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ABSTRACT

This study investigated the influence of race and gender on students' self-schema for movement activities. Study participants were 168 male and female seventh- and eighth-grade students, both African American and Euro American, from a semi-rural school in a Southeastern state. The Physical Activity Schema Analysis (PASA) was administered to measure students' endorsements of 20 different movement and team and individual sport activities. Participants were asked: in which activity they felt most competent; the highest level at which they expected to compete in the activity; how hard they thought they would have to work to be good at the activity; and how often they practiced or played in the activity. Study results revealed the importance of race and gender as predictors of schema development for particular sports and physical activities. For example, African Americans' overwhelming indication of basketball as the activity in which they perceived the highest level of competence supported the development of self-schemata for basketball based on race. Football and volleyball showed very similar results by gender, with males indicating football and females reporting volleyball as the activity in which they felt most competent. Overall, the results of this study reflect the notion that schema development for particular sports and physical activities do vary significantly by race and gender. (Contains 20 references.) (ND)

Self-schemata for Movement Activities: The Influence of Race and Gender

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Paper presented at the annual meeting of the American Educational Research Association, Chicago, March, 1997.

SELF-SCHEMATA FOR SPECIFIC MOVEMENT ACTIVITIES

Self-schemata are organizations of representations of past behavior used as a basis for making decisions, inferences and predictions about the self. Self-schema can also be viewed as a representation of oneself in memory. Endorsement of a movement or sport activity as self-descriptive along with rapid response and degree of perceived competency may be reflective of a well articulated self-schema.

Previous research has demonstrated that more rapid responses to self-descriptive information indicates that the responses are consistent with one's self-schema as well as an estimate of the relative strength of the schema. Fazio (1990) concluded that response latency measures are appropriate for addressing questions regarding spontaneous formation of a concept. Latency to respond is also viewed as a reliable measure of processing efficiency and subsequently indicate the strength of schemata (Fazio, 1990; Markus, 1977). Earlier studies (Bem, 1981; Cross & Markus, 1994; Markus, 1977; Markus et al., 1982) demonstrated that more rapid responses indicate consistency with one's self-schemata more so than terms which are inconsistent or less schema relevant.

Previous studies readily depict children's concepts of appropriateness (Lee, Belcher, & Friedenburg, 1996) and success estimations (Lee & Austin, 1986; Lee, Nelson & Nelson, 1988) for sport and movement activities as varying by gender. Also,

emerging evidence of the existence of racial self-schemata are found in studies that show a marked difference in sports and physical activities deemed appropriate for African Americans and Euro Americans (Harrison, in press; Heath et al., 1991) and differential modes of socialization into sport (Greendorfer & Ewing, 1981). From this evidence the existence of race and gender specific self-schemata for sport and physical activities appears to be a logical postulate.

The present study was an initial attempt to understand, conceptualize and describe the influence of race and gender on students' self-schema for movement activities. Specifically, the following questions were addressed: (1) Do students differ in their endorsement of self-descriptive information for movement and sport activities as a function of gender and race? (2) Are there racial and gender differences in the relative strengths of student's endorsements for movement and sport activities as measured by response latencies? (3)Do the endorsements for sport and movement activities coincide with the student's perceived most competent sport or movement activity?, and (4) Are there racial and gender differences in the (a)effort expended and (b) the perception of the ultimate level of achievement in the sport or movement activity of greatest perceived competency?

Method

Participants

Participants in this study were 168 seventh and eighth grade

students (38 African American males, 39 African American females, 43 Euro American males, and 48 Euro American females) from a semi-rural school in a Southeastern state. Permission was obtained via consent forms for participation. A stratified sample of students was taken with attempts to balance the sample by race and gender. The school which housed grades seven through twelve was chosen for several unique characteristics. First, the student body was comprised of a moderately balanced racial population of African Americans and Euro Americans. Second, there are no private schools in the area and a substantial range of socioeconomic (SES) levels were thus evident within the same school. The area within the school district can be classified as somewhere between urban and rural with characteristics of both. These features allowed for a diverse sampling of participants.

