

THE SOCIAL COSTS OF UNEMPLOYMENT

HEARING
BEFORE THE
JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES
NINETY-SIXTH CONGRESS
FIRST SESSION

—————
OCTOBER 31, 1979
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THE SOCIAL COSTS OF UNEMPLOYMENT

WEDNESDAY, OCTOBER 31, 1979

CONGRESS OF THE UNITED STATES,
JOINT ECONOMIC COMMITTEE,
Washington, D.C.

The committee met, pursuant to notice, at 10 a.m., in room 210, Cannon House Office Building, Hon. Parren J. Mitchell (member of the committee) presiding.

Present: Representative Mitchell.

Also present: David W. Allen and M. Catherine Miller, professional staff members; Mark Borchelt, administrative assistant; and Mark R. Policinski, minority professional staff member.

OPENING STATEMENT OF REPRESENTATIVE MITCHELL, PRESIDING

Representative MITCHELL. Good morning. The hearing will now come to order.

Today we shall hold hearings to address the issue of the social costs of unemployment. The focus of the hearing will be to identify the physical and mental disorders associated with unemployment variation. We also are looking forward to receiving testimony on the correlation of unemployment and criminal activity. Without the costs of these two elements incorporated in the calculation of unemployment costs, unemployment is grossly understated. At issue is the question of whether pockets of unemployment create an atmosphere that costs society. Are there hidden costs to unemployment?

We have held hearings in this committee to identify the factors that cause unemployment. We have identified and held hearings on education, occupational trends, discrimination, and the sundry factors that are correlated with unemployment. This committee has received testimony relating the costs of these factors to the economy. Today, we shall receive testimony on the costs associated with unemployment.

A study, recently completed by Coopers & Lybrand, indicates that it costs New York City \$71.87 per day or approximately \$26,000 per year to keep a prisoner locked up. Studies completed by the Congressional Budget Office and the General Accounting Office indicate that it costs between \$191 and \$241 per day or \$78,000 per year to maintain a patient in a hospital. If unemployment is highly correlated with crime, and physical as well as mental health, then we, as a society, are absorbing the real costs of unemployment. We first must be able to identify these factors, and second, we must be able to associate a cost with their existence. The economics of unemployment must be investigated by this committee, not only to find the answer as to why it persists, but to measure the degree of its pervasive existence.

Today we have two distinguished witnesses who have researched

two specific aspects of the social costs of unemployment. Before introducing the witnesses, let me say to all convened here that we anticipate that other members of the Joint Economic Committee will join us. We are facing a very difficult time in the Congress right now. We are trying to move ahead to adjournment day or at least a time when we can begin pro forma session. Almost all of the committees of the Congress and subcommittees of the Congress are meeting simultaneously. Actually, I should be over in the House Banking Committee this morning. We are marking up the solar bank bill which came out of my subcommittee. But that is the situation that we confront here in the Congress and I do hope that others will join us.

In addition, I would like to introduce Bishop Norton, who is visiting from Baltimore City. We are delighted that you can spend some time with us today.

Mr. M. Harvey Brenner, who is a professor in the division of operations research at the Johns Hopkins University, has done research correlating mental and physical pathology and socioeconomic status. Miss Ann Witte, who is an associate professor of economics at the University of North Carolina at Chapel Hill, one of my favorite places, has written extensively on the issues of criminal activity and unemployment. I would request that both witnesses now come up and we will receive your statements. I will issue just one brief caveat. At some period of time this morning the bells will ring. The House is now in session as evidenced by that little light on the clock. We might have a quorum call, move to approve the Journal, or a call to go into a Committee of the Whole. When that call comes, I will just adjourn the hearings for a brief period of time and run over and answer the vote and then come right back.

I mean it quite sincerely when I say that I am grateful that you could come up to testify for us this morning. Maybe the best way of proceeding is to have both witnesses give their statements and then we will launch into some questions, if that's satisfactory with both of you.

Mr. Brenner, please proceed in your own manner.

STATEMENT OF M. HARVEY BRENNER, PROFESSOR, DIVISION OF OPERATIONS RESEARCH AND DEPARTMENT OF BEHAVIORAL SCIENCES, THE JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD.

Mr. BRENNER. Thank you. The prepared statement itself is, if you will, a recently published article "Influence of the Social Environment on Psychopathology: The Historic Perspective," and what I would like to do is review for you what some of the physical appearances of these relationships between changes in the economy, specifically unemployment changes, and physical, mental, criminal, aggression look like.

We have slides prepared for this and it's interesting I think to just take the reproductions through.

Representative MITCHELL. Fine. Just proceed as you so desire.

Mr. BRENNER. The first slide shows the relationship between the suicide mortality rate for the United States from the early 1900's to the early 1970's in relation to changes in employment. The cross-hatched line is the suicide mortality rate and the solid line is the employment index or unemployment index. The reason for the inver-

sion in the slides you will see is that the basic unemployment data for the United States composed by the Economist Labor Guide began with actual unemployment data since the early 1930's and was pushed backward with employment data. Here we have simply converted the entire series to employment data.

So what we can observe is the fluctuation in suicide mortality in this graph in conjunction with changes in employment. At each point in the curve, at each cyclical move in employment, we see the inverse movement in the suicide rate and it's highly stable and predictable relationship observed in a number of different countries and at different points in time, and is one of the standard indicators of the relationship between symptoms of stress, mental pathology, and employment changes. [Slide.]

Next we have the relationship between changes in the homicide rate for 1910 through 1970 matched with the same economic indicator. The employment rate, again a very clear inverse match, at zero lag, which means that for both suicide and homicide the increases have tended to occur within 1 year of the increase of unemployment. I'm sorry, let me take that back just one more moment. The data here are for the homicide mortality of whites in the age group 25 to 29. This is simply an example of the relationship for this particular age group and racial group is very similar for the two major racial groups in this country, and throughout the age spectrum from infants to the elderly, but it's particularly pronounced in youth 15 to 24 and in the 25 to 34 range, this particular relationship, a very stable relationship. [Slide.]

This is the circulatory system mortality rate. It represents something between 60 and 70 percent of all mortality in the United States. This particular graph is for nonwhites in the age group 35 to 39 which is relatively young for mortality to be due to circulatory system disease. There's a lag of approximately 3 years to the peak of mortality for this group of people in relation to fluctuations in unemployment with the downturn in employment occurring approximately 2 to 3 years earlier than the mortality rate.

This particular graph represents a bit of an averaging effect because the true mortality rate extends much beyond 3 years for males and females in our country and other industrialized countries, but the peak of the relationship tends to occur at about 2 to 3 years after the downturn. [Slide.]

Here's circulatory system disease mortality for males and females of middle age, 40 to 44, looking at the opposite movements in unemployment 3 years later. [Slide.]

This is the beginning of a series on the infant mortality rate as it had been viewed up to around 1965 with the imagination that there had been a very steady downtrend. [Slide.]

With the removal of that downtrend and its observation of a matching with changes in employment, we see again the identical inverse relationship to the infant mortality rate as we do to cardiovascular mortality, to suicide, to homicide, and many other causes of death. [Slide.]

This is another view of that looking at 3-year changes in employment matched with the inverse, in this case infant mortality under 1 day, which is the most important source of infant mortality in our country and most industrialized countries. [Slide.]

This is an engineer's analysis of the same relationship looking at wavelike movements in employment of roughly 2 to 4 years, showing more precisely the lag in the relationship. It is approximately 1 year in the case of infant mortality. [Slide.]

Here we are looking at the older ages. This is the entire mortality rate for the population of the United States, at 55 to 64 years. There's normally a long downtrend associated with that mortality which cannot be seen in these graphs because they have been controlled, and what you are seeing is the residual variation in the mortality rate in these age groups matched inversely in this case again with a lag of 2 years to changes in employment. [Slide.]

This is a smaller change movement in the employment rate as related to the same mortality rate in the 55 to 64 range for the U.S. population with a lag of about 3 years. [Slide.]

The age group 65 to 74 with a lag of 2 years. [Slide.]

Continuing with that relationship and breaking the relationship down very finely to look at 3 year changes in it with the same observed relationship. [Slide.]

The age group 75 to 84 years, with again the same relationship, this time very easy to see with the naked eye with the lag again of 2 years of this elderly group or more nearly elderly group. [Slide.]

And finally, the group 85 and over also respond to the same depressed economic conditions and there's more likelihood of their families rather than themselves responding to changes in employment. [Slide.]

Here we have for the U.S. State prisoners received for the years 1925 or so through 1950, which is when we ceased in the United States to have national data on an imprisonment by crime. This is what the picture looks like for burglary, again high inverse, at zero lag; that means during the same year for a decline in employment. [Slide.]

Robbery, in this graph, with the same relationship. [Slide.]

This is looking at robbery for a State, the State of Massachusetts, which gives us data into the 1970 period with the same observed graphic relationships. [Slide.]

And this is larceny for the same State over the same period matched with employment. [Slide.]

This is mental hospitalization for the United States as a whole looking at different ages, from the upper left under 15 through the upper right 15 to 24 years of age. In the middle, 25 to 34, 35 to 44, 45 to 54, and finally 55 to 64, all the same inverse relationship at zero lag. [Slide.]

This is going to be a little harder to read from where you are sitting so I'll describe it. It is a table prepared for the first study I did for the Joint Economic Committee published in 1976 which gave the equations whereby the relationship was computed between these sources of mortality and mental hospitalization and imprisonment in the United States.

Keeping in mind per capita income changes, employment changes and inflation changes and other controls, the significance of this chart is simply that we can reasonably well estimate from these equations how such factors as unemployment relate rather specifically to the sources of morbidity and mortality holding constant other factors. [Slide.]

This chart is also taken from the earlier Joint Economic Committee report and indicates for the years roughly 1940 to 1973 the percentage change in each of these types of pathology for 1-percent increase in

the unemployment rate. For suicide, for example, it was 4.1; for State mental hospital admissions altogether, 3.4 percent; for State prison admissions a 1-percent increase in unemployment would be an equivalent 4-percent increase in imprisonment; for homicide, it's 5.7 percent; for cirrhosis of the liver it's 2 percent; for cardiovascular renal disease mortality, around 2 percent; and for total mortality for the Nation as a whole, around 2 percent.

Representative MITCHELL. Ordinarily I don't do this but I'm afraid I might forget it. Is the correlation fairly constant between all categories? For example, the correlation between suicide and unemployment, does it correspond roughly to the suicide rate across the board?

Mr. BRENNER. I don't know whether I have understood you, but let me try to answer.

Representative MITCHELL. It's kind of rough for me to see.

Mr. BRENNER. I know it's distant from the viewer. During the period 1940 through 1973—1973 was the last year for which data were available for mortality patterns for the country. During the period 1940 through 1973, according to the equations we saw earlier and controlling for inflation and changes in income and other relevant variables, with a 1-percent hypothetical increase in unemployment, we would have, let us say, a 4.1-percent increase in the suicide rate. Those figures are also given in the article. There's a table, suicide, in this case, which occurs at the middle of the chart in your last column, your right-most column, occurs as a 4.1-percent increase. I'm sorry. Have I answered you correctly?

Representative MITCHELL. Yes, because I picked it up on another table. When I looked at your levels of significance on table 4 it pretty much answers the question that I was asking.

Mr. BRENNER. Yes. These are statistically significant relations throughout the period.

Representative MITCHELL. And they remain fairly constant with each category?

Mr. BRENNER. That is correct. This is the result of that general study. The Joint Economic Committee economists subsequently went on to attempt to compute dollar costs for hospitalization, morbidity, loss of productivity, imprisonment—the kinds of numbers that you were giving earlier as you introduced the session, Congressman Mitchell. [Slide.]

And as a result of that effort, they were able to compute for each of the major categories the total cost for a 1.4-percent increase—the 1.4 percent which for instance occurred during 1970 would hypothetically be equivalent in those terms to something on the order of \$6.6 billion in costs if we were to evaluate that in dollar cost terms.

There are many, however, who object to this latter kind of analysis to attempt to put these in dollar terms, not only for the types of changes that have occurred in the relative expenditures in these areas but because there's something not quite humane about dealing with the social costs in simple dollar values. [Slide.]

This is the last thing I'll show. It is some of the more recent work I have been involved in. Looking specifically at youth unemployment, this is the simple computed difference chart between the youth and total unemployment rates. We can see that relative to the total unemployment rate the youth unemployment rate has climbed at a fairly steady pace, almost linearly, since prior to 1950, since World War II. [Slide.]

The next chart shows the ratio of youth unemployment to total unemployment from 1947 to 1976. We have found within the last several months that it is this particular ratio, the ratio of youth to total unemployment that is most—as unemployment measurements—most severely involved in the great variety of aggression and crime statistics. [Slide.]

