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Machiavellianism Achievement and Gender Roles

Kathleen M. Gibson
Old Dominion University

MACHIAVELLIANISM, ACHIEVEMENT, AND GENDER ROLES

by
Kathleen M. Gibson
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Approved by:

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H. Barry Gillen (Director)

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Barbara Winstead (Member)

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Fred Freeman (Member)

ABSTRACT

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Kathleen M. Gibson
Old Dominion University, 1998
Director: Dr. H. Barry Gillen

The focus of the current study was to find a relationship between Machiavellianism and achievement motivation. Gender, gender-role orientation, and college major were also introduced as variables. Two-hundred and forty university students majoring in either business or psychology completed various self-report measures. Results based on correlations and an analysis of variance produced the following results: Women of both majors had higher Machiavellian scores than males of both majors; business majors had a higher desire to work hard and were more competitive than psychology majors (especially males); scores on the Machiavellian scale positively correlated with competitiveness for females. For males, Machiavellianism correlated negatively with a desire to work hard. Masculine and androgynous gender-typed participants had higher achievement scores than feminine or undifferentiated participants; there were no differences in achievement based on gender. Interactions among the variables and implications for future research are discussed.

I'd like to dedicate this thesis to my father, Lawrence T. Gibson. Dad, you've always done the best you can to give me the finest things the world has to offer and I can never thank you enough for your love, support, and encouragement in everything I do in life. Your belief in me has helped me discover treasures beyond my wildest dreams.

Thanks Pop. I love you.

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The experience known as "higher" education has been quite an eye-opening adventure for me and I'd like to thank the following people for helping me keep my sanity (what's left of it, anyway): My mom for putting up with me at my worst and for introducing me to almost everything I now hold as sacred - thank you for sacrificing so much of yourself for your children - we appreciate it more than you will ever know; Larry for reminding me to giggle when I'm being too serious and for making me breakfast all those years; Kelly for being an inspiring example of determination and inner strength - I admire you very much; Nonny for reminding me to do what makes me happy during my brief time on the planet; Bev Hopkins for helping me discover my true self - your insight is amazing and none of this would have been possible without you; Stuart Dean for your love, generous spirit, and for giving me a feeling of safety and comfort anytime I'm with you; Dr. Carl for straightening me out (literally!) and being a limitless source of encouragement and laughs; a very special thanks to Tom for opening my eyes to the fact that no matter how much a person can master certain parts of their life, no matter their intelligence or how charismatic and unique a person they are, there are always new lessons that need to be learned before we're able to become truly enlightened - I wish you all the best; finally, I'd like to thank every person who has ever touched my life, made me

smile, and helped me learn more about myself and universe I find myself in. Thanks for everything - I'll see you all the next time around.

The eternal circle
Passed on from spirit to spirit
Without words, without material form
As light from a candle
Is carried from one to another.

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INTRODUCTION

General Purpose of Current Study

The current study was intended to investigate the relationship between measures of Machiavellianism and achievement. Moreover, significantly different Mach and achievement scores were expected based on gender, gender-role, and college major.

Machiavellianism

Since its introduction to the field of psychology over 25 years ago, the topic of Machiavellianism has generated volumes of research (see Fehr, Samson, & Paulhus, 1992 for a review). Machiavellianism is a personality dimension which is believed to characterize individuals who manipulate others for their own gain (Christie & Geis, 1970). High Machiavellians (H-Machs) possess a "cool detachment" during interpersonal interactions and are less emotionally involved with others. H-Machs have been shown to have elevated scores on measures of interpersonal control (Paulhus, 1983) and are quite skilled at swaying others while remaining resistant to social influence (Christie & Geis, 1970). Although there have been a myriad of studies on Machiavellianism, a recent review of research on the topic (Fehr, Samsom, & Paulhus, 1992) points out that one

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particular question about the construct has yet to be answered: Is there a relationship between achievement and Machiavellianism?

Christie and Geis (1970) saw no reason why a relationship between Machiavellianism and achievement should exist. They felt that H-Machs were concerned not with a general tendency to achieve but were focused on the methods used to achieve a goal (i.e., manipulation). In general, both high Machs and high achievers possess the need to succeed; however, H-Machs desire to gain power over others using manipulation while high achievers seek to gain control over themselves in order to accomplish personal goals.

Since Christie and Geis (1970) first pondered the question of a relationship, a variety of studies have investigated achievement and Machiavellianism. Although Christie and Geis (1970) saw no reason that a relationship should exist, many researchers feel that there is an intuitive link between achievement and Machiavellianism. If H-Machs use their manipulative tactics in a variety of interpersonal situations, they may also utilize these skills in achievement settings. If an H-Mach is able to use Mach skills to achieve a goal rather than actually work hard at achieving that goal, achievement motive should be high since it would mean the Mach would "win" in the end.

Both positive and negative correlations have been found between the measures of Machiavellianism and achievement. Smith (1976) found a statistically significant negative

correlation between Machiavellianism and achievement motivation measured by Mehrabian's achievement scale (1968) which differentiates low from high achievers based on motive to avoid failure. He speculated that high achievers have no need to use Mach skills while low achievers find it necessary to use Machiavellian tactics in order to get ahead. Using a different measure of achievement (Smith, 1973), however, he did not find a significant correlation between Machiavellianism and need for achievement.

Johnson (1980) found a positive correlation between Machiavellianism and a measure of achievement by Mehrabian (1968); however, the total sample included only 25 male students. With a larger sample of male participants a non-significant correlation was obtained. Turner and Martinez (1977) found that Machiavellianism was associated with larger incomes and higher occupational status for men with above-average educations; however, a specific measure of achievement was not taken.

These studies, and others like them, have failed to yield any obvious answer to the question of a meaningful and consistent relationship between Machiavellianism and achievement. Before discussing new methods of approaching the topic at hand, the role of gender differences in both Machiavellianism and achievement must be considered. Since males were studied in the majority of early research on achievement and Machiavellianism, it is important that

current studies include both female and male participants in order to examine the differences within and between genders.

Gender Differences: Achievement

While early studies on gender differences and achievement concluded that males have a higher need for achievement than females, other researchers have found that there are very few differences between the genders (Gaeddert, 1985; Kahn & Yoder, 1989; Maccoby & Jacklin, 1974). McClelland (1965) monitored male students with both high and low need for achievement for 14 years. He found that over three-quarters of those identified earlier as having a high need for achievement were in entrepreneurial positions 14 years later. Jenkins (1987) conducted a study similar to that of McClelland using female participants and found achievement patterns similar to those of males. Chandler, Cook and Wolf (1979) found no significant gender differences for achievement motivation. Wertheim, Widom, and Wortzel (1978), on the other hand, found that males scored significantly higher than females on achievement motivation as measured by Mehrabian's scale.

Sid and Lindgren (1981) found gender differences for achievement while examining students of different college majors. They found that male marketing majors scored significantly higher in need for achievement than males in other majors such as biology, psychology, humanities, and education. Women psychology majors had the highest achievement scores of all groups of women while women who

majored in education or nursing had the lowest need for achievement scores. Overall, men scored higher in need for achievement if they were business majors but lower if they were psychology majors and women had a higher need for achievement if they were psychology majors but lower if they were business majors.

Although females still are not on "level ground" with males in various occupations due to various societal factors including the "glass ceiling" phenomenon and discrimination in hiring and promotions, it appears that males and females have similar achievement motivation overall. There may be gender differences in achievement, however, depending on the profession or academic major a person chooses to pursue.

Gender Differences: Machiavellianism

Typically, males score higher than females on measures of Machiavellianism (Christie & Geis, 1970); however, the introduction of occupational variables has produced different results. Chonko (1982) found that Mach scores were significantly higher for female purchasing managers than for male managers. Gable and Topol (1989) reported that female managers of specialty stores had significantly higher Mach scores than male managers. Furthermore, Burnett, Hunt, and Chonko (1986) reported that Mach scores were significantly higher for female marketing "practitioners" than their male counterparts. Contrary to other studies, Okanes and Murray (1980) found no significant

differences between female and male managers' Machiavellian scores.

