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BRIERLEY LECTURE
on
COLLEGE TEACHING

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"Street Kids Can Learn to Love Scholarship"

To those of you who have come today for a glimpse into the mind and heart of a master teacher, please finish your dessert and leave quietly. I'm sad to say that Don Murray, my friend, breakfast partner and speech writer, has refused to prepare any remarks for me. My comments, regrettably, are my own.

The title of today's remarks is my way of documenting that I did not come to a love of scholarship through the process of acculturation, at least not in my youth. My parents were both born in tiny shtetls in eastern Poland. Fortunately, for them and me, they migrated to this country as young adults. I was born in 1938 and, as you can recall, Hitler invaded Poland in 1939. English was not the household language in my early childhood. There certainly were no books in our apartment, other than my father's prayer book, and the New York Times was nowhere to be found. He read the Jewish Daily Forward and, on occasion, brought home the Daily News for me to translate. To the best of my knowledge my father never attended school, at least as we know it, while my mother had limited schooling. Both of my parents spoke several languages. These were, as you might expect, survival skills for shtetl Jews in eastern Poland.

My mother valued my going to school, largely I think, because she felt it was a place where I might stay out of trouble. This, however, did not prove to be entirely correct.

The operative values in my daily life during adolescence I learned in the street, most often on the playground behind the school. It is unclear whether these values served me well, but you should know that until I was sixteen years of age, I was fully convinced that a New York Knickerbocker uniform was being reserved for me. At about this age, it dawned on me that, given my gene pool, I'd best look elsewhere to "mach a leben." For the Christians in the audience, I suspect there are one or two, that means "make a living."

But basketball did in fact serve a useful purpose -- it taught me to value, indeed, love and revere this quality in humans -- we have come to call competence. In case you haven't noticed, it's quite impossible to be an incompetent basketball player and get away with it. Historically, it has not been that difficult to be an incompetent professor and do quite nicely. I'm delighted to report that ,of late, lack of competence in the classroom and laboratory is more difficult to hide and is far less well tolerated. This can only bode well for higher education. I shall have more to say about competence shortly.

My goals for today are threefold:

1. To pay tribute to the people who, and institutions which, have enriched my life
2. To make several observations about the values that good teachers share and to note the growing importance of pedagogy in the preparation of perspective college teachers.
3. To share with you some recent data on physical activity and human health.

After all, this is the Brierley Lecture. I remind you of what Lee Seidel said to Nancy Kinner when Nancy suggested that she talk about her research -- sludge or waste treatment. Lee correctly noted that this might not be an appropriate after-lunch topic.

I am somewhat more fortunate. I have spent my adult life studying the physiological adaptations to exercise and the impact of these changes on human health, morbidity and mortality. It seems somewhat more appropriate.

Those who have given meaning to my life:

1. Family
2. Students
3. Colleagues
4. University of New Hampshire
5. Edgar Z. Friedenberg

The first person I wish to thank and clearly the most important individual in my life, is the quiet, unassuming, and unselfish woman to whom I have been married for almost thirty-five years. She was willing to sacrifice her career at a time when I was unwilling to do so. Both of our sons and I have been the beneficiaries of her kindness, love, and devotion. I love you, Joyce.

When my sons were young, in the morning before I left home, they would ask me where I was going. My response was always the same, "I'm going to school." This attitude has remained unaltered for thirty-three years and I must conclude that were it not for our students, I might long ago have stopped reading the journal articles I spend so much time trying to understand. The students have helped me see the necessity of a lifetime of study so that I may serve them better.

But recently I have observed that students can be agents of change in the attitudes and practice of even old professors. Witness the following: If, two years ago, you were to ask the Athletic Director at UNH to name a handful of the most antiathletic faculty on campus, I am quite sure that my name would have been included in the top three. I had attended only one athletic contest in the past twenty-five years and that was at the request

of a former UNH president. Yet for the past two years I haven't missed many women's ice hockey games, including the recent playoffs at the Fleet Center. Why? Because one of my students plays the game of ice hockey the way God intended for it to be played. Yes, old dogs can learn new tricks.

Colleagues - No group of individuals has played a more important role in my continuing efforts to learn and share what I've learned, than my colleagues. Simply stated, they have helped create an atmosphere in which I felt valued and useful. Not unimportantly, they have responded with kindness and understanding to what is occasionally my confrontational style to which 1, if no one else, have become comfortable. I am glad to see their faces each morning.

