SUICIDE, DEPRESSION AND ECONOMIC CONDITIONS

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Summary

This chapter concerns the strength and the nature of the association between unemployment and suicidal behavior. Since the recent increase in suicide rates in the majority of North-West and Central European countries has coincided with an increase in unemployment, the hypothesis has been put forward by several authors, that unemployment could be the principal agent of the rise in suicide.

First the literature is briefly reviewed. It is concluded that the evidence for a direct causal relationship between unemployment and suicidal behavior is weak. The same holds true for the role of unemployment as a moderator or intermediate variable between psychiatric illness and suicidal behavior, but this is mostly the result of a scarcity of studies in which the relationships between those three variables is investigated.

The second half of this chapter reports two studies, both carried out in the Netherlands. The first study analyzes trends in national rates of suicide and attempted suicide separately as well as in relationship to trends in unemployment and in indicators of subjectively experienced emotional disturbances between 1970-1987. There is an association between changes in depressed mood, unemployment, and incidence of suicide and attempted suicide. This association is particular close for males. The study does not, however, provide any conclusive evidence about the (causal) links between depressed mood, unemployment and suicidal behavior.

The second study uses data from a sample of psychiatric inpatients. It considers the relationships between suicidal behavior (attempted suicide) on the one hand and behavior repertoire, unemployment and personality characteristics on the other hand in such a way that the relative importance of each of those variables interacting with the other ones in causing suicidal behavior could be established. The results confirm the hypothesis that unemployment is not directly related to the occurrence of suicidal behavior. Unemployment increases the probability of suicidal behavior, but only in the presence of certain other conditions, such as `suicidal behavior repertoire' in the individual concerned and/or his social context.

The findings imply that in cultures (such as in many western countries today) or subcultures (such as psychiatric institutions) where attitudes towards suicidal behavior are relatively permissive and the incidence and visibility of suicidal acts relatively great, any life event or condition that involves an important loss with a concomitant high probability of dysphoric or depressive mood disturbance (such as economic recession causing an increase in unemployment) will in turn cause an increase in fatal and non-fatal suicidal acts.

1 INTRODUCTION

There is a large variation in death rates from suicide between countries in the world. Of the countries that report to the World Health Organization (WHO) and whose suicide rates are published in the 1987 World

Health Statistics Annual (WHO, 1987) or are available in the WHO data bank for at least one year after 1979, the range of suicide rates spans from practically zero (where there are no deaths from suicide) in countries like Malta and Egypt to the remarkably high figure of 661 per million in Hungary (see table 1).

The global picture of suicide mortality clearly shows a consistent pattern. Arab countries have relatively low rates of suicide. The same holds true for Latin American countries. The European countries and countries populated in the majority by people of european descent, such as Australia, the United States and Canada, tend to have relatively high rates. Within the European countries there is a discernible pattern also. Southern European countries have relatively low rates while Northern and Middle European countries usually tend to have higher rates. The Asians have rates more evenly distributed across the range.

The consistency of the global picture of suicide mortality is not only of a geographical but also of a chronological nature. An analysis of the suicide rates of the 62 countries that reported to WHO both in 1960 and at least one of the years 1980 to 1986 indicate that over that period their rank order has only slightly changed. This is true despite the often substantial changes in suicide rates within countries. It appears that more countries (42) have witnessed an increase than a decrease (20) over the past quarter of a century. The average percentage change is about +37% with a range of -82 % to +437 %.

Relatively large increases are observed in most countries in northwest and central Europe. Countries in the majority populated by people of European descent, show a similar trend though generally less sizeable. Striking is the fact that Latin countries, both around the Mediterranean as well as on the American continent, witness decreasing suicide rates. For the Asian countries the picture is mixed with relatively large increases for the South-East (Sri Lanka, Thailand and Singapore) and no changes or decreases for the Far East (Hong Kong, Japan and the Philippines).

The strikingly consistent global distribution of suicide mortality rates and of recent changes in those rates contradicts the suggestion made time and again (see a.o. WHO, 1982) that differences in classification or death certification procedures or changes in those procedures are the first and foremost factor of international variation in suicide statistics. Without ignoring any influence of certification procedures, it seems more plausible that differences in social, psychological and even biological factors between populations and ethnic groups lie at the heart of differences in national suicide rates as well as explain the trends in those rates.