The preceding gender difference studies on Machiavellianism have one common variable: measurement of Machs in business related fields. Generally, individuals with a Machiavellian orientation seem to prefer business related careers (Fehr, Samson, & Paulhus, 1982). McLean and Jones (1992) reported that business students scored significantly higher than science students in Machiavellianism. Business students have also been found to have higher Mach scores than social work students (Steininger & Eisenberg, 1976). Wertheim, et al. (1978), examining individuals in different graduate programs, found that management and law students were high Machs, education majors were moderately Machiavellian, and social work students were low Machs. There were no statistically significant gender differences within each major. Zook and Sipps (1987) pointed out that not all helping professions are the same and that high Machs may be more likely to enter one field than another. They found that counseling students had significantly lower Mach scores than experimental psychology graduate students.

Burnett, et al. (1986) suggest that H-Mach females may choose to enter careers in competitive fields (such as management and marketing) where their Machiavellian skills may be beneficial to their success. An alternative explanation for these kinds of results is that females in

male dominated professions find it necessary to use Mach tactics in order to achieve equal status and recognition (Chonko, 1982). It has also been stated that females may become more Machiavellian as they climb the "corporate ladder" (Gable & Topol, 1989). Another possibility why females in male dominated professions may have more Machiavellian characteristics could be that these women have what is known as a masculine gender role orientation.

Gender Role Orientation

Bem (1974) introduced the concept of psychological androgyny which denotes a person who possesses both feminine and masculine behaviors. Bem's approach to measuring masculinity and femininity differed from previous methods because she did not see them as poles of a unidimensional construct but rather as two independent dimensions. Spence and Helmreich (1978) also viewed masculinity and femininity as separate dimensions of personality which can vary independently.

Measurement of gender role by various inventories, the two most used being the Bem Sex-role Inventory (BSRI; Bem, 1974) and the Personal Attributes Questionnaire (PAQ; Spence, Helmreich, & Stapp 1974), yields one of four gender roles depending on scores for both a masculinity and femininity scale. People scoring high on both masculinity and femininity are classified as "androgynous". Those scoring high on one scale but not the other fall into either the "masculine" or "feminine" category. Finally, those who

score low on both scales are classified as "undifferentiated".

Research conducted during the last few decades has attempted to show that one gender role is better than another (e.g., androgynous males and females are more well adjusted than those with another gender role). While these studies are inconclusive and the debate still continues, a variety of studies has shown differences between the gender role in the areas of both achievement and Machiavellianism.

Gender Role Orientation and Achievement

Spence and Helmreich (1978) proposed that achievement motivation was more related to gender role than it was to gender. In fact, Orlofsky and Stake (1981) found that psychological masculinity and femininity are better predictors of achievement than gender alone. A variety of studies has shown that masculine gender-typed and/or androgynous males and females typically have higher levels of achievement motivation than feminine and undifferentiated gender-typed males and females.

Alper (1974) reported that women with traditional female gender role scored significantly lower on measures of achievement motivation than women with masculine or androgynous gender role. Hoffman and Fidell (1979) found that androgynous and masculine women worked more and had higher socioeconomic levels than feminine women. Heilbrun and Han (1984) reported that women who score high on androgyny have higher achievement than women who score low

on androgyny. These authors found no achievement differences between androgynous and non-androgynous men.

Wong, Kettlewell, and Sproule (1985) found that for females, masculinity is significantly and positively related to achievement while femininity is negatively correlated with achievement. Moreover, women who identified with the feminine gender role had the lowest level of career achievement. These researchers also performed a multiple regression to determine what variables predict women's career achievement and found that educational attainment and masculinity (in that order) were the only significant predictors of achievement. The non-significant predictors included femininity, mother's employment, age, number of children, marital status, and parental expectation. The authors pointed out that the participants in this study were middle-aged career women, many of whom were married, with children. They felt these circumstances may have affected the results because the women may have identified with more feminine items since they were older and had children.

Olds and Shaver (1980) found that masculinity was significantly related to fewer achievement conflicts for both males and females while femininity correlated with negative academic performance. These authors also found that masculinity was associated with competitiveness for males but not for females. Henschen, Edwards, and Mathinos (1982), studying female athletes, found that high achievement motivation was significantly correlated with

masculine and androgynous gender role orientations while low achievement motivation was related to feminine and undifferentiated gender roles.

These studies indicate that females and males who identify with masculine or androgynous characteristics are higher achievers than those who identify with feminine characteristics. Obviously stereotypical male characteristics such as assertiveness, leadership abilities, and ambition help any person (regardless of gender) in achievement situations (Wong, et al., 1985). Furthermore, Lemkau (1979) reported that women who are successful in male-dominated professions have both stereotypical masculine traits, such as assertiveness, independence, and dominance, as well as stereotypically feminine traits such as understanding and compassion (i.e., androgynous).

Gender Role Orientation and Machiavellianism

Research in this area has been quite limited. Nigro and Galli (1985) reported that men with PAQ scores low on both masculinity and femininity (i.e., undifferentiated) had higher Mach scores while females who scored low on the PAQ masculinity scale but high on the femininity scale (i.e., feminine) had higher Mach scores. The authors suggested that Machiavellian strategies were used more by individuals (both men and women) who had low masculinity scores. These results lead to no clear answers as to a relationship between gender role and Machiavellianism; furthermore, this

topic of research seems to have been neglected by researchers and deserves further study.

Measurement of Achievement

After reviewing the literature on achievement and Machiavellianism, one consistency must be noted: usually only business or scholastic achievement was measured. Moreover, it should also be recognized that the preponderance of previous studies used older measures of achievement that were based on projective techniques, such as the Thematic Apperception Test (TAT). Spence and Helmreich (1983) advised that achievement should not be viewed as a single dimension but rather a "...cluster of interacting factors" (p. 10). They devised the Work and Family Orientation Questionnaire (WOFO) (Helmreich & Spence, 1978) as a way to measure achievement as an objective, multifaceted construct.

The WOFO is a multidimensional instrument which contains three independent dimensions entitled work orientation, mastery, and competitiveness. The work dimension reflects one's desire to perform a job well and be a hard worker. The mastery factor measures the desire to "tackle" challenging tasks and perform guided by internal standards in order to accomplish a demanding assignment. Finally, the competitiveness factor gauges a person's longing to compete with others, to reach high levels of success, and win.

Gender, Gender Role, and the WOFO

Spence and Helmreich (1983) administered the WOFO to a variety of individuals including college students, varsity athletes, business persons, and academic psychologists. Gender differences surfaced. Males in all groups had higher mastery and competitive scores while females had higher work scores. Olds and Shaver (1980) also found that men had higher scores on the competitive scale than women.

When gender role is taken into consideration, it has been found that psychological masculinity (as gauged by the PAQ) is more significantly positively correlated with each of the WOFO scales than is femininity (Adams, Priest, & Prince, 1985; Taylor & Hall, 1982). Olds and Shaver (1980) found that androgynous and masculine males and females scored significantly higher on the mastery scale of the WOFO than feminine or undifferentiated subjects. Masculine, feminine, and androgynous subjects scored higher on the work scale of the WOFO than did undifferentiated subjects. For the competitiveness scale, masculine subjects scored significantly higher than feminine, androgynous or undifferentiated subjects.

