when powerful Ohio-Wesleyan visited East Lansing. The last time the Spartans hosted Wesleyan, MSU scored a stunning 7-6, upset victory.

This time, however, the magic wasn't there as the Spartans put up a spirited fight but finally succumbed to the more talented Bishops, 13-5, at Old College Field.

MSU fell to 2-5 in the Midwest Lacrosse Association, 1-7 overall, while Wesleyan, ranked No. 3 in the nation in Division III, upped its overall mark to 11-2.

"I'M NOT PLEASED with the loss, I never am," Kimball said. "But I'm pleased with the effort and pleased with the intensity we showed. Right now, I think we've played (Wesleyan) tougher than anyone in the Midwest."

The Spartans played tough physical defense for most of the match but were victimized by the explosiveness of Wesleyan's fast break.

"We get a goal. It gets us all pumped up, then they come right back down and score off a faceoff," Kimball said.

Although MSU couldn't come away with the upset Saturday, the Spartans managed to stay in the match until about midway through the final quarter.

THE BISHOPS SCORED three unanswered goals in the second quarter, including the first of three goals by attackman Rob Alvino and the second of three goals by midfielder by Rich White and led 4-1 at halftime. Attackman Mike James also scored in the second quarter, the first of his four goals in the game.

It appeared MSU would go into the final 15 minutes trailing by three goals, but the Bishops scored twice in the last minute of the third stanza and lead 8-5 after three.

Freshman mid-fielder Scott Tynan tallied for the Spartans 42 second into the fourth quarter to cut the Wesleyan lead to 8-4, but the Bishops exploded for five goals in a 6:17 minute span to put MSU away. Down at the time, 7-4 the Spartans netted their final goal of the game when freshman mid-fielder Dave Stein took a beautiful feed from junior midfielder Kevin Rice and rifled it past Wesleyan goalie Dan O'Neil.

O'Neil, who came into Saturday's game with a 4.36 goals against average — outstanding for lacrosse — was superb against the Spartans, making two brilliant saves in the first quarter when the game was scoreless.

"I THOUGHT THE difference in the game may have been when we missed on a couple chances early in the game," Kimball said. "If we got those two, maybe the game would have had a different complexion."

State News/ MICHAEL HONEYWELL

MSU freshman attackman Mike Daniels tries to go after the loose ball in Saturday's contest with Ohio-Wesleyan at Old College Field. The Bishops beat the Spartans, 13-5.

M-nine drop 2, hang in vs. Purdue

By DFT PROCTOR
State News Sports Writer

It ain't over til it's over, and after eight innings of soggy play Sunday, it still ain't over.

The MSU and Purdue baseball teams battled it out for eight innings in the third game of a four-game weekend series at Kobs Field but had the game called because of rain.

Weather permitting, the Spartans and the Boilermakers will put the

"When a fellow player tells you something, it's different than when a coach does," sophomore pitcher Rick Rozman said. "It was pretty much a crude pep-talk but I think it was good for us."

Rozman (2-0) went the distance in Sunday's opener, trying to keep the Boilermaker's big hitters off the bases.

"ROZMAN DID A good job for us," Smith said. "He put the ball in

The Spartan half of the scoreboard remained scoreless until the fifth inning in Sunday's game when freshman Steve Preston scored off a walk and a Hams double to left.

ANOTHER RUN SCORED in the sixth inning when leadoff hitter Kevin Dalson, who bunted to gain first base and made second off an error by the Purdue catcher, then scored off a Gavin single into center field.

They just want to keep it plain and simple.

Maybe it was the team pep-talk or maybe it was happenstance, but regardless, the Spartans showed renewed vigor in Sunday's game and hung tough in late innings when it was needed the most.

"I think the big thing is that we battled back," the coach said. "We didn't roll over and die. We pecked

Spartans split with OSU in 4-game weekend set

By RICARDO COONEY
State News Sports Writer

The MSU women's softball team won some games but failed to improve its winning percentage over the weekend with a pair of doubleheader splits against Ohio State.

The Friday and Saturday splits left the Spartans Big Ten record at 4-6 and 15-12 overall.

MSU got off on the right foot in Friday's first game, as Diane Kennett improved her record to 6-2 with a 2-0 over the Buckeyes. Kennett gave up only three hits and struck out two.

MSU scored the games only runs in the third inning on consecutive hits by Becky Aimesbury, Tracy Beadlescomb and Sheila Ovenhouse. Beadlescomb's hit was a run scoring double.

In the nightcap, despite five strikeouts by pitcher Diane Gentry, the Spartans didn't get the offensive punch they needed and lost 2-1. Gentry, whose record dropped to 5-6 after the loss, pitched well but suffered from lack of run support. The Spartans wasted a golden opportunity as they left the bases loaded in the bottom half of the fourth inning.

WITH ONLY ONE out, Diane Gentry struck out while Aimesbury popped out to end the threat. The Spartans scored their only run in the bottom half of the third when Gentry singled and moved to second on Aimesbury's sacrifice bunt. Gentry advanced to third on a wild pitch and later scored on a Wendy Jenkins base hit.

The Buckeyes scored single runs in their half of the second and third innings to gain the winning edge.

On Saturday, the Spartans may have suffered their most heartbreaking defeat of the season when they lost an extra inning nailbiter, 1-0.

The game, which lasted more than two hours and went 12 innings, ended when Ohio State scored the winning run on a wild pitch. The Spartans failed to score in their half of the 12th as pinch hitter Andrea Erratt struck out to end the game leaving Beadlescomb at third. Diane Kennett (6-3) pitched another strong game but took the loss.

"Obviously, we didn't hit the ball, and that's what hurt us," Kennett said. "I don't know what we can do to improve that."

KENNETT WAS HAPPY with her play, though, and especially her pitching.

"I was pretty pleased," she said. "My arm was pretty sore, and I didn't do well against Minnesota."

In the nightcap, Jodi McDonald (4-3) secured a split, giving up only two hits as the Spartans won 3-1.

McDonald had something Spartan pitchers haven't seen much of this year: run support. Beadlescomb who had a good weekend series on both offense and defense along with Wendy Jenkins, led a nine-hit attack with two hits apiece.

The Spartans scored in both the second and fifth innings to secure the victory for McDonald. An error in the sixth inning helped the Buckeyes pick up a run, but the Spartans tightened up on defense to end a possible Ohio State rally.

The Spartans will play a non-conference double-header at Wayne State on Tuesday.

cap on that game at noon today, opening with a 4-4 score in the top of the ninth inning. That game will be followed by the fourth and final game of the series.

MSU opened up its Big Ten season by dropping Saturday's double-header with disappointing 11-4 and 9-3 decisions.

IN BOTH THE opening game and the nightcap, the teams were playing fairly comparable ball in early innings, but it seemed the Spartans couldn't go the distance against Purdue's hard-hitting offense.

"We tried everything, but they're just a fine hitting team," MSU Coach Tom Smith said. "They hit the ball very well and make things happen. That's a good ball club."

Following its dual loss at the hands of the Boilermakers, the MSU baseball team held a players-only gripe session intended to fire each other up for a victory

play and got stronger as the game went on. If there was any kind of fault, it was a failure to keep their first hitter off base in a lot of innings.

