Achieving Tendency, Sex-Role Orientation and Video Game Playing Experience in College Females

1984

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ACHIEVING TENDENCY, SEX-ROLE ORIENTATION AND VIDEO GAME PLAYING EXPERIENCE IN COLLEGE FEMALES

BY

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B.A., University of Central Florida, 1982

THESIS

Submitted in partial fulfillment of the requirements for the Master of Science degree in Clinical Psychology in the Graduate Studies Program of the College of Arts and Sciences University of Central Florida Orlando, Florida

Summer Term 1984
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INTRODUCTION

Electronic video games are the center of much controversy today. According to a survey of video software dealers by A. C. Nielson Co. Gelman, (1983) reports that 76% sold video game cartridges while only 27% sold software for home computers, indicating the popularity of video games for the home. It must be noted however, that software is easier to copy than cartridges and therefore these figures cannot be interpreted to mean that more people actually own or use video games than software for their home computers. The controversy, along with the popularity, has posed important questions about the effects video games have on the people who play them. The plan of this paper is to discuss some of the perceived benefits and uses of video games, and some of the harms and criticisms. Then, research in the area of personality variables and their relationship to video game playing will be presented, followed by research regarding the variables that will be investigated in this study. After stating the hypotheses, the methods of the study will be presented.

Beneficial Effects

Turkle and Conrad (cited in Needham, 1982-1983), and Jones, Kennedy & Bittner (1981), support video games and their usage among young people because of the social, visual motor, and performance skills which can be learned through playing the games. Supporters of the video games, such as Sehulster (cited in Gibb, Bailey, Lambirth &
Wilson, 1983) believe that the arcades help develop social skills in young people. Needham (1982-1983) indicated that the arcades offer a sanctuary where young people can put their problems behind them and concentrate on the game. Others who support video game play because of the social gains offered include Mitchel (1982), who talked about video games as a means for gaining peer acceptance by children who are not athletically inclined. Turkle and Conrad (cited in Needham, 1982-1983) and Ross (cited in Collins, 1983) suggest that video games give the young a crucial sense of mastery which is particularly important for those who have never excelled at anything before. Another social benefit of video game playing is noted by Needham (1982-1983) who suggested that girls should play more because, unlike athletic games, men acknowledge the girls' achievement and success as absolutely equal to their own. Some supporters have found that video games can be used to help develop and train skills. Needham (1982-1983) cited finger dexterity and concentration as benefits; the U. S. Army had modified the video game Battlezone for use in training the infantry for electronic warfare because of its' helpfulness in developing the skills of quick reflexes and hand/eye coordination. Another example of a training use for video games is "Mr. Williamson", developed at Michael Reese Medical Center in Chicago. According to Locatis and Lunin (1983), it is a simulation designed to provide general practitioner medical students with experience in managing patients with diabetes.
Education

Video games are increasingly being used in the field of education. Anderson (1983) notes that a substantial number of the more than one million microcomputers sold in the United States during 1981 are located in educational environments. Slesnick (1983) discussed a game curriculum, "Creative Play", to be used in the classroom. "Creative Play" emphasizes the problem solving skills of logical reasoning, data collection and evaluation, creative (open ended) thinking, spatial visualization, and pattern identification. In addition, the social problem solving skills of cooperation, communication, and peer teaching are included. Berger (1983) reviewed two video games, "Gertrudes's Puzzles" and "Rocky's Boots" which teach reasoning skills useful in science, math, technology and philosophy, as well as being fun to play. Jones, Kennedy, and Bittner (1981) found Atari's "Air Combat Maneuvering" game, to be an "excellent prospect for use in performance testing" (p.1).

Harms of Video Game Playing

Much of the concern is directed toward the countless number of young people who are spending over seven billion dollars a year on arcade video games alone (Needham, 1982-1983). Needham (1982-1983) and Lamm (cited in Gibb, Bailey, Lambirth & Wilson, 1983 and in Geist, 1982) offered the criticisms that video games encourage antisocial tendencies, lead to anger, frustration and rage; and lead to gambling, panhandling and theft as a means for obtaining quarters. Bloch (cited in Collins, 1983) suggested that the games contribute little to social
skills. They put children on a narrowly defined developmental path. Krauss (1982) believes there is a danger of young people using the video games to dodge reality and human contact and they are used as a form of escape. U. S. Surgeon General Koop was quoted in the New York Times (November, 10, 1982) to have said "...video games might be hazardous to the health of young people who are becoming addicted body and soul,...more and more people are beginning to understand the adverse mental and physical effects of video games" (p. A-16). Hopkins was quoted in Kerr (1982) "If the places (video game arcades) are not properly supervised or controlled they can become a breeding ground for drug abuse and other illegal activities such as drinking and gambling" (p. C-8). According to Cravenson (1982), the wargame mentality of the games has a regressive effect on children.