Since the recent increase in suicide rates in the majority of North-West and Central European countries has coincided with important socioeconomic developments among which unemployment figures most prominently, it has been hypothesized by several authors (see Platt, 1984) that unemployment or loss of employment could be a principal causal agent of the current rise in suicide mortality in those countries.

This chapter reviews the evidence for this hypothesis drawing both on the available literature as well as on two studies in one particular country, i.e. The Netherlands. Departing from the point of view that unemployment can be considered both socially and individually a stressful event or stressor on which people may react with selfdestruction, a causal role, if any, of unemployment should be demonstrable for all categories of suicidal behavior, both those with fatal outcome (suicides) and with nonfatal outcome (attempted suicides or parasuicides) (see also Platt, 1984).

1.1 Suicidal behavior: distinctions and definitions

At present there are no internationally standardized and accepted definitions of the main types of suicidal behavior. Although most authors agree on the existence of two main types, usually distinguished by their (fatal or nonfatal) outcome, the terms to designate them may differ as well as the criteria for inclusion or exclusion of behaviors under a specific type. Suicidal acts with a nonfatal outcome are either labeled suicide attempts, attempted suicides, parasuicides or acts of deliberate self-harm, depending upon the country of origin of the author(s) or the `school' he or she adheres to. While those terms are often used as synonyms, several authors also distinguish between attempted suicide and parasuicide, the former implying an intention (however vague and ambiguous) to do away with oneself while the latter

encompasses also so-called `contraintentioned' acts, meaning that the individual uses the semantic blanket of `Suicide' with a conscious absence of any lethal intention.

In a recent WHO co-publication (Diekstra et al., 1989) the following set of definitions has been proposed:

Suicide:
(a) An act with a fatal outcome;
(b) that is deliberately initiated and performed by the deceased him- or herself;
(c) in the knowledge or expectation of its fatal outcome;
(d) the outcome being considered by the actor as instrumental in bringing about desired changes in consciousness and social conditions.

Attempted suicide:
(a) A non-habitual act with a non-fatal outcome;
(b) that is deliberately initiated and performed by the individual involved in expectation of such an outcome;
(c) that causes self-harm or without intervention from others will do so or consists of ingesting a substance in excess of its generally recognized therapeutic dosage;
(d) the outcome being considered by the actor as instrumental in bringing about desired changes in consciousness and/or social condition.

Like every general definition, these have to be used with certain legends or inclusion/exclusion criteria. For example, a person who lies on a railway track in order to be killed by the next train but who is rescued in time, or a person who jumps off a bridge in order to drown him- or herself but is then quickly pulled out of the water by others, might not yet have injured him-/herself. However, such an act should certainly be considered a case of attempted suicide according to the definition above. Furthermore, a person who is not a habitual drinker of alcohol or a user of tranquilizers and all of a sudden takes a large amount of alcohol or an overdose of tranquilizers, does so deliberately and at the same time fulfills criterion (d) of the attempted suicide definition (assuming the act is not simply undertaken to find out how alcohol or tranquilizers feel) has to be considered a case of attempted suicide. However, if that same person had taken clear precautions to prevent his or her act from resulting in death, such as by taking a substance that provokes throwing up of a later to be taken substance such as alcohol or tranquilizers, he/she should be considered a case of para-suicide. A habitual user of excessive quantities of alcohol or a habitual user of dangerous quantities of hard drugs is not to be considered a case of parasuicide if found unconscious as a result of an overdose (assuming that other information indicating lethal intent such as a suicide note is not present). A person who in an acutely psychotic state jumps out of a window in the unnatural assumption that he or she is able to fly, and then as a result of the fall, dies, is not to be considered a case of suicide, since that behavior does not fulfil all of the criteria of the definition of suicide.

Consequently, suicidal ideation should be broken down into two categories, that is a) ideation of suicide and b) ideation of parasuicide. In order to avoid terminological confusion here, it seems sensible to label the two categories as suicidal and parasuicidal ideation.

These definitions are based on the following assumptions. First of all, attempted suicides are not simply failed or bungled suicides, for there are important epidemiological, etiological and motivational differences between attempted and completed suicides. Secondly, the prefix `para' in parasuicide should be taken to refer to acts that are intended by the actor to resemble suicidal acts while both in terms of outcome and motivation they are not.

As to the first point, available research evidence (see a.o. the review by Van Egmond & Diekstra, 1989) suggests characteristic differences between suicide and attempted suicide in relation to the methods of self-harm which have been used, clinical aspects (such as psychiatric diagnosis and treatment), psychological features and personality patterns. Also there are differences in terms of age and sex of the persons involved

and in relation to emotional precipitants of the behavior. As to social antecedents, such as unemployment or loss of work, suicide and parasuicide populations seem to overlap considerably.