Rozman attributed some of his success on the mound to senior catcher Bill Hanis.

"From what I saw yesterday, I knew they could hit the ball," Rozman said. "I just tried to mix my pitches and keep changing the speed of the ball. Billy was doing a great job in there calling the pitches. We think pretty much along the same lines."

Runs brought in by Preston and Hanis in the seventh inning tied the game at four all. Preston got on base to score his second run of the game with a walk followed by a Hanis single into center advancing Preston to second. Preston scored and Hanis advanced to third when sophomore Brad Garmhausen singled past the second baseman. Hanis brought in the final run of the game off an infield hit by Dalson.

Smith said the Spartans have nothing fancy planned to gain their first Big Ten win of the season today.

away and pecked away, and I think it showed. It seemed like yesterday, every time we got close or even they'd put a three spot on us.

Dave Bolton Brad Warren

WEATHER ACROSS THE USA

HOW TO USE THIS PAGE

The color key shows today's high temperatures. The numbers below cities are today's forecast high and tomorrow morning's low. Temperatures are Fahrenheit.

LEGEND

Snow · Showers · T'storms

Below 10 · 10s · 20s · 30s · 40s · 50s · 60s · 70s · 80s · 90s · 100s

Fahrenheit	0	10	20	30	40	50	60	70	80	90	100
Celsius	-18	-12	-7	-1	4	10	16	21	27	32	38

Weather data: Weather Services Corp.

Pacific Coast: Few showers coastal Wash. to northern Ore. Mostly sunny Calif., turning cooler. Winds more westerly, especially coastal areas.

Rockies: Partly cloudy north. Windy Idaho and Mont. with 70s. Sunshine Wyo. and southern Idaho to Ariz. and N.M. Hot southern deserts, 90s.

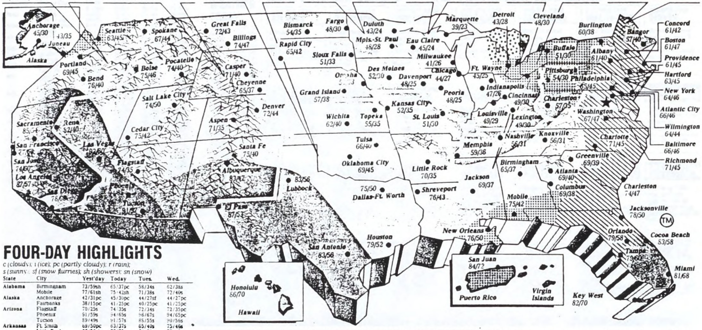
South Central: Mostly sunny Texas to Kan. Cool northerly winds Mo. to Ark. with sunny 50s. Cold tonight with frosts and freezes to northern Ark.

North Central: Warming trend west, winds to 30 mph western Dakotas. Very cool east, clear skies. Below freezing tonight Minn. to Iowa.

Midwest: Low clouds Great Lakes with showers or flurries eastern Mich. to eastern Ohio. Clearing westward. Freezing cold tonight, clear.

Southeast: Band of showers and thunderstorms Va. to southern Ala. Downpours southeastern Ga., northern Fla. Clearing, much colder west.

Northeast: Showers and thunderstorms most areas. Dry eastern Maine. Turning colder N.Y., Pa. and W.Va. Cooling off tonight east, very cold west.



FOUR-DAY HIGHLIGHTS

c (cloudy); i (ice); pc (partly cloudy); r (rain); s (sunny); sf (snow flurries); sh (showers); sn (snow)

State	City	Yest'day	Today	Tues.	Wed.
Alabama	Birmingham	73/59sh	65/37pc	58/34s	62/38s
	Mobile	77/61sh	75/42sh	71/38s	72/40s
Alaska	Anchorage	42/31pc	45/30pc	44/27sf	44/27pc
	Fairbanks	38/15pc	41/25pc	40/25pc	41/25pc
Arizona	Flagstaff	70/25s	74/35s	72/34s	72/35pc
	Phoenix	91/59s	94/65s	96/67s	94/65pc
	Tucson	89/49s	91/57s	88/55s	90/56s
Arkansas	Ft. Smith	69/50pc	63/37s	65/40s	75/46s
	Little Rock	66/56sh	70/35s	64/38s	75/45s
Calif.	Los Angeles	92/65s	87/57s	78/55pc	74/52sh
	Sacramento	84/50s	85/54s	81/52s	74/45sh
	San Diego	85/57s	78/66s	75/64s	71/60pc
	San Francisco	84/58s	77/65s	71/53pc	65/50sh
	San Jose	87/54s	74/60s	74/55pc	68/54sh
Colorado	Aspen	53/41c	71/35s	72/38s	74/40s
	Denver	67/40s	72/44s	76/45s	78/47s
Conn.	Hartford	70/32s	63/45sh	55/37sh	56/36sh
Delaware	Wilmington	65/43s	64/44sh	54/38pc	57/39pc
D.C.	Washington	64/49s	67/47sh	56/44pc	59/43pc
Florida	Jacksonville	82/47s	78/50sh	69/40s	72/42s
	Miami	79/63s	81/68s	79/62sh	77/60s
	Orlando	83/54s	79/58sh	71/50pc	73/50s
	Tampa	82/62s	79/60sh	72/54pc	74/54s
Georgia	Atlanta	68/56sh	69/40pc	58/35s	62/36s
	Columbus	72/61sh	69/38pc	58/34s	64/38s
Hawaii	Honolulu	87/73s	86/70s	87/71s	87/71s
Idaho	Boise	75/40s	75/46s	73/44pc	70/39pc
	Pocatello	71/42s	74/40s	72/38s	71/36pc
Illinois	Chicago	58/48r	44/27pc	48/30s	56/36sh
	Peoria	63/50r	48/25s	52/32s	58/40sh
Indiana	Ft. Wayne	52/41r	45/25pc	47/27s	54/35sh
	Indianapolis	54/43r	47/26pc	48/27s	58/40sh
Iowa	Davenport	63/41sh	48/25s	52/32s	60/40sh
	Des Moines	57/42sh	52/30s	58/35s	62/40pc

Warmth brings rain

Warm air is pushing slowly eastward this week. By the middle of the week it will be rising over cool air covering the East, creating widespread clouds and rain.

Cool air to hit South as West stays warm

By Jack Williams
USA TODAY

Blossom-threatening temperatures are more likely in the South this week than in the Northeast.

"Some very chilly air is coming into the Ohio Valley and Southeast the next few days," said Weather Services Corp. meteorologist Mark Nichols.

The northern Great Lakes

ther south will let the land cool, Nichols said.

"Atlanta could be colder than Boston Tuesday night," Nichols said.

The cool, dry air could bring a refreshing change for Florida, suffering from summerlike humidity. Tampa may be in the dry low-70s by Wednesday.

This weather pattern should also block warm air in the West from reaching the Atlantic.