**Personality Variables**

In a study addressing the effects of video game playing on personality, Gibb, Bailey Lambirth & Wilson (1983) found no evidence to suggest that video games encourage social isolation, anger, antisocial behavior and compulsivity. Two hundred and eighty video game players from commercial arcades, two hundred and one males and seventy nine females, participated in this study. The subjects were randomly administered one of two forms of a personality measure which the researchers had created for the purpose of their study. Form A was a 73-item true-false questionnaire containing the Bipolar Psychological Inventory (BPI), subscales of self esteem-self degradtion, social deviancy-social conformity, and valid-invalid. In
addition, Form A contained an obsessive-compulsive scale. Form B, a 72-item true-false questionnaire, contained the BPI subscales of unmotivated-achieving, social withdrawal-gregariousness, hostility-kindness and valid-invalid. The subjects were divided into high or low users according to the mean hours per week spent on video game play. For the Form A group males, the high use players had a mean of 15.09 hours per week, while a mean of 1.00 hour per week was defined as low use players. Because of the low variability on this measure for females, percentiles could not be calculated for this group. The authors performed an analysis of variance which yielded nonsignificance between males in the two groups for self-esteem, social deviancy, and obsessiveness-compulsiveness. Experience was divided into long (for males, a mean of 48.72 months and for females, a mean of 31.93 months) and short (for males, a mean of 15.11 months and for females, a mean of 6.17 months). Using an analysis of variance for each sex the authors found nonsignificance between the two groups for self-esteem, social deviancy, and for obsessiveness-compulsiveness. For the Form B group, the high use players had a mean of 6.21 hours per week spent playing video games and the low use males had a mean of 1 hour per week. For females in the Form B group, those with a mean of 40.2 hours per week were defined as high use players and 1 hour per week as low use players. With an analysis of variance across sex the authors found nonsignificance between the two groups for sociability, hostility and for achievement motivation. For the Form B group, experience was divided into long for males with a mean of 51.91 months and for
females with a mean of 11 months; and short experience for males with a mean of 30.92 and for females with a mean of 7.92. An analysis of variance yielded nonsignificance between male groups but significance was found for female groups, \( F(1, 23) = 9.37, \ p < .006 \), such that those with long experience playing video games scored significantly higher than those with short experience. One of the questions raised by this study is whether video games appeal more to females with higher achieving tendency than those with lower achieving tendency. Also, does experience playing video games increase the individual's achieving tendency.

**Relevant Research Variables**

In a study investigating the achievement motivation in female athletes Henschen, Edwards & Mathinow (1982) found that female high school track and field athletes "possessed significantly greater achievement motivation than nonathletic females" (p. 1860). In this study, 67 high school track and field athletes and 67 nonathletes were administered the Bem Sex-Role Inventory to assess sex-role orientation and the Mehrabian Scale of Achieving Tendency in order to assess achievement motivation. A two-way analysis of variance was used and indicated a significant difference, \( F(1, 126) = 16.0, \ p < .01 \), between athletes and nonathletes with athletes scoring higher in achievement motivation than the nonathletes in sex-role orientation, however the main effect of sex-role orientation was significant, \( F(3, 126) = 14.6, \ p < .01 \): masculine and androgynous sex-role orientation was related to high achievement motivation, independent of
whether the subject was an athlete or nonathlete. Again in this study, an issue is raised as to whether females already high in achievement motivation find the sport more appealing than those low in achievement motivation, or if participation in the sport actually increases the achievement motivation.

**Statement of Problem**

The purpose of this study was to investigate the relationships among time spent playing video games, achieving tendency, and sex-role orientation. More specifically to look at the question of whether those females high in achievement motivation choose to play video games more than those low in achievement motivation. This study also investigated whether those high in achieving tendency would perform better at the video game than those low in achieving tendency. It was hypothesized that: (1) There will be a direct relationship between achieving tendency and the number of minutes of video game play, such that those high in achieving tendency will play more minutes than those low in achieving tendency; (2) There will be a direct relationship between achieving tendency and performance level, as indicated by game scores, such that those high in achieving tendency will score higher than those low in achieving tendency; (3) It is expected that the masculine and androgynous sex-roles will occur with more frequency, in the high achieving tendency group, than the feminine and undifferentiated and with less frequency in the low achieving tendency group. This hypothesis has been included in the hope that it will help make sense out of the observed differences in video game performance.
METHOD