Instrumentation

Using an adaptation of the procedures developed by Markus (1977), the Physical Activity Schema Analysis (PASA) was administered to measure students' endorsements of 20 different movement and sport activities as self descriptive. The activities were soccer, swimming, rowing, snow skiing, golf, baseball, basketball, hockey, water skiing, football, track sprinting, weight lifting, boxing, gymnastics, tennis, bicycle riding, bowling, volleyball, pole vaulting, and walking. Activities were also chosen to elicit a variety of choices that, based on previous research (Greendorfer & Ewing, 1981; Harrison, in press;

Heath et al., 1991; Lee & Austin, 1986; Lee, Belcher, & Friedenburg, 1996; Lee, Nelson & Nelson, 1988) would vary by race and gender. The instrument includes a series of computer generated, labeled diagrams of physical activities being performed. Diagrams and response times were generated through a customized program utilizing Visual Basic Software (Microsoft, 1993). Diagrams were selected from clipart that were part of CorelDRAW 3.0 software (1992). Efforts were made to select diagrams that were race and gender neutral. The diagrams did not seemingly depict any racial or gender specific traits but did display actions or postures indicative of the sport or activity it portrayed. Response latencies were recorded as an indicator of the relative strength of the response.

Participants were also asked to respond to the following questions:

(1) In which sport or physical activity do you feel most competent? This question was to assess the participants perceived competency and schema development for a particular sport or physical activity.

(2) What is the highest level at which you expect to compete in this sport or activity? [recreational or just for fun (1), junior high school (2), high school (3), collegiate (4), or professionally (5)] This question was an attempt to describe differences in the levels of aspiration of participants.

(3) How hard do you have to work to be good at this sport or activity? (on a scale from one to ten with one being "easy" and 10 being "hard") This question was an attempt to assess the perceived difficulty level and amount of effort expended in the activity of highest perceived competency.

(4) How often do you practice/play this sport? (days per week in season). This question was an attempt to assess differences in time spent participating in the activity of highest perceived competency.

In addition, subjects were asked to give pertinent demographic information such as name, age, gender, the level of education of the mother and the occupation of the father to estimate of the family's SES.

Reliability

Approximately eight percent of the subjects were retested at least two weeks following initial testing to examine the reliability of the instrument. Test-retest reliability analysis yielded a coefficient of 0.914 for activity schema test and 0.8505 for response latencies. Both values were well within acceptable ranges and indicated that the PASA was a reliable instrument.

Procedures and Data Collection

Demographic data were collected along with the participants' father's occupation and mother's level of education to unobtrusively estimate the participants' socioeconomic

status(SES). Prior research indicated that the father's occupation and mother's educational level were reliable indicators of SES (Teddlie, Falkowski, Stringfield, & Garvue, 1984). All occupations included in the data were ranked by average income (Louisiana Dept. Of Labor, 1992; Waier, Murphy, Chiang, & Grant, 1991; U.S. Dept. Of Labor, 1994), combined with the mothers level of education and partitioned into quartiles to be included in subsequent data analysis. Inclusion of SES in data analysis was to diminish the possibility of SES as an underlying influence on analyses conducted by race.

Participants were tested individually using a 6500E Notebook Computer. After a brief introduction it was explained that a series of sport and physical activity diagrams would be shown on the screen. Subjects were instructed to respond immediately to the diagrams, simply indicating if the activity was one they could or could not "see themselves" involved in. The choices were indicated by depressing the N (Not Me) or the M (Me) on the computer keyboard as quickly as possible while retaining accuracy. "Me" responses prompted the researcher to ask if the response is something that the subject participates in or has participated in, or if the activity is one that the subject aspires to participate in the future (possible self). If the participant indicated that he or she had never participated in the activity the response was recorded as "Possible Me." Response latencies were recorded as an indicator of the relative strength

of the response.

