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THESIS ABSTRACT
GENDER-ROLE ORIENTATION OF FEMALE CADETS
AT THE UNITED STATES AIR FORCE ACADEMY

Michele Sakuyako Fincher
Captain, USAF
1993

Master of Science
Auburn University, Alabama
(B.S., United States Air Force Academy, 1987)

49 Typed Pages

Directed by Becky J. Liddle

The effects of a masculine service academy environment on the gender-role development of female cadets was studied. Past research indicates that gender-roles continue to change as individuals mature, making it a continually evolving process. Research also indicates that individuals adjust their gender-roles in accordance with their environment. Since the nature of this environment can often be characterized as masculine or feminine, it is likely that changes in gender-role orientation which occur in the context of these environments can also be characterized as such.

Female cadets from all four classes at the United States Air Force Academy were studied to determine whether the environment produced a more masculine or androgynous orientation in these women. Fifty-five subjects were administered the Bem Sex-Role Inventory to determine if orientation changed as the individual spent more time in the masculine environment.

Although there were no statistically significant differences found across classes for femininity, masculinity, or androgyny scores, a non-significant trend was evident which tended to corroborate a previous study. Additionally, there were dramatic changes in gender-role orientation for female cadets from the last time that this population was studied. Comparisons indicate that while the majority of women in general are not masculine in gender-role orientation, women at USAFA have definitely become more so in nature since they were last studied. Further investigations in the form of longitudinal studies are recommended for future research efforts.

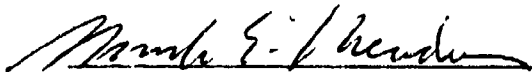
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AT THE UNITED STATES AIR FORCE ACADEMY

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**GENDER-ROLE ORIENTATION OF FEMALE CADETS
AT THE UNITED STATES AIR FORCE ACADEMY**

Michele Sakuyako Fincher

**A Thesis
Submitted to
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in Partial Fulfillment of the
Requirements for the
Degree of
Master of Science**

Auburn, Alabama

June 9, 1993

GENDER-ROLE ORIENTATION OF FEMALE CADETS
AT THE UNITED STATES AIR FORCE ACADEMY

Michele Sakuyako Fincher

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Michele Sakuyako Fincher, daughter of Clifton Franklin and Kazue (Terai) Fincher, was born October 13, 1965, in Osaka, Japan. She graduated from Basic High School as Valedictorian in 1983. She attended the United States Air Force Academy in Colorado Springs, Colorado, and graduated in the top 15% of her class with a Bachelor of Science degree in Behavioral Science in May, 1987. She entered Graduate School, Auburn University, in June, 1990.

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administered the Bem Sex-Role Inventory to determine whether orientation changed as the individual spent more time in the masculine environment.

Although there were no statistically significant differences found across classes for femininity, masculinity, or androgyny scores, a non-significant drop in masculinity scores for seniors was evident which tended to corroborate a previous study. Additionally, there were dramatic differences in gender-role orientation for female cadets compared with the last time that this population was studied. Comparisons indicate that while the majority of women in general are not masculine in gender-role orientation, women at USAFA have definitely become more so in nature since they were last studied. Further investigations in the form of longitudinal studies are recommended for future research efforts.

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TABLE OF CONTENTS

LIST OF TABLES	ix
I. NATURE OF THE STUDY	1
II. REVIEW OF THE LITERATURE	3
III. METHODOLOGY	12
Subjects	13
Apparatus	15
Procedure	16
IV. RESULTS OF THE STATISTICAL ANALYSIS	18
V. SUMMARY AND DISCUSSION	22
Limitations	27
Implications	29
REFERENCES	31
APPENDICES	37
A. Recruiter Instructions	37
B. Verbatim Instructions to Subjects	38
C. Sample Items for the Bem Sex-Role Inventory ..	40
D. Informed Consent for the Study of Gender Roles in Female Cadets At the United States Air Force Academy, Auburn University, Counseling and Counseling Psychology	42
E. Demographics Form	45

LIST OF TABLES

Table 1	One-Way ANOVA, Femininity Scores	18
Table 2	One-Way ANOVA, Masculinity Scores	18
Table 3	Classification of Subjects	19
Table 4	Chi-square summary, Androgynous Versus Non-Androgynous	21
Table 5	Class Medians and Means, Femininity and Masculinity	22

I. Nature of the Study

Despite the existence of deterministic theories of development, few individuals would assert that the psychological change and growth of a person terminates once that person reaches adulthood. In fact, the majority of teachings instead stress the fluidity of adult development, describing change over the entire lifespan of the adult (e.g., see Schlossberg, Troll, & Leibowitz, 1978). Specifically, research supports psychological development beyond adolescence in the form of gender-role orientation (Fisher & Narus, 1981; Schlossberg et al., 1978).