La.	New Orleans	76/63sh	76/50sh	74/47s	78/52s
	Shreveport	72/56pc	76/43pc	74/40s	80/50s
Maine	Bangor	66/32s	57/40c	53/35sh	51/32sh
	Portland	57/28s	55/43c	52/35sh	51/32sh
Md.	Baltimore	67/44pc	66/46sh	55/39pc	56/40s
	Hagerstown	67/50pc	60/40sh	49/32pc	51/32pc
Mass.	Boston	52/39s	61/47sh	55/42sh	56/40sh
	Springfield	69/40s	61/43sh	54/36sh	55/35sh
Michigan	Detroit	57/42r	43/28sh	42/27sh	52/34pc
	Marquette	51/40pc	39/23pc	44/25pc	51/32sh
Minn.	Duluth	45/34c	43/24s	51/27s	56/35sh
	Mpls.-St. Paul	54/41pc	48/28s	55/32s	58/38sh
Miss.	Jackson	75/59sh	69/37s	65/35s	70/40s
	Tupelo	70/59sh	67/35s	63/33s	67/35s
Missouri	Kansas City	68/45s	52/35s	61/40pc	72/48s
	St. Louis	61/50sh	51/30s	55/32s	62/36pc
Mont.	Billings	60/47c	74/47s	73/45s	68/40s
	Great Falls	68/43c	72/43s	70/40pc	62/35s
Nebraska	Grand Island	61/40pc	57/38s	66/42s	75/48s
	Omaha	60/43pc	53/33s	62/40s	70/45s
Nevada	Las Vegas	88/53s	92/60s	91/59s	85/55pc
	Reno	77/35s	82/40s	81/38pc	68/35sh
N.H.	Concord	69/26s	61/42sh	53/34sh	53/33sh
N.J.	Atlantic City	57/43s	66/46sh	56/42pc	57/42pc
	Newark	63/44s	63/44sh	53/40pc	55/40pc
N.M.	Albuquerque	73/40s	83/47s	84/45s	81/42s
	Santa Fe	68/33s	75/40s	72/38s	72/35s
N.Y.	Albany	70/44pc	61/40sh	50/33c	51/35sh
	Buffalo	64/46r	51/30sh	39/29sh	45/30c
	New York	64/47s	64/46sh	54/42pc	58/42pc
N.C.	Asheville	64/44sh	64/35pc	54/30s	60/32s
	Charlotte	75/52pc	71/45sh	57/35s	61/38s
	Raleigh	81/51pc	72/45sh	59/36s	61/35s
N.D.	Bismarck	48/35s	54/35s	65/40s	64/38s
	Fargo	45/36c	48/30s	58/35s	62/40pc
Ohio	Cincinnati	61/49r	49/30pc	45/28s	55/35pc
	Cleveland	57/49r	48/30sh	41/27pc	45/30pc
	Columbus	61/53r	49/30sh	45/27pc	50/32pc
Okla.	Oklahoma City	73/45s	69/45s	72/47s	81/50s
	Tulsa	71/49s	66/40s	69/44s	80/48s
Oregon	Bend	83/39s	76/40s	65/34sh	62/30pc
	Portland	79/44s	69/45pc	62/42sh	59/42pc
Pa.	Philadelphia	70/42pc	65/45sh	54/40pc	57/40pc
	Pittsburgh	64/55r	54/30sh	43/27pc	51/32pc
	Wilkes-Barre	70/45c	62/42sh	47/30pc	51/32pc
P.R.	San Juan	84/73pc	84/72sh	82/69s	83/70s
R.I.	Providence	67/37s	61/45sh	56/38sh	56/37sh
S.C.	Greenville	70/48pc	69/39pc	57/34s	61/34s
	Charleston	75/48s	74/47sh	65/40s	65/39s
S.D.	Rapid City	54/37sh	65/42s	72/45s	73/45s
	Sioux Falls	55/39sh	51/33s	60/38s	68/45s
Tenn.	Memphis	64/57r	59/36s	60/38s	68/45s
	Nashville	66/57r	56/31s	51/30s	56/34s
Texas	Dallas	75/52s	75/50s	78/52s	82/55s
	El Paso	80/37s	87/53s	88/55s	84/52s
	Houston	76/60pc	79/52s	78/52s	82/55s
	Lubbock	75/38s	83/56s	81/55s	84/57s
	San Antonio	77/51s	83/56s	81/55s	84/57s
Utah	Cedar City	67/31s	75/42s	76/43s	77/45pc
	Salt Lake City	64/40pc	74/50pc	76/52s	78/54pc
Vermont	Burlington	72/46pc	60/38sh	45/32sh	46/33sh
Va.	Norfolk	81/41s	73/50sh	62/44pc	62/43pc
	Richmond	84/46pc	71/45sh	58/38pc	61/38s
Wash.	Seattle	68/48sh	63/45sh	59/44sh	58/43pc
	Spokane	64/41pc	67/44pc	65/38sh	55/34pc
W. Va.	Charleston	72/55r	57/35pc	45/30pc	51/30s
Wis.	Eau Claire	55/35sh	45/24s	50/28s	56/34sh
	Milwaukee	57/47r	41/26s	50/28s	54/35sh
Wyoming	Casper	58/33pc	71/40s	72/40s	72/38s
	Cheyenne	59/36sh	65/37s	71/40s	73/42s

Source: Weather Services Corp. By Julie Stacey, USA TODAY

morning. By Wednesday, inland parts of the Carolinas also could dip to 32 degrees.

But clouds across the Great Lakes and New England will act like a blanket, keeping the nights warmer. Clear skies continue warming this week, but the Los Angeles area should cool to more normal 70s and 80s today and Tuesday.

- Western warmth, 3A
- Tornado cleanup, 3A

WORLD WEATHER TODAY

Acapulco	87/72s
Athens	66/54pc
Berlin	51/37sh
Bermuda	68/64pc
Buenos Aires	71/52pc
Cairo	89/57pc
Calgary	62/39sh
Copenhagen	41/38sh
Dublin	44/34sf
Geneva	52/39sh
Hong Kong	81/76sh
Jerusalem	76/52pc
Kingston	90/75pc
Lima	74/65pc
London	51/42r
Madrid	61/37sh
Manila	93/74s
Mexico City	83/45s
Montreal	61/40sh
Moscow	55/48sh
Nassau	81/69sh
New Delhi	101/79s
Paris	52/41r
Peking	64/41pc
Rio de Janeiro	83/72sh
Rome	62/48pc
Stockholm	38/32sn
Sydney	73/58pc
Tokyo	65/56sh
Toronto	52/28sh
Vienna	50/40sh

EXTREMES YESTERDAY

Low temperature: 22 in Houlton, Maine. (Minus 13 degrees in Anaktuvuk, Alaska)

High temperature: 99 degrees in Palm Springs, Calif.

AREA WEATHER CLOSE-UP

Call local telephone numbers listed below for more details.

404-767-1784 ATLANTA — Early clouds then clearing, cool, high [illegible], low 40. **Tomorrow:** sunny, cold, dry, high 58, low 35.

301-936-1212 BALTIMORE — Thunderstorms colder tonight, high 66, low 46. **Tomorrow:** clearing, cool, high 55, low 39.

617-567-4670 BOSTON — Turning gray showers, high 61, low 47. **Tomorrow:** showery, cool, high 55, low 42.

312-976-1212 CHICAGO — Gray morning then sunny, high 44, low 27. **Tomorrow:** sunny, high 48, low 30.

216-931-1212 CLEVELAND — Much colder showers, high 48, low 30. **Tomorrow:** very cool, windy, high 41, low 27.