Pilot Survey

A pilot survey (Appendix A) was conducted in order to determine video game playing experience and to determine the types of video game preferences held by college females. Fifty-seven female students from two undergraduate psychology classes participated in the survey. The mean age of the subjects was 24 years, 5 months; the mean grade point average was 3.02, and the mean number of semester hours completed was 82. Of these subjects, 44% were psychology majors and the rest of the subjects were one of 23 other majors. Of the fifty-seven subjects fifty-one (89%) played video games one hour or less per month, while the other seven (11%) played between two and twelve hours per month. Age differences between the pilot group and the eventual research group were anticipated. Thus the following results are provided to more accurately represent the group of subjects 30 years of age and younger. Forty-six females were under 30 years old, with a mean age of 21 years, 10 months; the mean grade point average was 2.93, and the mean number of semester hours completed was 62.17. Of these subjects 39% were psychology majors and the rest of the subjects were one of 19 other majors. Of the forty-six subjects forty-two (91%) played between two and twelve hours per month. The games played most often were "Pac Man" and "Centipede". The most common characteristics listed for choosing a game as favorite were its simplicity, followed by the challenge it offered. The games chosen as the least favorite by the
subjects were combat and space games, while the most common reason for disliking a game was its difficulty.

**Subjects**

Sixty-six female college students from undergraduate Psychology classes at the University of Central Florida volunteered for this study. Twenty-one of these students were members of an Introductory Psychology class in which the Professor offered extra credit toward the students' final course grade for participating in the experiment. These students all received the same amount of extra credit whether they were chosen to continue with the experiment or not. Forty-one of the subjects were chosen and tested at the end of the Spring Semester and twenty-six at the beginning of the Summer Semester. Inexperienced video game players were chosen based on: (1) a history of playing video games less than one hour per month, during the past year: and (2) no experience playing a video game with a keyboard. This experience was assessed with a questionnaire (Appendix B). Subjects with no keyboard experience were chosen to help insure that this was a new learning experience and that the scores were not based on practice effect.

The sixty-six subjects were asked to fill out the Questionnaire Measure of Individual Differences in Achieving Tendency (IDAT) developed by Mehrabian and Bank, (1978). A. Mehrabian (personal communication, November, 1983) gave permission for the use of this instrument, but specifically requested it not be made available in the publication. They also completed the Bem (1974) Sex-Role Inventory
(BSRI) a copy of which appears in Appendix C. The IDAT scales were scored and two groups of ten subjects were chosen. Ten subjects scoring one half standard deviation from the mean, 28 or below, were chosen for the low achieving (LA) tendency group. Ten subjects scoring one standard deviation above the mean, 82 or greater, made up the high achieving (HA) tendency group. Table 1 shows the means and standard deviations for the age and IDAT scores of the LA and HA groups.

<table>
<thead>
<tr>
<th></th>
<th>LA</th>
<th>HA</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YEARS, MONTHS</td>
<td>M: 19.4, SD: 1.4</td>
<td>M: 22.3, SD: 5.6</td>
</tr>
<tr>
<td></td>
<td>6.4</td>
<td>109.0</td>
</tr>
<tr>
<td></td>
<td>28.71</td>
<td>17.51</td>
</tr>
</tbody>
</table>

The twenty subjects were identified by the last four digits of their Social Security number throughout the experiment. Fourteen of these subjects were chosen from the Spring Semester and six were chosen from the Summer Semester. The experimenter called each subject and set up an appointment for the experiment without knowledge of the IDAT score for that subject. During each session of video game
playing the experimenter was blind as to which group the subject belonged.

The subjects were informed that this study was designed to measure the effects of video game playing on personality (Appendix D). The twenty subjects chosen to continue with the experiment were asked to play the video game "Snake Byte" for one hour in an office of the Psychology Department in Phillips Hall at the University of Central Florida. The subjects were given written game directions and shown a sample before beginning to play (Appendix F). They were informed that they had one hour to play and that they could stop and rest or discontinue at any time. When the subject completed her play she was thanked for her participation and told that she had completed her obligation for the experiment, but that she could play more if she desired. This was offered each time the subject played (Appendix G). This was based on the findings of Gibb, Bailey, Lambirth & Wilson (1983) that high use females played video games an average of 4.12 hours per week and low use females played an average of 1.00 hour per week. The actual game performance scores for each game along with the time, in minutes, spent playing, was recorded for each subject by the experimenter (Appendix E) who was watching on an auxiliary monitor on the opposite side of the room and behind the subject.