Data Analysis

Logistic regression analyses were performed on each activity collapsing ME and POSSIBLE ME responses and comparing to NOT ME. ME and POSSIBLE ME responses were an indication that the participant had developed self-schemata for those activities. Combining ME and POSSIBLE ME responses allowed for the creation of dichotomous variables appropriate for logistic regression analysis. Logistic regression analyses allows for the estimation of the probability of an event occurring. With regard to this data, logistic regression allows for prediction of a sport or physical activity being selected as self-descriptive (ME or POSSIBLE ME) or not self-descriptive (NOT ME). Unlike linear regression, in logistic regression the parameters of the model that make observed results most likely are selected (Norusis/SPSS Inc., 1990). For the purposes of this study independent variables included in these analyses were race (African American, Euro American), gender (Male, Female), and SES (4 levels). Independent logistic regression analyses were performed on each sport or activity. Forward stepwise logistic regression analyses were conducted on each activity utilizing race, gender, SES, and all possible interactions of independent variables. The probability score for variable entry and removal were both set at .99 which made for easy variable entry into the model and difficult exclusion. This allowed for observation of unusual changes in the

variables' probability both before and after inclusion in the model. Model selection was determined when none of the variables not yet entered into the model were significant at the $p \leq .10$ level. Independent t-tests were performed on response latencies for activities. The rationale for performance of twenty separate logistic regression analyses and t-tests hinge on statistical consultation and the opinion that the results may form a foundation for further investigation. Other statistical manipulations (e.g. Bonferroni technique) appeared unnecessary as they diminish the power of the analyses needlessly as all variables are considered independent of each other.

Frequencies of subjects' perceived most competent sport were analyzed by race and gender. Perceptions of competency provide additional verification of the development of schema for particular sport and physical activities. Differential responses by race and gender attest to the influence of these variables. Multivariate analysis of the maximum level of competition, subject's perception of how hard he or she works to be good at the sport or activity, and how often the subject practice/plays the sport or activity were performed to assess variability across race gender and SES.

Results

Logistic Regression Analysis

Results of logistic regression analysis are found in table 1. Variable coding for race was 0 (African American), 1 (Euro

American)and for gender was 0 (females), 1 (males). This coding made for easier interpretation of results. In logistic regression the B coefficient is interpreted as the change in the log odds associated with a one-unit change in the independent variable (Norusis/SPSS, 1990). Since it is easier to think in terms of odds, the column labeled Exp(B) expresses the coefficient in terms of the change in odds when the independent variable increases by one unit. If B is positive, the factor by which the odds change will be greater than one, which indicates the odds of the independent variable being one, or "ME", have increased; if B is negative, this factor will be less than one, indicating the odds have decreased. This indicates that when race or gender changes from 0 to 1 and all independent variables remain the same, the odds of the activity being a "ME" activity increases or decreases by the coefficient of the variable in question (Norusis/SPSS, 1990). An alternate and simpler interpretation strategy is to remember that for race, African Americans are coded 0, and for gender, females are coded 0, therefore negative B values indicate that African Americans or females are more likely to give "ME" responses. For example, for football, males are 7.76 times more likely to respond "ME".

Table 1 readily illustrates the influence of race in their endorsement of self-descriptive sports and physical activities. Race was significant in swimming, rowing, snow skiing, basketball, hockey, waterskiing, and bowling. Race was also

important in interactions with gender and/or SES in soccer swimming, rowing, golf, basketball, hockey, football, track-sprinting, weight training, tennis, and volleyball. The influence of race was most notable in bowling and waterskiing where Euro Americans were 4.91 and 7.66 times more likely to respond "ME". Basketball was the only activity in which African Americans were more likely to respond "ME".

The results delineated in table 1 illustrate the notable influence of gender in soccer, football, weight training, boxing, gymnastics, tennis, and walking. Additionally, gender was significant in interactions with race and/or SES in swimming, rowing, golf, basketball, hockey, track-sprinting, weight training, and volleyball. Gender appears to exert strongest influence in football and boxing where males are 7.76 and 6.48 times more likely to respond "ME". Soccer, gymnastics, tennis and walking were the only activities in which females were more likely to respond "ME".

Response Latency T-Tests

Response latencies were analyzed via t-tests by race and gender. Significant differences in response latencies are noted in tables 2 and 3. Variations by race (table 2) were noted in boxing (not me), and bowling (not me) with Euro Americans responding faster in each case. Response latencies analyzed by gender (table 3)revealed significant findings in swimming (me), hockey (not me), water skiing (me; not me), football (not me),

weight training (not me), boxing (me; not me), tennis (me; not me), bicycle riding (me), bowling, volleyball (me), and walking (me), with females responding faster in all cases. It should also be noted that females tended to respond faster that males overall. Means for male response latencies were faster that females in only 4 of the 40 measures. This tendency for more rapid female response may confound interpretation of the data.