817-654-0116 DALLAS-FT.W. — Blue skies comfortably cool, high 75, low 50. **Tomorrow:** mostly sunny, high 78, low 52.

303-639-1212 DENVER — Mostly sunny and mild, high 72, low 44. **Tomorrow:** windy and warm, high 76, low 45.

515-285-6908 DES MOINES — Breezy, chilly freezing tonight, high 52, low 30. **Tomorrow:** sunny, warmer, high 58, low 35.

313-976-1212 DETROIT — Cold showers gusty winds, high 43, low 28. **Tomorrow:** snowers ending, high 42, low 27.

713-228-8703 HOUSTON — Cool and dry mostly sunny, high 79, low 52. **Tomorrow:** very comfortable, high 78, low 52.

317-248-4040 INDIANAPOLIS — Blustery, cool partly cloudy, high 47, low [illegible]. **Tomorrow:** freezing at [illegible], high 48, low [illegible].

816-471-4840 KANSAS CITY — Crystal clear cold tonight, high 52, low 35. **Tomorrow:** warming trend, high 61, low 40.

213-554-1212 LOS ANGELES — Not as hot still sunny, high 87, low 57. **Tomorrow:** cooler west winds, high 78, low 55.

305-661-50[illegible] MIAMI — Warm, humid mostly sunny, high 81, low 68. **Tomorrow:** showers, thunderstorms, high 79, low 62.

612-452-2323 MPLS.-ST.P. — Still cool but sunny, high 48, low 28. **Tomorrow:** warming trend, high 55, low 32.

504-525-8831 NEW ORLEANS — Early shower then sunny, high 76, low 50. **Tomorrow:** cool and dry, high 74, low 47.

212-976-1212 NEW YORK — Damp today showers, high 64, low 46. **Tomorrow:** clearing, cooler, high 54, low 42.

405-685-5577 OKLA. CITY — Warm in sun but cool in shade, high 69, low 45. **Tomorrow:** perfect, high 72, low 47.

215-936-1212 PHILADELPHIA — Showers and thunderstorms, high 65, low 45. **Tomorrow:** breezy and cool, high 54, low 40.

602-957-[illegible] PHOENIX — Hot, dry and sunny, high 94, low 65. **Tomorrow:** continued clear, high 96, low 67.

412-936-1212 PITTSBURGH — Turning cold with showers, high 54, low 30. **Tomorrow:** more like march, high 43, low 27.

314-928-1198 ST. LOUIS — Freeze tonight sunny today, high 51, low 30. **Tomorrow:** mostly sunny, high 55, low 32.

801-521-3650 SALT LAKE — Outstanding sunny and warm, high 74, low 50. **Tomorrow:** continued fair, high 76, low 52.

619-289-1212 SAN DIEGO — Still warm under sunshine, high 78, low 66. **Tomorrow:** mostly sunny, high 75, low 64.

415-936-1212 SAN FRAN. — Beach weather sunny and warm, high 77, low 55. **Tomorrow:** cooler west winds, high 71, low 53.

206-382-7246 SEATTLE — Gray skies few showers late, high 63, low 45. **Tomorrow:** showery, high 59, low 44.

813-645-2506 TAMPA-ST.P. — Thunderstorms and humid, high 79, low 60. **Tomorrow:** turning cooler, high 72, low 54.

202-936-1212 WASH. D.C. — Gray skies showers, high 67, low 47. **Tomorrow:** clearing, cool, high 56, low 44.

BUSINESS/WALL STREET

1. What month did the Dow Jones Industrial Average break 1500?

_____

2. In what city does Burger King have its Office of Franchise Affairs?

_____

3. Where is Genentech, Inc. located?

_____

4. What corporation is expected to get approval for a hepatitis B vaccine?

_____

5. Who is the past president of the Institute of Certified Financial Planners?

_____

6. Which type of industry has done the worst over the past year (measured by the Market Value Index)?

_____

7. What company is a major supplier of power-generation equipment?

_____

8. Where does Roy Ehrhardt live?

_____

9. Which Biotech stock company closed the lowest on the OTC Stock Exchange Friday?

_____

10. On what date did the Dow Jones industrial average lose 35.68 points?

_____

BUSINESS/WALL STREET

11. Who is the head trader at Dreyfus, Corp.?

_____

12. Was a higher percentage of shares traded last week on the American or New York Stock Exchange?

_____

13. Was a higher percentage of shares traded last week Over the Counter or on the American and New York Stock Exchanges combined?

_____

14. How many biotech stock companies are mentioned on this page?

_____

15. Where does S. Robert Kupor work?

_____

16. Who compiles the "Ask Money" column?

_____

17. What does t-PA stand for?

_____

18. How many points could the Fed's rate cut add to the Dow today?

_____

19. How much (in %) was the discount rate cut by?

_____

20. What is Allen Sinai's occupation?

_____

21. What was the national debt on February 28?

_____

BUSINESS/WALL STREET

22. What company's first name begins with a small letter (instead of a capital letter)?

_____

23. Name another company whose first name begins with a small letter (instead of a capital letter).

_____

24. What is the difference between the percentages of outstanding shares traded between the companies you listed in #22 and #23 (answer to two places after the decimal point)?

_____

25. Who interviewed major analysts of biotech stocks?

_____

26. In what city is the Antique Trader Weekly published?

_____

27. What would be the annual growth rate based on last week's reported U.S.A. economic trend?

_____

28. Whose wife does not work?

_____

29. What city has a 33156 zip-code?

_____

30. What type of industry had a Market Value Index equal to 86 a month ago?

_____

31. What company markets services to credit-card holders?

_____

BUSINESS/WALL STREET

32. How much higher was textile products' closing Market Value Index yesterday compared to garden supplies' closing MVI?

_____

33. What is Thomas Alto's occupation?

_____

34. What city/town in Minnesota is mentioned on this page?

_____

35. How many squares are totally colored in the Dow Jones Industrial Average graph on the top of the page?

_____

36. What is Eugene's last name?

_____

37. How many squares are there in the Dow Jones Industrial Average graph on the top of the page?

_____

38. Which stock lost 72 cents a share in fiscal 1985?

_____

39. How many times a week will readers' questions be answered in the "Ask Money" column?

_____

40. Where does t-PA dissolve blood clots?

_____

CAREER OPPORTUNITIES

1. What is Patrick McGuire's phone number?

   _____

2. What is the man looking up at the globe holding in his left hand?

   _____

3. In what state would you find the city/town of Vienna?

   _____

4. What is TWA's motto?

   _____

5. What is the State of California's Licence Identification Number for one of these businesses?

   _____

6. Which business has a special toll-free number for residents of Indiana?

   _____

7. How many TWA offices are listed on this page?

   _____

8. What does Pansophic manufacture?

   _____

9. How much does a subscription to National Job Market cost?

   _____

10. In what city/town will you find 21031 Ventura Blvd.?

    _____

11. How much money do you have to put down to purchase a truck from one of these advertisors?

    _____

CAREER OPPORTUNITIES

12. How many countries are mentioned where you can earn money without paying any taxes?

_____

13. What company allows you to "set your own hours?"

_____

14. What is the nine digit zip-code of Sunnyvale, CA?

_____

15. What does Gannett publish?

_____

16. Which company offers "protected territories?"

_____

17. What is located at 10330 Natural Bridge Road?

_____

18. Which business has been around since 1947?

_____

19. What phone number should you dial from Lansing if you are interested in becoming an engineer in Tel Aviv?

_____

20. How many pages does each issue of National Job Market contain?

_____

21. Correspondence should be addressed to the attention of what department number for the Central Region in one of these advertisements?