As to the second point, most studies tend to adopt somewhat idiosyncratic nominal definitions of suicide/attempted-suicide/parasuicide, and it is not unusual to find studies in which attempted and parasuicide are brought together under the same heading, thereby making comparisons between different investigations more or less problematic. It is with these precautions in mind that the reader should approach the present state of knowledge with regard to the relationship between suicide and unemployment as reviewed in the remainder of this chapter.

1.2 Unemployment and suicidal behavior: the literature

Over the last decade several reviews of the literature on the relationship between unemployment and suicide have been published (for an overview see: Platt, 1984, and also Pritchard, 1988). In order to appreciate the similarities and dissimilarities in the conclusions drawn from these reviews, it is necessary to take into account that a) studies on the association between unemployment and suicidal behavior show a high degree of diversity in design and b) depending upon design characteristics and methods of analysis used, both type and strength of the association may vary (see Platt, 1984).

Aggregate-cross sectional studies, for example, provide no evidence for a consistent relationship between suicide and unemployment, while aggregate longitudinal studies do point to a positive relationship in a number of countries in the western hemisphere, though for some countries the evidence is negative.

Even the general conclusion drawn by Platt (1984) and confirmed by other reviewers, that there is firm evidence of an association between unemployment and suicidal behavior, but that the nature of this relationship remains highly problematic, might still be considered premature. The association appears relatively straightforward for men, but for women the evidence is quite equivocal or even negative, at least for some countries such as The United Kingdom and West Germany (Pritchard, 1988) as far as suicide is concerned. For attempted suicide or parasuicide in some parts of the United Kingdom there appears to be a clear positive relationship with unemployment both in males and females.

Since the social and economic consequences of unemployment differ from country to country and often also from community to community (to be unemployed might be relatively normal in one place and quite abnormal in another), findings such as the ones presented above cannot be considered sufficient evidence on which to build a `(para)suicide-unemployment case'.

But even if one goes along with Platt's conclusion of an association between the two phenomena, the question of the nature of this relationship remains largely unanswered. The assumption of a direct causal relationship between unemployment and suicide seems both theoretically unsound and empirically invalid.

Only a small percentage of those unemployed commit or attempt suicide or engage in parasuicidal acts, while among suicides and parasuicides a large percentage is not unemployed. Therefore, unemployment might (and almost certainly does) have its place in the causal link of events leading up to suicidal behavior in certain individuals or social groups, but not in others. Several authors (see Diekstra et al., 1986) have forwarded the hypothesis that unemployment might play the role of moderator or intermediate variable between psychiatric illness and suicide. Their reasoning is that the suicides' work loss not so much results from broad social and economic trends as from the fact that their psychiatric morbidity interfered with their capacity for work; which results in work loss with its attendant disadvantages, so that mental illness at once stimulated in them suicidal thinking and at the same time took away from them an effective protection against suicidal behavior.

This hypothesis might still hold even if one assumes that under unfavorable economic circumstances such as recession the psychiatric ill carry a relatively high risk for losing their job.

Although most of the literature reviews mentioned point to the plausibility of this hypothesis, not one of them presents research data that support it nor indicates in what way it could be tested.

1.3 Psychiatric disorder, unemployment and suicidal behavior

The evidence for a positive association between mental illness and the risk of fatal or nonfatal suicidal behavior is convincing. Although the estimated absolute percentages may differ from study to study, most studies on the topic concur in the conclusion that the majority of persons dying through their own hand suffer from an ascertainable mental disorder at the time of their death. Of the suicides suffering from a mental illness, most are diagnosed as patients of depressive disorders. In a recent review of the literature (Diekstra, 1989) the present state of knowledge with regard to the relationship between depression and suicide was summarized as follows:

- between 15 - 20% of patients suffering from major depression finally die by their own hand;
- 50 to 60% of persons committing or attempting suicide suffer from depressive disturbances.

Given these data it seems safe to assume that there is a positive association between changes in the prevalence and incidence of depressive disturbances in a population and (possibly but not certainly lagged) changes in the suicide rate of that population. Given the scarcity of data on the epidemiology of depression no aggregate longitudinal studies are available that validly have tested this hypothesis on the population level. The same holds true for the individual level. Understandably direct tests of the depression - unemployment - suicide sequence are not available.