Perceived Most Competent Sport or Activity

Frequencies for subjects' most competent sport are depicted graphically in figure 1. As evidenced by this graph, the number of Euro Americans far exceeds the number of African Americans who perceived baseball/softball as the sport or activity in which they possessed the highest level of competency while the number of African Americans surpassed the number of Euro Americans in basketball. The number of females exceeds the number of males who perceived volleyball as the sport or activity of highest perceived competency while the number of males was greater than the number of females that perceived football as the activity of highest perceived competency.

Multivariate Analysis

To assess group differences in the expected maximum level of competition (MLC) in the subject's most competent activity, the frequency in which the subject practiced or participated in that activity per week (PF), and the perception of how hard the subject had to work to be "good" in that activity (HH), a 2(race)

X 2(gender) X 4(SES) MANOVA was used to assess racial, gender, and SES differences. A significant race by gender interaction, Wilks' Lambda=.93,$F(3,150)=3.82$,$p=.01$ prompted a subsequent 2(Race) X 2(Gender) MANOVA to examine differences in MCL, PF, and HH. A significant interaction of race and gender was observed, Wilks' Lambda=.95,$F(3,162)=2.77$,$p=.04$. Univariate analysis revealed a significant difference in MLC, $F(1,164)=21.36$, $p=.00$ with African American males expecting to reach higher levels of competition than any other group. Also revealed in the univariate analysis was a marginally significant difference in PF again with African American males reporting practicing or participating more than any other group. No significant differences were noted for HH. Means are depicted graphically in figure 2.

Discussion

While the interpretation of results of these analyses are arduous at best, from a theoretical perspective, race and gender self-schema can be used to explain many the differences observed. Inspection of the data indicate Euro Americans made more "ME" endorsements in swimming, rowing, hockey, water skiing, and bowling, while basketball was the only activity in which African Americans made more "ME" endorsements.

Gender differences in "ME" responses were apparent with females making "ME" endorsements more often in soccer, gymnastics, tennis, and walking. Males were more likely to make "ME" endorsements for football, weight training, and boxing.

Race and gender were also influential in interactions with SES in several activities. The interactions of race and gender with SES make the results difficult to interpret from logistic regression analysis, however viewing the raw data provides insight into the possible sources of the differences. The race and gender interaction was significant in hockey where Euro American males appear to account for the preponderance of the difference observed, 48%, compared to 29% of Euro American females, 18% of the African American males, and 13% of African American females did so. Track-sprinting also included a significant race by gender interaction. This emanated from the disparity in racial responses with abundant "ME" endorsements, 68%, for African American males, 72% for African American

females, 54% of the Euro American males, but only 33% of females. "ME" endorsements for volleyball was 89% for African American males and 100% for females compared to 71% for Euro American males and 92% for females. It appears that the lower percentage of African American males were responsible for the significant race by gender interaction.

While interactions of race, gender and SES appeared in several activities, interpretations of these interactions are arduous in that negative coefficients may result from a negative value in any of the variables. These results do point out the importance of race and gender as predictors of schema development for particular sports and physical activities.

Results of response latency analysis, while not statistically significant in many cases, does however tend to support the results of logistic regression analysis. In many cases the participants do exhibit shorter response times for activities in which regression analyses reveal significant differences in "ME" endorsements. For example, basketball, the only activity in which African Americans gave more "ME" endorsements, also show faster response time for African Americans. Greater "ME" endorsements, faster response times, and the fact that African Americans overwhelmingly indicated basketball as the sport or activity in which they perceived the highest level of competence lend support to the notion of development of self-schemata for basketball based on race.

Frequencies of what subjects reported as the sport they felt most competent (figure 1) provides vivid evidence of the disparity of responses by race and gender. African American males and females indicate basketball more than Euro Americans by an almost 4 to 1 ratio, while the results are essentially opposite for baseball/softball. Football and volleyball show very similar results by gender with males indicating football and females reporting volleyball as the activity in which they feel most competent.