In order to fully understand this area and the significance of research associated with it, there are several important terms which need to be defined. The term gender-role, often used interchangeably with sex-role, can be defined in terms of behaviors, personality traits, and interests which are independent of biological sex (Beere, 1990). They are "...a socially based distinction that we label with the terms *masculine*, *feminine*, and *androgynous*." (Beere, 1990, p. 21). There are currently no agreed upon definitions of masculinity and femininity which can be defined through theory; their meanings are contingent upon time and culture (Beere, 1990). For example, what is

considered masculine in the United States in the 20th century may well be very different from masculinity in South Africa in the 18th century. Consequently, the terms masculinity and femininity have no consistent meaning if taken out of cultural and time context. Further, "androgyny" is a term which is used to describe the level of integration of masculinity and femininity in an individual (Bem, 1974, 1977). A person who is high in both masculinity and femininity is high in androgyny (Bem, 1977), making this term also bound by the same time and cultural constraints.

For the purpose of this study, gender roles are defined in the same manner as indicated by Bem (1974, 1977, 1981). Masculinity and femininity are described by the personality characteristics which are considered desirable at this time and in this culture for men and women (respectively) to possess. Again, androgyny is defined as possessing both masculine and feminine traits.

Operationally defined, the labels masculinity, femininity, and androgyny are derived from scores on masculinity and femininity scales on the Bem Sex-Role Inventory (BSRI). Classifications are based on the subject's scoring above or below the medians for female subjects of Bem's (1981) norm group.

II. Review of the Literature

Research supports the idea that gender-roles are affected by life situations and environments (Abrahams, Feldman, & Nash, 1978; Amstey & Whitbourne, 1981; Bennett & Grosser, 1981; Faulkender, 1987; Jacobs, 1986; Martin & Light, 1984; Tallichet & Willits, 1986; Tyr & Erdwins, 1979). Rather than developing in a vacuum, an individual apparently restructures his or her gender-role identity to adjust to the differing demands of the situation. Some of these demands can be characterized as typically masculine or feminine.

The military, and in particular, the service academies, are self-contained environments which place social, physical, and psychological demands on the individual. The service academies, along with the military as a whole can also be described as very much identified with a traditionally masculine role (Adams, 1984; DeFleur, Gilman, & Marshak, 1978; DeFleur & Warner, 1985; DeFleur & Warner, 1987; Durning, 1978; Milgram, Pinchas, & Ronen, 1988; Priest, Prince, & Vitters, 1977). In the socialization process, great emphasis is placed on such qualities as physical prowess, competitiveness, and agressiveness--all traits which are both desired of

military officers and stereotypically very masculine (Adams, 1984; DeFleur et al., 1978; Durning, 1978).

Given the knowledge available on the development of gender-roles, it followed that the service academy environment has the potential for impact on the individuals who exist in this context. Females are of particular interest in that they will probably experience the greatest amount of conflict between the gender-roles that they bring to the academy and the socialization process which exists there. Resolution of this conflict could foreseeably result in changes in gender-role orientation of these women.

Women who choose to attend the service academies differ from average women in many ways. They tend to rate themselves as being above average in such areas as academic and athletic ability, achievement orientation, self confidence, political conservatism, and physical attractiveness (Adams, 1984; Priest, 1978). Aside from self-reports, they are generally above the national average academically as indicated by the American College Test, Scholastic Aptitude Test, and other similar measures. These individuals rate very well on measures of leadership potential as indicated by high school involvement in athletics, student government, honor society, and other extracurricular activities (Adams, 1984; DeFleur et al., 1978; Priest, 1978).

It also appears that women who choose the military are already different in gender-role orientation than average women. Five studies of women in general have found a self-selection process in which women who favor more masculine or androgynous roles are more likely to choose non-traditional environments (Amstey & Whitbourne, 1981; Chatterjee & McCarrey, 1991; Clarey & Sanford, 1982; DeFleur, 1985; Galejs & King, 1983). This finding is further supported by research indicating that women specifically choosing the military as a career differ in gender-role orientation from the overall population of women (Adams, 1984; Priest et al., 1977). While research supported the idea that women who choose the military are more masculine or androgynous in gender-role orientation than the average woman, the question remained: what effect does this masculine environment have on a woman once she has entered it?

DeFleur & Warner (1987) suggested that if the socialization process of the military is successful, then one would expect military members to more strongly adopt a masculine orientation as the individuals spend more time in this environment. Particularly useful in support of this assertion were the studies conducted on Israeli women-soldiers (Dimitrovsky, Singer, & Yinon, 1989; Eshkol, Lieblich, Bar-Yosef, & Wiseman, 1987).

Military service for women is compulsory in Israel (Dimitrovsky et al., 1989; Eshkol et al., 1987).