This is even more so if one accepts the more refined model proposed by some authors (see Diekstra et al., 1986) in which mental illness (such as depression) may lead to unemployment, which in turn might increase the severity of the depressive disturbance which then becomes the breeding ground for suicidal tendencies.

One difficulty with all of the models linking mental illness, unemployment and suicide has to do with the fact that most authors, particularly if they are sociologists, approach suicide only in the sense of an act with a fatal outcome (suicide in the narrow sense), while in fact a suicidal death is the outcome of a process in which suicidal ideation, threats, gestures and nonfatal attempts usually precede that outcome. Furthermore, in the majority of cases the suicidal process will not end up in self inflicted death but by whatever forces will be halted before death can occur.

Often the fatality of a suicide attempt depends on factors such as whether or not others by coincidence discover and interfere with the attempt, the unpredictable or at least unpredicted interaction of suicide methods used, or the limited knowledge of some actors with regard to the method used and so on.

It follows then that if an association between unemployment and suicidal behavior exists in reality, that association on a population level generally will be closer in the case of attempted than of committed suicides. In addition, it might well be that attempted suicide, so common in persons suffering from emotional or mental disorders, through its social sequelae might in itself become a factor of unemployment or work loss so that the unemployment-suicide association is, mirabile dictu, at least partially caused by suicidal behavior!

In the following we will present the results of two studies that have attempted to assemble information relevant to these issues. In the first study we investigated the relationship between indices of emotional disturbance, unemployment, attempted suicide and suicide over the period 1975 - 1986 for one country, The Netherlands.

In the second study, while controlling for the variable mental illness by using a sample of psychiatric patients, we investigated the relationship between unemployment and suicidal behavior, in casu attempted suicide. The design is also allowed for establishing the effect of previous suicidal acts on work-record.

2 STUDY 1: EMOTIONAL PROBLEMS, UNEMPLOYMENT AND SUICIDAL BEHAVIOR: IN THE NETHERLANDS 1970-1987

In this study we analyzed trends in 1) rates of suicide and of attempted suicide; 2) unemployment rates; 3) subjectively experienced emotional disturbances. The study covers the period of 1970-1987 (1985 for attempted suicides) and concerns one particular country, the Netherlands. It is one of the very few and possibly even the only country to date where data on attempted suicide on a national level are available.

2.1 Materials and methods

The mortality rates for suicide (ICD code, 8th and 9th Revision: E950-959) over the period 1975-1986 were directly obtained from The Central Bureau of Statistics (Statistics Police and Justice) for men and women separately and for the age range 15 years and over.

The rates for attempted suicide were obtained from two sources that partially overlap, allowing for cross checking. The first source is the Foundation for Health Care Information (SIG), a national hospital inpatient register that records all cases of discharge (episodes, not persons) from general hospitals in the country after admission for attempted suicide (ICD code, 8th and 9th revision: E950-959). The second source are the Sentinel Stations (Continuous Morbidity Registration). These Sentinel Stations constitute a sample of general practices in the country, covering about 1% of the population, that is a fairly accurate representation of the total population in terms of age, sex, geographical distribution and level of urbanization (for further details see Diekstra & Van Egmond, 1989).

Comparison of the rates of hospital discharged cases of attempted suicide over each year revealed for 5 years sizeable differences, with the rates provided by the Foundation always being considerably higher than those reported by the Sentinel Stations. Since there are strong indications of underreporting by general practitioners of hospital admitted cases of suicide attempts from among their own patients (Diekstra & van Egmond, 1989) the rates reported by the Foundation were used for further analysis in this study.

The data used in this study on emotional disturbance were obtained from the Social and Cultural Planning office of The Netherlands. In 1975 this agency started a study titled `Cultural Changes in The Netherlands'[1], in which, among other things, indicators of subjectively experienced psychoemotional complaints are monitored by sample surveying, using samples of approximately 2000 persons in each monitor year. Data are available for the years 1975, 1979-1981, 1983 and 1986. Of the 9 items on emotional or psychological complaints mentioned in chapter 7, only two can be considered to be indicative of `depressive symptoms' or `depressive mood disturbance' according to generally accepted nosological standards (ICD-10 draft, WHO, 1988). The two items are: - Are there things that make you feel depressed?
- Do you sometimes have the feeling that life is without sense and purpose? (3 answer categories, no, yes and ?)