With regard to MLC, HH, and PF, the significant race by gender interaction and graphical representation of means (figure 2) show that African American males see themselves participating at higher levels (e.g. professional athletes) than any other group. This supports the findings of Greendorfer and Ewing (1981)and Lee (1983) who indicated that African American athletes expected their participation in athletics would lead to professional careers in sport. Additionally, African American males tend to play or practice the activity they feel most competent in more often than any other group. This finding, presumably, reflects an ease in accessability, enjoyment, or feelings of competence in their activity of choice.

Overall the results of this study reflect the notion that schema development for particular sports and physical activities do vary significantly by race and gender. While the results seem obvious, this investigation provides verification for what has

been assumed by many teachers, but until now has been uncorroborated by research.

Implications for Practice

In many instances minority students do not desire to participate in a variety of sports and physical activities (Ennis, 1995). Avoidance behaviors or a general sense of ambivalence may occur because the students do not see the activities as self-defining, thus have not developed self-schema for the activities being presented. Ignored is the idea that skill and knowledge of, and desire to participate in activities is sought only when the activity has value and meaning for the learner (Ennis, 1995). Additionally, practitioners ability to take into account the contextual factors brought to the learning environment must be explored. It would appear that some practitioners tend to ignore or feel incapable of modifying curriculum or pedagogical practices to better bridge the gap between teaching and learning. Conceptualizing teaching for learning as an interactional process requires that the teacher take into account where their students are within the developmental process. With respect to self-schema, this would require an awareness of the initial scope and sequence of curricular choices already internalized by the students.

An understanding of the underlying processes in self-schema development for sport and physical activity and specific research based strategies for expanding the range of activities for which

minority students develop self-schemata, will go beyond merely changing attitudes, the goal of many multicultural education programs. The few research studies that have been conducted in multicultural education effectiveness have shown that these efforts have done little to change attitudes on a long term basis, and even less in affecting teacher practice (Stanley, 1995). Understanding the dynamics created in the development of race and gender self-schemata for sport and physical activity with the intent to broaden the scope of these schemata for the minority population, may address both of these issues.

This is of importance since by the year 2000, approximately 30 to 40% of this nation's school children will be students of color (Hodgkinson, 1985) with enrollment in urban areas considerably higher. Coupled with the anticipated demographic change is the trend occurring in teacher preparation programs (Villegas, 1990) with the population of teachers becoming nearly 95% Euro American. With greater understanding of the educational process these opposing trends imply that there may be a need to examine teacher education practices to insure the creation of positive learning environment.

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Table 1. Logistic Regression Analysis for Each Activity

Activity Variable	B	SE	p	Exp(B)
Soccer				
gender	-.64	.33	.05	.53
race by ses	.33	.10	.00	1.39
Swimming				
race	1.13	.56	.04	3.11
race by gender by ses	-.37	.19	.05	.69
Rowing				
race	.49	.42	.25	1.63
race by gender by ses	.35	.14	.02	1.42
Snow Skiing				
race	1.34	.34	.00	3.82
Golf				
race by gender by ses	.39	.16	.01	1.48
race by ses	.25	.15	.09	1.28
Baseball *	---	---	---	
Basketball				
race	-2.16	.64	.00	.11
gender by ses	.51	.21	.01	1.66
Hockey				
race	.80	.44	.07	2.23
race by gender	.75	.44	.09	2.11
Water Skiing				
race	1.59	.33	.00	4.91
Football				
gender	2.05	.37	.00	7.76
race by ses	-.35	.12	.00	.70
Track-Sprinting				
race by gender	-1.33	.38	.00	.27
Weight Training				
gender	.30	.63	.63	1.35
race by ses	-.55	.16	.00	.58
gender by ses	.73	.27	.01	2.08
Boxing				
gender	1.87	.40	.00	6.48
Gymnastics				
gender	-3.41	.51	.00	.03
Tennis				
gender	-1.06	.33	.00	.35
race by ses	.28	.11	.01	1.32
Bicycle Riding *	---	---	---	

(table con'd)

Bowling				
race	2.04	.74	.01	7.66
Volleyball				
race by gender	-1.72	.50	.00	.18
Polevault *	---	---	---	
Walking				
gender	-1.58	.44	.00	.21

*Note. Activities with no values indicate no variables were significant.