Machiavellianism and the WOFO

There have been no studies to date that have used the WOFO as a measure of achievement when attempting to correlate Machiavellianism and achievement motivation. If we examine the WOFO, it seems that two of the factors of the WOFO do not relate to Machiavellianism. The mastery and

work factors measure a person's desire to perform guided by internal standards and do a good job, respectively. It appears that these scales do not relate to Machiavellianism because they measure what an individual person thinks or feels and do not examine interpersonal relationships, which are necessary for Machs to use their manipulative tactics. If the items on these scales are examined, however, they can be interpreted in a way that may in fact be related to the Machiavellian dimension.

Topics on the work and mastery scales include improving on prior performances, directing group activities, using a high level of skill, working hard, and persisting at tasks. If this is explored from a Machiavellianism orientation it is possible that the manipulation of others (i.e., a Mach's "work") requires a high amount of skill and is consistently refined and improved. Also, H-Machs work hard to make it a polished part of their skills in social situations. If viewed in this way, the mastery and work subscales may indeed be related to Machiavellianism. The relationship between Machiavellianism and the competitive factor seems much clearer, however, since H-Machs like to compete and dominate others (Christie & Geis, 1970). It could be hypothesized, then, that a positive correlation exists between Mach scores and the competitive scale of the WOFO.

Conclusions

Overall, men are typically higher Machs than females; however, in business related academic majors where Mach

scores are higher than other college majors, females are found to be higher Machs than males. It is possible, when considering gender role, that these women are masculine gender-typed. Although gender differences in achievement have been debated for decades, men and women do not appear to differ in their levels of achievement motivation. When gender role is taken into account, however, differences in achievement are apparent. Masculine gender-typed men and masculine gender-typed women appear to have higher levels of achievement than feminine gender-typed men and women. In studies examining achievement differences and college major, business students have been found to have higher achievement motivation than students in the social sciences. Gender differences for achievement and college major are also apparent. Male business majors have higher achievement scores than male psychology majors; conversely, female psychology majors have higher achievement scores than female business majors. Finally, previous methods of measuring achievement have focused on either business or academic achievement and have not included a larger spectrum of achievement behaviors. Instead of using a unidimensional construct to measure achievement, a multi-faceted instrument (such as the WOFO) should be utilized in order to find more specific relationships between achievement and Machiavellianism. Since no studies examining achievement and Machiavellianism have utilized the WOFO as a measure of achievement, the correlations between these scales can only

be speculated. The WOFO's mastery, competitiveness, and work scales should correlate with Machiavellianism based on the contents of the scales. In particular, since both H-Machs and individuals in business occupations have been identified as being highly competitive, these scales should be positively correlated.

After over two decades of research, the question of a relationship between achievement and Machiavellianism still remains unanswered. Previous studies attempting to correlate achievement and Machiavellianism have used subjective tests to measure achievement, focused on only one type of achievement, and excluded females. Furthermore, gender role has not been considered in the majority of studies attempting to find a correlation between Machiavellianism and achievement.

The purpose of the current study was to determine if new methods of approaching a relationship between Machiavellianism and achievement would produce significant correlations between the two concepts. Specifically, a multi-faceted achievement scale, such as the WOFO, should help to specify in what areas of achievement Mach's excel (e.g., mastery, competitiveness, or work). College major was also included in order to determine if business individuals are more Machiavellian and have higher achievement scores than non-business individuals. Finally, gender and gender role orientation were included as

variables in order to determine if there are differences between and within the genders.

Based on previous research, the hypotheses for the current study were as follows:

(1) In the overall sample of university students, men will be more Machiavellian than women, similar to the results found by Christie and Geis (1970). No overall gender differences were expected for achievement scores because of the findings of Maccoby and Jacklin (1974) and Chandler, Cook and Wolf (1979). However, because males are traditionally more competitive than females, men are expected to have higher scores on the WOFO Competitive scale than women.

(2) Business majors will be more Machiavellian than psychology majors. Furthermore, female business majors will be more Machiavellian than male business majors. Since there have been practically no studies which examined psychology students and level of Machiavellianism, no *a priori* hypotheses were made.

(3) Feminine and undifferentiated gender-typed participants (regardless of gender or major) will have higher Mach scores than masculine or androgynous gender-typed participants consistent with results found by and Nigro and Galli (1985).

(4) Masculine and androgynous gender-typed participants will have higher achievement scores than feminine or undifferentiated gender-typed participants on all WOFO

scales, no matter their college major, based on research conducted by Adams, Priest, and Prince (1985) and Taylor and Hall (1982).

(5) Although no studies to date attempting to correlate Machiavellianism and achievement have used the WOFO as a measurement of achievement, it was hypothesized that all three of the WOFO scales will positively correlate with Mach scores. It was thought that breaking achievement down into more specific areas would yield a correlation between Machiavellianism and achievement. A higher correlation was expected between Mach scores and the competitiveness scale due to Christie and Geis' (1970) statement that Machs are highly competitive.

METHODS

Participants

Two-hundred-forty university students (120 male and 120 female) were included in the study. Participants were recruited from undergraduate psychology and business courses and received class credit for taking part in the study. Half of the participants were psychology majors while the other half consisted of business majors (principally marketing, business administration, and management). Treatment of participants was approved by the Committee for the Protection of Human Subjects at Old Dominion University.

Materials

Independent Variables.

Gender and college major were ascertained by a self-report questionnaire. Gender role was measured by the Personality Attributes Questionnaire (PAQ; Spence & Helmreich, 1974). The PAQ contains three separate scales for femininity, masculinity, and masculinity-femininity. Each scale contains eight bipolar items to which participants respond on a 5-point scale as to how much they perceive the items describe themselves. Spence and Helmreich (1978) reported coefficient alpha values of .85 for the masculinity scale, .82 for the femininity scale, and .78 for the masculinity-femininity scale. Cronbach alphas of the masculinity and femininity scales in the current study were .62 and .69, respectively. Test-retest reliability averages in the .70 range over two and a half

months (Yoder, Rice, Adams, Priest, & Prince; 1978) and predictive and construct validity have been demonstrated by the authors (see Spence & Helmreich, 1978).

While the PAQ contains scales of descriptive traits that stereotypically differentiate women and men, these trait descriptors are considered to be socially desirable in both genders. The PAQ has only two orthogonal factors: the masculine and feminine scales (see Spence, 1991 for review). It is for these reasons that the PAQ is being used in the current study.

Dependent Variables.

The 20-item gender-free Mach IV scale as recommended by Zook and Sipps (1986) was used rather than the original version of the Mach IV by Christie and Geis (1970). The only changes in the updated version are three re-worded questions that eliminate sexist terminology from the original questionnaire. Zook and Sipps (1986) reported no differences in reliability between the original scale and the updated version; furthermore, correlations between the updated scale and social desirability were low for both males, $r(184) = -.05$, *ns*, and females, $r(184) = -.19$, *ns*. Cronbach alpha reliability coefficients are .73 for the original Mach IV and .68 for the gender-free version and test-retest value of the gender-free Mach IV over six weeks is .76 (Zook & Sipps, 1986). Cronbach alpha value for the current study was .58. Support for discriminant validity of the scale comes from the absence of significant correlations

between the Mach IV and intelligence and social desirability. Additional information on validity can be found in a review by Christie and Geis (1970). Although none of the studies mentioned in the introduction used the "gender free" version of the Mach IV scale, it was believed that this version should be used in the current study since scores on the original version and the updated version are not significantly different for males or females. Furthermore, the new version has low correlations with social desirability, and participants would not be offended by the sexist terminology in the original version. Following the advice of Christie and Geis (1970), a constant of 20 was added to each score; therefore, scores can range from 40 to 160 with a neutral of 100.