Additionally, the assignment of individuals to specific jobs is based on the needs of the military rather than choice of the soldier. These facts are relevant in that one can assume a heterogeneous population in terms of gender-role orientation, without having to deal with the self-selection factor as a potential confound or variable. Any changes that emerge after some period of military service (which do not result from maturation in this society) can be assumed to be a result of exposure to a masculine environment.

Dimitrovsky et al. (1989) noted that 17.1% of female soldiers were found to be high in masculinity and low in femininity as compared to 4.5% of females found in an Israeli high school population. These soldiers were recruited months after graduating from high school and the study began in the time period after they had completed 6 weeks of basic training. The differences found may be attributed to maturation, but that seemed unlikely due to the fact that the age range of both groups was so similar. It seemed more likely that the changes in gender-role orientation were due to the radically masculine environment of basic training.

Eshkol et al. (1987) found that Israeli female soldiers who held non-traditional jobs (i.e., commanders,

technicians, etc.) had significantly more androgynous role orientations than women in traditional jobs (i.e., secretarial). Given that self-selection of individuals to jobs was controlled for, differences in gender-role orientation were likely attributable to environmental impact.

Research specifically addressing the gender-role orientation of women at American service academies is relatively scarce. Priest, Grove, and Adams (1981) found that female cadets in the class of 1980 at the United States Military Academy (USMA) did tend to exhibit higher scores over time in both masculinity and femininity, with masculinity scores displaying greater increases overall than femininity scores. Although these findings were not statistically significant for female cadets, the researchers felt that the trend was indeed positive and the non-significant results were due to the small sample size. The study was longitudinal in nature and consisted of several administrations of the Personal Attributes Questionnaire (PAQ) and other instruments over a period of time from July 1976 to April 1980 (Priest et al., 1981).

DeFleur & Warner (1987) in a similar study found that female cadets in the class of 1980 at the United States Air Force Academy (USAFA) made no statistically significant changes in gender-role orientation over the same time period, 1976-1980. Their study was also longitudinal;

however, it consisted of two administrations of the Bem Sex-Role Inventory (BSRI), one in 1976 and one in 1980. They found that women who had a feminine orientation in 1976 were likely to maintain that orientation. Women who were in the remaining classifications were likely to change in ways that suggested movement towards feminine orientations. DeFleur & Warner (1987) felt that these findings indicated that the academy environment tended to instill traditional traits (i.e., masculinity for males and femininity for females) in its cadets rather than a strictly masculine orientation.

It was interesting to note the differences in trends despite the fact that the populations researched in these two studies were in all likelihood fairly similar. Entry requirements at the service academies dictate the admittance of individuals who meet certain standards of physical and academic prowess. Because entering cadets must be between the ages of 17 and 22, it was also likely that the women were all members of one cohort, i.e., a group of individuals who passed through time together.

One possible explanation could have been in differences in instrumentation. The women at USMA were administered the Personal Attributes Questionnaire (PAQ) while the women at USAFA were administered the Bem Sex Role Inventory (BSRI). While both are said to measure the concept of psychological androgyny (as defined by the

presence or absence of masculine and feminine traits), there is the question of whether in fact they measure the same construct. Antill and Cunningham (1982) found relatively high correlations between corresponding scales of the two instruments, which tended to refute this possibility.

Another possible explanation lay in differences in the physical and psychological environments of the two academies. The class of 1980 entered the service academies in 1976, making them the first class of women to enter (Stiehm, 1981). At USMA, very little was done to accomodate the new female cadets. In fact, officials expended a great amount of effort to make them as much like the men as possible. The women were issued uniform skirts, but were not permitted to wear them; nor was makeup allowed (Stiehm, 1981). Dormitories were coed, with the women being scattered in twos and threes throughout the platoons (Stiehm, 1981). There were no allowances in physical standards made in the first year for physiological differences (Stiehm, 1981). Finally, despite the fact that six women officers were assigned to USMA prior to the class of 1980's entry, all of the trainers for the incoming class were male upperclass cadets (Stiehm, 1981). The environment, in this particular case, was still decidedly male-dominated.

USAFA, on the other hand, made numerous accommodations for the women, making it an arguably more feminine environment. It was the administration's "...wish to turn girl cadets into women (not mannish) officers..." (Stiehm, 1981, p. 181). Women were not only housed together, but also had a cadre of trained women officers who were to act as upper class cadets and role models (Stiehm, 1981). Finally, women were allowed to set their own baselines for physical performance (Stiehm, 1981).

It seemed likely that these differences in environments accounted for the differing gender-role orientations of the women between institutions. Since those initial accommodations in 1976, 12 classes of women have graduated from the academies, and with the exception of some physical activities, female cadets at USAFA are now integrated into all aspects of cadet life. If it was the difference in environment rather than instrumentation or other factors which accounted for the apparently conflicting results of the DeFleur & Warner (1987) and Priest et al. (1981) studies, then female cadets in the current environment should have manifested gender-role orientations similar to the findings of the Priest et al. (1981) study, finding greater masculinity or androgyny in women who had spent greater time at the academy. The time lapse and environmental changes at USAFA justified the updating of the DeFleur & Warner (1987) study, once again

to determine whether or not the United States Air Force Academy influenced gender-role development of female cadets toward a more androgynous or masculine orientation.