_____

CAREER OPPORTUNITIES

22. In how many days will companies in all areas of the country have over 150,000 career openings that must be filled?

_____

23. To whom should you direct your resume if you are interested in Mechanical Engineering/Antennal Systems?

_____

24. The name of a hotel is incorrectly spelled on this page. In what town/city is this hotel located?

_____

25. What phone number would you dial to get a recorded message?

_____

26. How many airline-related companies have advertised on this page?

_____

27. In what section of this newspaper can you usually find Career Opportunities?

_____

28. In what state would you find Landmark Square?

_____

29. What kind of experience is "a plus" for working at a corporation in Hershey?

_____

30. What hours on Sunday is Overseas Unlimited open during Eastern Standard Time?

_____

31. What phone number should you dial to receive a Resume Writing Kit?

_____

CAREER OPPORTUNITIES

32. What position requires at least an MS in computer science?

_____

33. What city has a zip-code of 55426?

_____

34. What do you think Mr. Haldane's first name is?

_____

35. What company has over $300 million in new contract awards?

_____

36. What town/city in New Hampshire is mentioned on this page?

_____

37. What is the "formula for the future?"

_____

38. To which city should you mail an application if you cannot attend a seminar?

_____

39. What company is looking for your IBM Sales Talent?

_____

40. Name something located on US 90 East in Mississippi.

_____

CLASSIFIED

1. What is the address of Woody's Oasis?

_____

2. What is the person's name who buys late model domestic cars?

_____

3. In what building can you see a film about studying overseas?

_____

4. What is the phone number of Jobs Hotline?

_____

5. How much is the one bedroom apartment at 323-4787?

_____

6. What will Classified help you find "when it's too good to throw away?"

_____

7. Where is the Murray Hotel?

_____

8. Who lives at 351-6789?

_____

9. Who has repair manuals for over 120 foreign car titles?

_____

10. What time should you call 349-4084?

_____

11. What's located "just off Grand River -- Okemos?"

_____

CLASSIFIED

12. What is the most you should spend for a 1976 Plymouth Stationwagon?

_____

13. What is the name of an apartment resident who might play tennis?

_____

14. What word is missing a hyphen?

_____

15. What can you get by calling a certain phone number and asking for extension R-9440?

_____

16. Who has asked the reader to call a certain number collect?

_____

17. How many flagpoles are on the castle?

_____

18. Name one thing for which Scott and Lori are looking.

_____

19. What phone number should you call if you are familiar with archery?

_____

20. What is located at 355-8255?

_____

21. For what extension should you ask if you want to be in T.V. commercials?

_____

22. Which apartment complex overlooks a golf course?

_____

CLASSIFIED

23. A local announcement on this page will reach how many students?

_____

24. What is located at 2900 Northeast St.?

_____

25. To what state should you move in order to "get ahead?"

_____

26. What does Mr. Hall need?

_____

27. How many columns does the front of the Parthenon have?

_____

28. What can you buy for $44 from the U.S. government?

_____

29. With what type of package does the 1978 Toyota Celica GT coupe come equipped?

_____

30. What is at the corner of Abbott and Grand River?

_____

31. What is in Suite 303?

_____

32. In what year was the "Florida car" manufactured?

_____

33. How long will you have to be in the area in order to take the job offered at 339-2464?

_____

CLASSIFIED

34. For how many years has the Mason Body Shop been in business?

_____

35. How many passengers can fit on the ocean liner?

_____

36. You must have "reliable transportation" for a particular job offered on this page. Where should you apply for this job (where is the Personnel Office located)?

