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ABSTRACT

The papers in this collection explore the implications of Title IX in terms of educational equity, analyze sex-related differences between males and females, and outline some strategies for equality in physical education and athletics. Marjorie Blaufarb discusses the physical and psychological inequities that exist in the traditional approach to physical education which provides for separate programs for boys and girls. Dorothy Harris reviews the state of research on physiological sex differences and emphasizes the fact that observed differences are mediated by physical fitness levels rather than by sex. A. Mae Timer examines the requirements of Title IX regulations for physical education and athletics and suggests ways for developing supportive measures necessary to make compliance meaningful. Her paper holds that an understanding of the legal aspects of Title IX and well designed strategies for its implementation may help us to reevaluate current practices and to ascertain whether they contribute to the perpetuation of sex discrimination. (Author/EB)

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PHYSICAL EDUCATION AND ATHLETICS
Strategies for Meeting Title IX Requirements

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Introduction

The following papers are the products of a conference on Title IX and physical education sponsored by the ERIC Clearinghouse on Urban Education and the Sex Desegregation Assistance Center, Institute for Urban and Minority Education, Teachers College, Columbia University in June 1979. The conference was designed to assist education personnel in identifying and recognizing the problems and issues inherent in the implementation of Title IX in physical education and athletics. Three themes are characterized in the papers: 1) an exploration of the implications of Title IX as a question of educational equity, 2) an analysis of sex-related differences between males and females, 3) some innovative strategies for equality in physical education and athletics.

Although the regulations for achieving sex equity in physical education constitute only a brief portion of the Title IX-Education Amendments of 1972 (followed by the implementing regulations in 1975), it is this particular section that has attracted most public attention and has led to the greatest resistance in the educational community. Title IX provides that

> No person . . . shall, on the basis of sex, be excluded from participation in, be denied the benefits, or be subjected to discrimination under any education programs or activity receiving Federal financial assistance.

Prior to 1972, most secondary and post-secondary school physical education programs were segregated by sex. Although most elementary school sports have been co-ed for years, there has generally been a two-program approach to physical education in higher education. Marjorie Blaufarb, Director of Public Affairs for the American Alliance for Health, Physical Education, Recreation and Dance, Washington, D.C., examines the physical and psychological inequities that this dual program created. In her judgment, the issues of Title IX and physical education are basic issues of equality of opportunity, ensuring that all students, no matter what their physical, emotional, psychological, or genetic makeup, will have opportunities to become competent in physical activity. She believes that the "separate but equal" concept in physical education and athletics produces the same results as those found in race segregation. Because physical education is an integral part of total education it is her contention that physical education programs must be designed so that both sexes will have equal access.

Perhaps the most quoted explanations and arguments offered to explain segregated physical education and athletic programs have been those which have claimed that biological differences between the sexes make such separations necessary. Female fragility, biological and physical differences in strength, menstrual taboos, superior male motor performance are some of the explanations which have been used to support separate physical education and athletic programs. Dorothy Harris, Director of the Center for Women and Sports, Pennsylvania State University, University Park, Pa., reviews the state of the research on physiological sex differences. A resounding theme in her paper is the fact that observed differences are mediated by physical fitness levels rather than by sex. "Females respond to training and conditioning in the same way as males. It appears that while males and females do differ in many respects in terms of their response to vigorous exercise, there are more differences within a sex than between the sexes."

A. Mae Timer, Chief of the N.Y. State Board of Education Division of Physical Education, Albany, N.Y., examines the requirements of the Title IX regulation for physical education and athletics and suggests avenues for developing supportive measures necessary to make compliance meaningful. Her paper is based on the premise that an understanding of the legal aspects of Title IX and well designed strategies for implementation of Title IX may be used as vehicles to re-evaluate the current practices of these programs and to ascertain whether these practices contribute overtly or covertly to the perpetuation of discrimination on the basis of sex.

The overwhelming positive reaction expressed by the participants to the ideas and views of the speakers suggested the need for further dissemination of the information as a means of providing a lucid and candid base for Title IX implementation as it relates to physical education and athletics.

JEROME WRIGHT, *Teachers College*
Conference Coordinator

Athletic Sports and Title IX

Marjorie Blaufarb
American Alliance for Health,
Physical Education, Recreation and Dance

Title IX of the Education Amendments of 1972 affects all areas of education, including vocational education, industrial arts, home economics, and physical education. With regard to physical education the Title IX regulations state that all instruction in physical education must take place in a sex-integrated class. When the required degree of skill is reached the students may begin to play a particular sport; if it is one which includes a certain degree of physical contact, the teacher may, if (s)he desires, separate the classes by sex. Nowhere is it stated that in order to learn to play tackle football girls must tackle boys, nor that in a wrestling class, the young women who participate must wrestle with the male students. The requirement for coeducational physical education deals with equality of opportunity. It is based on an idea, confirmed by observation of results, that sex-separate programs do not provide equality of opportunity.

Why then did Title IX, which was not particularly designed to deal with sports problems, cause such a furor in the athletic establishment? I believe that in approaching this subject we must first look at the special place that sports hold in our culture.

Howard Slusher has a well developed theory in which he likens sports to religion. Other thinkers have mentioned its likeness to certain political systems and activities; still others see sports, particularly football, as a miniature of the business world. Whichever particular ideology one likes best, it is apparent that sports are most important in American life. Through participation in sports, men have made friends, become a part of the "old-boy" network, and gained considerable riches.

The ritualistic place occupied in our culture by interscholastic sports, intercollegiate athletics, and professional sports until recently excluded all but a few women. The near total exclusion of girls from organized team sports seems to have resulted from the organization of the class structure in this and other countries. The role that wives and daughters of the wealthier classes played as symbols of conspicuous consumption relegated them to an ornamental position in life. This view of their position made it necessary for them to be protected from exposure to the competitive aspects of sports, the physical dangers and the possibility of coarsening their faces or figures by repeated vigorous exercise.