III. Methodology

The independent variable in this cross-sectional study was class (freshman, sophomore, junior, and senior) and the dependent variables were mean scores of the masculinity and femininity scales on the Bem Sex-Role Inventory (BSRI). The fact that all four classes were studied allowed for observation of any changes during the sophomore and junior years which may have been overlooked in the DeFleur & Warner (1987) study. In the Priest et al. (1981) study of USMA females, the results of the final testing just prior to graduation indicated a downward trend in both masculinity and femininity scores for the female cadets. These trends were not statistically significant. However, if gender-role development of USAFA females was similar to that of USMA females, it could be that DeFleur & Warner's (1987) study missed the final upward trend in masculinity and androgyny that the Priest et al. (1981) study found, instead measuring the women at the same point in time (e.g., prior to graduation) where the USMA study found that masculinity tended to decline. In any event, the cross-sectional design which included all four classes was designed to answer some of the questions which the DeFleur & Warner (1987) study could not. It was hypothesized that

rather than encouraging the persistence of a feminine gender-role orientation, the modern environment at USAFA would cultivate changes leading to an orientation which would become more masculine (high masculine, low feminine) or androgynous (high masculine, high feminine) as the cadet continued through USAFA.

Subjects

Subjects were female cadets from all four classes at the United States Air Force Academy. They were volunteers solicited by officers and other female cadets from the general population, for a total sample of N=55. Cell sizes were: seniors (class of '93), 15; juniors (class of '94), 14; sophomores (class of '95), 14; freshmen (class of '96), 12.

A cell size of 25 was desired. The projected cell size was based on the concept that total variability is due to two sources, variability between groups and variability within groups (Ary, Jacobs, & Razavieh, 1990). If the variability within groups is high, then a higher number of subjects is required to determine statistically significant differences due to variability among the groups (E.W. Brazelton, personal communication, October 21, 1992). The variance of the USMA population which used the PAQ was relatively large within each class (Pries. al., 1981). The DeFleur & Warner (1987) study which used the BSRI did not report variance. Since the variance of the population

studied was not well-documented nor calculated from a single instrument, the cell size was selected based on the assumption that within-group variability would account for a moderate percentage of overall variability. In this case, a cell size of 25 would have provided the power required to determine statistically significant differences among the four groups at a significance level of .05 (E.W. Brazelton, personal communication, October 21, 1992). Unfortunately, the volunteer rate resulted in only 55 subjects, presumably due to such factors as a lack of time in daily schedules. Another possibility is the desire on the part of women to "blend" into the general population of cadets, that is, to not be singled out any more than they already are strictly on the basis of biological sex.

Despite the relatively low volunteer rate, the subjects comprised 10.9% of the estimated total of 504 women at the academy (USAFA/RRER, 1992). There were 15 seniors (14.2% of all senior women), 14 juniors (11% of all junior women), 14 sophomores (10.9% of all sophomore women), and 12 freshmen (8.5% of all freshman women). As a group, they ranged in age from 18-25, the average age for each class being 21.8, 20.7, 19.6, and 18.5, respectively. There were 46 Caucasians, six African Americans, two Hispanics, and one Native American. Family incomes ranged from \$10,000.00-\$100,000.00 with a median of \$50,000.00. Nine women had prior military experience, 11 had prior

college, and 14 came from military families. They came from 27 states with all of the regions represented, and one United States territory. They represented 24 different majors, well-distributed among the various disciplines, and as a group, possessed a grade point average of 2.80.

Apparatus

The instrument used was the short form of the Bem Sex-Role Inventory (BSRI). Different forms of the BSRI have been used more than 1,000 times in research, making it the most frequently selected instrument for gender-role study (Beere, 1990).

The BSRI is based on the concept that gender-role is defined as those behaviors deemed desirable for men and women by society (Bem, 1974, 1977, 1981). An individual is labelled sex-typed when scoring high on the scale associated with their biological sex and low on the opposite scale; sex-crossed when the opposite occurs; and androgynous when the individual scores high on both scales (Bem, 1974, 1977, 1981). If an individual scores low on both scales, they are called undifferentiated (Bem, 1977, 1981).