Note. Positive B values denote greater male influence for gender, while negative values indicate female inclination to respond "ME". Positive B values for race indicates greater Euro American influence, whereas negative values portray the influence of African Americans. The Exp(B) coefficient expresses the odds of responding "ME".

Table 2. Significant Response Latencies By Race

Activity		African Americans N	Mean	SD		Euro Americans N	Mean	SD
Boxing	not me	51	1.81	0.85	*	70	1.48	0.37
Bowling	not me	33	2.01	0.57	*	19	1.66	0.53

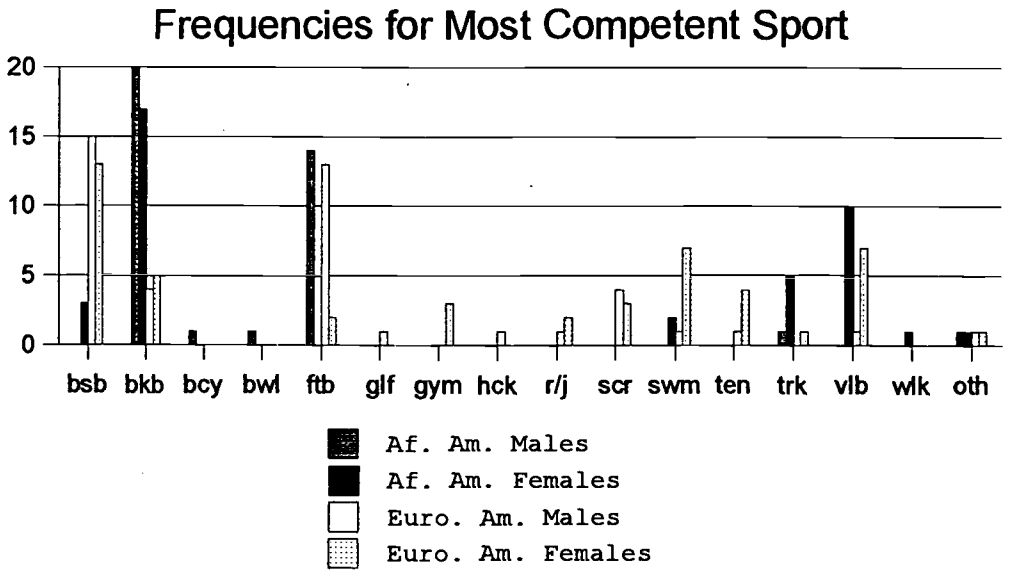
(* P<.05)

Table 3. Significant Response Latencies by Gender

Activity		Males N	Mean	SD		Females N	Mean	SD
Swimming	me	66	1.62	0.51	*	74	1.40	0.43
Hockey	not me	54	2.17	0.81	*	68	1.68	0.52
Waterski	not me	32	2.08	0.58	*	37	1.75	0.53
Football	not me	17	2.17	0.81	*	56	1.83	0.62
Wght-trng	not me	26	2.38	1.23	*	64	1.72	0.46
Boxing	me	37	1.78	0.63	*	10	1.48	0.20
	not me	44	1.89	0.91	*	77	1.47	0.32
Tennis	me	31	2.16	0.73	*	55	1.86	0.60
	not me	50	1.96	0.68	*	32	1.65	0.41
Bike-ridg	me	72	1.77	0.75	*	77	1.53	0.50
Bowling	me	54	1.91	0.48	*	62	1.58	0.36
Volleybal	me	64	1.98	0.60	*	83	1.52	0.40
Walking	me	53	2.00	0.91	*	79	1.65	0.83