Some of the same thinking that excluded the feminine sex from athletics may have operated in the structuring of physical education programs. Since boys were going to be involved and interested in athletics from a fairly early age it was considered necessary to teach them sports skills which were "unnecessary" for girls. The result was that programs for boys often stressed team sports skills almost exclusively and classes degenerated largely into extra coaching time for the varsity and junior varsity teams. School physical education programs for girls, on the other hand, focused on calisthenics and the more "ladylike" sports such as lawn tennis, badminton, and archery for the real tomboys.

Even when the results have not been so radically divergent, the fact is that segregated physical education programs have produced the same problems and ill effects found in other kinds of segregation. For example, after the Supreme Court decision in *Brown* vs. *Topeka* in 1954, schools in some areas of the country were racially integrated but sexually segregated. Research conducted in some parishes of Louisiana which had boys' high schools and girls' high schools has shown that the girls received an inferior education. This is not to say that girls' schools and women's departments have not tried to do a good job in their programs. Actually, in certain specific areas the girls have been better served than the boys. But the whole idea is that all should be served equally well.

A program in physical education, as an integral part of the total educational process, contributes to the development of the individual through the natural medium of physical activity—human movement. In it regular instruction and practice are provided in a variety of physical activities (leading up to and including athletics) that are suitable to the age, ability, and needs of the students and that contribute to the development of an adequate level of physical fitness. As such, physical education is a good which should be equally available to all—regardless of sex.

Yet all the furor about Title IX does not seem to center on the issue of coeducational physical education programs. Many schools had been progressing toward coeducational offerings in physical education for some years prior to the Title IX mandate. The trend toward electives had fostered this and the more recent focus on competency-based education helped it along still further. The heart of the matter really seems to be the issue of interscholastic and intercollegiate athletics.

At this point it is necessary to re-emphasize the fact that athletics and sports are educationally valuable—not because of the amount of money they raise in gate fees or because of their appeal to alumni and the national prominence they may give to an institution—but because they are part of the educational program as a whole.

If revenue producing sports are exempted from the regulations governing Title IX, i.e., if they are not perceived as part of the educational process, then perhaps those of us who care for equality of opportunity should begin a movement to get teams moved from the campuses and let them become in reality what they sometimes seem

to be already: farm teams for the professional sports arena.

Aside from the philosophical issue, there is also an economic factor that looms large in intercollegiate athletics. The recipient of an athletic scholarship receives the equivalent of thousands of dollars over four or five years and a valuable opportunity for visibility and advancement. Until quite recently this opportunity for financial aid and consequent upward mobility was limited to men. What Title IX did was to point out and attempt to change those aspects of the system which tended to exclude women from these same benefits.

I can think of few rights more basic in their application to the female half of the population than the opportunity for equality in education, including the opportunity to participate in the special stipends available for athletic participation at a certain level and the resulting visibility and job opportunities that go along with it.

Further, the concept of equality includes the opportunity to play in those sports one enjoys at the level of skill one has attained or can attain with the right kind of coaching. This means, and it is spelled out in Title IX regulations, that the same quality of coaching must be made available to both sexes; the same quality of equipment, facilities and supplies must be provided; and opportunities for competition must be available.

This final item was especially necessary because until recently, high school athletic associations did not provide similar opportunities for competition for both sexes. If the Office of Civil Rights' proposed policies for intercollegiate athletics go into effect, an equal per capita expenditure standard would be used to assess compliance. This does not mean that if a high school spends $50,000 on boys' athletics, $50,000 must be spent on girls' sports, any more than it means that a large state university with a total budget of $5 million for men's intercollegiates must find the same amount of money for the women's program. It does mean that the same amount of money must be spent on each individual who competes.

So, contrary to what many people think and say, what constitutes equality in athletic sports is simple and can be reduced to a few common sense factors: equality of opportunity to participate, accompanied by equal treatment in coaching, scholarships, facilities available, medical attention, insurance, and travel. And both sexes must have equal opportunities to state their interests.

It is impossible to emphasize too strongly that we must be openminded and approach both the athletic programs and the physical education instructional program with the desire to succeed and with the belief that success is possible. This is the only way we can bring our programs into the last quarter of this century.

Rita Bornstein of the Florida State Department of Education has said, "Educators must accept the responsibility for preparing individuals—regardless of sex—intellectually, socially, and physically for creative, rewarding, and self-sufficient lives of work and leisure. The Title IX mandate ensures that students and employees will be afforded every opportunity for self-discovery and fulfillment in an atmosphere unprejudiced by gender distinctions. Nothing more, nothing less."

Our attitude as educators is most important in the creation of such an atmosphere. Title IX need not be seen as a threat, but rather as an opportunity to fulfill the basic charge of American education—to provide the skills, training and experience that will allow each individual to become all that he or she can be.

Physiological Differences Between the Sexes: Exploring Old Myths*

Dorothy Harris
Pennsylvania State University

Females respond and adapt to exercise and physical training in much the same manner as males in spite of the fact that they are generally five inches shorter, thirty to forty pounds lighter and 10 percent fatter on the average when compared to males. Scientific efforts to determine the quantitative and qualitative differences in response to physical training of males and females have, for the most part, demonstrated that the observed differences are mediated by physical fitness levels rather than by sex. That is, the differences that have been observed are influenced more by factors other than one's biological sex. In all characteristics there are more differences within a sex than between the two sexes when physical fitness levels are controlled.

Even though the female responds to exercise in a fashion similar to that of the male, she performs at a substantially lower level than he does in almost all athletic events. As an example, in running (based on 1977 records) the percentage of difference in performance was 9.62 in the 100 meters, 11.02 in the 400 meters, 13.0 in the 1,000 meters, 15.3 in the 2,000 meters, 18.15 in the 10,000 meters and 17.0 in the marathon. Similar differences can be observed in swimming with even greater differences determined in the weight events in track and field. Are these differences truly biological ones? Are they the result of differences in training and coaching? Are they reflective of social and cultural restrictions and expectations placed on the female? Is the female in fact an inferior athlete when compared to the male? Or is Ashley Montague correct in his discussion of *The Natural Superiority of Women*? The following comments should help clarify these questions.