Again, you will not be able to see this because it turns out to be too small on the chart, but what we have here are a series of equations for sources of mortality pertaining particularly to youth suicide, homicide, automobile accident mortality, in which this ratio of youth to total unemployment plays a highly significant part. So that we can apply the same kind of statistical measures that you saw in evaluating the impact of unemployment, particularly in this instance for youth, to the criminal justice measures. [Slide.]

This is an equivalent chart to the one you saw earlier relating a 1-percent change—in this case to a 1-percent change in the ratio of youth to total unemployment—to a variety of sources of aggression and criminal activity that particularly pertain to youth mortality—in the homicide area, the motor vehicle accident area, and suicide areas, for personal injury, including assault, homicide, forced rape, and a variety of crimes to persons. All sources of data that are pertinent to this problem we used ranging from crimes known to police to arrest rates to actual mortality data with statistics with very much the same kind of results.

For instance, the arrest rate for assault for the United States over the period 1947 to 1976 for the age group 15 to 19 has tended to increase by 6.7 percent with a 1-percent increase in the youth to total unemployment ratio. For 20- to 24-year-olds, it's a little higher. It's 7.24 percent. For criminal homicide, it's considerably higher for that. For the 15- to 19-year-olds, the increase in criminal homicide is 12.2 percent; for 20- to 24-year-olds, it's 17.2 percent. That is the general range of the types of findings that on a national statistical basis we tend to observe. [Slide.]

This is a picture of the attempt to predict in this case the nonwhite male juvenile homicide mortality rate using a multivariate predictor which includes the youth to total unemployment rate ratio. The black line is the actual juvenile homicide mortality rate and the dotted line is our expected rate based on the equation. [Slide.]

The same kind of approach here for the rate of crimes known, in this case the crime of robbery, where the predictor is our overall model, and the key variable is the youth to total unemployment rate. [Slide.]

• The same for auto theft.

That is the end of the slides. The point of viewing the material in this way rather than simply looking at the numbers is one that I believe gets something of a sense of the reality of the actual movements of these data through time coincident with changes in the economy, particularly with those bearing on the issue of unemployment.

As a very last point, in answer to questions that you put to me in your letter of October 23 asking specifically whether these kinds of data could be disaggregated to reflect age, region and further nonwhite racial breakdowns, the answer is certainly "Yes." It's simply a matter of conducting such a study. One could do this by States or regions of the United States, by city of any size or type, by white, nonwhite

breakdowns, or within a nonwhite category black versus oriental. These data are available certainly for mortality, for criminal justice data in most instances, especially for arrests and for mortality we have them for white and nonwhite breakdowns. So such studies could certainly be done. That would be particularly relevant to the last portion of the testimony in the form of this article which contains an updated model of the one that I used in the earlier testimony and report for the Joint Economic Committee which includes one other major factor which is rapid economic growth, which for many of these indicators of pathology has turned out to be a rather damaging source of stress condition of unemployment, inflation, and rather beneficial features for the long-term economic growth. Thank you.

[The prepared statement of Mr. Brenner, entitled "Influence of the Social Environment on Psychopathology: The Historic Perspective," follows:]

Influence of the Social Environment on Psychopathology: The Historic Perspective

M. Harvey Brenner

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A logical if not ideal approach to the examination of the possible impact of life stresses on illness is through the use of historic data on major aspects of societal change. Indeed, virtually all the major types of life stress can be seen to have social trends of their own, e.g., rates of financial loss, unemployment, illness, mortality, birth, migration, marriage, divorce, separation, and criminal aggression. The confluence of such trends over time, with a greater or lesser intensity, should therefore produce greater stress. Thus if stress phenomena increase the risk of morbidity or mortality either directly as agents of disease (24,37) or by increasing susceptibility (or reducing immunity) (9,23,29), then we should be able to observe such intercorrelations historically and quantitatively. There is a technology, which is now about 20 years old, that can handle the principal methodological problems encountered in multivariate time series analysis (10,17,22).

The clinical researcher who is unfamiliar with these techniques may well wonder how such "highly individualized" factors as life changes or specific stress reactions can be analyzed using macrolevel historic data. In fact, however, from the purely methodological standpoint, macrolevel historic analysis is at least an equally efficient method, as compared with microanalyses, and frequently is the only one suitable for the analysis of social stresses and their possible consequences for illness.

Perhaps the principal methodological problem in stress research encountered at the individual level of analysis is the lack of a means to discriminate the alleged causal variable from its effect. The implication is that it becomes exceedingly difficult to ascertain (a) the direction of the relationship, (b) whether the relationship is spurious (due to unobserved relationships with a third, and truly causal, variable), or (c) whether the variables are not symptomatic of the same pathological process.

The most dramatic example of these methodological problems at the individual level of analysis is found in studies of stress that use low socioeconomic status as a stress indicator. Theoretically, the lower an individual's socioeconomic position, the more exposed he or she is to deleterious life changes (especially involving economic instability and losses) and the less protected he or she is

because of comparatively low financial or human support resources (1). The theory has been supported by empirical evidence that there is a statistically reliable inverse relationship between socioeconomic status and the prevalence of mental disorder. This finding has been the single most consistent empirical regularity in the field of psychiatric epidemiology for more than 40 years (13).

The difficulty has been that alternative hypotheses to the stress formulation could be raised to suggest that the relationship actually ran in the opposite direction. Thus a previous situation of mental disorder might result in diminished competence in the economic sphere. One well-known formulation of this thesis maintained that the reason the mentally ill tended to be of lower socioeconomic status is that they "drifted downward" in status as a result of earlier mental disorder (12,36). This interpretation has itself been impossible to sustain at the individual level of analysis even where there were findings that the mentally ill of lower socioeconomic status had in fact fallen in social status (14). This finding supports the stress hypothesis at least equally well because from the stress perspective it is that very loss of status that may have precipitated the currently observed mental disorder.

The only solution to this type of problem is to examine situations, as independent variables, that are not under the influence of the subjects. In stress research at the individual level, few such circumstances exist. Typically, then, when it is observed that illness tends to follow a period of several life changes or stresses, it is difficult to determine whether the factor(s) that precipitated the illness condition, (e.g., a psychopathological mental state) also precipitated the life changes (e.g., financial loss).

These problems of the direction or existence of causal relationships at the individual level of analysis are compounded further by a lack of control for factors that ordinarily influence morbidity or mortality due to specific causes. Since the person is put at risk to coronary disease, for example, by smoking, overweight, high levels of serum cholesterol, and other factors (25), proper epidemiological procedure requires that these be controlled in order to observe the impact of additional factors, including life changes, on coronary morbidity or mortality.

Such controls are rarely applied in stress research because samples are usually too small to cope with the gathering of data on life changes as well as on risk factors that would apply to the manifold outcomes of stress, ranging from the acute infectious disorders and accidents to the chronic diseases, mental disorders, and social pathologies.

There are no perfect research designs inherently free of all problems of validity and reliability. Yet for these problems, multivariate time series methods using aggregated (or macroscopic) data do provide a way out of the causal trap and allow us to control for the coincidence of multiple trends.

MACROSCOPIC HISTORIC APPROACHES IN STRESS RESEARCH

It is precisely the time series approach at the macrolevel that permitted a solution to the chicken-egg question posed by the socioeconomic status-mental

illness relationship. It was necessary to find a situation in which changes in the economic situation of persons affected by income and employment losses could not, in turn, be influenced by those persons. Such a situation exists at the macrolevel, and the employment rate was selected as the independent variable. The research question was, then, to what extent are changes in the employment rate associated with changes in first admissions to mental hospitals? Theoretically, if the stress formulations used in socioeconomic status-mental illness research were correct, then a reduction in status for a population average should be associated with increased first admissions. It was found that for at least 127 years in New York State, first admissions to mental hospitals were inversely related to the rate of employment (5).

It was not possible to interpret this relationship as indicating the influence of mental disorder (or hospitalization) on the employment rate because the hospitalization, as compared with the employment rate for the state, was too small. This is obviously because severe pathological phenomena are comparatively rare in a population compared to the number earning incomes subject to inflation, or to the unemployed. Moreover, a variety of tests indicated that it was precisely those who lost the most income, whose social roles were the most seriously affected (e.g., married males), and who were living in counties hardest hit by unemployment changes who were also the most readily hospitalized during economic downturns.

These findings, published in 1973 in *Mental Illness and the Economy*, strongly supported the thesis of a causal inverse relationship based on economic stress between changes in socioeconomic status and in the level of mental disorder. Nevertheless, these findings, based on first admissions to mental hospitals, left unclear to what extent—if at all—intolerance of mental disorder, rather than psychiatric symptoms alone, was precipitated by economic stresses. It thus became useful to work with indicators of pathology which would ideally not be contaminated by factors associated with administrative dispositions or changes in family or community behavior (Figs. 1-3).

A logical choice was found in the area of cardiovascular mortality. There had been substantial theoretical speculation and a body of empirical evidence that linked cardiovascular illness to stressful events (8,11,19,26,31,39-41,44). The predicted relationship was found between adverse changes in the economy, as indicated by the unemployment rate, and various subdiagnoses of cardiovascular disease mortality, including coronary artery disease. The peak of the average mortality reaction occurred at approximately 2 years after the peak in the unemployment rate (2). These findings on approximate lag time corresponded well with those obtained by Holmes, Rahe, and colleagues (20,34,35,42) in their examination of the cumulative effect of life event changes on the onset of subsequent pathology associated with various chronic diseases.

A second study (6), using similar hypotheses and methodology, found that trends in mortality rates associated with cirrhosis of the liver also tended to peak approximately 2 years after a peak in unemployment. In that case, the multiple regression analysis also revealed that the long-term trend in cirrhosis

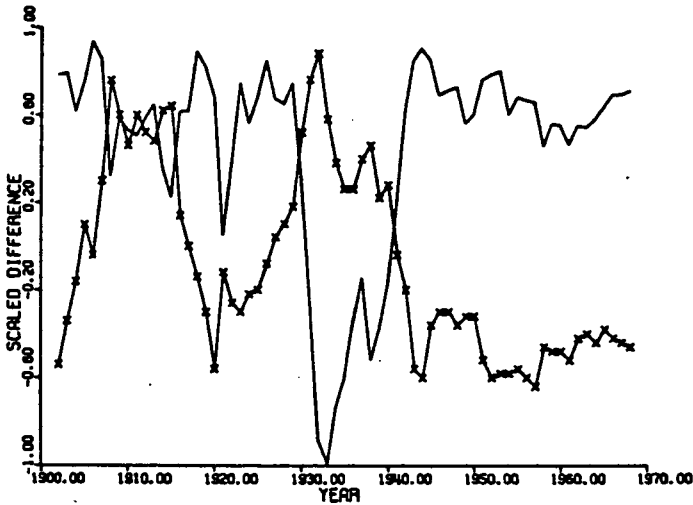


FIG. 1. Graphic analysis of the relationship between the suicide mortality rate and the employment rate, United States, 1902-1970. *Solid line*, inverted unemployment rate; *crossed line*, suicide rate. Scaled difference: Both series are scaled for viewing such that the greatest amplitude from the arithmetic mean of each series, which is set equal to zero, has been normalized to +1.00 if positive, or -1.00 if negative. Del = 0: long-term trends subtracted from the mortality series.

mortality was positively associated with the growth in real per capita disposable income. The same study also indicated that short-term increases in per capita consumption of alcohol tended to increase during economic downturns, as did arrests and trials for the crime of intoxication during automobile driving and first admissions to mental hospitals in the United States with a diagnosis related to alcohol abuse.

In a subsequent study (4), infant mortality rates in the United States were found to be related to economic recessions, as indicated by the unemployment rate, with a lag of from 1 to 2 years of the peak average mortality behind the peak of unemployment. The original hypothesis of this study specified that as a result of material deprivation and lack of medical care, in addition to psychological stress, economic decline would be associated with elevated infant mortality rates. It was suggested that the stresses of economic loss might result in maternal cardiovascular illness or in smoking or abuse of alcohol on the part of pregnant women, which are established risk factors in infant mortality.