_____

37. Who is looking for an Arts and Crafts Show Coordinator?

_____

38. To whom besides Karen can you speak by dialing 353-5143?

_____

39. How much can you earn by working at midnight in an apartment in Lansing?

_____

40. With what do you need experience to get a job at the store located at Frandor?

_____

SPORTS

1. Who improved her record to 6-2?

_____

2. How many people are honored for receiving a 3.5 GPA winter term?

_____

3. Who is the MSU baseball team coach?

_____

4. Who wrote a book available at Logos?

_____

5. Where did the Spartans play the Bishops?

_____

6. What is the State News' photographer's full name?

_____

7. Where can you get munchies?

_____

8. How many people have seen a slide presentation about the roots of rock-n-roll?

_____

9. Who made two brilliant saves in the first quarter?

_____

10. Who was leadoff hitter in the sixth inning?

_____

11. What number is on the sleeve of the white jersey?

_____

SPORTS

12. How much money should you send for shipping and handling?

_____

13. What should you "order now?"

_____

14. How long will Don Dowland be in the area?

_____

15. When will the Spartans play a non-conference double-header?

_____

16. Who was the MSU senior catcher?

_____

17. On what side of the graduate's head is the tassle hanging?

_____

18. What do they "think" in Freemont?

_____

19. Who scored the Bishop's second goal?

_____

20. Who knows quite a bit about sex?

_____

21. What is "outstanding?"

_____

22. What kind of pitch ended the long game?

_____

SPORTS

23. How many flowers are on the page?

_____

24. Who is Ricardo Cooney?

_____

25. If it wasn't happenstance, what was it that made the Spartans show renewed vigor?

_____

26. Who made a sacrifice bunt?

_____

27. Who is Brad Warren?

_____

28. Who scored off a walk?

_____

29. What kind of "fever" could you catch?

_____

30. What is "guaranteed?"

_____

31. What is the name of the "fine hitting team?"

_____

32. Who tried to go after the loose ball?

_____

33. How many hits did Tracy get?

_____

34. On what street would you find the Cooley Law School?

_____

SPORTS

35. How many brands of bottled beer are available?

_____

36. What can you "improve" for $3.50?

_____

37. What was the score of the game that "could have had a different complexion?"

_____

38. What is Phil's last name?

_____

39. What building should you go to if you want to ask what "marantha" means?

_____

40. Who "took a beautiful feed" from junior Kevin Rice?

_____

WEATHER

1. What city "could be colder than Boston Tuesday night?"

   _____

2. Name yesterday's hottest city in California?

   _____

3. What city has 617 as its area code?

   _____

4. What is 80 Farenheit degrees equal to on the Celsius scale?

   _____

5. How many states will be totally submerged in 70 degree temperatures?

   _____

6. In which direction is the warm air moving this week?

   _____

7. How many states will experience temperatures above 79 degrees?

   _____

8. What city will be over 100 degrees today?

   _____

9. What color is the girl's shirt?

   _____

10. How many states are totally covered with purple in the inset in the middle of the page?

    _____

11. What phone number should you dial for more weather details in Tulsa?

    _____

WEATHER

12. What city in the continental U.S. will have "beach weather" today?

_____

13. How many cities are named on this page?

_____

14. From your answer to #13 above, how many of these cities are not in North, Central, or South America?

_____

15. Name one city that will have a 31 degree difference between its high and low temperatures tomorrow.

_____

16. Name another city that will have a 31 degree difference between its high and low temperatures tomorrow.

_____

17. Name a third city that will have a 31 degree difference between its high and low temperatures tomorrow.

_____

18. Of the three cities listed (questions 15-17), which city had the lowest temperature today?

_____

19. What city in Florida pictured on the map should have the highest low temperature today?

_____

20. Who "makes the very best?"

_____

21. Given your answer to #20 above, what are they known for making?

_____

WEATHER

22. According to the map, which state has the highest predicted range of temperatures today?

_____

23. How many cities named on this page begin with the letter 'L'?

_____

24. What is -1 degree Celsius equal to on the Farenheit scale?

_____

25. On what page can you read about picking up the wreakage from a previous tornado?

_____

26. How many cities are expecting snow today?

_____

27. Name the city (or cities) from item #26.

_____

28. How many cities are expecting snow flurries today?

_____

29. Name the city (or cities) from item #28.

_____

30. What state will be humid today?

_____

31. Name a Weather Services Corp. meteorologist.

_____

32. Who is the baseball player pictured on this page?

_____

WEATHER

33. How many <u>cities</u> have area weather close-ups?

_____

34. What is Julie's last name?

_____

35. Which American city that legally operates gambling casinos will have the highest temperature today?

_____

36. Which American city that legally operates gambling casinos will have the lowest temperature today?

_____

37. Name an American city not already mentioned (in questions 35 and/or 36) that legally operates gambling casinos?

_____

38. What will the "warmth bring?"

_____

39. How many cities will be sunny for four days in a row?

_____

40. Frosts and freezes will extend tonight to the northern part of which state?

_____

BUSINESS/WALL STREET -- ANSWER KEY

1. December
2. Miami
3. South San Francisco
4. Chiron
5. P. Kemp Fain, Jr.
6. petroleum and coal products
7. Combustion Engineering, Inc.
8. Kansas City
9. Bio-Response
10. March 21
11. George Pirrone
12. New York
13. over the counter
14. 10
15. Cable House & Ragen
16. William Giese
17. tissue plasminogen activator
18. 10-12
19. .5% or from 7% to 6.5%
20. economist
21. $1,979,143,000,000
22. countrywide cr Inds. or conchemco Inc.
23. countrywide cr Inds. or conchemco Inc.
24. 3.86 or -3.86
25. Kathy Rebello
26. Dubuque
27. 3.2%
28. Thomas Schoenecker
29. Miami
30. Pipelines, except natural gas
31. SafeCard or SafeCard Services Inc.
32. 210
33. certified public accountant or accountant or CPA
34. Cambridge
35. accept any answer between 375-390
36. Peroni
37. 1326 or (26 X 51)
38. Amgen
39. once
40. in the heart

CAREER OPPORTUNITIES -- ANSWER KEY

1. 1-800-523-7366 or 523-7366
2. briefcase or suitcase
3. VA or Virginia
4. A Career in the Sky is Like None on Earth
5. E-4561
6. northAmerican van lines or long distance trucking
7. 5 or 17
8. computer software or peak performance software
9. $29
10. Woodland Hills
11. $2500
12. 3 or 4 or 5
13. Spectrum International EOE
14. 94088-3510
15. USA Today
16. North American Roofing Systems, Inc.
17. Park Terrace Airport Hilton or TWA office
18. Haldane Assoc.
19. (213) 739-8080
20. 64
21. 36 or 036
22. 30
23. ESL or Clarence Kastrop or Prof. Employ. Dept.
24. Clarksville
25. 816-234-8202 or TWA
26. 2
27. Classified or Classified Across the USA
28. CT or Connecticut
29. valve
30. 12-6
31. 1-800-323-7702
32. Supervisor of Artificial Intelligence
33. Minneapolis
34. Bernard
35. ESL or TRW
36. Manchester
37. ESL
38. Kansas City
39. Pansophic
40. La Font Inn

CLASSIFIED -- ANSWER SHEET

1. 970 Trowbridge or Trowbridge Rd.
2. Bill Burcham
3. Natural Resources
4. 887-2178
5. $310
6. a buyer
7. Mackinac Island, MI
8. Linda
9. Checquered Flag
10. after 5
11. Campus Hill Apts.
12. $600
13. Karin
14. cosmetics
15. current federal list or govn. jobs
16. Naval Reserve
17. 4
18. Programmers or DBA's or system programmers
19. 616-938-2200
20. Classified Office or 347 Student Services Building
21. 117
22. Cedar Greens
23. 39,000
24. Connxtions Comedy Club
25. Texas
26. Handyman or Parttime Handyman
27. 7 or 8
28. Jeeps
29. sport or 5 speed, air, am/fm
30. Evergreen Arms
31. Health Care Clinic
32. 1961
33. 2 years
34. 45 or 46 or since 1940
35. 500
36. Community Mental Health Board
37. MSU Union Activities Board
38. Carolyn
39. $3.50
40. clothing sales

SPORTS -- ANSWER SHEET

1. Dianne Kennett
2. 6
3. Tom Smith
4. Richard M. Czop, M.D.
5. Old College Field or East Lansing
6. Michael Honeywell
7. J.J. Winners
8. thousands
9. O'Neil
10. Kevin Dalson
11. 4
12. $0.50
13. Commencement apparel
14. 2 weeks or April 22 - May 3
15. Tuesday
16. Bill Hanis
17. left
18. thin
19. Rich White
20. Greg Ball
21. comedy
22. wild
23. 2
24. State News Writer or Writer
25. team pep-talk
26. Aimesbury
27. lives at Sigma Alpha Mu or he got a 3.5 GPA
28. Steve Preston
29. spring
30. satisfaction
31. Boilermakers
32. Mike Daniels
33. 2
34. Capitol Ave. or Capitol
35. 60 or over 60
36. your figure
37. 13-5
38. Arbit
39. Engineering
40. Dave Stein

WEATHER -- ANSWER SHEET

1. Atlanta
2. Palm Springs
3. Boston
4. 27
5. 2
6. east or NE or up
7. 8
8. New Delhi
9. yellow
10. 4 or 5
11. 405-685-5577 or 685-5577
12. San Francisco
13. 143
14. 25
15. Denver or Bend or Cheyenne
16. Denver or Bend or Cheyenne
17. Denver or Bend or Cheyenne
18. Cheyenne
19. Key West
20. Nestle
21. chocolate or candy bars or the very best
22. Alaska
23. 8
24. 30
25. 3A or 3
26. 1
27. Stockholm
28. 1
29. Dublin
30. Florida
31. Mark Nichols
32. Pete Rose
33. 31
34. Stacey
35. Las Vegas
36. Reno
37. Atlantic City
38. rain
39. 14
40. Arkansas

APPENDIX G

Perceived Stress Associated With Crowding Measure

APPENDIX G

Perceived Stress Associated With Crowding Measure

ATTITUDES TOWARD THE EXPERIMENT
(Please read each question carefully)

1. How confined did you feel during the experiment?

Not at all Confined						Very Confined

2. How comfortable did you feel during the experiment?

Very Comfortable						Not at all Comfortable

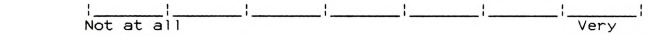
3. How crowded did you feel during the experiment?