First, when discussing performance in athletics, one has to accept the fact that smaller, slower, weaker individuals are discriminated against when it comes to being selected for sport performance. This fact applies to both males and females. Accepting that, one can envision a continuum from the most "masculine" to the most "feminine" on physical characteristics. There is a great deal of overlappage in the middle of this continuum with many females being taller, bigger, stronger, faster and so on than many of the males. Since sport is selective of those with these characteristics, more females who are successful in sport fall somewhere near the middle of the continuum. This has served to perpetuate the notion that females who participate in sport are more masculine and has been one of the greatest misconceptions about females in sport. For much too long it has been assumed that the female who is large, strong, and powerful and who is successful in putting the shot got to be strong and powerful as a result of putting the shot rather than the other way around. That is, she is successful in putting the shot because she was genetically endowed with the physical characteristics necessary for success in this event. If the fact were that participation in sport altered one's physical characteristics rather than that one is successful in certain sports because of physical endowments, all those individuals who wish to be taller should play basketball! All basketball players are tall; therefore, playing basketball must make one grow taller! This and similar types of illogical reasoning have contributed to the misconceptions and ignorance about female athletes.

Only about 20 percent of body types are represented among the Olympic athletes, male or female. Generally there is less difference in the body types of males and females who excel in the same athletic events than there is between males and females or between males who are selected for sports participation versus those who are eliminated. In other words, high jumpers, male or female, who use the Fosbury flop will be quite similar in body type. Much the same can be said about the most successful and effective basketball players, volleyball spikers, shot putters, and so on.

The female matures sooner than the male; twenty weeks after conception she is two to three weeks more mature, and at birth she may be as much as 20 weeks ahead of the male's maturation. This is due to the fact that the male must wait for "something to be added" or the Y chromosome to indicate that the gonads will be testicles. These cells must mature and multiply sufficiently to begin to produce androgen (the male hormone) which will then begin to differentiate to male development. This lag behind the female in development is not closed until the male is approximately 20 years of age. There is great variation in individual maturation rates, and this variation is most obvious in the male. Verne Siedenfelt, University of Minnesota, reported that there was as much as 40 months difference in maturation among six-year-old boys and 72 months difference in thirteen-year-old boys. The wide variation in maturation is not observed among females, most of whom have reached their mature height and growth soon after the onset of menarche. One cannot recruit a girl from high school for basketball and assume that she will grow several more inches while in college; however, most males will continue to grow during those years.

During late childhood the female may be bigger than her

*Portions of this paper were presented at the Sports Medicine Symposium, Hahnemann Medical School, Philadelphia, Sept. 10-14, 1978 and at the National Conference on Aerobic Exercise, Oral Roberts University, Tulsa, Oklahoma, Oct. 12-19, 1978.

same aged male peer as a result of reaching her growth spurt sooner. During this time she may be faster and stronger and outperform boys in athletic feats provided she has had the opportunity to learn skills and has been reinforced in a positive manner for her performance and involvement. Once physical maturity has been reached, there are average differences between males and females that have specific implications for athletic performance.

Males, because they mature later, grow longer and are generally bigger than females. The higher levels of androgens also influence development. Males have longer extremities in relationship to their trunk length, broader shoulders, greater muscle development in the shoulder area, and less body fat. Higher estrogen (female hormone) levels in the female close off the epiphyses of the long bones sooner, resulting in shorter height. Body fat is increased with the result that the female is ten percent fatter than the male. Her hips are broader in relation to her shoulders, she has less muscle mass in the shoulder girdle, and she tends to have a longer trunk in relation to length of leg. Body type is also influenced by genetics, nutrition, exercise, and other factors in addition to those of the endocrine system.

Implications of Differences for Sports Performance

As indicated, there are average differences between males and females that have specific implications for sports performance. Jack Wilmore and Harmon Brown examined 78 female distance runners and found that 12 had less than 10 percent body fat, 32 less than the 15 percent of the average college male. These trained women were significantly less fat than their untrained female peers who had approximately 25 percent body fat. While low body fat may be a genetic endowment, high intensity endurance type exercise is also a significant factor. It appears that females can approach relative values of male athletes with strenuous training. It is also appears that the average fat values of untrained females are higher than they should be; regular exercise could reduce those stores.

A greater percent of body fat in the female provides her with advantages in some activities. She is more buoyant in water and has better insulation in cold temperatures. This combined advantage has allowed females to better the world records in distance open-water swimming. A young Canadian woman swam the English Channel round trip in the fall of 1977 and knocked ten hours off the males' record. Joan Ullyot, a medical doctor and marathoner, has said that women "run off their fat," and that the additional fat that women have provides them with extra fuel for energy. Women may be able to use their fat stores more efficiently than males. It is possible that they burn a higher percentage of fat mixed with glycogen; since glycogen lasts longer they feel better after running a marathon than do males. While the biochemical mechanisms have not been isolated, there may be a difference in the adaptation to strenuous endurance type exercise between males and females.

Strength differences between males and females have traditionally been acknowledged. However, Dr. Jack Wilmore has stated that leg strength is nearly identical in the two sexes. When expressed relative to body size it is identical. In fact, when expressed relative to lean body mass, the females are slightly stronger! The difference between males and females in strength is greatest in the shoulders and somewhat less in the the trunk, while leg strength appears to be similar. The female responds to strength training in much the same manner as the male in terms of percent gained. While resistive weight training produces large gains in strength in the female, concomitant gains in muscle bulk do not result. In other words, the female will not develop the muscle bulk evident in the male even though she may begin gaining the same percent in strength. In the fall of 1977, a 114-pound female broke the males' lift record in that weight-class by lifting 225 pounds. There is much to learn about about both males and females regarding factors related to strength, strength development, and maximizing one's potential development in strength.

Efforts to determine qualitative and quantitative differences in the aerobic capacity of males and females have demonstrated that the female has a maximal oxygen uptake that is less than that of the male. In general, the level of physical fitness overrides the effect of sex. Female cross country skiers who are among the most fit women tested had an average of 55 ml/kg min while the average male had 44 ml/kg min. The ml/kg min indicates how much oxygen is being used per pound of body weight each minute. Female athletes have higher oxygen carrying capacity than untrained male peers. While athletic males are noticeably superior, trained females are 25 percent more efficient than untrained males. Body composition and level of training generally explain the observed differences between males and females. Whether the lean body mass of the female can approach that of the male with the same training is a moot point. The female must deliver oxygen to her fat tissue as well as her working muscle as part of her work load; she cannot leave her fat tissue in the locker room!