A final group of studies, which followed from the original research on mental disorder as related to economic change, was concerned with the problem of criminal aggression. Beginning with New York State (3) and finally involving the United States, Canada, England and Wales, and Scotland (7), economic changes were studied in relation to crimes known to the police, trials, convictions, and imprisonment for each of several crimes against persons (murder, manslaughter, rape, robbery) and property (embezzlement, fraud, arson, burglary,

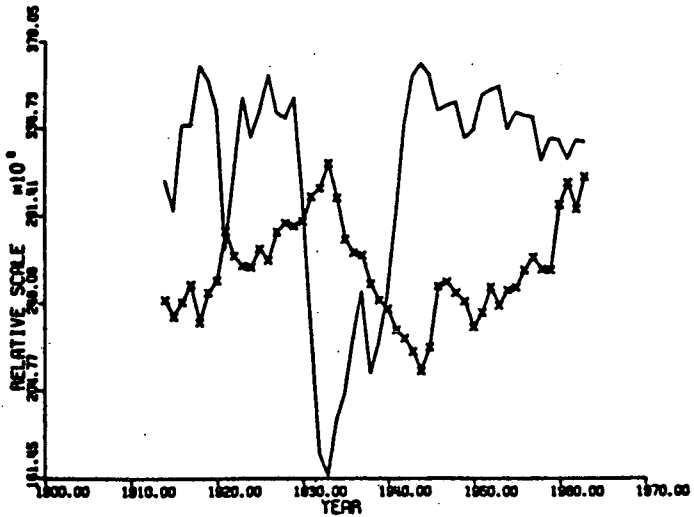


FIG. 2. Graphic Analysis of the relationship between the homicide mortality rate of white males ages 25-29 and the employment rate, United States, 1912-1965. *Solid line*, inverted unemployment rate; *crossed line*, homicide rate. Scaled difference: Both series are scaled for viewing such that the greatest amplitude from the arithmetic mean of each series, which is set equal to zero, has been normalized to +1.00 if positive, or -1.00 if negative. Del = 0: long-term trends subtracted from the mortality series.

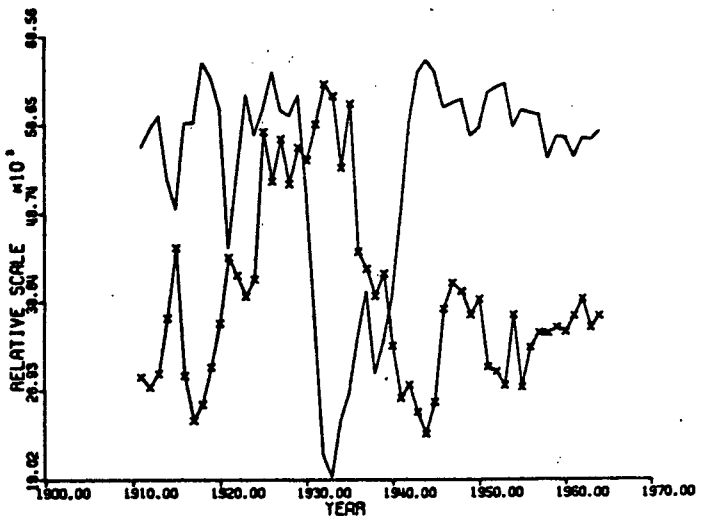


FIG. 3. Graphic analysis of the relationship between the circulatory system disease mortality rate of nonwhite males aged 35-39 at a lag of 3 years, and the employment rate, United States, 1912-1965. *Solid line*, inverted unemployment rate; *crossed line*, circulatory disease mortality rate. Scaled difference: Both series are scaled for viewing such that the greatest amplitude from the arithmetic mean of each series, which is set equal to zero, has been normalized to +1.00 if positive, or -1.00 if negative. Del = 0: long-term trends subtracted from the mortality series.

larceny). Adverse changes in employment and income were associated with increases in rates of all these crimes, controlling for the effects of urbanization, demographic changes, and changes in criminal justice system activity.

It was subsequently recognized that a single major indicator of intermediate and short-term fluctuations in the entire economy was inadequate, especially to express the full extent of economic stress even where it originated at the national level. Not only were such factors as inflation thought to have possible stressful consequences, but real income (i.e., in constant dollars), welfare, and education were thought to be important ameliorators of economic loss. In addition, questions were raised as to the more nearly precise timing of the lag in pathological reactions to changes in economic indicators. For example, increased pathology related to recession could appear to the naked eye—especially without multivariate controls—to occur as a result of the subsequent economic upturn if the lag were in the range of 2 to 4 years (15,43).

The need for more sophisticated analysis to take into account multiple economic and sociodemographic indicators became quite pragmatic when the Joint Economic Committee of the United States Congress requested that estimates be made of the amount of increased pathology that would follow from increased unemployment or the maintenance of it at a high level. To deal with this problem, it was necessary to control for the effects of those economic and sociodemographic factors that ordinarily influence the pathological phenomena in question. Also, it was crucial to know over how long a span of time the deleterious effect of unemployment might precipitate an increased incidence of pathology. It was not sufficient, therefore, to estimate the average or peak lag interval but rather the entire span over which the elevated rates of pathology would occur.

The predictive equation that was finally set up included the unemployment rate, the inflation rate, real per capita personal income, and demographic variables relating to each of the specific types of pathology. The dependent variables or indices of pathology involved the general areas of physical health, mental health, and criminal aggression. The conception was that no single type of indicator, such as depression or heart disease, would serve as a proper measure of the pathological impact of economic life stress. Rather, specific indicators relating to mental disorder and physical morbidity and mortality—involving both acute and chronic problems—would have to be involved. Also, illegal activities involving both violence and property should be included. The following indices of stress outcome were used, based on the United States as a whole: (a) first admissions to mental hospitals by sex and age, (b) total mortality by sex, race, and age, (c) suicide by sex and age, (d) homicide by sex and age, (e) cardiovascular-renal disease mortality by sex and age, (f) cirrhosis of the liver mortality by sex and age, and (g) imprisonment by age.

A sample of the resulting predictive multiple regression equations, and measures of the goodness of fit of these equations to each major type of pathology, are shown in Tables 1 and 2. It is clear that in all cases the unemployment

TABLE 1. Multiple regression of national economic indices on selected mortality rates, United States

Dependent variable	Years	Intercept	Time trend	Log time trends	Per capita income	Unemployment rate	Inflation rate	R ²	F	D.W.
General mortality rate ^a (lag 0-5) ^c										
(1) Mortality rate, total whites	1940-1974	96.2			-0.53E-2 (1.92)*	0.62 (5.05)**	0.87 (2.96)**	0.89	21.9	1.93
(2) Mortality rate, total nonwhites	1940-1974	136.4			-0.32E-1 (6.55)**	1.68 (6.95)**	2.83 (5.16)**	0.96	74.1	1.67
(3) Mortality rate, LT 1 whites	1940-1974	497.7			-0.24 (7.06)**	12.65 (8.01)**	3.59 (5.44)**	0.97	98.6	2.11
(4) Mortality rate, LT 1 nonwhites	1940-1974	936.2			-0.43 (10.48)**	17.74 (10.69)**	30.77 (6.49)**	0.99	199.6	2.40
(5) Mortality rate, 75-84 whites	1940-1974	1141.0			-0.22 (7.59)**	10.39 (7.02)**	17.56 (5.20)**	0.97	103.8	2.47
(6) Mortality rate, 75-84 nonwhites	1940-1974	767.1			-0.83E-1 (2.07)*	15.45 (6.96)**	14.80 (2.91)**	0.84	14.8	2.38
(7) Cardiovascular disease mortality rate ^a (lag 1-4) ^d	1945-1973	537.7			-0.33E-1 (2.49)**	5.46 (2.62)**	-0.04 (0.37)	0.85	11.8	2.89
(8) Cardiovascular disease mortality rate ^b (lag 1-4) ^d	1940-1973	-2836.8	-17.8 (4.70)**	1077.0 (4.76)**		2.35 (1.83)	1.04 (0.78)	0.74	6.50	2.36
(9) Cardiovascular disease mortality rate ^b (lag 1-4) ^d	1945-1973	-843.8	-7.5 (1.43)*	436.3 (1.35)*		6.15 (3.17)**	-1.10 (0.74)	0.79	6.70	2.02
(10) Cirrhosis mortality rate ^b (lag 0-5) ^c	1940-1973	-0.2			0.65E-2 (8.99)**	0.14 (4.21)**	0.16 E-3 (0.01)	0.98	114.4	1.85
(11) Cirrhosis mortality rate ^b (lag 0-5) ^c	1945-1973	-0.2			0.69E-2 (8.81)**	0.12 (3.62)**	0.29E-1 (0.37)	0.98	114.4	1.82

^aPer 10,000 population.

^bPer 100,000 population.

^cSecond degree polynomial distributed lag equation.

^dOrdinary least squares equation.

† 0.10 level of significance; $t = 1.31$; $F = 1.89$.

* 0.05 level of significance; $t = 1.71$; $F = 2.28$.

** 0.10 level of significance; $t = 2.48$; $F = 3.21$.

TABLE 2. Multiple regression of national economic indices on selected pathological indices, United States

Dependent variable	Years	Intercept	Time trend	Log time trends	Dummy constant or trend	Other trends	Per capita income	Unemployment rate	Inflation rate	R ²	F	D.W.
(12) Suicide rate ^a (lag 0-5) ^c	1940-1973	6.34					0.90E-3 (1.50)+	0.42 (14.23)**	0.27 (4.23)**	0.91	26.2	1.80
(13) Suicide rate ^a (lag 0-5) ^c	1945-1973	6.38					0.11E-2 (2.17)*	0.40 (17.30)**	0.25 (4.70)**	0.95	40.9	2.35
(14) Suicide rate ^a (lag 0-5) ^c	1940-1973	-0.62		2.08 (3.63)**				0.43 (12.51)**	0.31 (6.68)**	0.87	25.3	2.03
(15) Homicide rate ^a (lag 0-5) ^c	1940-1973	-7.60			DT 1967-74 ^e TJ ^f 0.14E-1 0.30 (3.90)** (3.16)**		0.16E-2 (1.56)†	0.10 (2.38)*	0.11 (0.92)	0.99	115.6	2.29
(16) Homicide rate ^a TJ ^f (lag 0-5) ^c	1940-1973	1.02	0.65E-1 (5.30)**		DT 1967-74 ^e 0.18 (3.79)**			0.54 (5.00)**	0.84 (5.30)**	0.94	47.0	1.88
(17) Imprisonment rate ^a (minus 1942-1945 (lag 0-2) ^d)	1935-1965	-577.90	-3.18 (3.14)**	195.5 (3.48)**				1.59 (5.92)**	0.64 (3.35)**	0.76	10.4	1.87
(18) Imprisonment rate ^a (minus 1942-1945) (lag 0-2) ^d	1935-1973	-594.50	-2.55 (2.38)*	180.9 (2.93)**	DC 1967-71 ^f TJ ^f -8.36 1.31 (8.33)** (4.27)**			1.52 (5.60)**	0.57 (3.07)**	0.90	23.9	1.90
(19) Mental hospital admission rate LT 65 ^a (minus 1942-1945) (lag 0-5) ^c	1940-1971	-77.70					0.55E-1 (9.78)**	3.39 (9.58)**	1.78 (2.58)**	0.96	60.0	1.52
(20) Mental Hospital admission rate LT 65 ^a (lag 0-5) ^c	1940-1971	-70.00					0.49E-1 (8.69)**	3.11 (8.92)**	2.19 (3.21)**	0.97	63.4	1.85

^aPer 10,000 population.

^bPer 100,000 population.

^cSecond degree polynomial distributed lag equation.

^dOrdinary least squares equation.

^e"Dummy" trend.

^f"Dummy" constant.

† TJ, percentage of total male population who are ages 15-29.

* 0.10 level of significance; $t = 1.31$; $F = 1.89$.

** 0.01 level of significance; $t = 2.49$; $F = 3.21$. 0.05 level of significance; $t = 1.71$; $F = 2.28$.

rate is significantly positively associated with increases in each pathology over a 5-year period following the first year of impact of an increased unemployment rate. In other words, we allow the cumulative effect of increased pathology within a 6-year period to be taken into account. The assumption was that the impact of major economic stresses may occur over each of several years, with the more nearly acute reactions (e.g., mental hospitalization, imprisonment, suicide, homicide) predominating during the first 3 years and the more nearly chronic reactions (e.g., cardiovascular-renal disease, cirrhosis, and total mortality) predominating during the second 3 years.

The same procedure of estimating the 5-year distributed lag of pathology to changes in the economic indicator was used in the case of per capita income and inflation. Tables 1 and 2 show that while significant relationships were found for per capita income and inflation, the overall results were less stable,

TABLE 3. *Estimates^a of the total effects of 1% changes in unemployment rates sustained over a 6-year period on the incidence of social trauma (based on the populations of 1970 and 1965)*

Measures of social trauma	Incidence of pathology related to 1% increase in unemployment based on 1970 population	Incidence of pathology related to 1% increase in unemployment, based on 1965 population	Total incidence of pathology, 1965	Incidence of pathology in 1965 related to 1% increase in unemployment, 1960-1965 as a proportion of total 1965 pathology
Total mortality,	36,887	35,042	1,828,000	0.019
Whites				
Males	12,360	11,866	911,000	0.013
Females	16,534	15,709	895,000	0.023
Nonwhites				
Males	3,829	3,599	125,000	0.028
Females	4,161	3,911	98,000	0.040
Cardiovascular mortality	20,240	19,228	1,000,787	0.019
Cirrhosis of liver mortality	495	470	24,715	0.019
Suicide	920	874	21,507	0.041
Homicide	648	616	10,712	0.057
State mental hospital first admissions ^b	4,227	4,045	117,483	0.034
Males	3,058	2,935	68,917	0.043
Females	1,169	1,110	48,566	0.023
State prison admissions	3,340	2,952	74,724	0.040

^aEstimates are derived from equation types in Tables 1 and 2 as follows: Total mortality classified by sex and race, equation (1)-(6); cardiovascular mortality, equation (9); cirrhosis of liver mortality, equation (10); suicide, equation (14); homicide, equation (16); mental hospital admissions, equation (19); state prison admissions, equation (17).