Achievement motivation was measured with the Work and Family Orientation Questionnaire (Helmreich & Spence, 1978). The WOFO is a three scale inventory which has a total of 19 items divided between the subfactors of work, mastery, and competitiveness. Participants reflect their level of agreement or disagreement for each item on a 5-point Likert-type rating scale. Cronbach alpha coefficients range between .65 and .70 for all three scales and test-retest reliability ranges from .76 to .92 over one month. Cronbach alpha values of the scales for the current study were between .60 and .64. Adams, Priest, and Prince (1985) found similar alpha coefficients ranging from .56 to .74. These authors also factor analyzed the WOFO and found the three

scales to be independent, thus lending additional support for the construct validity of the questionnaire. Reliability and validity of the questionnaire have also been demonstrated by its authors (for a full review see Helmreich & Spence, 1978).

Procedure

Participants received a take-home packet that contained instructions for completing the questionnaires, a sheet asking for general demographic information (age, gender, major, etc.), departmental forms (informed consent, experiment questionnaire, etc.) and the aforementioned scales. After turning in the packet and completing an extra credit form, each participant was debriefed.

RESULTS

Means and standard deviations of all variables based on gender, major, and gender role are listed in Table 1. Participants were classified as low and high Machs based on the median split method (*Mdn* = 93.00). Median splits, based on the entire sample, were also used to classify participants into the PAQ Categories. Participants were classified as either feminine (low masculinity, high femininity), masculine (high masculinity, low femininity), androgynous (high masculinity, high femininity) or undifferentiated (low masculinity, low femininity). The median masculinity score was 24.00 and the median femininity score was 22.00. Table 2 lists the percentage of participants falling into each of the PAQ Categories.

Table 1. Means and standard deviations of all variables based on gender, gender-role and major.

Participants	*n*	Mach IV Score	WOFO1* Scale	WOFO2* Scale	WOFO3* Scale	PAQM Scale	PAQF Scale
Males	120	87.23 11.71	21.22 2.62	19.84 4.59	14.12 4.84	25.01 3.93	20.88 3.76
Females	120	95.80 11.38	21.82 2.44	20.67 4.16	11.88 4.85	22.45 4.28	24.01 4.14
Business majors	120	92.26 12.59	21.97 2.22	20.63 4.08	13.55 5.40	24.22 4.24	21.94 4.30
Psychology majors	120	90.78 11.99	21.07 2.76	19.88 4.70	12.45 4.44	23.25 4.31	22.94 4.16
Business Major Males	60	87.93 12.16	21.95 2.04	20.32 4.61	15.27 5.04	26.08 3.29	20.05 4.17
Business Major Females	60	96.58 11.57	21.98 2.41	20.95 3.49	11.83 5.23	22.35 4.28	28.86 3.55
Psychology Major Males	60	86.53 11.28	20.48 2.93	19.36 4.56	12.97 4.37	23.93 4.23	21.70 3.13
Psychology Major Females	60	95.02 11.23	21.65 2.47	20.38 4.76	11.93 4.48	22.57 4.31	24.18 4.68

Table 1 (Continued)

Participants	*n*	Mach IV Score	WOFO1* Scale	WOFO2* Scale	WOFO3* Scale	PAQM Scale	PAQF Scale
Masculine Gender-typed	94	91.09 12.85	21.72 2.13	20.78 4.41	14.66 4.33	26.14 2.56	19.22 2.95
Feminine Gender-typed	60	92.37 13.07	21.08 2.63	18.95 4.72	10.57 4.81	19.38 3.66	25.93 2.61
Androgynous Gender-typed	51	90.73 11.58	21.78 3.10	21.43 4.24	13.10 5.04	26.71 2.62	25.96 2.71
Undifferentiated Gender-typed	35	92.37 10.64	21.31 2.48	19.37 3.24	12.57 5.08	20.40 2.06	19.97 2.33

Note: Standard deviations are listed directly below the means.
*WOFO1 = Work Scale
WOFO2 = Mastery Scale
WOFO3 = Competitiveness Scale

Table 2. Percentage of participants falling into each of the PAO categories based on gender and major.

	PAO Category			
Group	Feminine	Masculine	Androgynous	Undifferentiated
Gender				
Female	39%	23%	24%	14%
Male	11%	56%	18%	15%
Major				
Business				
Female	40%	25%	20%	15%
Male	1%	59%	27%	13%
Psychology				
Female	38%	20%	29%	13%
Male	20%	53%	10%	17%

Multiple chi-squares were utilized in analyzing the PAQ results. As expected in the overall sample, a large percentage of each gender fell into the gender-typical category (e.g., feminine females) with only a small percentage in the opposite gender-type category (e.g., feminine males), $\chi^2(1, N = 154) = 36.01, p < .001$. The percentage of masculine and feminine gender-typed females did not change when participants were split based on college major. The percentage of men classified as masculine gender-typed did not change from the overall sample to the major based sample. However, there was a difference in feminine gender-typed males between business majors and psychology majors, $\chi^2(1, N = 80) = 8.73, p < .01$. This is not unusual considering the importance placed on stereotypical male traits in business environments. Likewise, since individuals who enter into careers in psychology are typically more understanding and aware of others' feelings, it seems appropriate that male psychology majors in the current sample have higher feminine scores since the PAQ Feminine scale measures these kinds of traits.

The results of a 2(Gender) x 2(Major) x 4(PAQ Category) analysis of variance (ANOVA) for the dependent variables of Mach scores, WOFO Work scores, WOFO Mastery scores, and WOFO Competitiveness scores are summarized in Tables 3 through 6, respectively.

Table 3. Analysis of Variance Summary Table for Mach scores.

Source	*df*	*SS*	*MS*	*F*
Gender	1	4403.27	4403.27	33.73*
Major	1	132.02	132.02	1.01
PAQ Category	3	118.35	39.45	.30
Gender x Major	1	.42	.42	0.00
Gender x PAQ Cat.	3	983.31	327.77	2.51
Major x PAQ Cat.	3	833.60	277.87	2.13
Residual	227	29636.97	130.56	--
Total	239	36107.93	--	--

*$p < .001$

Table 4. Analysis of Variance Summary Table for WOFO Work scale scores.

Source	*df*	*SS*	*MS*	*F*
Gender	1	21.60	21.60	3.49
Major	1	48.60	48.60	7.85*
PAQ Category	3	20.37	6.79	1.10
Gender x Major	1	19.27	19.27	3.11
Gender x PAQ Cat.	3	25.40	8.47	1.37
Major x PAQ Cat.	3	.67	.22	.04
Residual	227	1406.03	6.19	--
Total	239	1541.93	--	--

*$p < .01$

Table 5. Analysis of Variance Summary Table for WOFQ Mastery scale scores.

Source	*df*	*SS*	*MS*	*F*
Gender	1	40.84	40.84	2.32
Major	1	34.51	34.51	1.96
PAQ Category	3	225.66	75.22	4.28*
Gender x Major	1	2.20	2.20	.13
Gender x PAQ Cat.	3	115.93	38.64	2.20
Major x PAQ Cat.	3	196.44	65.48	3.72*
Residual	227	3993.92	17.59	--
Total	239	4609.50	--	--

*$p < .01$

Table 6. Analysis of Variance Summary Table for WOFO Competitiveness scale scores.

Source	*df*	*SS*	*MS*	*F*
Gender	1	299.27	299.27	13.84**
Major	1	72.60	72.60	3.36
PAQ Category	3	621.08	207.03	9.57**
Gender x Major	1	86.40	86.40	4.00*
Gender x PAQ Cat.	3	.02	.02	.99
Major x PAQ Cat.	3	86.52	28.84	1.33
Residual	227	4909.02	21.63	--
Total	239	5880.00	--	--

*$p < .05$
**$p < .0001$

Mach Scores

For Mach scores, a significant main effect was found for gender with females scoring significantly higher than males.

WOFO Work Scale Variable

A significant main effect for major was found for the WOFO Work variable with business majors having significantly higher WOFO Work scores than psychology majors.