This University hired me when I was twenty-five years old, right from Ph.D. training and clearly very wet behind the ears. Six years later, at age thirty-one, I was granted tenure and given a lifetime position. I have never been treated any other way but kindly and fairly by anyone representing this institution. UNH has encouraged and supported me handsomely and I am thankful. My friend, Jimmy Morrison, once remarked that I represented UNH efforts toward affirmative action in 1965. I doubt it, but if its true, thanks!

No one has helped me to comprehend this fixation I have had with competence more than Edgar Friedenberg. I met him when I was eighteen years old. For those who are not familiar with his work, he is the author of several elegant texts on adolescence. These include: The Vanishing Adolescent, Coming of Age in America - Growth and Acquiescence, and The Dignity of Youth and other Atavisms. Why he took an interest in me is unclear.

Edgar Friedenberg was America's most devastating critic in the 1960's and 70's. Chandler Brossard, Senior Editor at Look Magazine in 1967, characterized him as follows:

"Dr. Friedenberg is quite a phenomenon: passionate but in no way fanatical, clinically analytical yet highly poetic; traditional yet seemingly heretical and the words of his heart and his head are in complete agreement. As a spokesman for the cause of youth, he is in a class by himself."1

Edgar Friedenberg is the smartest man I have ever known and he remains to this day, the only person by whom i have ever been intimidated. He went to school for the first time at age thirteen to study chemistry. At seventeen he left for Stanford to get an M.A. in chemistry. He then went to the University of Chicago to begin a Ph.D. in chemistry but changed to education when "He found that education was a process that could go wrong."

No one writes about adolescence and competence the way Friedenberg does. For example:

"Competence is the foundation of autonomy; in the adolescence peer-group it is respected in a variety of forms. Respect for competence is a penetrating source of discipline. In adolescence it is almost a religion, and sometimes more. I have known adolescents who had become atheists, not because they did not believe in God, but because they did, and were disgusted with the way He handles his job."2

"The basic lesson the school teaches the adolescent is that in a mass society it is unwise even to claim authority on the basis of special competence; the more competent the student may be, the more humility is demanded of him."3

Friedenberg is discussing the rising complaint about overemphasis on athletics in the school.

"There is a substantial basis for the complaint in many schools, for athletics is sometimes the only activity that is taken seriously at all. But conversely, athletics is sometimes the only activity that is at all serious, and in which any distinction of style or achievement is permitted or recognized. The clue to whether resentment is at the root of the complaint lies in the terms in which it is couched. Complaints that the emphasis on the preoccupation with athletics interferes with specific aspects of the academic program are serious and legitimate. What are highly suspect, however, are complaints that the emphasis on athletics allows the athletes to become an elite group and gain favor and eminence unavailable to their less glamorous colleagues. Before considering such protests, one would like to be certain that the history teacher encourages a brilliant and resourceful analysis of American foreign policy with as much joy -- and technical assistance -- as the basketball coach does brilliant and resourceful play-making and backcourt work (for these are not inherently glamorous). It is possible that students respect an elite of athletes because good athletes are encouraged to be proud of themselves for being as good as they can, and that these are the only people left on campus with anything in particular to be proud of."4

As my first task in preparing my remarks for today's presentation I carefully reviewed the previous Brierley Lectures which were available. These included the talks of Chris Bauer, Wally Bothner, Dave Hebert and Nancy Kinner. My initial goal was to find common elements, shared values, and some mutually agreed upon sensitivities about the teaching and learning process. However, with a few notable exceptions, these previous Brierley recipients seem to share little in common with each other and with me. Some examples might suffice. Nancy Kinner5 noted that her Dr. Anderson never got ruffled, angry, intimidating or sarcastic to motivate students. Please note that I am often ruffled, occasionally angry, intimidating and certainly sarcastic, when the situation requires it. Then again, I've never trusted anyone who didn't have a sense of outrage. Or, for example, Chris Bauer's suggestion6 that "teaching is an avocation of most university faculty and will remain so." It is quite normal for me to say, quite in juxtaposition to Chris, that it is essential in my role, not as a researcher but as a teacher, to stay abreast of recent developments in my field.