There have been numerous studies supporting the validity of the BSRI scales in general (Faulkender, 1987; Martin & Ramanaiah, 1988; Maznah & Choo, 1986; Thompson, 1989). However, Bem (1981) described the short form as a more refined version of the original BSRI. Product moment

correlations of test-retest reliability of the short version for a period of four weeks resulted in coefficients of .91, masculine scale; .85, feminine scale; and .88, androgynous scale for female subjects. Additionally, several researchers have found that the short form provides higher internal consistency and scales which are more distinct, and there is agreement that the shorter version is easier and more convenient for scoring purposes (Bem, 1981; Martin & Ramanaiah, 1988; Maznah & Choo, 1986).

Procedure

The procedure was relatively simple. The USAFA Cadet Counseling Center was the central point of contact for soliciting volunteers. The director of the Cadet Counseling Center enlisted the aid of officers and female cadets involved in various committees and associations who recruited volunteers by word of mouth. In addition, the Center director requested that instructors in all mandatory Behavioral Science courses make announcements in class to solicit volunteers. All recruiters were given standardized instructions explaining volunteering procedures (Appendix A). The recruiters were briefed to ensure the element of coercion which may be present between officer and cadet or upper- and lower-classmen was minimized. The prospective volunteers were also informed that any services in connection with the counseling center could not be

contingent on participation, nor would they receive any credit for participation.

The subjects reported to the USAFA Cadet Counseling Center during one of their free class periods. All individuals received the same set of verbal instructions administered by the investigator (Appendix B), the Bem Sex-Role Inventory (Appendix C), an informed consent form (Appendix D), and a brief demographic sheet (Appendix E). The instructions consisted of a brief explanation of the instrument and the subjects were asked to use the instrument to describe themselves. An opportunity for questions was also given prior to the start of the test. The test was not timed, and once the individual had completed all forms, she was allowed to leave. Finally, all cadets were invited to return on the last day for a question and answer session.

IV. Results of the Statistical Analysis

Two one-way analyses of variance (ANOVAs) were used to determine statistically significant differences between the dependent variables (class averages of masculinity and femininity) across differing levels of the independent variable (class) at a significance level of .05 (Ary et al., 1990). Summaries are shown in Tables 1 and 2.

Table 1

One-Way ANOVA, Femininity Scores

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F-ratio</u>
Between Gps	.2236	3	.0745	.1129
Within Gps	33.6735	51	.6603	
Total	33.8971	54		

Table 2

One-Way ANOVA, Masculinity Scores

<u>Source</u>	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F-ratio</u>
Between Gps	2.3489	3	.7830	1.2956
Within Gps	30.8195	51	.6043	
Total	33.1684	54		

There were no statistically significant differences found among classes for either femininity or masculinity scores.

The classification of subjects into categories based on their masculinity and femininity scores is shown in Table 3. Classification was accomplished using the median split method, in which the subjects' scores of masculinity and femininity were compared with the medians from the normative sample (Bem, 1981). This norm group consisted of 340 female and 476 male undergraduate Stanford University students who were administered the BSRI in 1978. In the BSRI manual, this sample is separated by gender and the subjects in this study were compared to the female norms only. The given norm group was used for classification as recommended due to the small size of the sample as well as the fact that it consisted only of women (Bem, 1981; Faulkender, 1987).

Table 3

Classification of Subjects

	<u>Masculine</u>	<u>Feminine</u>	<u>Androgynous</u>	<u>Undifferentiated</u>
<u>Fresh</u>	4 (33.3%)	1 (8.3%)	2 (16.7%)	5 (41.7%)
<u>Soph</u>	6 (43%)	1 (7.1%)	5 (35.7%)	2 (14.3%)
<u>Junior</u>	8 (57.1%)	1 (7.1%)	3 (21.4%)	2 (14.3%)
<u>Senior</u>	6 (40%)	3 (20%)	3 (20%)	3 (20%)

If a subject was above the median of the norm group for masculinity but below for femininity, she was classified as masculine; if she was above the median in femininity but below in masculinity, she was classified as feminine; a subject scoring above the median on both scales resulted in an androgynous classification; scoring below the median on both resulted in an undifferentiated classification. It was this data which was used to answer the last question, regarding any changes in androgyny over time.

After establishing the numbers of subjects in each class for each category, a Likelihood Ratio Chi-square distribution (3, N=55) was performed on androgyny scores to determine whether or not the variance was dependent in some way on class (Hinkle, Wiersma, & Jurs, 1979; Norusis, 1990). The Likelihood Ratio was selected based on the fact that the data was nominal and categorical in nature, as well as the small sample size (Norusis, 1990).

For the purpose of this analysis, the classifications of masculine, feminine, and undifferentiated were collapsed into the class "not androgynous" and compared with the remaining androgynous classifications. The results are summarized in Table 4. The significance level of the Likelihood ratio was determined to be .68, indicating that the frequency for androgyny was found to be very close to what would be expected due to chance. There were no

statistically significant differences found across class
for the way in which androgyny varied.