Achievement Measure

A Questionnaire Measure of Individual Differences in Achieving Tendency developed by Mehrabian and Bank (1978) was used to assess the achieving tendency of the subjects. The scale was developed to assess
those whose motive to achieve is stronger than their motive to avoid failure (high achievers), and those whose motive to avoid failure is stronger than their motive to achieve (low achievers). This scale is an improved version of Mehrabian's (1969) male and female measures of achieving tendency. The final questionnaire is based on aspects of achieving tendency which are identified in other measures of achievement and in the literature. In a study investigating reliability and validity, Mehrabian and Bank (1978) administered their 38-item achieving tendency scale, the Jackson achievement scale, Mehrabian (1969) achieving tendency scale, and the Crowne and Marlowe social desirability scales to 76 male and 66 female university undergraduates. An internal consistency reliability coefficient of .91 ($p < .05$) was found for their achieving tendency scale (using a Kuder-Richardson formula), indicating the scale's generalization. The authors found a correlation of .02 between their measure and the Crowne and Marlowe scale, reflecting that theirs' is free of social desirability bias. Since the items were balanced for scoring direction, the scale is also believed to be free of response bias. The achieving tendency scale correlated .74 with Jackson's achievement scale, .59 with Mehrabian's (1969) measure of achieving tendency for males, and .68 with Mehrabian's (1969) measure of achieving tendency for females, all significant at the .01 level. The format of this 38-item measure of achieving tendency is balanced for response bias with 19 items positively worded and 19 negatively worded. A 9-point scale, which ranges from +4 (strong agreement) through 0 (neither agreement nor disagreement) to -4 (strong disagreement) is
used. A total score is computed by subtracting the algebraic sum of the subject's responses to the negatively worded items from the algebraic sum of his or her responses to the positively worded items. Mehrabian and Bank (1978), found that the achieving tendency measure correlated .14 ($p < .05$, with sex, a small but significant correlation showing males to have higher achieving tendency scores than females, therefore separate norms are given. The authors suggested that they be used when subjects of one sex only are being categorized according to high, medium and low achieving tendency. Table 2 shows the means and standard deviations established for the Mehrabian Achieving Tendency scale.

**TABLE 2**

<table>
<thead>
<tr>
<th>POPULATION</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>55</td>
<td>34</td>
</tr>
<tr>
<td>Females</td>
<td>46</td>
<td>36</td>
</tr>
<tr>
<td>Overall</td>
<td>51</td>
<td>35</td>
</tr>
</tbody>
</table>

According to Farley (1972), and Cronbach (1970) (cited in Mehrabian and Bank, 1975) and Mehrabian and Bank (1975) theories about and the instruments for measuring achieving tendency do not relate well to females and often yield puzzling results. In the proposed
study, the Bem Sex-Role Inventory is being added to account for this problem and hopefully yield less puzzling results.

**Sex-Role Measure**

The Bem Sex-Role Inventory (BSRI) was developed by Bem (1974) as an assessment tool that treats masculinity and femininity as two independent dimensions; an individual may therefore be characterized as feminine, masculine, androgynous or undifferentiated as a function of the difference between his or her endorsement of masculine and feminine personality characteristics. The scale was developed from a list of approximately 200 personality characteristics which were judged to be both positive in value and either masculine or feminine in tone. The final items for the Masculinity and Femininity scales were chosen if they were judged to be more desirable in American society for one sex than for the other. There were 100 Stanford undergraduates, half of whom were male and half of whom were female who participated as judges in the development of this scale. Another list of 200 characteristics were chosen that were judged to be neither masculine nor feminine in tone. Half of these neutral characteristics were positive in value and half were negative. From this list the Social Desirability scale was formed. From these neutral items 10 positive and 10 negative personality characteristics were selected for the Social Desirability scale. Once the masculine, feminine and neutral items had been selected, mean desirability scores were computed for each of the 100 judges. It was found for both females and males that the mean desirability of the masculine and
feminine items was significantly higher for the "appropriate" sex than for the "inappropriate" sex and the mean desirability of the neutral items were no higher for one sex than for the other. It was also found that "sex-appropriate" characteristics were more desirable for both males and females than "sex-inappropriate" characteristics.