My second task in preparing my talk was to review the many Teaching Excellence Newsletters distributed to the University community by Lee Seidel.

Contemporary Trends
1. preparation for future teaching responsibilities
2. importance of instruction in faculty responsibilities
3. growing visibility of our own Teaching Excellence Program

While our doctoral preparing institutions provide candidates with a wealth of skills prerequisite to conducting highly specialized research, it is very clear that these same institutions have done far less in preparing graduate students for some of the other roles which must be assumed by the professoriate.7 On many campuses, including I'm pleased to say, our own, graduate students are now being better prepared for their teaching responsibilities. Witness the UNH Institute on College Teaching held on May 18-June 19, 1998, on the Durham campus in which seven graduate-level courses, largely for prospective professors were, offered. Current faculty at UNH were invited to sit in. We are all grateful to both UNH, and Lee Seidel in particular, as the director of our Teaching Excellence Program, for helping us to focus on pedagogy in a fashion in which we have never done before.

How I Used Brierley Funds

1. equipment for the Exercise Physiology Laboratory
2. computer and printer
3. National Conference on Cardiovascular Health
4. honoria for internship speakers for Exercise Science students.

One piece of evidence that UNH values teaching is the handsome stipend I received for this award.

As I noted earlier, I used some of my Brierley funds to attend a national conference on cardiovascular health9 sponsored by the NHLBI and the California CVD Prevention Coalition. The following slides provide recent evidence regarding the nature of cardiovascular disease in the United States and the role of physical activity in its prevention and treatment.10-18

"The U.S. has shared with other Western countries a profound decline in CVD rate during the last thirty years. All ages and ethnic groups and both sexes have experienced the decline but some groups have benefited less than others. Preventive strategies of risk lowering contributed most to the decline in deaths until the mid-1980's. Recent improvements indicate a powerful effect also of new cardiac procedures and their wider application.

"There is evidence that the slope of the mortality decline is becoming less steep and that the trend toward favorable risk factor levels is decelerating especially among certain segments of the population."11

IMPETUS TO VALUE OF PHYSICAL ACTIVITY IN 1990's

1. July 1994 - American Heart Association
2. December 1995 - National Institutes of Health
3. July 1996 - Surgeon General's Report on

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Physical Activity and Health

The importance of physical activity as a major factor in disease prevention, particularly in the area of cardiovascular disease (CVD), was prominently proclaimed in July 1996 with the release of the Surgeon General's report on physical activity and health. Previous reports from the AHA in 1994 and NIH in 1995 substantiated that physical activity is a major risk factor for CVD.

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U.S. TRENDS AND PATTERNS OF PHYSICAL ACTIVITY

1. prevalence of physical inactivity
2. gender differences
3. age differences

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"Estimates from the 1991 National Health Interview Survey reveal that 24% of adults reported being physically inactive in leisure time, with women having significantly higher rates than men. Hispanic men and women reported higher rates of inactivity than their black and white counterparts. Inactivity was highest at older ages, among adults with the lowest education and income levels, among southern residents and during winter months. 14% of youth, ages 12-21, report no vigorous activity or walking or cycling lasting 30+ minutes."13

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CARDIOVASCULAR DISEASE

1. How much physical activity is necessary to reduce risk?
2. What kinds (or intensities) of physical activity are optimal?
3. Intermittent versus continuous activity.

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"Physical activity clearly is associated with a reduced risk of cardiovascular disease. What is less clear, however, are the amount, kinds, and pattern of physical activity that we should prescribe for health. How much physical activity is necessary to reduce risk? What kinds (or intensities) of activity are optimal? Do intermittent bouts of activity confer the same benefit as one continuous bout? A review of the literature indicates that there is a dose-response relation: the greater the total amount of physical activity, the greater the benefit for cardiovascular disease. What is less clear is the actual shape of this dose-response curve. Some studies show incremental decreases in physical activity, while others show that the majority of the benefit is achieved by moving from a sedentary level to the next activity level, with little additional benefit thereafter. With regard to optimal intensity, it appears that at least moderately vigorous activity (including brisk walking) is needed. The issue around intermittent versus continuous physical activity remains unresolved as few data exist. Given our present state of knowledge, the recent recommendation exhorting Americans to accumulate 30 minutes or more of moderate-intensity physical activity over most days of the week appears reasonable."14

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INTERVENTIONS TO PROMOTE PHYSICAL ACTIVITY IN CHILDREN AND ADULTS15, 16

1. physical activity need not be continuous nor take place in a specialized facility.