WOFO Mastery Scale Variable

There was a significant main effect for PAQ Category on the WOFO Mastery scale. A Student Newman-Keuls *post hoc* test revealed that androgynous and masculine subjects (whose means did not differ) had significantly higher scores than undifferentiated and feminine subjects (whose means did not differ). An interaction effect was found for major x PAQ Category for the WOFO Mastery scale. A Student Newman-Keuls *post hoc* test showed that feminine gender-typed business majors had significantly higher WOFO Mastery scores than feminine gender-typed psychology majors (see Figure 1).

WOFO Competitiveness Scale

A significant main effect was found for gender for the WOFO Competitiveness scale with males scoring higher than females. There was a significant main effect for PAQ Category and the WOFO Competitiveness scale. A Student Newman-Keuls *post hoc* indicated that masculine and androgynous gender-typed participants (whose means did not differ) scored significantly higher than feminine and

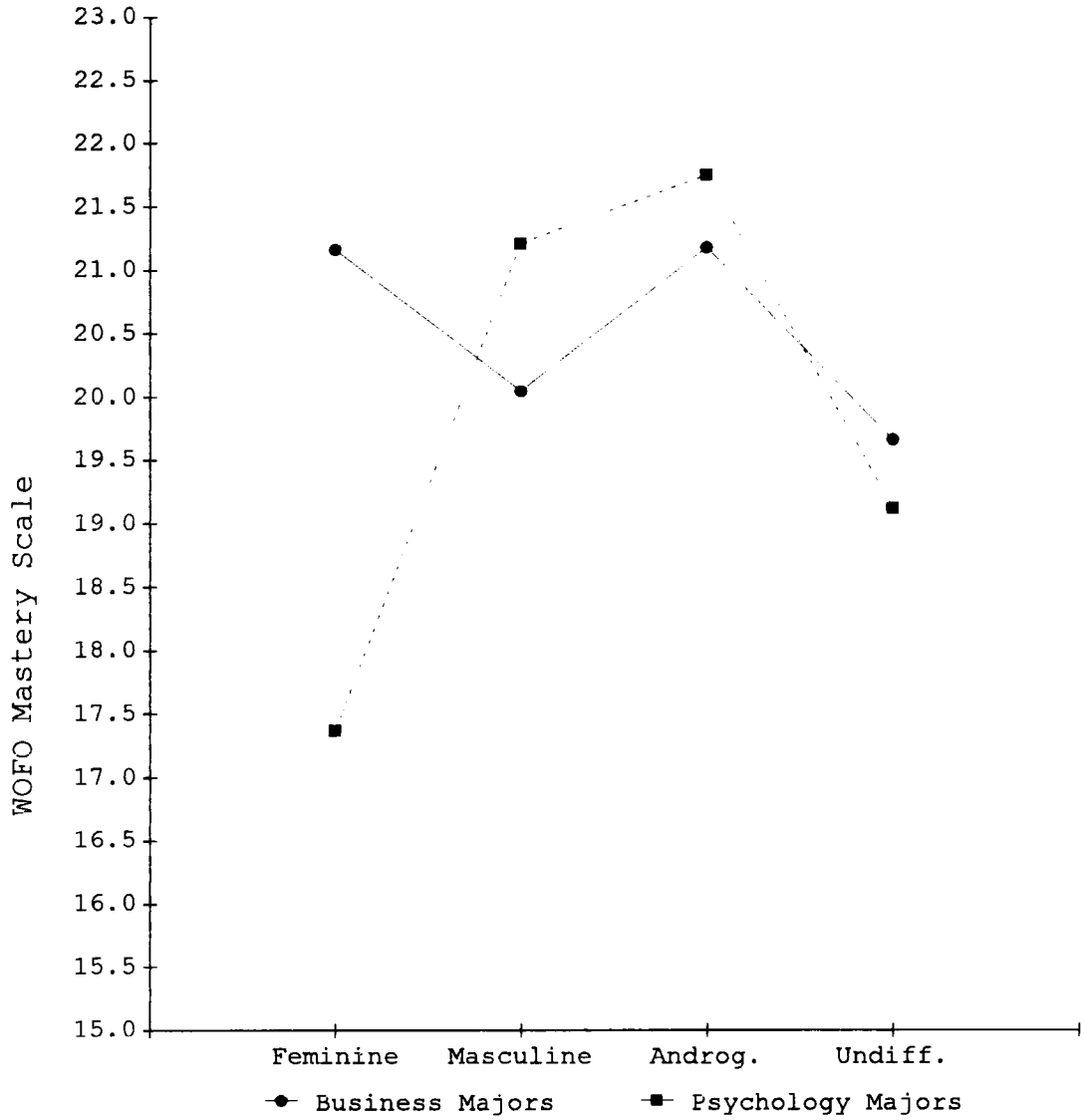

Figure 1. Interaction effect of major x PAQ Category for the WOFO Mastery Scale.

undifferentiated gender-typed participants on the WOFO Competitiveness scale. An interaction effect was found for gender x major for the WOFO Competitiveness scale. A Student Newman-Keuls *post hoc* test showed that men of both majors were more competitive than females of both majors and that male business majors were more competitive than male psychology majors (see Figure 2).

Correlational Analysis

Results of a correlational analysis are presented in Table 7. There were significant positive correlations between the WOFO Mastery and WOFO Work scales. The PAQ Masculine scale positively correlated with all three of the WOFO scales. Finally, a significant negative correlation was found between the PAQ Feminine scale and the WOFO Competitiveness scale.

It was disappointing not to find a significant correlation between Mach scores and the WOFO scales so it was decided that computing six new correlations (one for each gender, major, and gender within major) might show a relationship (see Table 8). It should be noted that this was an exploratory *post hoc* method of determining if there might be correlation between Mach and the WOFO scales. Significant correlations were found between Mach scores and scores for the WOFO Competitiveness scale for female participants and female business majors. A significant negative correlation was obtained between Mach scores and WOFO Work scores for male business majors.