Psychometric analysis was conducted and normative data gathered using 444 male and 279 female students in Introductory Psychology at Stanford University, and 117 male and 77 female paid volunteers at Foothill Junior College. The internal consistency of the BSRI was evaluated through the use of a separately computed coefficient alpha for the Masculinity, Femininity, and Social Desirability scores of the subjects in each of the two normative samples. All three scores for both samples were found to be highly reliable. For the Stanford sample Masculinity $\alpha = .86$; Femininity $\alpha = .80$; Social Desirability $\alpha = .70$; and for the Foothill sample Masculinity $\alpha = .86$; Femininity $\alpha = .82$; Social Desirability $\alpha = .75$. The reliability of the Androgyny difference score was computed using the formula for linear combinations and found to be .85 for the Stanford sample and .86 for the Foothill sample. It was found that the Masculinity and Femininity scores were not constrained by the structure of the test and were therefore free to vary independently and would not artifactually force a negative correlation between masculinity and femininity. For the measures of androgyny, males scored on the masculine side of zero and females on the feminine side. Subjects are classified as sex typed, whether masculine or feminine, if the Androgyny $t$ ratio reaches statistical significance and they are classified as androgynous if the
absolute value of the $t$ ratio is less than or equal to one. When completing the BSRI, the person is asked to indicate on a scale ranging from 1 (Never, or almost never, true) to 7 (Always, or almost always, true) how well each of the 60 masculine, feminine, and neutral personality characteristics describe him or her. On the basis of his or her responses, the person receives a Masculinity score, a Femininity score, and Androgyny score and a Social Desirability score. The extent to which a person endorses masculine or feminine personality characteristics as self-descriptive and indicated by the Masculinity and Femininity scores. Each of these scores can range from 1 to 7.

LaFrance and Carmen (1980) proposed a scoring method to be used in research which they amended from a method proposed by Spence, Helmreich & Stapp (1975). A median split procedure is used in which masculine and feminine individuals are the ones scoring above the median for that sample for the masculine or feminine items, respectively, and below the median for the other set of traits. Those scoring above the median for both masculinity and femininity are classified as androgynous and those scoring below the median for both sets of characteristics are undifferentiated.

**Video Game**

The video used was "Snake Byte" (1981) by Chuck Sommerville, Sirus Software. This game was on a floppy disk and was played on an Apple II personal computer. The screen was a black and green playing field consisting of four boundaries with floating ovals called plums.
(the number of plums is chosen before the game begins). The object of
the game is to move the snake around the field and eat apples by
running into them head first which causes the snake to grow in length.
The direction of the snake is controlled by pressing the following
keys: (I) up, (K) right, (M) down, and (J) left. If the snake runs
into the boundaries, himself or a plum he will crash and the player
goes on to the next snake untill she has crashed all three snakes and
the game ends. Points are earned by eating the apples. If the apples
are not eaten before the time runs out the player moves through an
opening at the top of the screen and moves on to a second level which
has an added barrier in the playing field. If the player progresses
through the second level there is a third level with another barrier
added to the playing field and so forth through 15 levels.

Based on the information gathered in the pilot survey this video
game was chosen because it is simple to understand, yet challenging
and not easy to master. The game was chosen also because it was not
war or space related, and because it was a game not found in video
game arcades, therefore it was expected to be a new task for the
subjects rather than one they had previously learned.
RESULTS

The scores for the IDAT scales ranged from -65, the lowest, to 148, the highest. The norms established for females by Mehrabian and Bank (1978), are $M = 46$, $SD = 36$. The LA group for this study consisted of subjects scoring one half standard deviation below the mean, 28 or below, and the HA group consisted of subjects scoring one standard deviation above the mean, 82 or greater. These figures are based on the standardized norms for college females established by Mehrabian and Bank (1978). An independent groups t-test performed on the achieving tendency scores for both groups differentiated the low achieving tendency (LA) and the high achieving tendency (HA) experimental groups. The LA group ($M = 6.4$, $SD = 28.71$) scored significantly lower than the HA group ($M = 109.0$, $SD = 17.51$), $t(18) = -9.65$, $p < .001$, indicating that the two groups do indeed differ significantly.

The data for hypothesis 1 (there will be a direct relationship between achieving tendency and the number of hours and minutes of video game play, such that those high in achieving tendency will play more than those low in achieving tendency) were collected as the number of minutes spent playing video games. An independent groups t-test was performed with these data yielding no significant difference in the amount of time spent playing between the LA group ($M = 72.10$, $SD = 7.42$) and the HA ($M = 99.90$, $SD = 49.95$) $t(18) = -1.54$, $p = .1372$. A Pearson Product Moment correlation also
failed to yield a significant difference between the LA and HA groups $r (19) = .266, p > .05$. Thus, the hypothesis was not supported.

The data for hypothesis 2 (there will be a direct relationship between achieving tendency and performance level, such that those high achieving tendency will score higher on the game than those low in achieving tendency), were the average game scores of the highest common number of games completed for each subject (63). The dependent variable for this hypothesis was the performance level and the independent variable was achieving tendency. An independent groups $t$-test was performed using these data and compared the low achieving tendency group with the high achieving tendency group. No significant difference, in performance scored, was found between the low achieving tendency group ($M = 1712.0, SD = 576.67$) and the high achieving tendency group ($M = 1652.0, SD = 922.01$), $t (18) = .174, p = .6495$. This indicates that the achieving tendency was not significantly related to the initial performance of an inexperienced video game player. A Pearson Product Moment correlation coefficient also failed to yield a significant difference between the achieving tendency scores and the performance scores, $r (19) = .031, p > .05$, thus hypothesis 2 was not supported.