2. technology to deliver interventions
3. school and family-based interventions for children

"Physical activity interventions in adults have moved beyond the simple exercise prescription. There is no longer the expectation that physical activity needs to be continuous and take place in a specialized facility. This is largely due to interventions that have taken into account barriers for inactivity and programs to address them, thus leading to demonstrated improvements in cardiovascular disease (CVD) risk factors. These interventions have been conducted in everyday settings such as homes and physicians' offices. They have utilized short bouts of exercise and expanding physical activity choices to include numerous lifestyle activities. Newer interventions are also employing technology to deliver physical activity interventions. This includes computers programmed to deliver physical activity advice and counseling by telephone. Although substantial progress has been made toward understanding how to develop efficacious physical activity interventions in adults, there are still major gaps in knowledge."15

"Many young people are not meeting physical activity guidelines, and activity levels decline with age. Interventions are needed to increase the proportion of children and adolescents who are obtaining sufficient physical activity to experience psychological and physical health benefits. School-based interventions are the most thoroughly studied, particularly in elementary schools. Controlled studies indicate that health related physical education can increase physical activity during classes, enhance multiple fitness components, and in some cases promote physical activity outside of school. Family-based interventions targeting healthy families have not been effective in increasing children's physical activity. Family-based interventions for obese children have been successful in promoting physical activity and weight loss. There are numerous opportunities for promoting physical activity through community agencies, primary health care, and religious institutions, but there are no published studies of interventions in these settings."16

PHYSICAL ACTIVITY AND TYPE 2 DIABETES17
1. Prevention
2. Management

"There are an estimated 15.7 million people in the United States with diabetes. Approximately 2/3 of these people know they have diabetes and the remaining 1/3 are undiagnosed. The most common form of diabetes is type 2, accounting for 90-95% of diabetes cases. The relationship between physical activity and type 2 diabetes can be addressed in two primary areas: prevention and disease management. The evidence supporting the role of physical activity in prevention of type 2 diabetes suggests that physical activity may work directly through decreasing insulin resistance/improving insulin sensitivity, and improving glucose tolerance. Physical activity may also be related to the prevention of type 2 indirectly through reduction of central adiposity. Physical activity is also a very important and often underutilized component to managing type 2 diabetes. Physical activity has been shown to offer some degree of the following benefits: blood glucose control, improved lipid levels, reduction in mild hypertension, improved

coagulability, increased lean body mass, and reduced stress levels. Recent national recommendations suggest that the majority of overall health benefits from physical activity are gained from moderate levels of physical activity done most days of the week."17

PREVENTION
Physical Activity:
1. decreases insulin resistance
2. improves insulin sensitivity
3. improves glucose tolerance
4. reduces central adiposity

MANAGEMENT
Physical activity:
1. improves blood glucose control
2. improves lipid levels
3. reduces mild hypertension
4. improves coagulability
5. increases lean body mass
6. reduces stress levels

Despite these benefits, exercise therapy for type 2 diabetics is not reimbursed by insurance companies.

PHYSICAL ACTIVITY AND HYPERTENSION18
1. primary and secondary prevention
2. role of low-intensity training
3. impact on other risk factors

"Increased physical activity has long been proposed to reduce blood pressure in hypertensive However, observational studies have also found that a person's risk of developing future hypertension is 20-50% higher in inactive compared to active persons. Based on previous literature, it appears that -75% of hypertensives reduce their systolic and diastolic blood pressure with exercise training. Furthermore, it appears that low-intensity exercise training may reduce blood pressure as much or more than higher intensity training. It also appears that blood pressure is reduced shortly after beginning exercise training. It is perhaps most important to keep in mind that exercise training may also improve other cardiovascular disease risk factors in hypertensives. Thus, exercise training may be associated with a greater overall cardiovascular disease risk reduction than first-line medications."18

Gettman has recently reviewed the research on the economic benefits of physical activity.19