In addition to body composition and level of training, other factors influence the maximal oxygen uptake. The female generally has a smaller heart, lungs, chest muscles, blood volume, etc. She compensates for these average differences with the ability to increase her heart rate to levels higher than that observed in most males. Another significant difference is observed in the percentage of hemoglobin, with the female having ten percent less than the male. No significant differences between males and females are observed until puberty. The assumption has been that the female's hemoglobin is reduced through blood loss with menstruation. However, Dr. David Lamb of the University of Toledo has reported a 20 percent increase in hemoglobin in castrated male animals when testosterone was injected and has concluded that testosterone promoted red blood cell production. It appears that males significantly increase their hemoglobin as testosterone increases and that females do not necessarily reduce hemoglobin through normal menstruation. However, males have approximately one million more red cells than females and can store 850 mg of iron as compared to females' 250 mg. Compensatory factors do not appear to adjust for this difference in males and females; therefore, some type of iron supplement is frequently recommended for the female athlete.

Menstruation and Sports

Menstruation and factors relating to that process have probably produced more concern and misinformation than any other difference in males and females. Females have made and broken their own personal best performances at

all phases of the menstrual cycle. It appears that there is no decrement in performance for females who have made a serious commitment to sport pursuits; however, it is possible that the athletic population has been biased toward women who experience no impairments. Those who do experience impairments may have been systematically eliminated from serious sports pursuits.

During the 70s, awareness of another pattern of response in females who are training strenuously has developed. It has been estimated that perhaps 15 to 20 percent experience secondary amenorrhea or cessation of menstruation. There are several theories attempting to explain this response. The percentage of body fat is the most often expressed rationale. Joan Ullyot, M.D., says that it is nature's way of protecting the female. Because of reduced body fat, for whatever reasons (starvation, disease, exercise, etc.) the body does not have sufficient fat storage to support a pregnancy so the system "shuts down." Dr. Rose Frisch of Harvard supports this theory to some extent. She developed a method for predicting age for onset of menarche by charting the height and weight of girls every year during the age span of nine to thirteen years. She concluded that the ratio of lean body weight to fat is an important determinant of sexual maturation in the female. However, this relationship is not a cause-effect one since increasing levels of estrogen cause the female to begin to store body fat as well as triggering the menstrual cycle. In essence, body fat and menarche are both caused by elevating levels of estrogen; therefore, increased body fat is not the cause of the onset of menarche. They coincide.

There are several situations in which a significant decrease in body fat does appear to be related to secondary amenorrhea. Starvation, anorexia nervosa, and a drastic reduction in caloric intake resulting in a significant weight loss over a short period of time produce secondary amenorrhea. At the same time, being obese can also cause cessation of menstruation. Other stressful situations such as being in a concentration camp, entering college, experiencing the loss of a loved one, divorce, fear of failure, etc., can also alter the menstrual cycle.

Since reduction of body fat does not hold along all cases of secondary amenorrhea reported, other explanations have to be explored. Females, who are on the same training program, who have no significant differences in percent of body fat, and who have not lost a significant amount of body fat can be on the same track team. Some of these women will experience secondary amenorrhea while others will not. Individual differences in response to stress may be the explanation. Why some endure stress without any noticeable changes while others do not is currently a medical mystery. As Hans Selye of Montreal suggests, "stress is stress." This may be the case whether that stress is exercise, reduction of body fat in a short period of time, emotional stress, competitive stress, or whatever. There is need to examine a whole array of responses to understand why secondary amenorrhea occurs in some women.

The magnitude of the problem has not actually been established. It appears that several different patterns occur. First, those who have had normal cycles, then experience secondary amenorrhea with an increase in physical training and exercise, generally resume normal cycles with detraining. In many cases individuals who did not menstruate for two or more years stopped hard training and resumed their cycles followed by normal pregnancies and deliveries of healthy babies.

Secondly, some women experiencing cessation of menstruation did not alter their training programs or replace the lost fat tissue, yet their cycles reappeared with time. This would suggest that the body adapted to the stresses placed upon it and accommodated to them without long-term endocrine alteration. A 1978 survey study of runners completed at Boulder, Colorado suggests that the percentage of those experiencing secondary amenorrhea increases significantly as mileage increases. Running 60 or more miles a week may be the critical factor. At this point no one knows for sure whether exercise per se or low body fat causes the condition. As Dr. John Marshall, co-chairman of the N.Y. Medical Society's Committee on the Medical Aspects of Sports said, "The body fat percentage is not the cause; all kinds of things we don't know about the delicate balance of hormones have an effect. It may have to do with the kind of training, it may be psychological." Certainly, the medical profession does not know.

In response to an article written on the topic for *WomenSports* nearly 200 letters relating case studies were received. The Medical treatment and guesswork that some women were subjected to, not to mention the almost total disregard of the possibility that vigorous exercise had anything to do with their secondary amenorrhea, was appalling. One woman spent six years with different physicians experimenting with various tests and theories; doctors subjected her to everything from brain scans, injections of hormones, oral hormone medication, to exploratory surgery, and finally came to the conclusion that she was "having identity problems and denying her femininity" since nothing showed up that was irregular or abnormal beyond the fact that she did not menstruate!

While alterations and changes in the female cycle are obvious, males may have similar alterations and not even know about them. A little known Finnish study conducted in 1973 and reported in the 1976 *British Journal of Steroid Biochemistry* involved hormonal assays in males before and after they ran a marathon. Statistically significant changes were observed in several hormones which impact on male sexuality. A rise or fall of their levels can adversely affect fertility, both through decreasing sex drives and lowering sperm count. Almost no one has examined this relationship. Dr. Mona Shangold, physician-endocrinologist, has suggested that "there may be a relationship between reproductive problems and chronic exercise such as extensive training done by long-distance runners." Further, she has stated that if there is a correlation between very low body fat levels and fertility problems, this may mean that runners of both sexes will have to decrease their running if they wish to have children: for women, until their cycles return; for men, who knows? Shangold has suggested that a male with a low sperm count who wishes to restore it to normal may have to stop running for 74 days because it takes that long for sperm to mature.