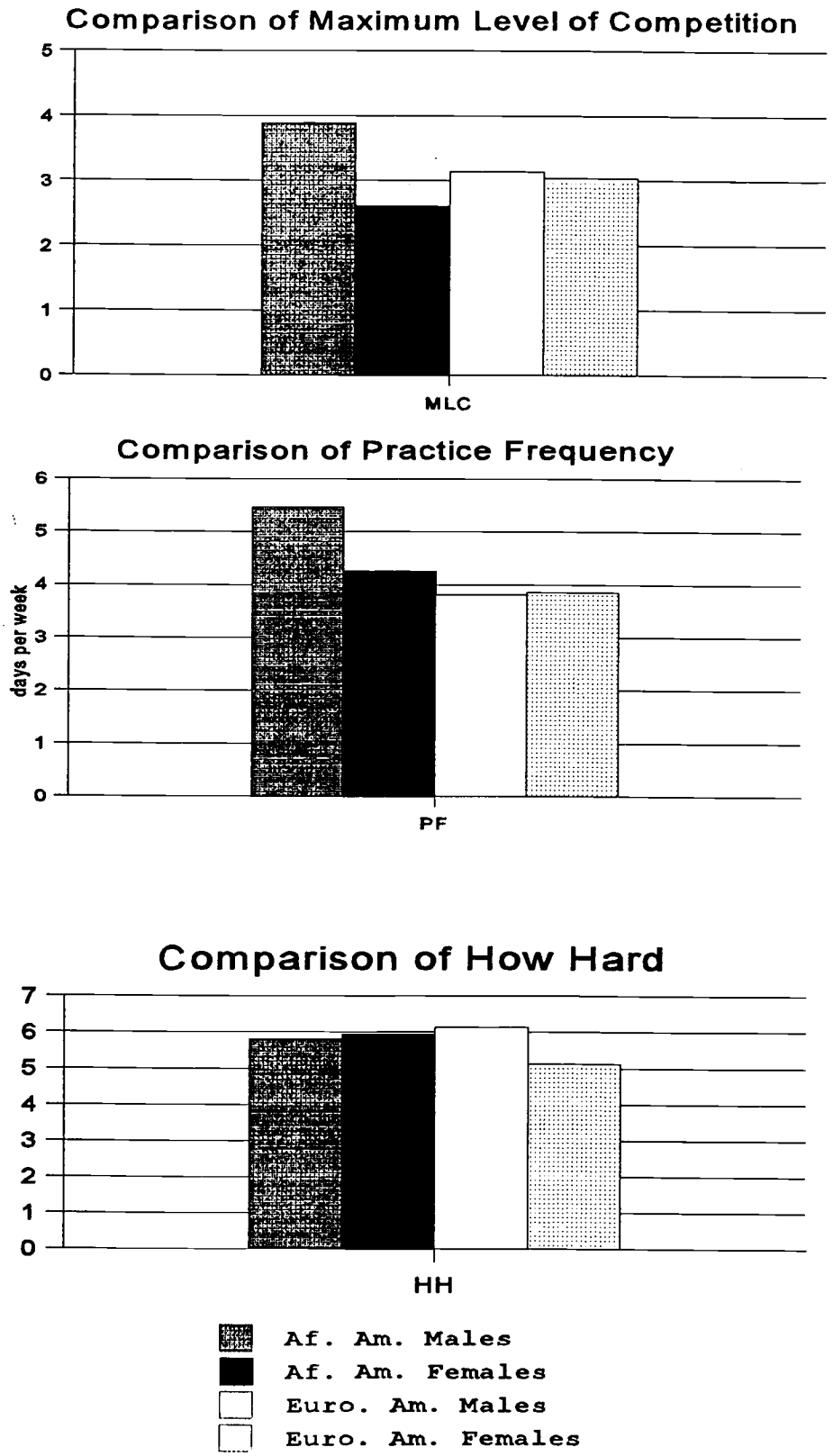
(* P<.05)

Figure 1. Subjects perceived most competent sport.



bsb=baseball/softball
bkb=basketball
bcy=bicycle riding
bwl=bowling
ftb=football
glf=golf
gym=gymnastics
hck=hockey
r/j=running/jogging
scr=soccer
swm=swimming
ten=tennis
trk=track and field
vlb=volleyball
wlk=walking
oth=other

Figure 2


Comparison of Maximum Level of Competition
5
4
3
2
1
0
MLC
Comparison of Practice Frequency
6
5
4
3
2
1
0
days per week
PF
Comparison of How Hard
7
6
5
4
3
2
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HH
Af. Am. Males
Af. Am. Females
Euro. Am. Males
Euro. Am. Females

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