"The most widely used measure of the economic benefits of physical activity programs is the benefit/ cost ratio. The benefit is expressed in amounts of dollars saved from lower

medical costs, less absenteeism, or reduced disability expenses. The costs in the equation refer to the cost of the physical activity program. The ratio is money saved divided by the money spent. For example, a benefit/cost ratio of 3.43 would mean that $3.43 were saved for each $1.00 spent. Benefit/cost ratios reported in the literature for physical activity programs range from .76 to 3.43 (Table 1)."19

Table 1. Worksite Fitness Programs and Benefit/Cost Evaluations

Study/Author(s)/Year	Purpose	Benefit/Cost Ratio
Canada Life Shephard 1992	Compare medical costs in a company with a fitness program to a control company with no fitness program.	3.43
Toronto Municipality Shore et al. 1989	Evaluate a fitness program designed to reduce job-related injuries and absenteeism	1.41
Mesa Petroleum (1982) Gettman 1.07 (1983) 1986	Examine relationship between physical activity level and medical costs and absenteeism	0.76
Prudential Fitness Bowne et al. 1984	Evaluate effects of worksite fitness program on health care and disability costs	1.93

"In addition to benefit/cost studies, there are health risk appraisal publications that have reported lower annual medical claims costs for exercising individuals (low risk) compared to sedentary (high risk) individuals (Table 2). However, the differences between the high risk and low risk medical costs reported by Bertera (1991) and Yen et al. (1991) in Table 2 are statistically non-significant."19

Table 2. Association Between Annual Medical Claims Costs Per Person and Sedentary Risk Factor

Study/Author(s)/Year	Sedentary High Risk Cost	Active Low Risk Cost	Difference
Du Pont Co. Bertera 1991	$3335	$3205	$130 ns
Steelcase employees Yen et al. 1991	$870	$479	$391 ns

Milliman & Robertson Business & Health 1995	$1248	$1152	$96

Blair has recently studied the influence of cardiorespiratory fitness on CVD and all-cause mortality.20

OBJECTIVE
To assess the relation of fitness to CVD mortality and all-cause mortality.

METHODS
32,000 men and women who completed medical exam including a maximal treadmill test.
RESULTS
1. Independent predictors of mortality among men and women were low fitness and smoking.

2. Fit persons with any combination of smoking, elevated blood pressure or elevated cholesterol had lower adjusted death rates than low-fit persons with one of these characteristics.

CONCLUSION
Low fitness is an important precursor of mortality.

The next four slides from Blair et al21 show how the lack of exercise and low levels of physical fitness are very important risk factors for disease and early death.

Thune has recently studied the relationship between physical activity and breast cancer.22

OBJECTIVE
To assess whether everyday exercise is related to risk of breast cancer.

METHODS
26,000 women, 20-54 years at baseline, answered questionnaires about leisure-time and work activity.

RESULTS
1. Greater leisure time physical activity decreased risk of breast cancer
2. Reduction in risk greater in pre-menopausal than post-menopausal women and greater in younger women than older women.
3. Risk was lowest in lean women who exercised at least four hours/week.

CONCLUSION

Physical activity during leisure time and at work is associated with a reduced risk of breast cancer.

William's recent work sheds light on the relative value of exercise quantity and intensity.23

OBJECTIVE
To assess the relationships of exercise amount and exercise intensity to CHD risk factors measured cross-sectionally in runners.

METHODS
Physician-supplied medical data compared with reported average running amount and running intensity during best recent 10 km. race in 9000 male and female recreational runners

RESULTS
Those who ran faster had:
1. Lower blood pressure
2. Lower triglycerides
3. Lower ratios of total-cholesterol to high density lipoprotein-cholesterol
4. Lower BMI (body mass index)

Relative to the effect of running distance, running velocity had:
1. 13.3 x greater effect on systolic blood pressure
2. 2.8 x greater effect on diastolic blood pressure
3. 4.7 x greater effect on waist circumference in men
4. 5.7 x greater effect on SBP in women

Running distance had a 6 x greater effect on HDL-C than running velocity in both sexes.
CONCLUSIONS
1. Exercising more intensely may reduce CHD risk factor level beyond that achieved by exercise amount alone

2. Proof of causality not determined

I hope that this brief review of recent literature helps to document the growing importance of physical activity in the prevention and treatment of a number of chronic diseases afflicting Americans.

With the exception of Edgar Friedenberg, every constituency I value is represented in this audience. Thank you very much, both for the Brierley Award and this opportunity to share my thoughts with you.

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