To date there is nothing in the literature to support the belief that there is a high infertility rate among runners, male or female. The problem may be on a very small scale indeed because of great individual differences and responses to exercise and stress. The cardiovascular, psychological, and other benefits of running far outweigh potential adverse effects on reproduction. Further, there is no evidence to suggest that any reproductive problems that develop while training are irreversible.

Another even less-researched issue has to do with the

possibility of strenuous exercise delaying the onset of menarche. The *New York Times* quoted Dr. Jack Wilmore, as saying, "We know there is a tendency for girls who participate in heavy competition before menarche to have onset delayed until they are seventeen or eighteen; but we do not know whether that is good or bad." The average age of onset is between twelve and thirteen years; however, beginning menstruation at age fifteen or sixteen is still considered normal. At a discussion of the issue at the American College of Sports Medicine meeting in Chicago in May, 1977, physicians could not agree as to the age at which one should become concerned if the female has not begun to menstruate. At this point it is not known whether or not strenuous training prior to puberty can be detrimental to normal development of the endocrine or reproductive systems or not. No one knows whether it is possible to delay development and then make up for that delay with a decrease in training routine.

Apparently there is little reason to drastically alter one's exercise pattern with pregnancy if that pattern has been a part of one's lifestyle for some time. There are many case studies where pregnant athletes have accomplished all sorts of athletic feats during the early stages of their pregnancies. Lynn Blackstone, during her ninth month, ran twice around Central Park's reservoir (a distance of approximately three miles) each evening. She finished 58th out of 102 women in the 1977 Boston Marathon. Mary Jones ran a half-marathon race at the Dallas White Rock Marathon in two hours and five minutes in December, 1976, when she was nearly nine months pregnant. She returned to marathon running ten weeks after giving birth, saying "Pregnancy is not a disease. I listened to my body and let it dictate what I could do and I'm healthier for it." Many others report the same experience. Trina Hosmer, U.S. Olympic cross-country skier in 1972, ran four miles in two hours before her first child was born. She barely had time to get changed and to the hospital for delivery. While Trina may be exceptional, there is no evidence that regular exercise and running during pregnancy has to be discontinued if the female is used to regular exercise.

Differences in Physical Responses to Exercise

Osteoporosis is far more prevalent among women than men; this may be the case for several reasons. First, growing girls are not generally socialized to participate in vigorous exercise during those years when bones are developing and growing so that stresses placed on them during this time can result in stronger, more dense bones. Secondly, estrogen levels decrease with aging and onset of menopause and the effect that estrogen has in stimulating bone maintenance is lost to some degree. Thirdly, females do not exercise enough throughout their lives to stimulate bone maintenance. Running, jogging, or other types of regular exercise are especially important for aging women, yet the emphasis has been on males getting exercise. The harmful effects of inactivity on bone tissue are well documented; long-term bed rest can lead to early osteoporosis. Even bones that are in a plaster cast for a short time tend to become lighter due to mineral loss. The astronauts experienced alteration in bone metabolism during periods of weightlessness and physical confinement.

On the other hand, exercise stimulates bone growth and maintenance; one has only to examine his of her dominant arm to compare the difference between that one and the lesser used one. Prevention and/or delay of osteoporosis appears to be related to vigorous exercise during the growing years to maximize the skeletal development, and then continued exercise throughout one's lifetime with some attention paid to the amount of calcium in the diet.

Females may be more or less efficient in heat dissipation than the male, depending on how the research is interpreted. Studies show that males do sweat sooner and more profusely than females in response to increased body temperatures. However, males may be prolific and wasteful sweaters. The female may adjust her sweat rate more efficiently; that is, she can compensate for the observed differences. On the average, a female has more sweat glands than a male. Her body temperature generally gets two to three degrees warmer than that of the male's before she begins to sweat. Females sweat less than males and can accomplish the same work loads with less water loss. Both males and females acclimatize to work or exercise in heat; however, females are able to do so without increasing their sweat rates. There may be some explanations that have not been examined. First, higher levels of estrogen in females tend to provide greater vascularization; therefore, the female may be able to get more blood to the surface of the body for cooling which would delay the sweating process. This fact may allow her to compensate for her additional fat insulation and smaller body surface. Secondly, since the female has more active sweat glands than the male, her sweat is distributed more evenly over her body for maximal cooling by evaporation, again compensating for her smaller body surface.

While the male sweats sooner, the female may sweat better! Chris Wells of Arizona State University, who has researched heat environments, has suggested that women may regulate their body temperature more effectively than males. Perhaps it is time to examine this response more carefully and stop perpetuating the notion that females may be less effective in heat dissipation. Once the next generation is socialized out of the notion that men sweat, gentlemen perspire, and ladies glow, we may observe a different response to heat stress!

When training and conditioning are equal, there appears to be no difference in injury predisposition between males and females. Statistics suggest that females are more vulnerable to leg and knee injuries. Again, the level of physical conditioning and fitness is more important than one's sex with regard to injury predisposition. As increasing emphasis is placed on conditioning of female athletes, the injury statistics are associated more with the type of sport played than with whether one is male or female. In short, individuals who play basketball will experience similar types and rates of injuries that will not be sex-linked. A great deal of research is needed before full understanding and insight is gained into just what differences do exist between the response of males and females to long-term strenuous exercise.

Conclusion

In summary, it appears that while males and females do differ in many respects in terms of their response to vigorous exercise, there are more differences within a sex than between the sexes. The level of physical fitness mediates the difference to a greater degree than sex. When differences are observed in trained males and females, the response in most cases is one of adapting and conditioning

to chronic exercise in a different manner. In many situations the female adapts in such a fashion that she compensates for physiological differences between herself and her male counterpart. Or, one could say that the male compensates when he differs from his female counterpart, as in the case of his having to sweat sooner in order to cool his body because he cannot get as much blood to the surface as she can.