^bIncludes only individuals under 65 years of age.

predictable, and interpretable than was the case with the unemployment rate.

From these equations, it was possible to estimate the historic impact, from 1940 to 1974, of a 1% increase in the unemployment rate on the various pathological indices (Table 3).

RAPID ECONOMIC GROWTH VERSUS UNEMPLOYMENT AS SOURCES OF ECONOMIC LIFE STRESS

In the multivariate equations described above, each of the sources of economic life stress—decreased income, inflation, and unemployment—are understood to be unidirectional in their impact on pathology; their impact is conceived as entirely deleterious. This view is traditional with respect to the literature on low socioeconomic status as a risk factor in mental disorder, morbidity and mortality, and criminal aggression. Indeed, the idea that only deleterious changes provoke pathological reaction has been traditional “common sense” as well as the professional behavioral science view.

The formulation of Selye in 1956 (37) went a considerable distance to change these traditional perspectives. It suggested that the phenomenon of change itself—beyond the capacities of the organism to adapt—is the critical precipitant of pathology. This formulation has been the guiding concept to a large number of researchers into the stress-producing potential of different types of life changes. For example, in summarizing the theoretical orientation of many researchers in this field, Levi (24) indicates that the highest stress levels are usually found at the extremes of the stimulation continuum, and thus deprivation or excess of almost any influence is provocative of stress.

However, the research evidence from studies on mental disorder (30), especially depression (32) and criminal behavior (16), show clearly that life changes viewed as undesirable showed considerably greater potency to provoke pathological responses. The weight of the evidence, when one includes traditional research pioneered by Holmes and Rahe (20,21,33) dealing in large measure with chronic physical illnesses (18), is that while all significant life changes are potential stressors, undesirable changes are predictive of higher stress levels.

If this perspective is correct, then we should observe that economic recession should show more severe and longer lasting pathological effects than periods of rapid economic growth, but that the periods of growth themselves, while desirable overall, nevertheless are stressful. A related issue, which the stress literature does not deal with systematically, is that of the interrelationship among life changes. The guiding hypothesis of the formulation in the present study is that deleterious life changes in particular are capable of producing stresses, which in turn lead to other life changes and stresses. We label this interaction among stresses the principle of acceleration of stress. An example would be the loss of a job, which may lead to financial disruption, marital and parent-child strains, and possibly the breakup of family, loss of friendships which were occupation-related, and the securing of a new job at a lower status with

the requirement of moving to a home in a new area. In this formulation, the more undesirable the life change, the greater the probability of additional life changes (or stressors).

This principle of stress acceleration, which can be observed in the life of a single person, should not be confused with that of the "contagion," or multiplier, effect of one person's stresses upon those of another. Examples of the latter principle can be seen in the stress on each member of an entire family in the financial and status loss of a head of household. We therefore come to the proposition in this case that while rapid economic growth carries with it short-term stressful effects based on what may appear to be desirable life changes, the impact of economic recession—based almost entirely on undesirable effects—carries a considerably more stressful impact over a much extended span of time.

A more detailed and incisive examination of the relationship between economic change and pathology allows us to test this proposition. We can isolate the impact of long-term economic development from that of rapid economic growth periods because economic growth usually occurs in spurts of 1 to 3 years and is followed by periods of pause or recession, during which it usually slows or actually declines somewhat (27,28). We isolate the long-term, smooth, economic development trend from the rapid growth periods by fitting an exponential trend to the real per capita income data. The exponential fit then represents the long-term trend of economic development, and the residuals represent the abrupt periods of rapid economic growth and pause. We can also isolate the short-term "random" fluctuations in real per capita income by calculating the annual changes in that series.

Since there is only a moderate and unstable correlation over time between unemployment rates and per capita income in any of the forms—(a) long-term exponential trend, (b) residuals from the exponential trend, and (c) annual changes—we can add each of these components in per capita income trends to a prediction equation in which unemployment is also an independent variable. Such an equation is ideally suited to discriminate the differential impact on pathologies of rapid economic growth as compared with unemployment, short-term income losses (annual changes in per capita income), and the long-term trend of economic development.

Furthermore, since the impact of inflation on the pathological indices was observed to be highly unstable, it is useful to determine whether our predictive equation actually requires a separate variable for inflation, especially considering that we have already controlled for inflation by using real per capita income. Finally, in view of recent work showing the importance of educational level to health (38) and the probable contribution of welfare and social security and related health care benefits, it is prudent to control for trends which would measure them.

The principal hypothesis is that rapid economic growth, as well as unemployment, will be positively related to pathology. Since it is argued that economic

growth will have only a short-term pathological effect, we do not require a distributed lag measure for this variable. On the other hand, we continue to suggest that the unemployment rate will show a distributed lag effect of from 0 to 5 years on pathology. All the other independent variables in the predictive equation—the exponential trend of economic growth, welfare (i.e., the percentage of government spending allocated to welfare and social security, including health, payments)—except for annual changes in per capita income, are considered without lagged effects. Since the annual changes in per capita income series has virtually no trend (i.e., zero autocorrelation), 1 year of lag has been added to the measurement procedure.

The findings (Table 4) support the principal hypothesis that rapid economic growth, unemployment, and short-term income loss are significantly related to the pathological indices. In this test, only mortality data in general and for specific causes generally associated with psychosocial stress are used, including suicide, homicide, cardiovascular disease, and cirrhosis of the liver. It can also be seen (Table 4) that the statistical significance of the lag of mortality rates by cause to changes in the unemployment rate varies by cause of death. Thus the theoretically slower reacting chronic diseases, indicated by cardiovascular, cirrhosis, and total mortality, often require that the lag estimate of average impact begin with the second year and end in the fifth. The theoretically "quick" reacting causes of death, such as suicide and homicide, require that the lag structure include the early years (0 and 1); indeed, the predominant impact is seen during those years. The implication of these findings is that, as hypothesized, while both rapid economic growth and unemployment are positively related to pathology, the impact of unemployment lasts for several additional years, particularly for the chronic illnesses. These findings further explain why it has appeared to some observers using only graphic techniques or simple correlation (i.e., not using multivariate procedures) (15,43) that the heaviest incidence of increased mortality occurs during upswings in the "economic cycle."

These findings support the position of the majority of researchers that undesirable events are likely to produce far greater stress reactions than are desirable ones. Yet the thesis is also supported that apparently desirable events (or groups of events), such as are involved in rapid economic growth, are also provocative of pathology. We must infer that the totality of changes rather than only the undesirable ones are the more appropriately used in a complete index of economic life stress.

It is also possible, however, that researchers working with life change data have made far too fine a distinction between desirable and undesirable events. In fact, it is possible that all major life changes, whether inherently agreeable or disagreeable, may possess undesirable features. In the examples of agreeable cases, e.g., marriage, birth of a child, and job promotion, each of these life transitions may involve substantially increased responsibilities for which a certain proportion of individuals may be unprepared. The unprepared persons then stand a substantial risk of role failure. We may say, in a rather straightforward

TABLE 4. Multiple regression of national economic indices on selected pathological indices, United States

Dependent variable	Years	Intercept	Time trend	% Govt. expenditures on welfare from total expenditures	No. of college graduates	% Juveniles in total population	Exponential Trend: Long-term per capita income	Residuals from long-term per capita income	One year change in per capita income ^a	Unemployment	R ²	F	D.W.
Total mortality rates	1940-1973	137.06		-0.03	-0.04		-0.02	0.01	-0.6E-2	0.60	0.94	38.17	2.38
	(2-5) ^c	(5.92)**		(-0.22)	(-2.95)**		(-1.65)†	(2.29)	(-0.73)	(4.72)**			
1940-1973	113.13			0.16	-0.04		-0.01	0.5E-2	-0.76	0.54	0.94	40.34	2.55
	(0-5)	(3.85)**		(0.81)	(-3.29)**		(-0.51)	(0.84)	(0.89)	(3.21)**			
Suicide mortality rates	1940-1973	-24.85			-0.01	34.49	0.02	-0.2E-2	-0.6E-2	0.20	0.87	15.69	1.96
	(2-5) ^a	(-1.59)†			(-2.43)*	3.08)**	(1.98)*	(-1.13)	(2.26)*	(5.13)**			
1940-1973	-6.27				-0.9E-3	23.32	0.6E-2	0.5E-4	-0.3E-2	0.28	0.91	27.55	2.06
	(0-5)	(-0.47)			(-2.70)**	(2.52)**	(0.88)	(0.08)	(1.27)	(7.56)**			
Homicide mortality rates	1940-1973	0.38			0.7E-3	38.08	-0.5E-2	0.4E-2	-0.8E-2	0.06	0.98	100.95	1.36
	(2-5)	(0.04)			(0.26)	(5.11)**	(-0.86)	(3.03)**	(-4.33)**	(2.27)*			
1940-1973	-4.97				-0.4E-3	42.45	-0.2E-2	0.3E-2	-0.6E-2	0.07	0.97	97.69	1.59
	(0-5)	(-0.43)			(-0.13)	(5.25)**	(-0.34)	(2.25)	(-3.26)**	(2.23)*			
Cardiovascular mortality rates	1950-1973	388.6	24.10				-0.80	0.28	-0.21 ^c	18.17	0.87	13.63	2.90
	(2-5) ^c	(11.92)**	(5.91)**				(-5.56)**	(2.74)**	(-1.94)	(2.62)**			
1950-1973	367.17		21.62				-0.68	0.16	-0.17 ^d	8.79 ^c	0.86	10.08	2.57
	(0-5) ^c	(11.56)**	(5.25)**				(-5.14)**	(2.30)*	(-1.40)	(2.35)			
Cirrhosis mortality rates	1940-1973	1.82		-0.03	-0.39E-2		0.48E-2	0.01	-0.01 ^f	0.19 ^f	0.98	119.78	1.43
	(2-5) ^c	(0.25)		(-1.49)†	(-0.29)		(7.93)**	(2.15)*	(-5.16)	(4.82)			
1940-1973	0.25			0.66E-1	-0.1E-2		0.61E-2	0.5E-2	-0.01	0.09	0.98	117.09	1.57
	(0-5) ^c	(0.26)		(1.49)†	(-0.29)		(7.93)**	(2.15)*	(-4.44)**	(1.30)			

^aIndicator of rapid economic growth.

^bIndicator of very short-term income change; includes lags of 0, 1 years.

^cUnemployment lags.

† 0.10 level of significance; $t = 1.31$; $F = 189$.

* 0.05 level of significance; $t = 1.71$; $F = 2.28$.

** 0.01 level of significance; $t = 2.49$; $F = 3.21$.

manner, that it is likely that when marriage, childbirth, and job promotion are associated with stress, it is because of anxiety over, if not the actuality of, failure. In general, then, probably all desirable life changes are potentially stressful to the extent that they carry the risk of failure, in which case, of course, they are in fact undesirable.

In terms of the present study, rapid economic growth might on the surface be thought of as inherently desirable. It involves new jobs, promotions, and increased real income, and is associated with higher marriage and birth rates (3,15,43). However, since nearly all of these changes involve potential anxieties over fulfillment of new responsibilities, for a certain proportion of persons who are anxious or who actually fail, they may be extremely undesirable.

We can practically distinguish between relatively desirable and undesirable events by (a) the probability of failure (or maladaptation) and (b) the extent to which other life changes may follow. In such a formulation, for example, death or serious illness of a husband would be considered extremely grave because of loss of job, income, and family status as well as the need of the wife to manage the family affairs, possibly take or change jobs, perhaps move to another residence, and so on. Major undesirable life changes, then, are inherently correlated with other life changes in an almost epidemic fashion.

This feature of the interrelationship of life changes, the acceleration principle of stress, is especially important in understanding the lag of several years over which mortality increases with respect to a major undesirable life change, such as unemployment. Not only must the unemployed person encounter the short-term disruption to finances, family, social network, and work life, but he or she also encounters an entirely new set of stressful life changes when reemployed. First, it is probable that the reemployed individual will be at a lower position than was previously held; thus, despite a new job, this situation really indicates downward mobility, with loss of work status, income, and social position. Second, the implications of the downward mobility for family and social relationships must be considered, as well as the possible move of residence associated with the job change.