Two categories of data on unemployment were used: a) the number of persons unemployed as % of the workforce and b) rate of unemployed per 1000 of adult population.

First we shall present the results of the analyses of trends on suicide and attempted suicide over the period under observation. Next the findings on the relationship between those trends, unemployment and emotional disturbance variables will be presented.

2.2 Changes in suicide and attempted suicide 1970-1987

Trends in suicide rate

Figures 1 and 2 show the trendlines in suicide rates for men and women in the period 1970-1987.

For men (figure 1) the rate has gradually been rising from 1970 onwards until it peaked around 1983 and has been levelling off somewhat since then. While the percent change for all age groups taken together is about 22.5%, there is considerable variation between groups. Persons aged 20 to 39 years show almost a

[1] SCP, 1976 and Mootz (chapter 7 of this volume).

doubling of their rates, while those 50 to 79 years of age have 1987 rates at the level of their rates in 1970 or even slightly below.

The youngest age group shows a trend similar to the overall trend.

For women (figure 2) the picture is pretty much similar to the one found for men.

The ratio of the male-female suicide rate did hardly change over the total period and continues to centre around 160 to 170 male suicides for every 100 female suicides. There are, however, substantial differences between the age groups in this respect. Both for the very young (15-19) and the very old (80 and over) there are about 300 male suicides for every 100 female ones.

Among men incidence of suicide tends to increase with age, with the peak rate found among 80-plus years old. Among women the suicide rate usually also increases with age, but the peak age is equally often found in either the 60-69 years old or the 70-79 years old depending upon the year under consideration. Remarkable is the strong decline in the suicide rate in women 80 and over (minus 60% contrasted with an increase in males 80 and over of about 10%).

Trends in the suicide attempt rate

Figures 3 and 4 show the trendlines in rates of attempted suicide for men and women. For men (figure 3) the rate has gradually been rising from 1970 onwards until it peaked around 1983 and thereafter has been slightly decreasing. The percentage change for all age groups taken together is about 100%, and there is little variation between age groups in this respect, with the exception of persons aged 50 to 69 years showing a more moderate rise.

The ratio of the male-female suicide attempt rate is almost exactly the opposite of the one for suicide. Here we find around 160 to 170 female attempts to every 100 male attempts, and again this ratio did hardly change over the whole over the period. For the youngest age group (15-19), however, the ratio is significantly different from the general trend. Here we find about 250 to 300 female attempts for every 100 male attempts.

For men and women the rate of suicide attempts peaks in the first part of life, that is to say in the 20 to 49 years age groups. While for men the most vulnerable age in this respect is between 20 to 29 years, vulnerability for non-fatal suicidal behavior among women appears to last longer because they show a broad age top covering the whole of the age range 20 to 49 years. Thereafter a steady decline in rates can be observed for women, while for men the oldest group (80 and plus) shows a rate that is at the level of the 60 to 79 years old.

Discussion

The incidence of both suicide and attempted suicide seems to decrease slightly since 1982-1983 in men and in women, after a strong and steady rise over the preceding decade or so. However, the changes observed are still too small and the period of observation too short to draw any definite conclusions about contemporary downward trends.

A question of particular concern here is what factors can be held responsible for the upward jump in both suicides and suicide attempts in the 1982-1983 period. Given the fact that the most recent economic recession in Western European countries reached its lowest point in that period as well, the possibility of a relationship between both developments seems to be worth studying.

2.3 Suicide, attempted suicide and unemployment 1974-1985

Figure 5 graphically shows the developments in suicide and unemployment rates over the period 1974-1985.

In figure 6 the trendlines are shown (best fit trendline through datapoints based on least square fit). Clearly both suicide and unemployment rates present a similar picture over the study period. As to be expected the association between suicide and unemployment is close among males, while among females there appears to be a tenuous relationship.

The same sex difference is found for the association between attempted suicide and unemployment (see figure 7), although here the association between the female rate and unemployment is closer than in the case of suicides.

It is noteworthy that for all rates and for both sexes the peak year is 1983.

Association with emotional disturbance

Figure 8 depicts the developments over time of the indicators of emotional disturbance. Both for females as well as for males the correlation between both indicators is relatively small (although somewhat bigger for males than for females). Only the depressed mood indicator shows a development similar to the one found for suicidal behavior and unemployment.