During the 1970s there has been enough scientific evidence generated to counter the misconceptions, ignorance, old wives' tales and male chauvinism that have existed for generations and prevented full participation of females in sport and physical activity. In spite of the greater knowledge and understanding, there are still many who are unwilling to accept what the female's physical capabilities may be or to accept that there are some differences that might have implications for performance in tasks where strength, speed, and the ability to generate power are required. The fact that the members of the International Olympic Committee (all males who are well into their years) have refused to sanction a 3,000 meter race for women for the 1980 Olympics because they do not believe that sufficient numbers of females are capable of performing in that event is indicative of the ignorance that persists. Literally thousands of women throughout the world are running marathons and other long distance races without any detrimental effects. The recent court case in Rhode Island involving the 19-year-old, six-foot-tall male who was suing the High School Athletic League for the right to play on the girls' volleyball team is another example of lack of understanding. At the initial court hearing the judge ruled in favor of the boy.

Changing attitudes through evidence and education takes a long time. The impact of Title IX has speeded up that process considerably; however, there is still much to be done. Conferences like this one contribute significantly to the process of education and understanding. There is absolutely no adequate rationale to support the notion that males need more and better programs in sports and physical activity than females. Nor is there any rationale to support the notion that females' participation produces detrimental effects physically and/or psychologically. At this point in time it appears that the "sauce for the gander is good for the goose." The female gains as many benefits and pleasures in having a healthy, fit body as the male. Certainly the joys, challenges, and satisfactions, as well as the disappointments of sports participation are not sex-linked. From everything in the literature, the positive response of the female far outweighs any of the unfounded causes for concern about her femininity and well-being.

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Implementing Title IX in Physical Education and Athletics

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Title IX has forced educators to look critically at certain practices which have been traditional in our field. It has been interesting to observe the polarization that responses to Title IX have created. At one extreme are those who refuse to admit that there have ever been discriminatory practices in physical education and athletics and, therefore, find the philosophy behind Title IX to be completely irrelevant. The idea of sex-integrated classes or of equal access to classes for both sexes thus becomes an object of ridicule rather than a meaningful issue. At the other extreme are those who are convinced that blatant discrimination has occurred throughout the history of physical education and athletics, and that radical action must be immediately taken. Somewhere between the solutions or non-solutions offered by these two extremes lies innovative program reform for physical education and athletics.

Implementation

School administrators have the responsibility of establishing the policies, parameters, and structures for reinforcing the principle of equal access to educational activities and programs. The major adjustment to and moral success with the implementation of Title IX rests with the staff.

Taking this as a focus, I am assuming that as educators we have completed the first year requirements of Title IX. Specifically, these include:

1. the notification policy
2. the grievance procedure
3. the compliance coordinator position
4. the self-evaluation report
5. the remedial action plans
6. the filing of the HEW Compliance Confirmation form.

What has been the quality of our compliance with these requirements? Have we faced up to all the possibilities of adjustment within classes to a sex-integrated situation? Or, conversely, are we creating needless barriers to the enjoyment of activities? Are we waiting for sex discrimination legislation to be changed?

Obviously, the law which prohibits discrimination on the basis of one's sex is not going to be drastically changed or repealed. Several amendments to Title IX have already been proposed. These amendments, which would have seriously affected physical education and athletics, have been defeated in the U.S. Congress. The Regulations as they now exist and are published in the July 21, 1975 *Final Title IX Regulation Implementing Education Amendments of 1972* still remain law.

Title IX is not the kind of law that can be implemented merely by seeing that all the first year requirements are completed. If the principle of Title IX is to be truly normative, something that is integrated into every aspect of the school-community system, it must have the administration to create the mechanisms, the structure, and the policies for a process that will allow for continuous self-assessment. These actions are critically necessary if reforms are to be made that will eliminate the possibility of sex discrimination in education.

Problem Areas

What are some of the current problems? The implementation problems in the area of physical education can be categorized under the following headings:

1. Communication
2. Curriculum
3. Scheduling
4. Staffing
5. Coaching
6. Athletics

The first problem is that of communication. When they found that Suzy and Johnny were now in "gym" together, many parents, students, and even teachers were horrified. Basically, parents who were concerned for the safety of the youngsters found it difficult to accept a togetherness which differed from their own "gym" days. Students and teachers were often unprepared for the drastic change they encountered. Some schools did communicate but did so in a negative fashion. They informed people with statements like, "this is what women's lib wants—this is State law—this is Federal law—this is equality—if you don't like it, write to your Congressman." Communications of this nature served only to heighten already confused and negative feelings about changes that parents and students knew little, if anything, about.

In the area of curriculum, implementation of Title IX raises the question of how those activities which have formerly been designed for girls or for boys can now be combined to challenge and benefit boys and girls together in the same class with the same teacher. What is happening in some districts is simply that the boys' program has become the class program for girls and boys. In other districts, it has been suggested that only contact sports be taught; or that all sports be designated contact sports, thus eliminating the need to integrate the sexes during class instruction.

Many of the greatest abuses are found in the area of scheduling. Discrimination cannot be ended by scheduling 175-200 students in one big gym or field which can be divided into four teaching stations. This simplistic procedure may be easy to schedule, but it creates a nightmare for teachers, provides a disservice to students, and makes a farce of sex-integrated classes. The "circus-like atmos-

phere" gives the illusion of sex-integrated classes, but is often only a way of redistributing students once again on the basis of sex.

Staffing poses another problem in the implementation of Title IX. Many teachers are voicing concerns over their competencies in teaching certain activities for which they were not prepared. Inservice education is critically needed.

The coaching problem involves the issues of equal pay for equal work, the determination of criteria for coaching salaries that are legitimate, and the availability of qualified coaches. With the tremendous growth in the area of athletics, qualified coaches are hard to find. Further, redistribution of funds, facilities, and equipment has proven difficult for some administrators.

The final problem area is that of athletics. This category includes budgetary decisions regarding what gets cut and/or what gets added. The issue of girls and/or boys going to the other sex's program is directly related to differences in offerings and quality in the girls' and boys' programs.