SUMMARY AND CONCLUSIONS

We have endeavored to show that major economic life changes, as basic stressors, are associated with severe pathology in the areas of mental and physical health and criminal aggression. The hypotheses underlying the studies involved are that the number and magnitude of life changes and life changes which disrupt patterns of social organization are generative of stress. The observation was made that the pathological impact of life changes can often be more easily observed on the macro-, or societal, level of analysis than on the individual level. Several factors contribute to the special utility of stress research when conducted at the macrolevel. Most critical is that a continuous scale over time

can be constructed of the occurrence of any particular life change as it affects a population in terms of rates (e.g., unemployment, migration, divorce, illness, or birth rates). The confluence of high rates of stressful events can then, through applied regression analysis over time, be tested with respect to relationships with pathological indicators. Thus quite sophisticated causal models can be investigated, including simultaneous, reciprocal, and detailed multivariate causation.

Additionally important contributions of time series analysis with macrohistoric data are that they permit the use of large population aggregates to allow controls for multiple sources of causation which may be important in disease epidemiology but minimally related to stress. Finally, these techniques permit a clearer resolution of issues of direction of causation that have proven nearly intractable in stress research using socioeconomic status or life changes as independent variables.

The use of some of these time series techniques has been reviewed with respect to the pathological impact of major economic changes, such as unemployment rates and changes in per capita income. In this chapter, data are utilized to examine the question of whether major economic changes in general, rather than only undesirable ones, were associated with mortality rates for stress-sensitive causes. It was found that in most instances, these sources of mortality responded to both rapid economic growth and increased unemployment. The response to unemployment, however, was more intense and occurred over a considerably longer period (at least 5 years for unemployment as compared with 1 year for rapid economic growth).

We conclude, therefore, that abrupt economic changes, regardless of direction, are stress provoking, but that undesirable changes, such as unemployment and income loss, are substantially more generative of pathology. Thus these macroscopic analyses confirm the importance of the overall stressful nature of extremely high stimulation, as in the formulations of Selye (37) and Levi (24), or, put another way, of a large number of stressful events, as in the Holmes and Rahe scheme (21). These analyses are also consistent with the findings of Paykel (32), Mueller et al. (30), Gersten et al. (16), and others who argue that undesirable changes are more stress-provoking than desirable ones. The findings in this chapter suggest that the undesirable events are not only inherently more stressful but have further implications for additional life stresses subsequent to the initial major event.

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Representative MITCHELL. Thank you. That's just fascinating and I have lots of questions as per usual.
Miss Witte, please proceed.

STATEMENT OF ANN DRYDEN WITTE, ASSOCIATE PROFESSOR OF ECONOMICS, UNIVERSITY OF NORTH CAROLINA, CHAPEL HILL, N.C.

Miss WITTE. Thank you very much. It's a privilege to be able to testify before the committee.

I would like to narrow the focus a bit in the sense that I would like to look at the relationship between unemployment and crimes specifically rather than at the broader relationships that Professor Brenner has addressed. In addition to that, I would like to look at a different type of data. Professor Brenner's, and indeed most work that has looked at the relationship between unemployment and crime, has used aggregate data. That is, this work has data for jurisdictions as a whole such as data you, Professor Brenner, used here. Yet our intuition and our theory is not an aggregate theory. It does tell us how whole jurisdictions behave, whole cities, whole States. It tells us how individuals behave. I would like to look at what we know at the individual level; what the type of research tells us that has been conducted on individuals rather than the aggregate level.

If you look at this research, I think you will see two broad strands of effort that bear on this question. First of all, there's a set of research which has attempted to test what we call the economic model of crime. This model sees crime as caused by a number of factors. For example, we can deter crime if we have higher penalties, if the probability of imposing penalties are higher, if the rapidity with which penalties are imposed on criminals is greater. In addition to that, these models suggest that if we provide better legitimate opportunities to potential criminals, they will commit fewer crimes and, of course, this is the portion of the model that we are particularly interested in today.

Consider this theoretical research. What are the elements when we talk about legitimate opportunities? First of all, whether or not you can get a job certainly makes a difference. That is, the unemployment connection is definitely relevant. In addition to that though, we have to broaden our perspective and look at the nature of the jobs that are obtained. Here what we want to consider are two specific factors. We want to look at the wage rate on the jobs, what the monetary rewards of the job would be. In addition to that, we want to look at the job satisfaction, the psychic rewards—which, of course, economists must never address but I'm afraid I'm going to have to today—what one obtains from one's job.

For example, I think if many of us at these hearings today were to think about our jobs, many of the nice things we think about, in addition to the paycheck on Friday, are those psychic rewards of being at hearings like these today, and I think this is true for many potential criminals as well as for those of us here today.

Let's now look further at these studies. When we look at these studies we find some very intriguing results. First of all, what we find from these studies is very little, if any, support for lower unemployment encouraging individuals to lesser crime. So I can't, as Professor

Brenner has been able to, tell you that lower unemployment is going to solve your crime problem. At the individual level, the data simply tells us that that is not the case.

However, if we look further into these tests, what we find is that higher wage jobs are associated with lower crime for those who are potential criminals. In addition, an even stronger relationship that we find from this individual data is that job satisfaction as measured by work stability is associated with lower crime.

Let's see if we can try to tie this a little bit more closely to the national economic scene. When we try to do that, we find that individual work indicates that for property offenders, not for person's offenders, a simple increase in unemployment may not have a large effect. At least we cannot find that at the individual level.

But what seems to have more of an effect from these individual results is highly cyclical economic activity such as we have experienced during the 1970's. When this occurs, what happens is many of your largest firms—your General Electrics, your General Motors—that produce the best jobs, the best jobs both in terms of high wages and the best jobs in terms of job satisfaction, are very reluctant to hire permanent employees because they are afraid of the fall in demand that will occur shortly after cyclical peaks. Instead of hiring permanent employees, for whom there will be bad publicity or extensive cost involved in termination. During the 1970's these companies have increasingly provided secondary jobs. What these secondary jobs consist of and the way in which they have been produced is that rather than hiring regular employees, these firms are hiring temporary employees and sending work out to small vendors in time of high demand. When demand falls back, rather than firing their own permanent employees, they fire the temporary employees and bring work back in from the vendors. Primary jobs that the individual data tells us would be particularly effective in reducing crime rates are not being provided at the rate they would be if we had a more stable level of economic activity.

You might wish to look a little further at this relationship between unemployment and crime and investigate why it isn't stronger? There's been some very interesting work that has broken down the nature of the relationship between unemployment and crime into four different groups where the relationship is quite different.

The first of these groups contains offenders of the white collar variety. When you think of these types of offenders, when you think of the employee thief, when you think of the embezzler, what you know is that in order to commit the crimes they have to be employed. Employment and jobs go hand in hand for this particular type of offender and these particular types of offenses. The relationship between unemployment and crime is not what we expect, but rather is direct; that increased employment might increase these types of crimes rather than lower them because a job is necessary to commit these types of offenses.

If we move to a second type of criminal that has been identified with this individual research, this type of criminal combines crime and work. We can break this group into two subcategories. One of these subcategories is a category where people moonlight in crime. Instead of moonlighting as a house painter, they moonlight as a drug dealer or

shoplifter or a robber or burglar. The other subcategory in this group consists of those individuals who use their legitimate employment as a front for their illegal activity. You see this particularly for gambling and for narcotics dealing and also in the fencing industry. These individuals use their small secondhand store as a front for their fencing operations. They use their cabdriving as a front for delivering drugs. Again, the nature of the relationship between unemployment and crime is more complex for this group than we expect.

There's a third group where we do get the expected relationship and these include large numbers of juvenile offenders. The individual research indicates that these offenders tend to alternate between legitimate and illegitimate employment. That is, they will bagboy for a while or they will work in the local textile mill or metalworking mill, depending on where they are, and then when they get tired of that job or something better turns up in the illegal sector they will quit and move into the illegal sector. For this particular group you get the expected relationship between unemployment and crime.

There's a fourth group where you get no relationship and this group is just those whose job is crime, and this is estimated to be between 5 and 10 percent of all property offenders. Employment doesn't matter. They are not going to switch to legitimate employment with any reasonable type of job availability.

If you switch now from this theoretically based literature to the programmatic literature, you find some very interesting things going on around the country. Indeed, Congressman Mitchell, some of these things—perhaps the most exciting went on in Baltimore in your own home state. You may indeed be familiar with it. It was called the LIFE program—living insurance for ex-offenders. This program gave selected nonaddictive property offenders released from the Maryland Department of Corrections, payments of \$60 a week, to tide them over until they could become self-sufficient after their release from imprisonment.

The results of this particular experiment showed that indeed these individuals significantly reduced their property offenses as a result of these payments. So I think this type of programmatic research indicates that providing economic viability may be one way of reducing crime.

Another thing I was asked to address was the cost of unemployment; that is, if unemployment increases crime, what are the costs involved? Well, a program like LIFE obviously has direct costs to our society in that we have to make payments to ex-offenders. But what we find if we do a benefit-cost analysis of a program like LIFE and some others that I can tell you about if you wish is that the social benefits flowing from these programs exceed those social costs. We as a society are better off having made those payments than not having done so.

I would be glad to discuss any other programs that you would like. My overall conclusion from looking at a wide variety of individual research is that it's not so much jobs per se that are going to reduce our crime rate and our crime problem, but rather, that it is good jobs that are going to do this. Thank you.

[The prepared statement of Miss Witte follows:]

PREPARED STATEMENT OF ANN DRYDEN WITTE

• *Unemployment and Crime: Insights From Research on Individuals*

Most research on the relationship between unemployment and crime, such as Professor Brenner's, has used data for jurisdictions (e.g., cities, states, nations) rather than data for individuals. (Such data is referred to as aggregate data since its observations are obtained by the aggregation of data for individuals in the jurisdiction.) Yet, the theory and intuition which lead us to believe that unemployment and crime are related is based on beliefs about the way in which individuals behave. Research using aggregate data is only able to provide reliable insights about individual behavior if certain restrictive assumptions hold. In practice, the assumptions necessary to make inferences concerning individual behavior from aggregate data rarely hold. Thus, in order to truly test our theories concerning the way in which unemployment affects an individual's tendency to commit crimes, we must use individual data.

To date, there are two distinct types of research which can provide insight into the way in which unemployment affects an individual's criminality. The first type of research has been mainly theoretical and has been concerned with the nature of labor markets for individuals committing crimes and with the way in which labor markets affects criminality. This type of research is reviewed in Section 1 and 2 below. The second type of research, surveyed in Section 3, has been largely atheoretical and is designed to evaluate programs to improve the labor market performance of criminals. After surveying each type of research we will, in Section 4, combine insights from both and assess what we know about the relationship between unemployment and crime from studies which use individual data.

1. THE NATURE OF LABOR MARKETS FOR THOSE CONVICTED OF CRIMES

Our knowledge of the nature of labor markets for these who commit crimes comes mainly from research on the labor market performance of prison releasees, generally parolees. The labor market performance of Federal parolees (Glaser, 1964; Pownall, 1969), Massachusetts parolees (Evans, 1966, 1968; Cook, 1973, 1975) Michigan parolees (Hardin, 1975 and Borus, Hardin and Terry, 1976), North Carolina prison releasees (paroled and unconditionally released) (Witte, 1975; Witte, 1976; Witte and Reid, 1980), Wisconsin parolees (Feyerherm, 1976) and Canadian releasees (Waller, 1974) have been studied in detail.

The situation of a correctional releasee immediately after release depends on the nature of his/her correctional experience, the type of release (supervised or unsupervised) and the availability of family and community services. Probationers and releasees from community correctional facilities generally have established labor market ties (if they ever will) and are relatively well prepared to cope with freedom as their activities have generally not been greatly constrained by their correctional experience. Parolees generally have a job prior to release as having a job is often a prior condition to parole. Generally, the jobs obtained by parolees are of a low wage, low skill nature and parolees often experience substantial job instability as they seek to improve their labor market position. The labor market position of unconditional releasees from prison and jails is perhaps most difficult although the establishment of work release, prison industries that pay wages and pre-release programs has eased their plight in some areas. Such individuals have few resources other than gate money,¹ and are, thus, usually forced to accept the first job offered.

Existing evidence seems to indicate that employment for correctional releasees depends on the conditions in local labor markets. Evidence surveyed by Cook and Witte seems to indicate that prison releasees have little trouble finding jobs although the jobs found are usually rather dismal. However, Feyerherm's study of a cohort of Wisconsin parolees during the 1974 recession found that only half of the releasees studied were able to find full-time employment within a month of release.

Most studies find unemployment rates for prison releasees which greatly exceed those for comparable population groups. However these studies generally find, in

¹ Glaser (1964, p. 319) found that 85 percent of his sample of Federal releasees had no external savings and the median savings of the remaining 15 percent was \$433. Pownall (1969, p. 182) found the median amount of cash possessed by men in his post-release survey was only \$50. Individuals who have been on work release are often considerably better off. Men in Witte's work release sample had savings from the work release jobs which averaged over \$400 on release (Witte, 1976, p. 36).

contrast to Feyerherm, that unemployment does not usually result from an inability to find a job, but rather from short periods of leisure, job search and illegal activity between frequent job changes.