A Pearson Product Moment correlation coefficient was computed in order to determine the correlation between the performance scores and the time spent playing the video game. It was expected that there would be a positive correlation such that those with higher initial performance scores would choose to play more. For all 20 subjects $r (19) = -.029, p > .05$ indicating no correlation between time
spent playing and the initial performance score. These data were also
analyzed for the two groups independently. For the low achieving
tendency group $r (9) = -.04$, $p > .05$, and for the high achieving
tendency group $r (9) = .11$, $p > .05$. This means the initial
performance score had no relationship to the amount of time the
subject chose to play the video game.

Data were collected on sex-role orientation using the Bem Sex-Role
Inventory. These scales were scored and the original 66 subjects were
placed in the masculine, feminine, androgynous or undifferentiated
groups based upon a median split. The median for the masculine
scores was 4.75 and for the feminine scores 5.1. Subjects were
assigned to the sex-role orientation as indicated in Table 3.

TABLE 3
SCORING FOR SEX-ROLE ORIENTATION

<table>
<thead>
<tr>
<th>SEX-ROLE ORIENTATION</th>
<th>SCORING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masculine</td>
<td>Score above 4.75 for masculine and below 5.1 for feminine</td>
</tr>
<tr>
<td>Feminine</td>
<td>Score below 4.75 for masculine and above 5.1 for feminine</td>
</tr>
<tr>
<td>Androgynous</td>
<td>Score above 4.75 for masculine and above 5.1 for feminine</td>
</tr>
<tr>
<td>Undifferentiated</td>
<td>Score below 4.75 for masculine and below 5.1 for feminine</td>
</tr>
</tbody>
</table>
In hypothesis 3 it was expected that the masculine (M) and androgynous (A) sex-roles would occur with more frequency in the high achieving tendency group that the feminine (F) and undifferentiated (U) and with less frequency in the low achieving tendency group. A Chi Square was used to analyze this notion and a significant difference was found. Table 4 shows the frequencies with which the sex-role orientations appeared in the HA and LA groups for the 20 experimental subjects.

TABLE 4

<table>
<thead>
<tr>
<th></th>
<th>HA</th>
<th>LA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M &amp; A</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>F &amp; U</td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>

The analysis was performed for the masculine and androgynous sex-role orientations grouped together and for the feminine and undifferentiated sex-role orientations grouped together, \( \chi^2 (1, N = 20) = 8.05, p < .005 \). This indicated that the masculine and androgynous sex-role orientations appeared with significantly more frequency than the feminine and undifferentiated in the HA group and with less frequency in the LA group.
DISCUSSION

The present data do not support all of the hypothesis investigated in this study. It was found that achieving tendency had no effect on the time an inexperienced video game player spent playing. Achieving tendency was also found to have no relationship to the initial score of an inexperienced video game player.

Past researchers (e.g., Gibb et al. 1983) found that among females who were experienced video game players those with high achieving tendency spent more time playing the games. The present data indicate that high achieving tendency alone does not lead females to play video games. It is speculated that some other variable or variables lead a female to play video games in the first place and then the high achieving tendency effects her to play more.

There was found to be no correlation between the initial score and the amount of time spent playing video games among the inexperienced video game players in this study. This indicates that something other than performance score motivated those subjects who chose to play more. Another speculation would be that the subjects perception of their scores differed and what seemed successful to one may have appeared as failure to another.

These data did indicate a relationship between sex-role orientation and achieving tendency. This is congruent with past research (e.g., Henschen et al., 1982) in which those high in
achieving tendency were also found to be of the masculine or androgynous sex-role orientation. It was also indicated that those low in achieving tendency were more frequently of the feminine or undifferentiated sex-role orientation.

Although the subjects were significantly different in terms of achieving tendency it should be noted that they were all college students and possibly have some additional motivating factors which would lead them to participate in an experiment. All of the subjects in this experiment have chosen not to spend their time playing video games, possible indicating that they do not like video games. It may be more accurate to hypothesize that among those females who choose to play video games the level of achieving tendency makes no difference. It is expected that a similar study involving a larger number of subjects with four groups would yield the hypothesized results. In addition to the high and low achieving tendency groups of inexperienced video game players, high and low achieving tendency groups of experienced video game players could be added. This along with extended periods of available video game playing time would look more closely at the question of the relationship between video game playing and achieving tendency.