Table 4

Chi-square Summary, Androgynous Versus Non-Androgynous

Count			
	Expected Val	Androgynous	Not Androgynous
	Residual		Row Tot
Fresh		2	10
			12
		2.8	9.2
		.8	- .8
Soph		5	9
			14
		3.3	10.7
		1.7	-1.7
Junior		3	11
			14
		3.3	10.7
		.3	- .3
Senior		3	12
			15
		3.5	11.5
		- .5	.5
Column Tot		13	42
		76.4%	23.6%

V. Summary and Discussion

Despite the fact that there were no statistically significant differences found in overall class averages of masculinity, femininity, and androgyny, there was one interesting trend which could be explored. By looking at the data presented in Table 5, it is evident that masculinity drops in the senior year.

Table 5

Class Medians and Means, Femininity and Masculinity

	<u>Fresh</u>	<u>Soph</u>	<u>Junior</u>	<u>Senior</u>
<u>Femininity</u>				
Median	5.30	5.35	5.15	5.50
Mean	5.31	5.32	5.21	5.38
Standard Dev	.74	.86	.83	.81
<u>Masculinity</u>				
Median	5.00	5.45	5.20	4.80
Mean	5.05	5.18	5.17	4.69
Standard Dev	.84	.75	.92	.58

It is interesting to note that this drop is sufficient in magnitude that the seniors, on average, fail to reach the norm group mean score on the masculinity scale (4.78).

The other classes do exceed this score. Based on the literature review, it is understandable for this population to fail to reach the norm group means for femininity. However, it seems noteworthy that the seniors, as a class, fail to reach the mean masculinity score of a norm group which is not necessarily masculine in nature.

This finding concurs with the Priest et al. (1981) study, except for the fact that femininity in this case did not make a decline as it did in the past study. The Priest investigators felt that the decline indicated a drop in self-concept and self-confidence which occurred prior to graduation as the reference frame changed from that of a relatively safe and familiar college environment to that of the Army. Another study (Amstey & Whitbourne, 1981), found greater identity crisis in women as they neared graduation as women faced new decisions and uncertainty about the future. While this may be what is occurring in this particular group of women, the consistency of femininity scores indicates that the changes which occur do so only in the aspect which has had the greatest amount of change, that of masculinity.

Informal conversations with many of the subjects indicated that masculine traits such as assertiveness were desired, but not at the expense of their femininity. Based on this informal data collection, this view corroborates the findings in that despite any changes in masculinity,

the women maintained their femininity throughout their experiences.

It could also be that USAFA, rather than encouraging movement towards masculinity in all cadets, places emphasis on traditional gender-roles, as concluded in the DeFleur & Warner (1987) study. While this is yet another possibility, it should be noted that although senior women had the highest femininity scores, they as a class did not reach the median cut-off point on the femininity scale which was used to classify them. If USAFA had a "traditionalizing" effect on its members, one would presumably expect that the women would score high enough as a class to be classified as feminine. With masculinity and femininity being considered as separate variables rather than degrees on one continuum, movement towards less masculinity does not necessarily indicate movement in a feminine, or "traditional" direction.

A final concept offered as a possible explanation of the lack of expected significant increases in masculinity and androgyny involves examining the experiences of the women themselves. It is possible that any dramatic changes in freshmen women occurred prior to this particular testing, after basic cadet training (BCT). BCT occurs in the freshman summer and consists of such things as rigorous physical training, weapons handling, deployment, and drill; all arguably masculine in nature. The summer between

freshman and sophomore year, however, is probably the most intensely masculine environment that the female cadet will face in her time at USAFA. Cadets learn to parachute and fly motorless gliders. They also undergo a program known as SERE, which stands for Survival, Evasion, Resistance, and Escape. It is a program which prepares cadets for survival and possibly internment under the conditions of an armed conflict. The summer between sophomore and junior year is not as intensely masculine; however, it is a time when the cadets take on a majority of the responsibility, particularly in terms of training new basic cadets. Senior year, particularly the semester prior to graduation, may well be marked by anxiety, stress, and an identity crisis prior to graduating into the "real" Air Force. If the environment has an effect on the development of gender-roles, then masculinity or androgyny might be expected to be the highest in the three lower classes, as was indicated by the non-significant trends in the study.

The one conclusion that can definitely be made from this study is that female cadets have changed dramatically since 1976. In the DeFleur & Warner (1987) study, the classification of women was predominantly feminine (42%). Women who were classified as masculine comprised only 14% of the total population. In 1993 the classification of women was predominantly masculine (44%), with the feminine classification accounting for only 11% of the women

studied. While it is difficult to state whether this is due to the environment or the type of women applying to USAFA, this is a noteworthy change.