Sex Integrated Classes and Grade Levels

The requirement that physical education classes in the elementary school be integrated presents little, if any, difficulty for grades K-4. Classes at this level have been sex-integrated for years. It has also been common practice to assign either a man or woman physical educator to these mixed classes. This presents a comfortable situation for most teachers since classes at this level are designed to teach games of low organization, rhythm and dance, and perceptual-motor activities for both girls and boys.

Starting at grade 4, however, many schools have separated students by sex because instructors begin to introduce sports skills at this level. There is no sound educational basis for sex separation, since all children should have sports skills like throwing, running, and dodging. A reason often cited for separation is that some of the sports skills being introduced at this stage are too rough or dangerous for girls. Certainly, an activity presented for class instruction that is too rough or dangerous for one sex, regardless of the sex, would be rough or dangerous for the other sex.

The magazine, *WomenSports*, reported in 1974 that: "For all but a few individuals of either sex, sport is a recreation, a part-time enthusiasm, a way of feeling good." This quote offers an interesting perspective that may provide guidance in structuring class instruction.

The typical student is not enrolled in physical education classes to become an accomplished athlete. He or she is concerned with acquiring basic skills necessary for recreational enjoyment of an activity. Therefore, considerations of physiological and biomechanical differences which become prime factors in preparing athletes should not be of great import during class instruction. Rather, student needs and expectations should be the prime consideration in determining course goals that are appropriate to the education of the students.

Dr. Thomas E. Schaffer of the American Medical Association further reminds us that, while there are very significant sex-related differences between males and females, it should be borne in mind that there are undoubtedly greater differences between the 3rd and the 97th percentile in each sex than there are differences between the average female and the average male in terms of physical performance.

Title IX does not presume to dictate specific philosophies or practices schools must follow; it does require that once a philosophy or practice is established, it must be applied equally regardless of sex, and that one sex should not receive more benefits than the other.

Grades 5-8

By grades 5-8, boys and girls who have been exposed to a good physical education program in grades K-4 have acquired the skills, bodily control and readiness for the more complex game design and competition that sports offer.

It is in these grades that we have, traditionally, separated the classes by sex. This undoubtedly has been because the selection of sports offered to boys were the same sports available in the interschool program. At this time coaches can start identifying the young athletes and begin the grooming process. Some say it is a time to separate the boys from the men. And, indeed, in many physical education programs of this type, a great many young men have been left out because they were not varsity material.

Professionally, we educators know that in grades 5-8 both girls and boys are developing at very different rates depending on early or late puberty. The teacher is well aware of the need to keep track of the range of abilities, sizes, and weights of individual students. This awareness was important when the teachers taught sex-segregated classes, and it is even more critical for teaching sex-integrated classes. It is the teacher's responsibility to make an assessment of each class and then determine the types of activities that fit students' readiness levels, organize the class to allow for maximum safety, and administer rules and procedures designed for participation success.

At these grade levels, physical education subject matter is generally determined by the teacher. Students are scheduled for physical education and then teachers decide what and how they are going to teach during the fall, winter, and spring. In the past, the activities selected have traditionally paralleled the interscholastic season.

Although the sexes may be segregated within the class when contact sports are being taught, it is recommended that some contact sports be modified so that they may be played by all students together. Almost all the activities which have been taught in segregated physical education classes are suitable for teaching in integrated classes.

Grades 9-12

If the class instructional program is coordinated from K-12, by the time a student reaches grade 9, he or she will have the necessary basic skills to participate in specific games, dances, aquatics, or sports activities.

Title IX makes no curricular requirements except that physical education classes may not be conducted separately on the basis of sex. Courses may be oriented to an elective-selective program that includes many single, dual, team, and carryover sports, depending on local conditions. Students may be scheduled into classes by skill level and this may result in a class being almost all of one sex. The criteria for forming classes may be varied as long as they are not based on sex and do not adversely affect members of one sex.

Once a class has been scheduled, students may be separated by sex during participation in contact sports. Title IX identified rugby, wrestling, football, basketball, boxing, and ice hockey as contact sports. Separation by sex during the instruction of isolated skills that comprise the contact sport in question is not generally necessary for

safety purposes. Further, there is nothing to prevent a teacher from modifying sports in such a way as to provide for the safety of the students. For example, international rules of basketball might be used in integrated classes. The resistance to this approach is often based on the fact that teacher-modified rules or formalized international rules are not the rules used in varsity level play.

Ultimately, it is important to remember that the desired outcomes of a good physical education program are consistent with sex-integrated physical education classes.

Suggested Procedures

What action steps can be taken to create a process that will provide continuous feedback while contributing to the implementation of Title IX both legally and morally?

Communication

1. Have meetings with the physical education staff to:
   a. discuss not just the legal requirements of Title IX, but the moral and philosophical aspects. When you come down to it, your staff members are the ones who implement Title IX. Faculty and staff attitude, behavior, and understanding are critical.
   b. discuss progress and/or changes regarding Title IX based upon your self-evaluation report.
2. Have meetings with the student body. They, too, need information about the law and its moral and societal aspects.
3. Schedule meetings with the community, the PTA, and other community service organizations. Again, the purpose would be to help people understand the reasons behind changes in the school. The physical education programs experienced by most adults in their own education were probably quite different from programs implemented as a result of Title IX. Any break with tradition generally requires clear explanation. Your discussions with community members should include safety aspects and what is being done to insure student welfare, as well as the reasons for program changes—the move to lifetime activities, to sex integrated classes, etc.