Jobs obtained by prison releasees are generally low skilled and often transient in nature. Witte found the jobs on release of 54 percent of the North Carolina releasees studied to be classified in the three lowest skill categories of the U.S. Department of Labor's occupational classifications. Even an average three years after release, 39 percent of these prison releasees still occupied jobs that were so classified. As a result, at least partially, of low skill, employment tends to be concentrated in large manufacturing industries employing mainly unskilled or semi-skilled labor (textiles in North Carolina, metal working in Wisconsin), in services industries and construction. When the jobs of prison releasees require skills, they usually require mechanical skills rather than skills related to data or people. Common occupations are manufacturing operative, craftsman (e.g. painters, cement finishers) and non-farm laborer.

Earnings on release tend to be low relative to comparable population groups. Pownall found his Federal releasees to earn only approximately half the median income of the population as a whole and Feyerherm's releasees earned only approximately 65 percent of the average weekly wage of production workers in Wisconsin. Witte found that even approximately three years after release, the North Carolina releasees she studied earned a mean annual income only 70 percent of that earned by all adult males in a similar geographic area. However, these releasees earned substantially above ($2\frac{1}{4}$ times) the mean income of those below the poverty line. Interestingly, the only two studies which include unconditional releasees as well as parolees (Waller, 1974 and Witte and Reid, 1980), find that parolees have significantly lower wages than do unconditional releasees. This would seem to indicate the desirability of reorienting traditional supervisory activities (e.g., probation and parole) toward labor market improvement. At the least, supervision should not be allowed to depress labor market performance.

As noted above, all studies find marked instability of employment among prison releasees. Cook found the Massachusetts releasee in his sample to, on the average, have a new job every three months. Pownall found that his Federal releasees remained on their first job a median period of only 4.1 months and on their last job only slightly longer, 5.2 months. Using a longer follow-up period (average 37 months), Witte found median job tenure of 10 months. In general the available evidence seems to indicate that this labor market instability is chosen, as most job terminations are voluntary.

Considering the previous descriptive work as a whole, one might paint the following picture of the labor market performance of the typical prison releasee. On or shortly after release (within two to three weeks), the releasee generally obtains a low skill, low paying job as a manufacturing operative or nonfarm laborer which (s)he maintains for only a short period (3 to 4 months). Through time, the jobs of releasees improve only moderately in terms of pay and skill level. The releasee's employment pattern is generally that of frequent job changes with short periods of unemployment between jobs. For many releasees (approximately one-third), labor market activity is also frequently interrupted by periods of imprisonment. The low skills and unstable work patterns of prison releasees mean that they generally earn substantially less than comparable general population groups. However, their annual incomes are substantially above those of individuals below the poverty line.

A number of studies (Cook, 1973; Hardin, 1975; Borus Hardin and Terry, 1976; Witte and Reid, 1980) have explored the determinants of labor market performance of prison releasees. These studies have found that labor market performance is most affected by the race and sex of the individual, by familial responsibilities, by the nature of the individuals previous work experience and current job, and in some cases by the type of correctional program in which an individual had participated. The negative findings of these studies are at least as important as the positive ones. Perhaps, the most interesting of these negative findings are that previous criminal record generally has no effect on labor market performance and that an individual's level of education affects neither earnings nor other measures of labor market performance. The findings of these studies suggest both policies which are potentially effective in improving labor market performance and policies which are likely not to be effective. Specifically, the results indicate that, on the positive side, programs designed to provide stable job records and to provide full time, regular employment in high wage, high skill industries and occupations are likely to be effective in improving labor market

performance. Further, it appears that some type of graduated release may lead to better performance. On the negative side, the results raise considerable doubts about the effectiveness of traditional supervisory programs (parole) and programs designed to improve general educational attainment.

2. THE RELATIONSHIP BETWEEN EMPLOYMENT AND CRIME FOR INDIVIDUALS

To date, there have been few attempts to explore directly the relationship between unemployment and other measures of labor market performance and crime using individual data. Cook (1975) provides a survey of early work and Sickles, Schmidt and Witte (1979) and Witte (1980) are examples of more recent work. I have continued to work with individual data to explore the relationship between labor market performance and crime and the following conclusions are based on this additional work as well as work that is currently available. This work provides consistent but weak support for the expected inverse relationship between wage and crime and weak, if any support, for the expected relationship between unemployment and crime. To date the strongest relationship between labor market performance and crime which has been found is that between employment stability (a measure of employment satisfaction) and crime.

As a whole these results seem to indicate that it is not so much individual unemployment per se which causes crime, but rather the failure to find relatively high wage satisfying employment. From this individual work it appears that increases in unemployment and the general recession in economic activity usually associated with such increases may not greatly affect the level of crime directly, but may do so indirectly by decreasing the availability of desirable employment opportunities.

A number of sociologists and radical economists have suggested that the labor markets in our economy are becoming increasingly segmented. Desirable jobs (primary sector job) with high wages, good benefits, employment stability, and advancement opportunities are only open to the well trained, conforming members of our society like those of us attending these hearings. For the less well educated, non-conforming individuals who commit most crimes only transitory, dead end jobs in "secondary labor markets" are available. These jobs provide relatively low income, fail to provide skill training or advancement opportunities and generally breed frustration and/or boredom.

The cyclical nature of economic activity during the 1970's has caused many large firms to provide fewer primary jobs than would have been the case in earlier periods. Fearing fluctuations in demand and the difficulties (e.g., bad publicity, benefit payments) involved in terminating permanent employees, these firms meet increased demand in periods of prosperity by hiring temporary employees and sending work out to relatively small vendors. When demand falls back, it is quite easy to terminate temporary employees and decrease the amount of work sent out to vendors. While this type of decision making is quite rational from the point of view of the businesses involved, it means that fewer desirable jobs are generated by high levels of economic activity than would otherwise be the case. Given the research surveyed above, it may be this aspect of highly cyclical economic activity rather than unemployment per se which is associated with increased criminality.

Recent work by the Vera Institute (Sviridoff and Thompson, 1979) and Rand (Petersilia, et al., 1977) have also indicated that the relationship between unemployment and crime is far more complex than indicated by the statement "unemployment causes crime". This research suggests that the nature of the relationship between unemployment and crime depends on the type of crime and type of individual involved. Sviridoff and Thompson identify four distinct types of relationships between unemployment and crime. First, some types of crime (white collar crime, employee theft) require jobs in order to be possible. For these types of crime, one would expect a decrease rather than an increase as unemployment rises. Second, some offenders mix employment and crime. These individuals either "moonlight" in criminal activities or use their legitimate job as a front (e.g., fences, drug dealers). For this group like the first employment and crime go hand in hand. For individuals moonlighting in crime, unemployment may increase criminal activity as predicted by our simple models; however, for those using legitimate employment as a front, unemployment may make criminal activity more difficult and may lead to decreased rather than increased illegal activity. Third, some offenders, particularly younger offenders, appear to alternate between employment and crime. For these individuals unemployment or dropping out of the labor force generally indicates a switch from legal to illegal income generating employment rather than unemployment as we normally perceive it. For individ-

uals in this group, we would expect either a rise in unemployment or a drop in labor force participation to be associated with increased criminal activity. It appears that it is for this group that our simple model, "unemployment causes crime", is most relevant.

Finally, there appears to be a small group (5 to 10 percent of property offenders) that are firmly committed to crime as their primary means of support. For this group, enemployment or non-participation in the labor market is a way of life. We would expect no relationship between unemployment and crime for this group. Note that we only expect decreased employment to be associated with decreased criminal activity for individuals in group three discussed above and some individuals in group two. However, one might well expect a direct relationship between the quality of job and decreased criminal activity for some member of all of the first three groups. This may provide at least a partial explanation for the stronger relationship found between job quality and crime than between unemployment and crime at the individual level.

3. INSIGHTS FROM THE PROGRAM EVALUATION LITERATURE

Numerous programs have been developed which are designed to improve an individual's economic viability. These programs are usually based, at least implicitly, on the assumption that improved economic viability will lower criminal activity. Careful evaluation of programs of this type give insight into the relationship between economic viability and crime as well as suggesting particular programs which are likely to be effective in lowering criminal activity. As a whole, the results of employment related program evaluations provide only weak support for our simple model, "unemployment causes crime." However, these programs provide somewhat more support for satisfying employment experiences and economic viability being associated with decreased criminal activity.

Evaluations of pretrial intervention projects which provide employment oriented assistance find that such programs are more effective for adults than juveniles and that they decrease criminality in the short, but not the long run (Rovner-Piecznik, 1970; Taggart, 1972). Evaluations of vocational training and remedial education projects in prison, parole, or probation settings have almost uniformly found that such programs have insignificant effects on both labor market performance and criminality. Evaluations of work programs in prison (e.g. work release, prison industries) have had mixed results. These evaluations generally show that such programs reduce the cost of running a prison system (see Cooper, 1968; National Institute of Law Enforcement and Criminal Justice, 1978a and 1978b) but have reached conflicting conclusions regarding the effect of such programs on criminal activity. On the one hand, evaluations of California's and North Carolina's work release programs indicate that work releasees commit either less crime or less serious crime when released from prison than do releasees who do not participate in the program. On the other, evaluations of Massachusetts' and Florida's work release programs show no beneficial effects. We could learn much from a thorough evaluation of why some work release programs appear to reduce criminal activity while others do not.

In the early 1970's two new programs, transitional aid and supported work, aimed at improving the economic viability of released offenders in the community were implemented and produced promising results. The transitional aid program, begun in Baltimore in October, 1977 by a nonprofit research organization provided financial aid and job placement services to offenders in the period immediately following their release from prison. This program called LIFE (Living Insurance for Ex-Prisoners) carefully selected a pool of "high risk" non-addicted, property offenders from Maryland Corrections Department releasees returning to the Baltimore area. An evaluation of the effects of the program indicated: (1) individuals receiving only job placement services had neither better employment records nor criminal records than those who received no services, and (2) that those receiving financial aid had no better employment records, but did have significantly fewer arrests for property crimes. A benefit-cost analysis (Mallar and Thornton, 1978) indicated that we as a society were better off having made payments to the releasees that not having done so: the social benefits of the LIFE program exceeded its social cost.

The supported work program, begun in New York City in 1972 by the Vera Institute of justice, provided subsidized employment in a "low stress" environment for ex-addicts meeting certain requirements. In the support work program, the "treatment" is work itself in a supportive environment that features graduated stress, peer support and close supervision. The program also features special

challenges, for example, offering cash bonuses or "psychic rewards" for good performance, in an attempt to wean participants for old habits inappropriate to work life.² An interim evaluation of the program effects indicated that individuals who participated in the program earned more, required fewer welfare benefits, and were arrested less often than controls. Further, as was the case for transitional aid, a benefit cost analysis indicated that the social benefits emanating from the program substantially exceeded social costs. (See Friedman, 1977 for additional details).

Due partially to the above favorable evaluations, but probably due more to the attractiveness of economic approaches to crime to an increasingly conservative national mood, both the transitional aid and supported work programs were rapidly expanded. Fortunately, these expansions were subject to careful experimental evaluation and at least partial results are currently available. Unsurprisingly, the nature of both programs were substantially modified during expansion. We will discuss each expanded program in turn and the evaluation results currently available.

The transition aid program, renamed TARP (Transitional Aid Research Project), was operated in Georgia and Texas by the State Department of Corrections and Employment Security Offices and made available to individuals released from jail and prison between January and July 1976. This program made transitional aid payments available to all Department of Corrections releases returning to areas with Employment Service Offices (mainly urban areas) and to selected groups of those returning to areas of the state without such offices. There are a large number of differences between LIFE and TARP; two are particularly important. First, while under the LIFE program, employment and legal earnings merely deferred payments, under the TARP program, employment and legal earning actually decreased payments. Thus, while the LIFE program gave few if any work disincentives, the TARP program provided often large incentives not to work. Second, TARP payments were given to all eligible releasees while LIFE payments were given only to non-addicted, property offenders. Evaluation results indicate no significant differences in criminality between individuals receiving transitional aid payments and those who did not. Further, individuals receiving transitional aid were found to work less and earn lower incomes than individuals who received no aid. This latter effect is probably the result of the work disincentive in the TARP program noted above. When the work disincentive effect of transitional aid payments is controlled, evaluation results indicate that releasees in Texas, but not Georgia, who received transitional aid payments had significantly fewer property arrests than individuals who received no such payments. (See Rossi, Berk and Lenihan, 1980 for additional details.)