To ensure that these dramatic differences reflect changes in women attending USAFA and not American women in general, recent literature on women's gender-roles were examined. Comparisons using the long (and less refined) version of the BSRI with women in general indicate that most women are still feminine in nature. Lagerspetz, Bjorkqvist, Bjorkqvist, and Lundman (1988) found that 43.8% of their female subjects were feminine and 9.3% were masculine. These women provided a relatively heterogeneous group as they were from a variety of professional and educational backgrounds and had a mean age of 22.4 years. Lyons and Greene (1988) also found a majority of their female college students to be feminine (43%) and a minority masculine (16.9%). Finally, Yanico (1985), using the median split method, classified both female freshman and senior classes as feminine. These studies tend to support the idea that while women in general have not necessarily become more masculine in orientation, the women at USAFA definitely have.

The source of this change is difficult to identify. It could well be that masculine women are applying for admission in greater numbers. If this is the case, then perhaps it is simply that the women who are admitted to

USAFA are already as masculine in nature as they need to be and do not need to adapt. The findings of this particular study tend to support this theory, since masculinity does not increase or decrease in a statistically significant manner. As the research regarding women in general does not support the idea that they have become more masculine with the passing of time (and advancement of feminism), there appears to be some environmental interaction taking place, whether it be in the type of women attracted to USAFA, or what takes place some time after admittance (e.g., Basic Cadet Training).

Limitations

The largest concern regarding this study was sample size. The data (see Table 5) indicate that within group variability was indeed relatively large compared to between group variability. This in turn implies a need for a larger sample size in order to obtain the amount of power needed to find statistically significant differences. Recommendations for any future research include a sample size of at least 100 subjects, with 25 in each cell.

The cross-sectional design of the study produced some concerns. The first of these was the possibility of differences as a function of cohort. It is possible that the experiences of an individual who was a freshman in 1990 were different from those of a 1993 freshman. These differences are based on social, economical, political, and

other factors which form society or the university environment at any given time. If the administration of the cadets changed hands at some point between the classes, this could have caused a change in policy. This change could have affected the development of the classes in different ways.

The second limitation of a cross-sectional design was in coming to conclusions regarding the possible causes for non-significant findings. Perhaps it was that the women who are seniors now did manifest changes, having started out feminine, but this change was masked by incoming freshman who were already masculine in orientation. Or, perhaps cadets who were feminine dropped out of the academy prior to this testing. The only way that these concerns can be answered is through a study which is longitudinal in design and tests incoming freshmen prior to exposure to the USAFA environment.

Finally, it became apparent that the location of the testing site was a limitation itself. The Cadet Counseling Center is located in Vandenberg Hall, between a cadet squadron (a distinct group which houses approximately 100 cadets) and staff headquarters. All cadets belong to a squadron and freshmen do not normally have the privilege of entering other squadrons. In order for a freshman to have participated in this study, she would have had to either travel through a squadron which she did not belong to, or

through staff headquarters, possibly suffering the consequences of being caught in a forbidden area by upperclassmen before being able to explain her presence. This in itself would have required a certain kind of individual willing to risk unpleasant consequences, mostly in the form of verbal harassment. Additionally, considering cadets' constrained time schedules, a testing site located in the academic building would have been much more convenient for the volunteers. It is possible that the combination of risk and time factors led to the low volunteer rate, particularly among freshmen.

Implications

Unfortunately, this study did not have the power to do more than scratch the surface regarding the evolution of the female cadet within the context of a traditionally masculine environment. The data did nothing more than corroborate past research to a certain extent as well as indicate that gender-roles of female cadets have changed since 1976, becoming more masculine in orientation. Perhaps a larger sample size and a longitudinal study starting before the commencement of basic cadet training will produce the information necessary to answer remaining questions.

The greatest benefit that this study had to offer was in a better understanding of the impact that the military environment has on women. Women in the military continue

to make advances in rank as well as the type of career field that they are allowed to enter. With these advances come the inevitable burdens and adjustments that all women who choose non-traditional careers make in order to succeed. These adjustments which may be desirable and necessary in the world of work may or may not lend themselves to overall self or life satisfaction. This makes it doubly important to first understand how the environment impacts women; second, to judge whether the impact is positive or negative; and third, to use this information to better serve the needs of all women. The results of this study hopefully helped to begin to answer the first question, that of understanding.

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Appendix A

Recruiter Instructions

Capt. Michele Fincher is presently attending Auburn University on an Air Force AFIT scholarship. She is compiling research in the area of gender role development. Capt. Fincher's study will examine the effect of the AF Academy's environment on gender role development of female cadets. She will be considering behaviors, attitudes, interests, etc., which can be labelled masculine, feminine, or androgynous.

Capt. Fincher will be in the Cadet Counseling and Leadership Development Center, Rm 2C14, Vandenberg Hall, from 0800-1600, on 28-29 Jan 93 (Thurs.- Fri.). You are asked to come during a free period in your schedule. The survey has no time limit, but should only take about 20 minutes to complete. Your responses will be kept confidential. The Cadet Counseling and Leadership Development Center is located directly across the quadrangle from the Cadet Store. Your support will provide important data about the impact of a traditionally male environment on women. Also, the survey can be a source of exploration and greater self-awareness. A question and answer session will be given on the last day.