Curriculum

1. Have one or two persons in each building be responsible for receiving staff and student concerns about the implications of Title IX. These persons would also periodically review and analyze current program offerings, policies, and practices. The representatives would submit their analyses and recommendations to the Director in January and in June for final reports to the Superintendent and Board of Education.
2. Have either building or grade level teachers meet to identify the activities to be taught every quarter or season to both girls and boys. The teachers should then determine the activity appropriateness for each class situation.
3. For every different activity, the Director should have each teacher submit a report identifying: the name of the activity; the progressions used for skills and strategies; the rules to be used; and specific rules to be modified. Any other information that may be unique to a class or an activity should also be reported. This type of documentation is important in liability cases.
4. Form a committee to develop student interest surveys for class instructional activities. This survey should be compiled once a year and used to develop the following year's program. The committee may also develop the criteria for establishing priority activities.
5. The Director should also see that written building or district policy statements are developed, Board approved, and made public. These would deal directly with such issues as:
   a. the district's position on the minimal amount of time a teacher devotes directly to physical fitness during each class period;
   b. the policy regarding the minimal amounts of class time set aside for teaching skills and strategy lead-up activities prior to any "whole game" play;
   c. the position regarding class structure for maximum participation during class instruction and athletics;
   d. the position on teaching while also officiating during class instructional periods;
   e. the purposes of and differences between class instruction, intramural, and interschool activity;
   f. the district's position on teacher modifications of rules and game structures to insure safe and successful performance during class instruction;
   g. the district's position on programing provisions for different grade levels and different ability levels such as intramurals and junior high modified varsity.
6. Develop a "Required Selective-Elective Program" for grades 9 and 10. Students would be *required* to elect and select at least one activity in each of the following categories: dual, individual, team, aquatic, and dance. Lifeline types of activities should be introduced and stressed during these grades.
7. Develop a required elective program for grades 11 and 12. Students would be able to take any course as many times as it was offered. At this level, courses could be designed to help students further career interests or a vocational interest. For example, students could learn how to officiate—a skill that would lead to an earned officiating rating. Or, courses could be designed specifically for students who are interested in being leaders at camps, playgrounds, or other areas that require an understanding and knowledge of how to organize groups for safe activity, etc.
8. Identify and organize students with particular skill or leadership ability for peer-teaching and student assistance in other classes. Some students may wish to be scheduled for such service during their free periods; others may be selected right from within their scheduled physical education class. Several districts have used students from the upper grades to assist with elementary programs.

Scheduling

1. It is important for a district to have ongoing records for each activity elected by students. These records should identify total class membership and number of students by sex.
2. When classes are not scheduled on an elective or elective-selective basis, physical education issues should be scheduled in the same way as any other

class. The physical education teacher, like any other teacher in the school, should receive a class list prior to the first class meeting. Every teacher has the right to know who and how many students he/she will be responsible for during each scheduled period. This information is necessary for both planning curriculum and developing a consistent rapport with a class.

Staffing

1. Develop a procedure for identifying current staff teaching activity interests as related to grade and skill level of students.
2. Design and implement an inservice program directly related to staff needs. Perhaps each staff member could be responsible for presenting a "master lesson." If budget is no problem, outside experts can be brought in. When staff members attend conferences or workshops, hold them responsible for reporting back to the district staff new ideas, techniques, etc. Develop a plan for systematically covering one or two new activities each semester.
3. Assign staff to grade levels and activities that most reflect their capabilities and willingness to work with sex-integrated classes. If possible, schedule team teaching opportunities for staff. Also, rotate your better teachers.

Coaching

1. Establish clear policy regarding the number of days, hours, length of season, and number of scheduled and non-scheduled contests minimally expected of coaches.
2. Make available district requirements with regard to qualifications for each activity. These need not be sex related.
3. For each coach, keep professional records that identify training experiences and years of instruction.
4. Establish a written policy and practice for meeting with all the coaches involved in the girls' and boys' program to review scheduling of practice time and facilities, length of schedule, transportation arrangements, policies for student membership on teams, etc. This meeting should be held early in the school year to avoid any difficulties or discrepancies between the girls' and boys' programs.

Athletics

1. Form a group of students and staff to survey student interests. Areas of interest should be identified for intramurals and interschool programs. It is also important to know how much time per week students would be willing to devote to each sport or activity chosen.
2. Develop criteria for determining when to add or drop a program. The following are areas that should be considered: How many students are needed in order to conduct a program? What are the minimal budget requirements for the activity? What is the availability of a qualified coach? In terms of the ongoing program, what are the space and time requirements? Is the activity one that is supportive of the district's goals for the students?
3. Each year, determine district policy with regard to persons playing on athletic teams formed for the other sex. It is important to keep in mind that Title IX clearly says:

> A school may preclude men or women from participating on teams for the other sex if athletic opportunities have not been limited in the past for them, regardless of whether the sport is contact or non-contact.

Conclusion

There is no question that if physical educators really want to implement sex-integration, they can. The problems of implementing the law do not stem from lack of knowledge. Professionals know how to schedule, and they know subject matter. Professionals know about human learning and human growth and development. They know how to organize, improvise, and modify. To see the evidence for this, we have only to look at the range of skills and techniques used for teaching gifted athletes, the modifed programs based on readiness levels for the junior high students, special programs for handicapped students and other students with special needs. Physical education is a *doing* profession and professional physical educators can do—if they want to.

Perhaps the administrator's job is that of helping teachers understand the significance of having all activities and programs accessible to students regardless of their sex. They need to feel supported, especially in periods of drastic change, and they need to know that their efforts will make the difference in ending sex discrimination. It is most important for teachers to understand that the total program of physical education (class instruction and athletics) has a place for everyone and that those students with special interests and skills will have opportunities to pursue specialized learning. Students who want to acquire skills and knowledge in order to enjoy athletically oriented activities have the benefits of class instruction. Students who want greater involvement in athletics can participate in intramurals. And students who are more skilled and want more organized and highly competitive experiences have interschool possibilities. Equal opportunity provides something for every girl and boy.

No one can predict with infallible accuracy what the future will be like. Schools have the heavy burden of preparing students to live wisely and peacefully in an unknown future. In addition, society has traditionally turned to the schools to help resolve social problems. In view of the accelerated pace of changes in today's society, overcoming sex stereotyping, providing equal opportunity, and encouraging the recognition and development of individual differences not based on ethnic, racial, religious or sexual differences are even more formidable tasks.

The leadership possible in the area of physical education and athletics is very potent. Students for the most part have liked physical education and the profession has served them well. Historically very fine programs for girls and boys have been developed, separately. It is time now for the men and women in the field of physical education to work together to develop curricula for both sexes to enjoy and learn together.