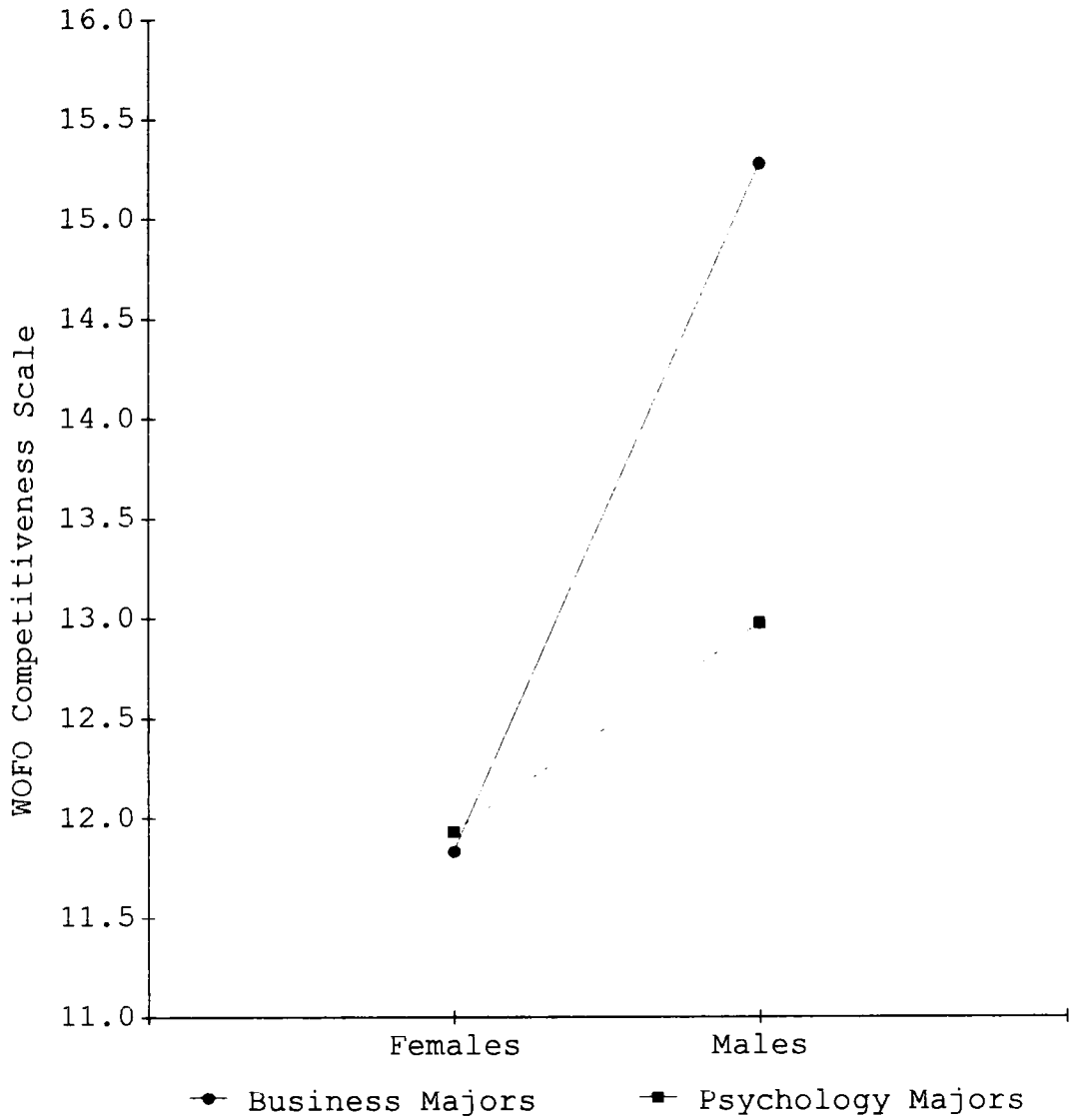

Figure 2. Interaction effect of gender x major for the WOFO Competitiveness Scale.

Table 7. Correlations between all variables.

Variable	Mach	WOFO 1_a	WOFO 2_b	WOFO 3_c	PAQM	PAQF
Mach	-	.04	.08	.06	-.04	.03
WOFO 1		-	.32***	.05	.13*	-.08
WOFO 2			-	.08	.29***	-.03
WOFO 3				-	.34***	-.21**
PAQM					-	-.25***
PAQF						-

a = WOFO Work Scale
b = WOFO Mastery Scale
c = WOFO Competitiveness Scale
*$p < .05$
**$p < .001$
***$p < .0001$
$N = 240$
$df = 239$

Table 8. Correlations between Mach scores and WOFO scale scores for gender and major.

Variable	Mach	WOFO Work	WOFO Mastery	WOFO Competitive
		Females (N = 200, df = 199)		
Mach		.01	.04	.21*
		Males (N = 200, df = 199)		
Mach		-.02	.06	.10
		Psychology Females (N = 60, df = 59)		
Mach		-.02	.10	.12
		Business Females (N = 60, df = 59)		
Mach		.04	-.05	.26*

Table 8 (Continued)

Variable	Mach	WOFO Work	WOFO Mastery	WOFO Competitive
	Psychology Males (N = 60, df = 59)			
Mach		.14	-.05	.23
	Business Males (N = 60, df = 59)			
Mach		-.28*	.15	-.03

*$p < .05$

While obtaining these correlations might be nothing more than chance, it was thought that this new information might help in pin-pointing in what areas of achievement Machs might excel.

DISCUSSION

The results section is organized by a discussion of each hypothesis.

Hypothesis 1: Gender differences for Machiavellianism and Achievement

It was hypothesized that men would be more Machiavellian than women. It was also believed that there would be no gender differences for achievement, however, men were expected to have higher levels of competitiveness than females. This hypothesis was only partially supported. The ANOVA results did not support the idea that men would be more Machiavellian than females. In fact, it was found that women scored significantly higher than men. This hypothesis was formulated under the idea that in the general population males typically have higher Mach scores than females (Christie & Geis, 1970). It was not considered that the current sample would include a large percentage of female business majors who might have higher Mach scores than their male counterparts based on previous research with business professionals (Burnett, et al., 1986; Chonko, 1982; Gable & Topol, 1989). In hindsight, the absence of support for this hypothesis was most likely due to the lack of considering the makeup of the subject pool.

The second part of hypothesis one, which stated that males and females would not differ in their levels of achievement on the WOFO scales (except for competitiveness), was supported by the ANOVA results. Specifically, there

were no significant main effects for gender for either the WOFO Work scale or the WOFO Mastery scale. There was, however, a significant main effect for gender for the WOFO Competitive scale with males scoring higher than females.

A gender x major main effect for the Competitiveness scale showed that men of both majors were more competitive than females of both majors. Moreover, male business majors were more competitive than male psychology majors. These findings are not surprising considering that males are traditionally more competitive than females and males in business professions have a higher level of competitiveness than men and women in other professions.

Since the WOFO does not measure an overall level of achievement motivation it is difficult to compare the current results with those of other studies which used an overall measure of achievement motivation. In general, however, the current results confirm previous findings that males and females do not differ in their levels of achievement motivation (Kahn & Yoder, 1989; Maccoby & Jacklin, 1974).

Hypothesis 2: Choice of college major and Machiavellianism

The first part of hypothesis two proposed that business majors would be more Machiavellian than psychology majors. There was no support for this hypothesis in the ANOVA results. These findings differ from those of researchers who found that business students were more Machiavellian than those in the social sciences (McLean & Jones, 1992;

Steininger & Eisenberg, 1976; Wertheim, et al., 1978). It should be mentioned, however, that the majority of social science students in these studies were counseling or social work majors, not psychology majors. The lack of significant differences between business majors and psychology majors in the current study is most likely due to the tendency for psychology students to have higher Mach scores than their counseling and social work counterparts (Zooks & Sipps, 1987). This conclusion is just speculative, however, since previous studies have not used psychology majors as subjects. While these results lend additional support to Zook and Sipps' (1987) claim that psychology students are more Machiavellian than students in the social sciences, their findings need replication before more definitive statements can be made. The second part of hypothesis two proposed that female business majors would be more Machiavellian than male business majors. This was not supported by the ANOVA results even though there was a main effect for gender with women having higher Mach scores than men.

Hypothesis 3: Gender role orientation and level of Machiavellianism

Hypothesis three stated that feminine and undifferentiated gender-typed participants would have higher Mach scores than masculine and androgynous gender-typed participants. The lack of significant ANOVA results does not lend support to hypothesis three. Even though the means

were not significantly different, undifferentiated and feminine participants had the highest Mach scores followed by masculine and androgynous gender-typed participants. These results, although not significant, support Nigro and Galli (1985) who claimed that Machiavellianism is related to low masculinity scores (i.e., those classified as feminine or undifferentiated). While Nigro and Galli obtained significant differences for Mach scores based on PAQ Category it should be observed that they obtained their participants from an Italian university and there may be cross-cultural differences between their sample and the current sample. For instance, only 18 percent of their male participants were classified as masculine while 56 percent of men in the current sample were classified as masculine. Perhaps there is not a difference for Mach scores based on gender role but many more studies are needed to investigate any possible connection between the two concepts considering the scarcity of studies and conflicting results.

Hypothesis 4: Gender role orientation and achievement

Hypothesis four stated that masculine and androgynous participants would have higher scores on all WOFO scales than feminine or undifferentiated participants. The results of the ANOVA showed that the hypothesis was supported for only the Mastery WOFO scale.

An interaction effect was found for the Mastery scale. A major x PAQ Category interaction effect showed that feminine gender-typed business majors had higher WOFO

Mastery scores than feminine gender-typed psychology majors. This result suggests that even though feminine participants had the lowest scores on the WOFO Mastery scale out of all PAQ Categories, feminine gender-typed female business majors may be influenced by their choice of major (a competitive and still male-dominated field) and thus feel the need to strive for excellence more than their psychology major counterparts.