Not at all Crowded						Very Crowded

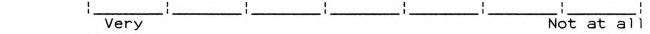
4. How ill at ease did you feel during the experiment?

Very Ill at Ease						Not at all Ill at Ease

5. How stressed were you during this experiment?



6. To what extent were you aware of the presence of other people?



APPENDIX H

Manipulation Check for Attribution

APPENDIX H

Manipulation Check for Attribution

While many people enjoy participating in psychological experiments, some people feel stressed during the experience. The list below contains many explanations describing why you might have felt stressed this evening. Please rate how stressful you perceived each of them to be:

1. I had a fight with my girl/boyfriend earlier.

Not at all Stressful						Very Stressful

2. The room was too hot.

Very Stressful						Not at all Stressful

3. I had too much caffeine today.

Not at all Stressful						Very Stressful

4. The newsprint I had to review was creating some strain on my eyes.

Very Stressful						Not at all Stressful

5. I was afraid the experimenter might single me out of the group.

Not at all Stressful						Very Stressful

6. The experiment was boring.

Very Stressful						Not at all Stressful

7. The room was too cold.

Not at all Stressful						Very Stressful

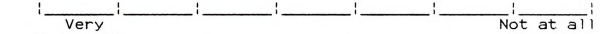
8. I felt very crowded in this room.

Very Stressful						Not at all Stressful

9. I feel sick today.

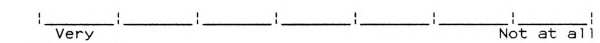
Not at all Stressful						Very Stressful

10. I was nervous about looking foolish in front of my peers.



11. I was nervous that the experimenter may evaluate my performance.

12. I was tired.



APPENDIX I

Comfortable Interaction Distance Measure and Oral Instructions for Completing This Measure

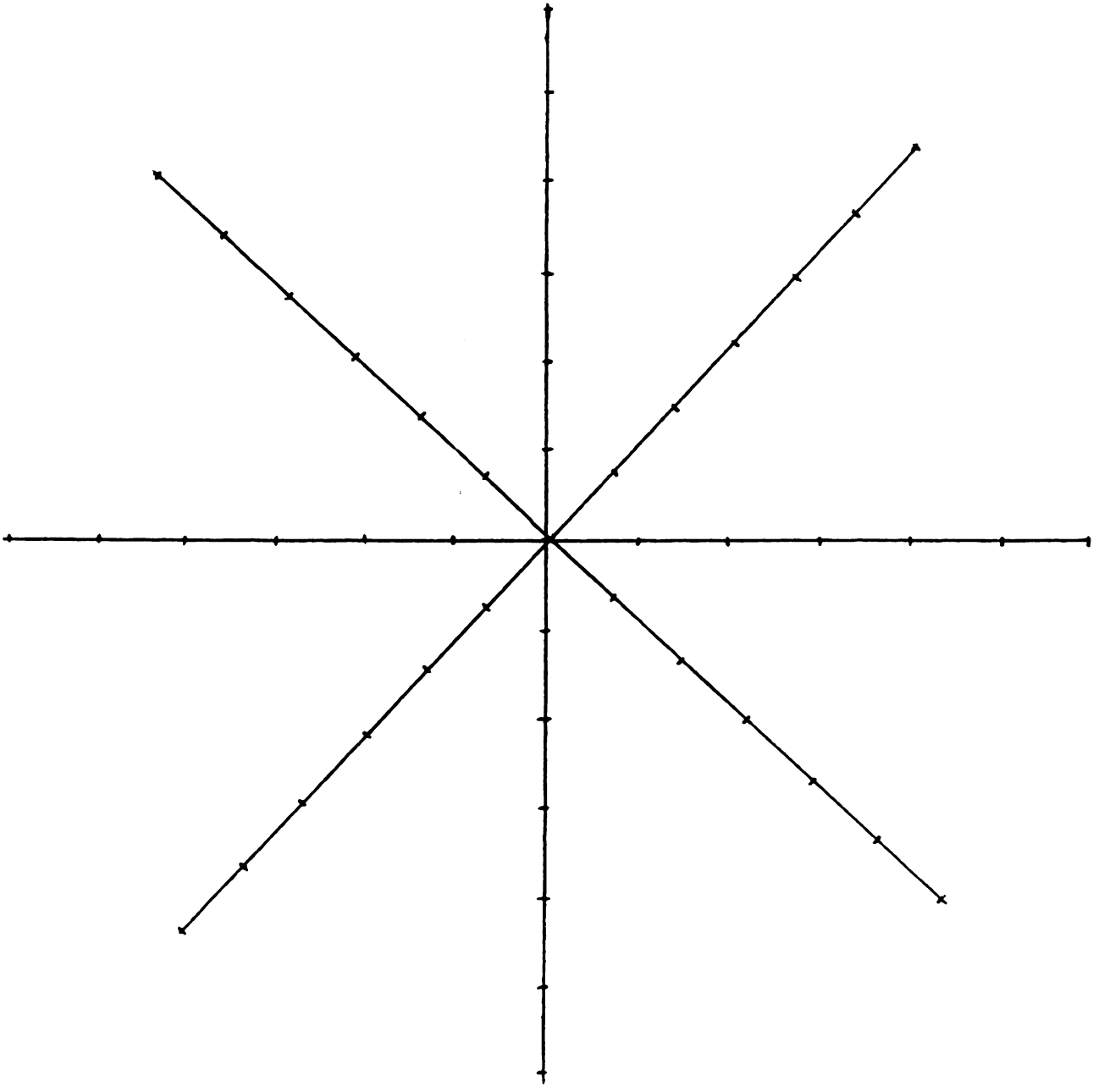


Figure 10. Comfortable Interaction Distance Measure.

Oral Instructions for Completing
Comfortable Interaction Distance Measure

"Please take a good look at the photograph you are holding...Imagine yourself standing in the middle of a large, round room. Straight in front of you is the only doorway to the room. I would like you to imagine that the person who you see pictured is slowly walking through that doorway towards you. Try to determine how close you would allow that person to approach you before you begin to feel uncomfortable. In other words, at what distance would you want that person to stop and not come any closer. That distance can range anywhere from a few inches (i.e., touching distance) up to six feet [mention to the subjects the distances they are currently standing apart from each other]...."

BIBLIOGRAPHY

BIBLIOGRAPHY

Allgeier, A. R. & Byrne, D. (1973). Attraction toward the opposite sex as a determinant of physical proximity. Journal of Social Psychology, 90, 213-219.

Allport, F. (1924). Social psychology. Boston: Hougton Mifflin.

Altman, I. (1975). The environment and social behavior. Monterey, Calif.: Brooks/Cole.

Anastasi, A. (1982). Psychological testing (5th Ed). London: MacMillan.

Byrne, D., Ervin, C. R., & Lamberth, J. (1970). Continuity between the experimental study of attraction and real-life computer dating. Journal of Personality and Social Psychology, 16, 1, 157-165.

Cohen, J. & Cohen, P. (1975). Applied regression/correlation analysis for the behavioral sciences. Hillsdale, N. J.: Lawrence Erlbaum Associates.

Cozby, P. C. (1973). Effects of density, activity, and personality on environmental preferences. Journal of Research in Personality, 7, 45-60.