Appendix B

Verbatim Instructions to Subjects

Good morning. My name is Captain Michele Fincher. I am here to conduct research on gender-roles in relation to female cadets. You have been provided with two copies of an informed consent form, which, if you agree to participate, I would ask you to read and sign. Please take the second copy to keep for your records. Once you have read and completed this form, please turn the other copy in at this desk. You will then be handed a small package consisting of a brief demographics sheet, and the actual instrument, which is the short form of the Bem Sex-Role Inventory. Do not put your name or any other information on these forms which would serve to identify you.

You are not required to answer any items which you find objectionable; however, please attempt to respond to the instrument to the fullest extent possible. The Bem Sex-Role Inventory gives a series of characteristics which you are to rate using a number from 1 to 7 as to how similar they are to you. I repeat, you are to rate these characteristics in relation to how you view yourself. You will be completing the short version of the BSRI, which means that you are to stop at the heavy black line in the

middle column of the instrument. There is no limit to the amount of time you have to complete the forms. You are free to leave when you are finished. Please turn your completed packages back in to me.

I will be available tomorrow at 1600 hours, here in the Cadet Counseling Center to answer any questions that you may have regarding this study. Although it is not mandatory, it will be an opportunity to find out more about the research. Are there any questions at this time?

Appendix C

Sample Items for the Bem Sex-Role Inventory

by Sandra L. Bem

Directions: On the opposite side of this sheet, you will find listed a number of personality characteristics. We would like you to use those characteristics to describe yourself, that is, we would like you to indicate, on a scale from 1 to 7, how true of you each of these characteristics is. Please do not leave any characteristic unmarked.

Example: sly

Write a 1 if it is never or almost never true that you are sly.

Write a 2 if it is usually not true that you are sly.

Write a 3 if it is sometimes but infrequently true that you are sly.

Write a 4 if it is occasionally true that you are sly.

Write a 5 if it is often true that you are sly.

Write a 6 if it is usually true that you are sly.

Write a 7 if it is always or almost always true that you are sly.

Thus, if you feel that 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

SAMPLE ITEMS:

Masculine:	Feminine:	Neutral:
Self-reliant	Yielding	Helpful
Defend my own beliefs	Cheerful	Moody

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Appendix D
Informed Consent
for
the Study of Gender Roles in Female Cadets
at the United States Air Force Academy
Auburn University
Counseling and Counseling Psychology

You are invited to participate in a study of gender-roles in female cadets at the United States Air Force Academy. You have been selected because you are a representative member of this population.

If you decide to participate, you will be asked to fill out two forms in addition to this one; a brief demographics form which will provide me with background information on you, and, the Bem Sex-Role Inventory (BSRI). Total time to complete these forms should be 30-45 minutes. The BSRI is not a particularly invasive instrument and may be valuable in helping you gain a better understanding of yourself. I do not anticipate any risk associated with participating in this study.

Any information obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your

permission. If you give me your permission by signing this document, the information you provide will be combined with that of other participants. That aggregate information will become a part of my thesis at Auburn University, Auburn, Alabama. By regulation, a copy of my thesis will also be given to Headquarters Air University, Air Force Institute of Technology, Wright Patterson Air Force Base, Ohio. No individual responses nor names will be reported in the thesis.

Your decision whether or not to participate will not jeopardize your future relations with Auburn University nor the United States Air Force Academy. Further, you may discontinue participation at any time without penalty. If you decide later to withdraw from the study, you may also withdraw any identifiable information which has been collected about you.

If you have any questions, I invite you to ask them. I will also be available in the Cadet Counseling Center on 29 January, 1993 at 1600 hrs. If you have additional questions later, please feel free to write Captain Michele Fincher, 2014 Haley Center, Auburn University, AL, 36849, and I will be happy to answer them. The question and answer session on the 29th is not mandatory, but you are urged to attend. Please take the second copy of this form to keep.

YOU ARE MAKING A DECISION WHETHER OR NOT TO
PARTICIPATE. YOUR SIGNATURE INDICATES THAT YOU HAVE DECIDED
TO PARTICIPATE HAVING READ THE INFORMATION PROVIDED ABOVE.

Date

Time

Subject's Signature

Investigator's Signature

Appendix E

Demographics Form

Age_____ Ethnic Background_____

Academic Major (if applicable)_____

GPA (cumulative)_____ Class_____

Home of Record (state only)_____

Prior Military Experience Yes_____ No_____

Prior College Experience Yes_____ No_____

Family Background Military_____ Civilian_____

Estimated Annual Family Income_____

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