The fact that the gender types did not differ on the WOFO Work reveals that they all have similar attitudes about work. Spence and Helmreich (1978) described the WOFO Work scale as a gauge of "...positive attitude toward working hard" (p. 89). The actual effort and performance of the gender-types in a work-related environment might be quite different, however. As Orlofsky and Stake (1981) note, when someone has a very high level of feminine traits unbalanced by masculine traits they may be more vulnerable to achievement-related anxieties. There was a main effect of major for the WOFO Work scale which showed that business majors had higher scores than psychology majors. While previous research has shown differences in need for achievement based on college major (see Sid & Lindgren, 1981) the differences typically involve gender as well (i.e., males having higher need for achievement if they are business majors rather than psychology majors).

The finding that PAQ Category was significant in competitiveness confirms results found by Olds and Shaver

(1980) who found a significant relationship between psychological masculinity and the WOFO Competitiveness scale. These findings also partially support Adams, et al. (1985) and Taylor and Hall (1982) who found that masculinity is more positively correlated with each of the WOFO scales than is femininity.

Hypothesis 5: Correlations between Machiavellianism and achievement

Hypothesis five proposed that Machiavellianism would correlate with all three of the WOFO scales, especially the WOFO Competitiveness scale. There were no significant correlations between the Mach scores and any of the WOFO scales which provides no support for hypothesis five. The lack of a correlation between Mach scores and the WOFO Competitiveness scale is quite surprising considering the tendency for Machs to be highly competitive (Christie & Geis, 1970).

The decision to compute the new correlations based on gender and major was made in order to see if Machiavellianism might correlate with achievement in a more specific subject population. These new correlations yielded significant correlations between Machiavellianism and competitiveness for females and female business majors. There was also a significant negative correlation between Machiavellianism and the WOFO Work scale for male business majors. These results contradict Okanes and Murray (1980) who found a negative correlation between Machiavellianism

and achievement for females. These authors used a global measure of achievement motivation (Mehrabian's scale) however, so it is difficult to compare the current results with those of Okanes and Murray.

While Christie and Geis (1970) stated that H-Machs were competitive, their early studies only utilized male participants. The current findings indicate that H-Mach females are also competitive. In the overall sample, female business majors had the lowest mean score on the WOFO Competitive scale but it appears that female business majors who are also H-Machs are more competitive. The lack of a correlation between Machiavellianism and the WOFO Competitive scale for male participants lends no support to Christie and Geis' research nor to the idea that male H-Machs are highly competitive. Perhaps only certain H-Machs are highly competitive (i.e., females or those in particular professions). If someone is a H-Mach it should not be assumed, therefore, that they will also be more competitive than someone who does not rely on Mach tactics. The fact that Mach scores and WOFO Work scores correlated negatively for males suggests that males who are H-Machs don't feel the need to excel in work situations because they might be relying on their Mach skills instead. These conclusions are just speculative, however, since there is not a previous study which has used the WOFO when attempting to find a relationship between Machiavellianism and achievement.

Finally, various correlations between the scales must be noticed. A positive correlation between the WOFO Mastery and Work scales is similar to findings by Helmreich and Spence (1978). The finding that the PAQM scale correlated with all three of the WOFO scales supports the work of Adams, et al., (1985) and Taylor and Hall (1982) who found that psychological masculinity is more related to achievement than psychological femininity. The lack of finding significant correlations between the PAQF scale and the WOFO Work and Mastery scales does not support Adams et al. (1985), who found low but significant positive correlations between the PAQF scale and the WOFO Work and Mastery scales. Perhaps their use of military school cadets could be the reason for the differing results between their research and the current study. The level of regimentation in a military school could lead these students to have higher standards and attitudes about work and mastery of skills.

Overall, these results (including the lack of an overall correlation between gender and the WOFO scales) support the claims of Spence and Helmreich (1980) and Orlofsky and Stake (1981) who proposed that achievement motivation is more related to gender role than it is to gender.

CONCLUSIONS

The primary focus of this study was to investigate the relationship between Machiavellianism and achievement. The lack of any significant relationship between the two concepts does not support previous studies which have found a link between Machiavellianism and achievement. It was proposed that a more specific measure of achievement would show a relationship between Machiavellianism and achievement. However, it appears that breaking general achievement motivation into specific categories is no more likely to show a relationship between the two than a general need for achievement measure. Previous studies which have found a connection between Machiavellianism and achievement have had various methodological problems (i.e., using only male subjects, low number of subjects, using little-known achievement scales) and have not been able to be replicated.

Although business majors were no more Machiavellian than psychology majors in the current study, psychology should not be considered with other social sciences (e.g., social work and counseling) because of its emphasis on experimental methods. While a psychology curriculum at some universities may consist of a more counseling-type approach, the curriculum of the participants in the current sample is largely based on experimental methods, not face-to-face contact with clients in a counseling setting. Future researchers who use psychology students as subjects in experiments dealing with Machiavellianism should clarify

whether their subject's curriculum is general experimental psychology or counseling psychology because there will most likely be a difference between the two for level of Machiavellianism.

Gender role and its effect on achievement is another area that should be given more attention in research. Although there was not a global relationship between Machiavellianism and achievement, where a relationship between Machiavellianism and achievement may be found is in specific subject populations.

The results of the current study do not support previous findings that there is a difference in level of Machiavellianism based on gender role orientation. Once again, only a handful of studies have examined the potential of a relationship between these two variables. It seems sensible that more studies should explore this topic to determine if there is a relationship between gender role and Machiavellianism.

The finding that psychological masculinity and femininity are related to achievement in the current study confirms research done by Spence and Helmreich (1978) and shows the importance of gender role in a variety of research including both Machiavellianism and achievement. The current results, along with those of previous studies, suggest a further need to stop comparing the genders and begin focusing on gender roles as the platform for differences in achievement motivation.

Limitations of the current study include its use of self-report measures, especially in the area of achievement. Obviously the measurement of actual achieving behavior rather than using a self-report inventory would be helpful in obtaining more accurate results in these type of studies. The use of self-report measures also makes it more difficult to compare the results of the current study with those that measured actual achieving behavior or monitored Machiavellian tactics in an experimental setting. The use of college students as participants is also a potential problem in studies dealing with achievement. As Gaeddert (1985) notes, men and women in college populations may have more similar levels of achievement than individuals already in occupational settings. It is important, therefore, that future studies find participants from a variety of settings and not rely solely on college students for their research.

Although the results of the current study do not lend support to the idea of a overall relationship between Machiavellianism and achievement, a possible link between the two concepts is sure to receive more attention from researchers in the future. The results of this study, however, when taken with the majority of the literature on Machiavellianism and achievement suggest that Christie (1970) was correct when he stated that "...available evidence does not suggest a strong positive relationship between Machiavellianism and achievement motive" (p. 44).

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APPENDIX A. Mach IV Scale

Listed below are a number of statements. Read each statement carefully and then indicate the extent to which you agree or disagree by writing a number between 1 and 7. Use the following scoring guide to indicate your answers:

7 = Strongly agree
6 = Moderately agree
5 = Slightly agree
4 = No opinion
3 = Slightly disagree
2 = Moderately disagree
1 = Strongly disagree

1. Never tell anyone the real reason you did something unless it is useful to do so.
2. The best way to handle a person is to tell them what they want to hear.
3. One should take action only when sure it is morally right.
4. Most people are basically good and kind.
5. It is safest to assume that all people have a vicious streak and it will come out when they are given a chance.
6. Honesty is the best policy in all cases.
7. There is no excuse for lying to someone else.
8. Generally speaking, people won't work hard unless they're forced to do so.
9. All in all, it is better to be humble and honest than to be important and dishonest.
10. When you ask someone to do something for you, it is best to give the real reasons for wanting it rather than giving reasons which carry more weight.
11. Most people who get ahead in the world lead clean, moral lives.
12. Anyone who completely trusts anyone else is asking for trouble.
13. The biggest difference between most criminals and other people is that the criminals are stupid enough to get caught.
14. Most people are brave.
15. It is wise to flatter important people.
16. It is possible to be good in all respects.
17. Barnum was wrong when he said that there's a sucker born every minute.
18. It is hard to get ahead without cutting corners here and there.
19. People suffering from incurable diseases should have the choice of being put painlessly to death.
20. Most people forget more easily the death of their parents than the loss of their property.