The supported work program was expanded originally to thirteen cities and to include three target groups in addition to ex-addicts: (1) women who had received AFDC welfare payments for substantial periods of time, (2) prison and jail releasees, and (3) young school drop outs. The program was administered by diverse groups in the various location ranging from governmental bodies to non-profit community groups. While the exact program and nature of job available varied from location to location, the new programs were quite similar to the original. Results for the first eighteen months of the expanded program are currently available (Maynard et al. 1979). For ex-offenders they indicate significantly improved labor market performance only during program participation although significant welfare payment decreases continue even after ex-offenders leave the program. There is no significant decrease in reported criminal activity for ex-offenders either while they are in the program or after termination. However, ex-addicts participants do significantly decrease their criminal activity. These results are disappointing for ex-offender but support the original results for ex-addicts. Final judgment must await final results which will only be available later. Some additional support for providing supported work environments comes from a recent evaluation of the job corps (Mallar, 1979). The evaluation found significant decreases in arrests for corpsmen after program completion.

Taken as a whole the program evaluation literature supports conclusions similar to the more theoretical literature surveyed in Sections 1 and 2. Unemployment per se only appears to be weakly related to criminal activity. However, rewarding work experiences and economic viability appear to be more strongly associated with decreased criminal activity.

² This description was given by personnel of the Vera Institute of Justice who ran the original supported work program.

4. WHAT DO WE KNOW ABOUT THE RELATIONSHIP BETWEEN EMPLOYMENT AND CRIME FROM STUDIES OF INDIVIDUALS?

The literature surveyed above is highly diverse and as a whole provides only weak support for our simple model: "unemployment causes crime." Rather, this literature indicates that if we are to understand the relationship between employment and crime we must narrow our perspective in some ways and broaden it in others. First, we must broaden our perspective in the sense that we must consider the whole issue of economic viability, rather than just employment per se. In addition, we must consider the quality of job as well as simply whether an individual is employed. Second, we must narrow our perspective in the sense that the nature of the relationship between employment and crime varies with the type of offender and type of offense under consideration. Unemployment may lead to violent crimes simply because unemployment allows more time for interpersonal contact in non-structured environments, and often causes greater family stress. Unemployment may lead to less white collar crime and employee theft because of lack of opportunity, but to more traditional (e.g., larceny, robbery) property crime and other illegal activities (e.g., gambling, drug sales) as individuals substitute illegal for legal employment.

Individual research provides more support for the potential effectiveness in reducing crime of either providing economic viability directly (e.g., cash payments) or providing rewarding work experiences (e.g., supported work, desirable jobs) than for simply reducing the unemployment rate. However, the relatively wide cyclical economic swings which we have experienced during the 1970's may be at least partially responsible for the failure of more criminals and potential criminals to obtain desirable jobs. Thus, it appears from the research to date that unemployment may increase crime both directly and indirectly. Individual research to date indicates that the direct effect of unemployment on crime may be quite small and limited to that relatively small group of individuals who alternate between legal and illegal employment. However, this individual research also indicates that the indirect effect of highly cyclical economic activity may be much greater. Such cyclical economic conditions appear to decrease the number of desirable jobs which our economy provides. From existing research, it appears that it is possession of such desirable jobs that has a major effect on an individual's criminality not simply employment per se.

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Representative MITCHELL. Thank you. You have awakened all of the old tendencies of a former sociologist—one who sought to be a former social scientist. It was just fascinating testimony for me.

In general, your testimony about the quality of jobs is particularly significant to me. I think it has to be seen within the context of what social scientists used to call the difference between real need and felt need. Not many people will actually starve to death in America. Some will. I don't think that there is a real need in terms of lack of food. However, there is a felt need. The difference between whether one eats chicken wings—they're expensive now—but hot dogs versus filet mignon—and I think I can easily understand why the quality of

the job, the salary of the job is certainly far more significantly related to crime than is the job itself when you look at the whole milieu of America in which the marketplace operates in terms of creating felt needs. I think I would be safe in saying that.

One other point that I would like both of you to address and that's the matter of what is legitimate? I think you both addressed the issue of legitimacy. Let me find my notes—legitimate opportunities. Would there not be a variation in the definition of legitimate opportunities as one moves across or through various, call them for the moment, subcultural groups? For example, the numbers racket which presents quite a problem in my State of Maryland. We continue to arrest people for the illegal lottery and we induce them to play in the legal lottery of the State of Maryland, which is kind of paradoxical; but for certain subcultural groups, would not the numbers racket itself be a legitimate opportunity? Would you agree with that, Mr. Brenner?

Mr. BRENNER. It's very tricky. I would imagine, Congressman Mitchell, the cultural ethic varies as to what is morally proper from time to time. Now, it's morally proper to use various legal, in fact State-encouraged, gambling. A decade or two ago it was not. There are very fine lines. It's hard to believe that that sense of a fine line between what is proper and what is improper morally does not contribute to what we would ordinarily think of as moral.

If I may go just a bit beyond that though, on this issue of quality of job, as Miss Witte raised it, we have one, I think, significant point of connection between our statements, which is largely concerning the issue of youth employment, which in terms of the crime issue altogether is the vast majority of all crime and increasing proportionately as the decades pass. It is the major source of crime in the United States and most of Europe.

To just take that a step further, the issue I was trying to raise on youth unemployment is not so much that youth themselves are employed or not. The status of youth is very peculiar. Youth do not have to be employed. They can go to school. They can go to high school or college. They can be outside of the labor force altogether. In both cases they are simply not employed, so they cannot be unemployed. To be unemployed, one must be a member of the labor force and looking for work. It's rather a situation of youth who are unemployed when much of the society is employed. It is the disparity issue that is probably the fundamental one to trends in crime that we have been looking at.

If you focus on the issue of national trends and their magnitude and where they are moving, the fundamental issue seems to be, both in our country and elsewhere in North America and Western Europe, that disparity between the unemployment level for youth in terms of its ratio to the national unemployment rate. It is not so much perhaps a question of whether youth are or are not employed as compared with the issue of whether they are unemployed when the rest of society is doing reasonably well. The ratio seems to be the key phenomenon.

Representative MITCHELL. Could I pursue that just a little bit? I'm not at all sure that I can sort my thoughts out properly, but I want to address just one problem or one area. I guess I would almost come down on the position that save for very affluent, very wealthy families, youth must be employed. I say that for two reasons and

break it down into two categories: One category is where the youth becomes a part of the economic component of the family's well-being and has to be employed. Then there's another category where youth has to be employed because he is the end object of an awesome "sell" campaign which creates what I referred to earlier as "the need." The family whose income is \$20,000 a year and has three teenage boys, from one perspective, those three teenagers might not have to be employed. Their income might not be essential to the ongoingness of the family. But if you consider those three as a target of a constant, relentless, unremitting campaign to make them acquire, make them have, make them use, then it almost becomes "must" employment for them. Would you agree with that?

Mr. BRENNER. Yes. That's very close to what I was trying to indicate, sir. It is particularly during the times of general economic growth that are coincident with times of relatively high unemployment for youth that the disparity is most acute, that on the one hand you have the kind of pressure for acquisition that you spoke about in the face of a time that's particularly difficult for youth in comparison with the rest of the population to be working.

This is a tendency that has been growing over the last 30 years because jobs are less and less available at lower skills altogether and particularly in families in which the tradition has been comparatively lower skill work or work in small businesses where the comparative status of that kind of work—the volume of availability of that kind of work has declined over the last three decades or so. This, in the face of continuously greater demands at higher levels of acquisition—that is the point of connection.

Representative MITCHELL. Let me just direct another question to you. I'm fascinated again by your correlation between unemployment and mental illness. Have you fine-tuned that to the point that you could make correlations between types of mental illnesses and unemployment? For example, those unemployment-induced more psychotic behavior or psychoneurotic behavior or a general—what do you call it—mentally disturbed condition, sort of a malaise of feeling? Have you broken it down?

Mr. BRENNER. Yes. In a book published in 1973 entitled "Mental Illness and the Economy," there were examined the various sources of functional mental disorders, they are called, those that do not involve damage to the brain. These include manic depressive disorders, schizophrenia, and other functional disorders. Most rapidly and acutely reacting to changes in employment and income are the depressive disorders, a good example of a symptom of which clinically is suicide. It is indicated in the field that some 70 percent or so of suicides are in some state of clinical depression. This is why suicide is such a very good indicator of depressed economic conditions as we have seen over time in this country and elsewhere.

In the case of homicides that are more nearly chronic illnesses, like schizophrenia, for example, the observation is that hospitalization for schizophrenics responding to changes in employment and income occur at a lag of about 2 to 3 years. This is particularly true of lower socioeconomic groups as distinguished from higher socioeconomic groups which we would imagine can hospitalize their kind at a much quicker level.

Representative MITCHELL. Suppose we look at unemployment and various forms of pathological behavior. I suppose many would say that it is the antidote to the depressive conditions that is causative rather than the condition itself. For example, the person who's out of work for a long period of time starts to rely on alcohol or drugs. I'm sure some people would argue that the correlation is between the antidote to the depressive condition rather than the condition of unemployment itself.

Would you speak to that?

Mr. BRENNER. Again, if I understood you correctly, one prevailing theory is pretty much as you described it, which is that the pathological condition itself is a reaction, of course, to the state of the mental pathology, if you like, the antecedent pathology; namely, the situation of depression, the situation of alienation which is another term frequently used to describe the precondition for drug abuse, severe alcohol abuse, aggression. These kinds of conditions are generally described in the psychological and psychiatric literature in pretty much that way, where the conditions themselves that result in mortality and severe morbidity and hospitalization are understood to be the reaction to the disturbed mental condition, the mental condition itself resulting from changes in stress levels often related to economic conditions.

Representative MITCHELL. Thank you.

Miss Witte, in your statement you indicated that the real reduction in criminal activity can best be achieved in terms of investment in human capital programs or remedial programs. You refer to the program that we carried on in Baltimore, the supportive program, rather than—and maybe I'm misreading you, but you suggested that approach rather than training in advanced production skills. Is that correct?

Miss WITTE. No, I don't believe that is correct. Indeed, there are two sets of literature that bear on your question. The first set is the literature on the determinants of labor market performance for potential criminals. If you look at that literature you find that traditional education has no effect, that we can find, on their labor market performance. So giving them traditional education is not going to be helpful.

Rather, the types of things that are promising—and I can't say that they are always going to work everywhere—are things like the LIFE experiment. Two other good examples are supportive work experiments that were started by the Vera Institute of Justice in New York and now have been expanded to 17 cities throughout the country, and also the Job Corps programs. What many of these individuals seem to need is some sort of supportive work environment, somewhere to learn job skills, not necessarily the vocational skills that we normally think of, but rather just to learn the habit of work, to learn that you stay somewhere 8 hours a day, that you get rewards from a working situation, that you show up at 8 o'clock every morning, these sort of skills which may seem very simple to those of us that learned them but are not terribly simple to individuals that we're considering here.

Representative MITCHELL. Then I guess your recommendation would be a greater investment of public funds in those kinds of programs than we presently have. Is that correct?

Miss WITTE. Yes; I think that would be true, and also in vocational training related to satisfying job opportunities. We have spent a great deal of money on vocational training, as you're well aware, but what's often happened, particularly with this potential criminal group or ex-criminal group, is that the job skills that they are trained in are never used. There was a study of Federal prisons releasees that found that only approximately 10 percent of those individuals receiving vocational training in Federal prisons ever had a chance to use those skills. You just can't train someone. You have to train them for jobs that they are going to be able to find when they go into the labor market.

I did have one other thing I wanted to mention and it related to a question that you asked Professor Brenner concerning the relativity of legitimacy. In the course of one research project, I had to interview a large number of ex-offenders in their home communities and it was a very enlightening experience, or at least I found it so. We had obtained their criminal records—we had been to the local police departments and FBI, so we knew what they had been up to. However, we went ahead and asked them what criminal activity they had been involved in. There were very consistent gaps in the sense that many people didn't consider gambling illegal; many people didn't consider prostitution illegal; many people didn't consider drug sales illegal or drug use. You get very consistently different definitions by different types of individuals that you would interview in this situation. It is relative.

Representative MITCHELL. I am inclined to that direction. My entire life has been spent deep in the ghetto of Baltimore and I enjoy a pretty good rapport with most of the people there. Having worked for the courts, perhaps Mr. Brenner knows the definition of what is legitimate varies significantly as you go through subcultural groups.

Let me address a question dealing with demographics—really two questions. One might want to assume that the higher rate of youth crime is directly reflective of the baby boom we experienced in this country and now that it is dwindling down one would expect a similar decline in youth delinquency and crime rates in the Nation. That's the first part.

The second part, again dealing with demographic factors, people are living longer and we are going through a fascinating series in the city of Baltimore on shoplifting and senior citizens, an enormous problem. They are now being tried in the courts and found guilty and they become a crime statistic. Obviously, part of that reflects the fact that they are on fixed incomes and inflation is spiraling and a whole host of other things.

Could you comment, both of you, on both of those demographic aspects—longevity increasing the length of time in which people live, and reducing the baby boom of a few short years ago?