Desor, J. A. (1972). Toward a psychological theory of crowding. Journal of Personality and Social Psychology, 21, 79-83.

Duke, M. P. & Nowicki, S., Jr. (1972). A new measure and social-learning model for interpersonal distance. Journal of Experimental Research in Personality, 6, 1-16.

Eberts, E. H. (1972). Social and personality correlates of personal space. In Mitchell, W. J. (Ed.), Environmental design: Research and practice. Los Angelos: University of California Press.

Edney, J. J. & Grundmann, M. J. (1979). Friendship, group size, and boundary size: Small group spaces. Small Group Behavior, 10, 124-135.

Evans, G. W. & Howard, R. B. (1973). Personal space. Psychological Bulletin, 80, 334-344.

Felipe, N. J. & Sommer, R. (1966). Invasions of personal space. Social Problems, 14, 206-214.

Freedman, J. L. (1975). Crowding and behavior. San Francisco: Freeman.

Freedman, J. L., Klevansky, S., & Ehrlich, P. R. (1971). The effect of crowding on human task performance. Journal of Applied Social Psychology, 1, 7-25.

Gottheil, E., Corey, J., & Paredes, A. (1968). Psychological and physical dimensions of personal space. Journal of Psychology, 69, 7-9.

Guado, C. J. & Meisels, M. (1971). Child-parent spatial patterns under praise and reproof. Developmental Psychology, 5, 365.

Hall, E. T. (1963). Proxemics: The study of man's spatial relations. In Goldston, I. (Ed.), Man's image in medicine and anthropology. N. Y.: International Universities Press.

Hall, E. T. (1966). The hidden dimension. Garden City, N. Y.: Doubleday.

Hayduk, L. A. (1978). Personal space: An evaluative and orienting overview. Psychological Bulletin, 85, 117-134.

Heller, J. F., Groff, B. D., & Solomon, S. H. (1977). Toward an understanding of crowding: The role of physical interaction. Journal of Personality and Social Psychology, 35, 183-190.

Keppel, G. (1982). Design and analysis: A researcher's handbook (2nd ed). Englewood Cliffs, N. J.: Prentice-Hall.

King, M. (1966). Interpersonal relations in preschool children and average approach distance. Journal of Genetic Psychology, 109, 109-116.

Kleck, R. (1967). The effects of interpersonal affect on errors made when reconstructing a stimulus display. Psychonomic Science, 9, 449-450.

Knowles, E. S. (1978). The gravity of crowding: Application of social physics to the effects of others. In Baum, A. & Epstein, Y. (Eds.), Human response to crowding. Hillsdale, N. J.: Lawrence Erlbaum Associates.

Knowles, E. S. (1980). An affiliative conflict theory of personal and group spatial behavior. In Paulus, P. B. (Ed.), Psychology of group influence. Hillsdale, N. J.: Lawrence Erlbaum Associates.

Kuethe, J. (1962). Social schemas. Journal of Abnormal and Social Psychology, 64, 31-36.

Langer, R. & Saegert, S. (1977). Crowding and cognitive control. Journal of Personality and Social Psychology, 35, 175-182.

Lawrence, J. E. (1974). Science and sentiment: Overview of research on crowding and human behavior. Psychological Bulletin, 81, 10, 712-721.

Little, K. B. (1965). Personal space. Journal of Experimental Social Psychology, 1, 237-247.

Marshall, G. D. & Zimbardo, P. G. (1979). Affective consequences of inadequately explained physiological arousal. Journal of Personality and Social Psychology, 37, 970-988.

McCallum, R., Rusbult, C. E., Hong, G. K., Walden, T., & Schopler, J. (1979). Effects of resourcea availability and importance of behavior on the experience of crowding. Journal of Personality and Social Psychology, 37, 1304-1313.

Middlemist, R. D., Knowles, E. S., & Matter, C. F. (1976). Personal space invasions in the lavatory: Suggestive evidence for arousal. Journal of Personality and Social Psychology, 33, 541-546.

Patterson, M. L., Mullens, S. & Romano, J. (1971). Compensatory reactions to spatial intrusion. Sociometry, 34, 114-121.

Paulus, P. B., Annis, A. B., Seta, J. J., Schkade, J. K., & Matthews, R. W. (1975). Density does affect task performance. Journal of Personality and Social Psychology, 34, 248-253.

Paulus, P. B. & Matthews, R. W. (1980). Crowding, attribution, and task performance. Basic and Applied Social Psychology, 1, 1, 3-13.

Rapoport, A. (1975). Toward a redefinition of density. Environment and Behavior, 7, 133-158.

Rawls, J. R., Trego, R. E., McGaffrey, C. N., & Rawls, D. J. (1972). Personal space as a predictor of performance under close working conditions. Journal of Social Psychology, 86, 261-267.

Sanders, G. S. & Baron, R. S. (1975). The motivating effects of distraction on task performance. Journal of Personality and Social Psychology, 32, 6, 956-963.

Schacter, S. & Singer, J. E. (1962). Cognitive, social, and physiological determinants of emotional state. Psychological Review, 69, 379-399.

Seguin, C. A. (1967). The "individual" space. International Journal of Neuropsychiatry, 108-117.

Sommer, R. (1959). Studies in personal space. Sociometry, 22, 247-260.

Spence, K. W., Taylor, J., & Ketchel, R. (1956). Anxiety (drive) level and degree of competition in paired-associates learning. Journal of Experimental Psychology, 52, 306-310.

State News (1986). April, 21, pp. 9, 11.

State News (1986). September, 29, Shopping Supplement, p. 12.

Stokols, D. (1975). Toward a psychological theory of alienation. Psychological Review, 82, 26-44.

Stokols, D. (1976). The experience of crowding in primary and secondary environments. Environment and Behavior, 8, 49-86.

Stokols, D., Smith, T. E., & Proster, J. J. (1975). Partitioning and perceived crowding in a public place. American Behavioral Scientist, 18, 792-814.

Sundstrom, E. (1975). An experimental study of crowding: Effects of room size, intrusion, and goal-blocking on nonverbal behavior, self-disclosure, and self-reported stress. Journal of Personality and Social Psychology, 32, 645-654.

U. S. A. Today (1986). April 21, pp. 14A, 3B, 7E.

Valins, S. & Baum, A. (1973). Residential group size, social interaction, and crowding. Environment and Behavior, 5, 4, 421-440.

Willis, F. N., Jr. (1966). Initial speaking distance as a function of the speakers' relationship. Psychonomic Science, 5, 221-222.

Worchel, S. (1978). The experience of crowding: An attributional analysis. In Baum, A. & Epstein, Y. (Eds.), Human response to crowding. Hillsdale, N. J.: Lawrence Erlbaum Associates.

Worchel, S. & Teddlie, C. (1976). The experience of crowding: A two-factor theory. Journal of Personality and Social Psychology, 34, 30-40.

Worchel, S. & Yohai, S. (1979). The role of attribution in the experience of crowding. Journal of Experimental Social Psychology, 15, 91-104.

Zajonc, R. B., Heingartner, A., & Herman, E. M. (1969). Social enhancement and impairment of performance in the cockroach. Journal of Personality and Social Psychology, 13, 83-92.