APPENDIX B. Work and Family Orientation Questionnaire

Please read each statement carefully and rate yourself on each item using the following scale:

1 = Strongly agree
2 = Somewhat agree
3 = Neither agree nor disagree
4 = Somewhat disagree
5 = Strongly disagree

1. It is important for me to do my work as well as I can even if it isn't popular with my coworkers.
2. I find satisfaction in working as well as I can.
3. There is satisfaction in a job well done.
4. I find satisfaction in exceeding my previous performance even if I don't outperform others.
5. I like to work hard.
6. Part of my enjoyment in doing things is improving my past performance.
7. I would rather do something at which I feel confident and relaxed than something which is challenging and difficult.
8. When a group I belong to plans an activity, I would rather direct it myself than just help out and have someone else organize it.
9. I would rather learn easy, fun games than difficult thought games.
10. If I am not good at something, I would rather keep struggling to master it than move on to something I may be good at.
11. Once I undertake a task, I persist.
12. I prefer to work in situations that require a high level of skill.
13. I more often attempt tasks that I am not sure I can do than tasks that I believe I can do.
14. I like to be busy all the time.
15. I enjoy working in situations involving competition with others.
16. It is important to me to perform better than others on a task.
17. I feel that winning is important in both work and games.
18. It annoys me when other people perform better than I do.
19. I try harder when I'm in competition with other people.

APPENDIX C. Personal Attributes Questionnaire

Please read each statement carefully and rate yourself on each item by circling which number best corresponds to your feelings. For example, on the first item, if you are moderately independent circle 3, if you are somewhat independent circle 1, if you are neutral circle 2, etc.

0	1	2	3	4
Not at all independent				Very independent

0	1	2	3	4
Very Passive				Very Active

0	1	2	3	4
Not at all Competitive				Very Competitive

0	1	2	3	4
Has difficulty making decisions				Can make decisions easily

0	1	2	3	4
Gives up easily				Never gives up easily

0	1	2	3	4
Not at all self-confident				Very self-confident

0	1	2	3	4
Feels very inferior				Feels very superior

0	1	2	3	4
Goes to pieces under pressure				Stands up well under pressure

0	1	2	3	4
Not at all emotional				Very emotional

APPENDIX C (continued)

|---|---|---|---|
0 1 2 3 4

Not at all able to devote self to others — Able to completely devote self to to others

|---|---|---|---|
0 1 2 3 4

Very rough — Very gentle

|---|---|---|---|
0 1 2 3 4

Not at all helpful to others — Very helpful to others

|---|---|---|---|
0 1 2 3 4

Not at all kind — Very kind

|---|---|---|---|
0 1 2 3 4

Not at all aware of feelings of others — Very aware of feelings of others

|---|---|---|---|
0 1 2 3 4

Not at all understanding of others — Very understanding of others

|---|---|---|---|
0 1 2 3 4

Very cold in relation to others — Very warm in relation to others

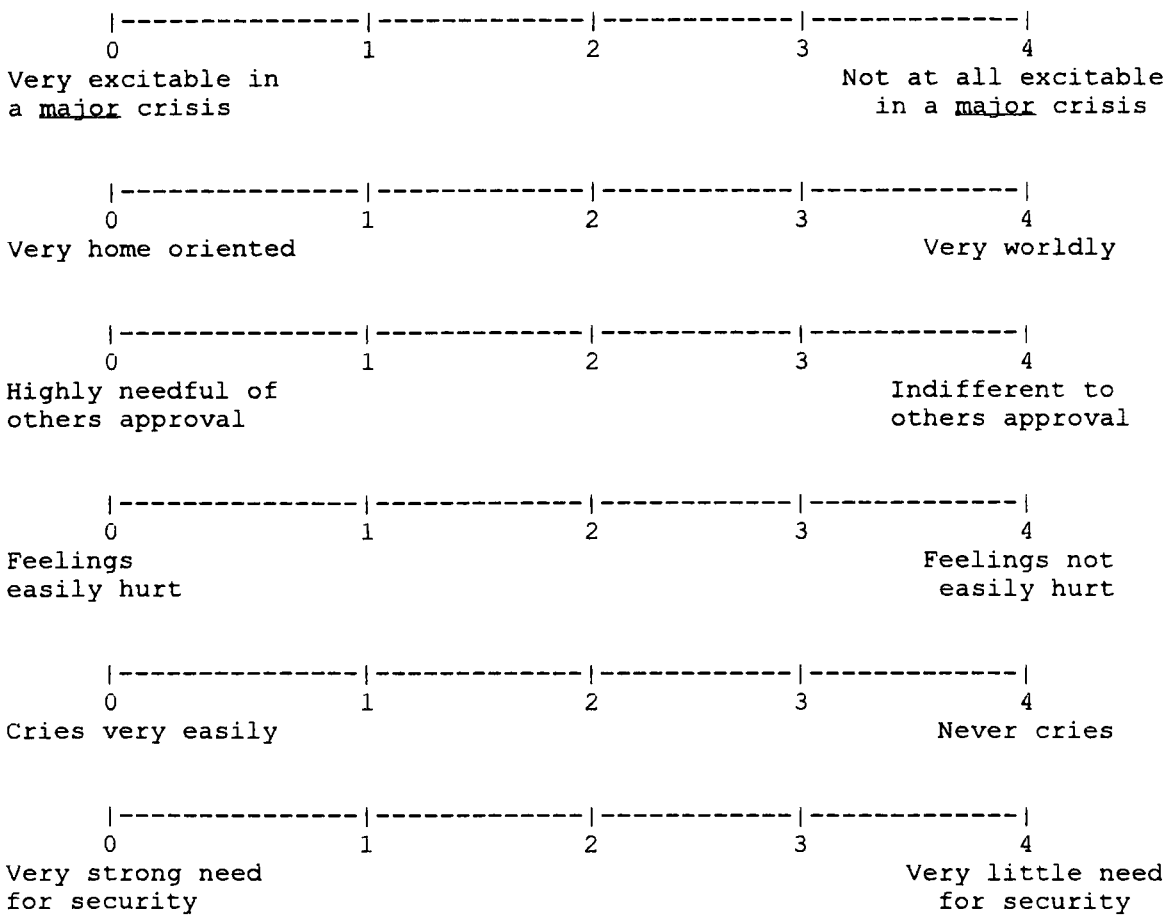
|---|---|---|---|
0 1 2 3 4

Not at all aggressive — Very aggressive

|---|---|---|---|
0 1 2 3 4

Very submissive — Very dominant

APPENDIX C (continued)



VITA

Kathleen M. Gibson

EDUCATION

Old Dominion University Norfolk, VA
Bachelor of Science, December 1993; Cum Laude
Major: Psychology Minor: Counseling
Member of APS and named to Dean's List

Old Dominion University Norfolk, VA
Master of Science, expected May 1998
Major: Psychology

AWARDS

Best poster presentation, Virginia Academy of Sciences 73rd annual meeting, May 1995 for The Influence of Introversion/Extraversion and Sensation Seeking on Clothing Selection.

PROFESSIONAL MEMBERSHIPS

Virginia Academy of Sciences
Psi Chi Honor Society in Psychology