Mr. BRENNER. On the first question of the baby boom, since the Great Depression—actually beginning with the increase in the population coming in the 1950's and 1960's and most important by the late 1960's and early 1970's being into their teens and 20's, the data on crimes known to police nationally in this country at least do indicate that that is a significant factor. It is not the overriding factor, but it is certainly one factor in the longer term trend of crimes known to police.

A factor of equal significance is the long-term trend in economic growth as an important factor, as a deleterious factor in this case, in its effect on increasing the crime rate oddly in conjunction with youth unemployment. So that it is probably the case at least in terms of crimes known to the police that over time we will see a diminution in those trends coincident with a diminution in size of population age 15 to 24, but there's no indication that that will have much of an impact on the more stable relationship that's existed over the past 30 years or so involving youth unemployment relative to total unemployment in conjunction with economic growth. In fact, when we look at other societies in Europe which have not had anything like the increase in youth population that we have experienced, their statistics and relationships of crime to youth unemployment and youth unemployment relative to national unemployment are very similar to ours but do not include such trends as are reflected in our birth rates and the size of our population age 15 to 24. So in all likelihood, over the long term, what will remain as the 15- to 24-year-old proportion of the population diminishes is the relatively stable relationship focusing on youth unemployment to total unemployment in the face of economic growth.

On the second question on the vulnerability of the older population as it enlarges, there are two issues. One, as far as we can tell, yes, that has happened. A larger number of elderly over the age of 60, for example, are subject to homicide which we can pick up through vital statistics mortality data, in conjunction with these changes in youth unemployment to total unemployment rates, in the face of economic growth in particular.

A related issue, however, which may not have perhaps been the intention of your question but just to say, if I may, is that these youth who are subject to this particular problem involving crime do indeed become older themselves. When they do, they don't fall typically into the situation of a perpetrator of crime any longer. That tends to diminish after the age of 25 to 30. You simply don't see many of them. We pick them up, however, in many other ways. We pick them up in mental hospitals. We pick them up in morbidity and mortality data. Particularly the lower socioeconomic groups of our population, as far as we can tell, for the last century at least, have had considerably higher mortality rates than the population generally. So it's not the end of the story that the youth grow up, as it were. They simply fall into other categories that continue to be vulnerable to these types of fluctuations in the national economy, but respond in a different way.

Representative MITCHELL. In a sense, we simply pull them out of society in one fashion or another so they are not really counted any more.

Miss Witte, did you have any comment on either aspect?

Miss WITTE. I think a little on both, but more on the effect on youth than on the effect of the increasing elderly population, if you look at the individual data, you see a very stable relationship. People do mature out of crime. That is, as they establish social ties, as they marry and have children and support a family, as they develop labor market ties which generally occurs during the mid to late 20's, you do see them maturing out of crime.

Given this, and given some of the correlations we see in the individual data, you would expect the level of crime to be declining in the coming years because of the falling proportion of our population in the crime-prone years, which, in general, one would consider to be 15 to 35. Most of your criminals are in this particular age group.

If you look at the older population issue you have a dual effect. Most of your older population has been pretty well socialized. We all become more socialized as we get older and I think this group is not likely to be a highly crime-prone group unless they are faced with dire economic need.

Representative MITCHELL. May I interrupt just at that point? Certainly they are much more socialized. However, based upon the facts that I have read, with reference to shoplifting and related offenses, it occurs to me that under very dire circumstances many of them face the process of desocialization.

Miss WITTE. There would have to be some process of that nature. However, many payments to the elderly—for example, social security and many pension schemes—are indexed now so they are to some extent buttressed against the inflationary costs. But if their need were to become very dire, you could see a large increase in these types of offenses—minor larceny and shoplifting offenses.

Another thing is that a large elderly population has a tendency to increase crime since they are a very tempting victim group. They provide easy prey for the young people on the streets.

Representative MITCHELL. May I put one more question to you? You might have addressed it. I don't know. In prior hearings we have gotten testimony to the effect that much of our job training or work experience programs are either too sophisticated or they have tried to do too much too quickly with a little bit of money, and as a result, these programs really provide little or no true assistance to those who are the structurally unemployed in our society.

Could you make those same kind of remarks about those with criminal records?

Miss WITTE. I think even more so. If we are not willing to spend money to adequately train our youth who have not been involved in crime, how much less are we willing to spend money to train those who we define as criminal? If you look at the programs we put people in who have been involved in illegal activities and convicted of crimes they are very weak and we do very little for them. We claim to be doing a lot. We have a lot of program titles, but we do very little.

Representative MITCHELL. Again to both witnesses, prior to putting the question to Mr. Brenner, I would just assume that you are now working to update your data, your research, in terms of the current situations that we are confronting. Am I right in assuming that?

Mr. BRENNER. Well, almost. This is the intention. I have had a career interest in these problems for all of my career and will continue to do so and as I'm able to secure research funding to persist in this work it will certainly continue if I'm able to do it.

Representative MITCHELL. I think it would be significantly beneficial for the Joint Economic Committee. I think this committee has a duty and a responsibility to keep putting out to our colleagues in the House and into the public in general what we are actually paying out in terms of the cost of crime, and what we are doing in this Nation is kind of insane in addressing the problem of increasing crime rates.

We're on a big prison-building spree right now and I, for one, would submit I don't think America has enough money to build all the prisons necessary. I just don't think we can afford that and I also think it's much cheaper to address the problem directly through some of the strategies that both of you suggested.

This really isn't a question. I'll get to the question in a minute. I hope this Thanksgiving I will be able to again have Thanksgiving dinner in one of the institutions in Maryland. I have been doing that for a number of years and it's not grandstanding. I think that just by going to have Thanksgiving dinner in the penitentiary or Christmas dinner at the house of correction, it's another method of highlighting the futility of imprisoning men without really going through any serious efforts at rehabilitation.

Now I'll come to my question. I'm just totally confused. Since the recession of 1974-75, we have enjoyed—the bulk of the population has enjoyed—enormously high employment rates. Much of America is at work. Yet at the same time, we have had a sort of fixed level of unemployment for a whole series of people in our society. Now it seems to me that this is a little different from the kind of data that you presented where you talked about the cycles of unemployment and the correlation between those cycles and crime, as opposed to a new strange sort of phenomenon where you have high employment and persisting high unemployment at the same time.

Would your data, that you presented on the cycles of the economy and unemployment, be applicable to the situation that we now confront?

Mr. BRENNER. I'm afraid I may have presented too much data all at once for anybody to be able to receive and digest rapidly. There are two stories in relation to crime and aggression generally over the last three or four decades. Up until the 1950's and 1960's the major relationship seemed to be with these depressed movements, movements of depression in the economy typified by unemployment, yielding almost immediate increases in whatever crime measure one chose to look at. Since that time the nature of the relationship has changed altogether.

First of all, we find a greater proportion of youth involved in the relationship than ever before and this is true across the western societies.

Second, the principal variable seems to have changed, changed from a situation where the major predictor was unemployment generally or recession behavior, to one indicating disparities, indicating economic disparities, particularly for the youthful population, indicating a ratio, if you like, of the youth to general unemployment rate.

Let me try to give an example of how this might work at the individual level. It is one thing to be unemployed when the people in your neighborhood or on your block are themselves having a relatively high rate of unemployment. Then one doesn't strike out. On the other hand, when times are relatively better and employment is higher for the general population and for many of the people in one's own neighborhood and one still is unable to find work, where the pressures of society are more intense for acquisition of income than ever, the situation of what in sociology is referred to as relative deprivation becomes most acute. It is this type of relationship in the area of crime

generally that seems now to have taken over completely and this is what I tried to show in that last set of graphs. It is the youth dominated pattern for our country in the last 20 or so years and it is a relative deprivation pattern. It's not a pattern of high unemployment generally for the society. It is a pattern of high youth unemployment relative to that for the society as a whole. This is a different pattern of aggression, not only as compared to what prevailed, say, pre-1950 in particular, but it is a different pattern as compared with sources of other pathological behavior for adults. The youth problem has tended now to be, at least since the Second World War, one of relative deprivation. Therefore, you can have or we tend to have in the example that you gave a situation of, one, comparatively high employment; two, comparatively high unemployment; and in the face of a long-term trend for increase in real per capita income. That is a perfect situation in the 1970's making for a high crime rate.

Representative MITCHELL. There are significant differentials between white youth unemployment and black youth unemployment rates. Would much of the data that you have presented be applicable to the white youth offender? What I'm trying to ascertain is the role of race.

Mr. BRENNER. In general, to stay with the problem of crime and aggression for a moment, the impact of youthful unemployment on the nonwhite population in terms of arrest rates and in terms of homicides mortality where we can actually distinguish the racial groups, the effect on the nonwhites is at least three times as great. That means for increases in unemployment—again in a ratio form of youth to total—the nonwhite population, which is obviously much more heavily involved in the entire issue of unemployment at any age—is responding almost certainly due to that differential in unemployment, at a rate that is three times as great. Its homicide rate is responding at three times as great a rate. Its assaultive behavior is as far as we can tell from arrest rates, the rate of rape is, the rate of robbery and burglary is certainly, and particularly all of the major violent crimes are behaving that way. The same is true typically for other sources of pathology that are unrelated to crime—infant mortality, cardiovascular mortality, mental hospitalization. There is a ratio of about 3-to-1—in fact greater—in the nonwhite population. It will vary with the region of the country. As one moves to areas in which we find a lower skilled, less well educated nonwhite population in the large urban centers in the United States, that ratio becomes even higher. It comes to a level of about 4-to-1.

Representative MITCHELL. Does it also vary in terms of population density, concentration of blacks, not regional, but suburbs versus cities?

Mr. BRENNER. Yes. There are some researchers who have found that on a micro level, on a State level, for example—and I believe on the city level as well—that simply the population concentration of the nonwhite population will show that effect. That is something that can be investigated in fact for cities in the United States looking at the differential and response rate, given changes in such factors as employment and income for that matter, and that work has yet to be done.

Representative MITCHELL. I just hate to have hearings like these because, unfortunately, I get a sense of frustration and futility. The data is there. It says what this Congress needs to do, but we aren't going to do it. We haven't done it in the 10 years that I have been here. Constantly in the Budget Committee and the Joint Economic Committee we talk about the cost of unemployment. We have some knowledge about the cost of crime and yet it appears that my colleagues in the House and the Senate continue to blithely ignore this enormous cost that we pay each year.

Do you have any idea of what a 1-percent increase in youth crime would cost us in dollar figures?

Miss WITTE. Well, first of all, if you want to value crime, you have many different sorts of crime, each of which have to be valued separately. We were talking about this before the hearings began. Consider murder. You're talking about how to value a human life. This is very difficult if not impossible to value, although a number of methods have been suggested. It's very tricky and anybody who's willing to give you a dollar figure without telling you that the variability of that figure is tremendous should be suspect.

What you're adding when you're talking about the overall crime rate, you're not only talking about what is the value of saving a number of human lives—what is the value of avoiding a major concussion? What's the value of avoiding a broken leg? You're also talking about what do we, as a society, suffer as a result of fear in our streets and these things are extremely difficult to measure, and putting a single dollar figure on it would be very difficult. You could say it's a very large number. I think you could say that with considerable confidence. But to say what that number was I think would be nearly impossible.

Mr. BRENNER. I would certainly agree, but I would add to the confusion, if I may, by pointing out one other thing that from time to time is pointed out; that is, if you really attempt to judge the value, the dollar significance if you like, however inhumane type of calculation that would be with respect to individuals, you misestimate by quite a large amount because you neglect, of course, the effect on regional economies, particularly urban economies of large volumes of crime due to fear not only of the population wishing to remain in those areas and utilizing the shops and services and industrial areas that are normally a part of that, but fear of the merchants themselves. In a word, the urban environment altogether is subject to a plague of fear and a sense of damage to ego and integrity by this kind of an effect on the society. It is one we are all familiar with, given the kinds of curfews we like to keep and walking in cities at different times of the day and evening and in any particular regions.

It is, in my opinion, at least one of the reasons that minority groups in particular have had a particularly difficult time in obtaining investments, in moving out of the cycles of those very low socioeconomic statuses that give rise to such a relatively high crime rate. Very few reasonably wise investors will put money into areas that are subject to such great fear on the part of the population. So we do another type of damage to the regional, local and probably national economy, particularly focusing on groups that have a difficult time

maintaining capital investment by allowing the maintenance of this relatively high crime rate among the industrialized societies of the world.

Representative MITCHELL. I was going to ask both witnesses whether you wanted to make a closing statement, but I think you have in response to my last inquiry. I think it was a very comprehensive and effective closing statement. Thank you for being here. This has been a truly informative session for me, although it does add to my frustration as I indicated earlier. Thank you very much for taking your time to be here.

Miss WITTE. Thank you for having us.

Mr. BRENNER. Thank you very much.

[Whereupon, at 11:20 a.m., the committee adjourned, subject to the call of the Chair.]