There may have been a difference had the experiment been conducted over a longer period of time, for example several months, during which subjects could come and play at any time rather than a limited number of scheduled times to play. This would have eliminated the possible effects of scheduling conflicts, jobs, classes or leisure time activities. Also related to this is the fact that this
experiment was run during the Spring and Summer in Central Florida. The weather may have been a variable with subjects choosing to go to the beach, pool or other outdoor activities rather than participate in an indoor experiment. This could be controlled for, just as the relatively short playing time, by offering playing time over a longer period of time without the rigid scheduling.

This study leaves open further questions in the area of achieving tendency and video game playing among females. Would the results be different if the subjects were experienced video game players? Does achieving tendency itself increase with video game playing experience? Would the sex-role orientation of an individual change with video game playing experience? The relationship between personality variables and video game playing is a new branch of study with far reaching implications. There are many variables other than achieving tendency which could be examined in relation to video game playing. Some of these are risk-seeking, competitiveness, birth order, and intelligence level. This appears to be an area greatly in need of research as there is currently an enormous amount of social controversy; much of it lacking factual support.
APPENDIX A

SURVEY OF VIDEO GAME PLAYING

Descriptive Section

Today's Date: _____  Age: _____  Date of Birth: _____

Overall GPA: _____  Number Semester hours completed: _____

Major:

Video Game Experience

1. How often do you play electronic video games?
   a. 1 hour or less/month: _____  b. 1-3 hours/week: _____
   c. 1 hour/week: _____  d. 4-6 hours/week: _____
   e. more than 6 hours/week: _____  f. How many?: _____

2. What type of Video game do you play the most?
   c. Arcade-type not in an arcade parlor (in a bar or convenience store): _____
   d. Atari/Coleco/Intellivision/other home video game: _____
   e. Other (what type?): ___________________

Video Game Preferences

1. What game/games do you play the most? (list commercial names)

2. What is your favorite video game?
   a. What do you like about it?

3. What is your least favorite video game?
   a. What do you dislike about it?
Interest Option

If you are currently playing video games less than one hour per month and would be interested in participating in research which may allow you the opportunity to play some free video games, please print:

NAME:________________________________________

PHONE:_____________________________________

THANK YOU

Teresa J. Holden
Burton I. Blau, Ph.D.
APPENDIX B

VIDEO GAME EXPERIENCE

1. How often do you play electronic video games?
   a. 1 hour or less/month:
   b. 1 hour/week:
   c. more than 1 hour/week:

2. Have you ever played a video game with keyboard controls:

Interest Option

If you are currently playing video games less than one hour per month, answered no to question 2, and would be interested in participating in research which may allow you the opportunity to play some free video games, please print:

NAME: ____________________________________________

PHONE: ______________________

THANK YOU!

Teresa J. Holden
APPENDIX C

BSRI

Subject #___________(last 4 digits of SS#)

On the following page, you will be shown a large number of personality characteristics. We would like you to use those characteristics in order to describe yourself. That is, we would like you to indicate on a scale from 1 to 7, how true of you these various characteristics are. Please do not leave any characteristic unmarked.

Example: sly

Mark a 1 if it is NEVER OR ALMOST NEVER TRUE that you are sly.
Mark a 2 if it is USUALLY NOT TRUE that you are sly.
Mark a 3 if it is SOMETIMES BUT INFREQUENTLY TRUE that you are sly.
Mark a 4 if it is OCCASIONALLY TRUE that you are sly.
Mark a 5 if it is OFTEN TRUE that you are sly.
Mark a 6 if it is USUALLY TRUE that you are sly.
Mark a 7 if it is ALWAYS OR ALMOST ALWAYS TRUE that you are sly.

Thus, if you feel it is sometimes but infrequently true that you are "sly", never or almost never true that you are "malicious", always or almost always true that you are "irresponsible", and often true that you are "carefree", then you would rate these characteristics as follows:

Sly  3  Irresponsible  7
Malicious  1  Carefree  5
### Describe Yourself

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never or almost never true</td>
<td>Usually not true</td>
<td>Sometimes but infrequently true</td>
<td>Occasionally true</td>
<td>Often true</td>
<td>Usually true</td>
<td>Always or almost always true</td>
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<tr>
<td>Self reliant</td>
<td>Reliable</td>
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<tr>
<td>Yielding</td>
<td>Analytical</td>
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<tr>
<td>Helpful</td>
<td>Sympathetic</td>
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<td>Defends own beliefs</td>
<td>Jealous</td>
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<tr>
<td>Cheerful</td>
<td>Has leadership abilities</td>
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<td>Moody</td>
<td>Sensitive to the needs of others</td>
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<tr>
<td>Independent</td>
<td>Truthful</td>
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<tr>
<td>Shy</td>
<td>Willing to take risks</td>
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<td>Conscientious</td>
<td>Understanding</td>
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<td>Athletic</td>
<td>Secretive</td>
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<td>Affectionate</td>
<td>Makes decisions easily</td>
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<td>Theatrical</td>
<td>Compassionate</td>
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<td>Assertive</td>
<td>Sincere</td>
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<tr>
<td>Flatterable</td>
<td>Self-sufficient</td>
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<tr>
<td>Happy</td>
<td>Eager to soothe hurt feelings</td>
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<td>Strong, personality</td>
<td>Conceited</td>
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<td>Loyal</td>
<td>Dominant</td>
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<td>Unpredictable</td>
<td>Soft spoken</td>
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<td>Forceful</td>
<td>Likable</td>
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<tr>
<td>Feminine</td>
<td>Masculine</td>
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Subject # (last 4 digits of SS#)
The purpose of this study is to investigate the effects of video game playing on personality. There is a great deal of controversy regarding this topic and also a great need for empirical research in the area. As a participant in this study you will be administered standardized psychological tests. You may or may not be chosen as a subject once you have completed the tests. If chosen to continue you will be required to play a video game for one hour. Playing the electronic video game will be at no cost to you. This research is being conducted by Teresa Holden in fulfillment of the Master's degree requirements in the Clinical Psychology graduate program at The University of Central Florida. The project is under the supervision of Burton I. Blau, Ph. D. The results will be available in the UCF library, or if you desire a summary can be sent to you.

Consent

I hereby acknowledge that the psychological testing in which I participate will be used for research purposes and will be kept confidential. My permission to use the data gathered during my participation in this research is granted. If selected, I agree to attend the video game session.

NAME: ____________________________________________

PHONE: __________________________

SIGNATURE: _________________________________________

DATE: __________________________

SUBJECT # _________________ (last 4 digits of SS#)
APPENDIX E

DATA SHEET

Instructions

Use a new sheet for each session, (i.e., if a subject comes in two different times on the same day, use two different sheets). Fill in the beginning and ending times for each session and enter the total number of hours and minutes.

A new trial begins each time the game score starts at zero. Enter the total score at the end of each trial.

Subject#: __________ (last 4 digits of SS#)

Date: __________ Beginning Time: __________ Ending Time: __________

Time: __________ hours, __________ minutes.

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<tr>
<th>Trial #</th>
<th>Score</th>
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<table>
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<tr>
<th>Trial #</th>
<th>Score</th>
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</table>

31
"Snake Byte" Information

"Snake Byte" is the video game you will be playing. The object of the game is to move the snake around the field and eat apples by running into them head first, which causes the snake to grow in length. The direction of the snake is controlled by pressing the following keys:

(I) up
(J) left     (K) right
(M) down

If the snake runs into the boundaries, or himself he will crash and you will lose that snake. You will have 3 snakes at the start of each game. If you crash all 3 snakes then the game ends. There is a time bar at the side of the playing area and you have until it reaches the top to eat each apple. If the bar reaches the top and you have not eaten an apple then more will be added. When you have eaten all of the apples an opening will appear in the top boundary. Move the snake through this opening where you will reach the next level of play, receive an extra snake and bonus points. Each successive level has an added barrier on the playing field.

You will now be shown a sample game on the screen.

Each time you begin a new game the screen will ask "How many plums?", answer zero to this question and the game will begin immediately.
APPENDIX G

VERBAL INSTRUCTIONS

SAY You will be playing a game called "Snake Byte", please read these written instructions. You will then be shown a sample of how the game is played.

DO Hand the subject an instruction sheet and wait while she reads it. Fill in the subject number on the data sheet.

SAY Do you have any questions about the written instructions? (Answer any questions) OK now watch the sample.

DO Begin sample game and watch for three minutes.

SAY Do you have any questions?
Now you will be given your first 3 snakes to practice. When the screen asks how many plums, press 0 and the game will begin immediately. You will have one hour to play, you may stop to rest or discontinue at any time. When you crash a snake press the space bar and begin immediately.

DO Record the score after each snake, allowing 5 seconds, and SAYING Go ahead.

SAY Do you understand how the game is played? Do you have any questions? After each three snakes you will have to answer 0 to the question "How many plums?". Are there any questions? Please begin.

DO Record the score after each snake, while watching on the auxillary screen. (Continue until the hour is up.)

SAY Thank you for your participation. You have completed that which is required for the experiment, as you agreed but if you would like to come back and play the game some more I have time available.

DO Sign the subject up for next week if she wishes to play more.

SAY Thank you very much!

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REFERENCES