A plausible explanation for these findings might be the fact that the second indicator (`Do you sometimes have the feeling that life is without sense and purpose') does not precisely tap personal feelings of stress and depressive mood, because the word life might be interpreted to mean `life in general' and not so much `one's own life'. Furthermore, the question can be answered truthfully in the affirmative by referring to feelings that existed in the past only. It is for those reasons that we used only the depressed mood indicator in further analyses.

Figures 9 and 10 show there is a close association between changes in depressed mood, suicide, attempted suicide and unemployment among males. Among females the correlation between those variables is considerably lower (although each one by one correlation reaches a statistically acceptable level of significance).

Discussion

Our data show that there exists an association between changes in depressed mood, unemployment, and incidence of suicide and attempted suicide and that this association is particularly close for males, but less for females. Although our study does not provide information on possible explanations, the observed sex difference might well be interpreted to mean that depressed mood has a different meaning and possibly even a different etiology in men than in women. Women, for example, may more often experience and admit dysphoric feelings, while men may less often be inclined to that, unless already a relatively severe state has been developed. Another explanation might be that depressed mood in men might more often be related to economic and work-conditions than in women.

Our data also do not provide any conclusive evidence about the (causal) links between depressed mood, unemployment and suicidal behavior. It is for that reason that we undertook a study in which suicidal and nonsuicidal psychiatric patients were compared with regard to an array of personality and social variables, including employment status, and their linkages.

3 STUDY 2: A SOCIAL LEARNING MODEL OF THE SUICIDE-UNEMPLOYMENT ASSOCIATION

It has been widely established and generally accepted that the best predictor of future suicidal behavior appears to be a history of similar behavior (previous suicidal attempts, plans, threats or ideation) in response to life events in the past (Van Egmond & Diekstra, 1989). Consequently, suicidal behavior as a way of coping with a life event, such as unemployment, seems first and foremost to be a function of the individual's response or behavior repertoire, which of course is acquired in the process of socialization or social learning. The closeness of the association between suicide and unemployment therefore will vary

from culture to culture or social group to social group and might also vary within social groups over time depending upon the socialization of suicidal responses.

Since socialization processes affect all individuals in a specific culture, independent of their specific personality make-up, the association between suicide and unemployment may be influenced by but is not necessarily dependent upon the existence of particular personality characteristics, such as psychiatric or psychological morbidity or intelligence quotient.

In the second study the relationships between suicidal behavior (attempted suicide) on the one hand and behavior repertoire, unemployment and personality characteristics on the other hand were investigated in such a way that the relative importance of each of those variables interacting with the other ones in causing suicidal behavior could be established.

3.1 Method

The study utilized 580 psychiatric inpatients, admitted to the psychiatric ward of a general hospital in The Netherlands, of whom 109 had been admitted because of suicide attempt. The study group consists of all patients admitted to and discharged from the ward in two consecutive years. The psychiatric facilities of the hospital (in- and outpatient clinic) serves an area of almost 150,000 persons, that in terms of age and sex distribution as well as socioeconomic status can be considered as representative for the whole of the country.

From each of the subjects in the study during admission anamnestic data, demographic data, objective psychological testscores (paper and pencil personality tests, intelligence tests and neuropsychological tests) as well as experts' ratings of psychiatric and psychological morbidity using a standard protocol were collected (for further details see Diekstra, 1986).

3.2 Data analysis

The interrelationships between demographic, behavioral and personality variables in the causation of suicidal behavior were analyzed by means of an interaction analysis technique. For this purpose, Sonquist's Automatic Interaction Detector (AID) procedure was used (Sonquist, 1970):

> "The ... technique may best be regarded as a step-by-step application of a univariate analysis-of-variance model. An attempt is made to split up a set of investigation units (subjects, interviewers) into a series of non-overlapping subsets, of which the means account for more of the variance in the dependent variable than any other series of subsets. The classes of multi-categorical variables are regarded as point and the total group is divided into subgroups according to a certain criterion on the most important variable. Each subgroup is now further divided with respect to its most important variable and this process is continued until the number of observations or investigations units reaches a certain minimum or until the variance accounted for remains below a certain minimum. Every division is performed on a basis of maximizing the explained variance. The result is a tree structure which may have all subclasses of the variables as terminal points." See Diekstra 1973 (pp. 173-174) for a further description of the technique.

The predictor variables used in this type of analysis are shown in table 2.

3.3 Results

Some of the demographic characteristics of the group under investigation are shown in table 3 (for further details, see Diekstra, 1986). Figure 11 shows the results of the AID analysis with demographic, behavioral and social history variables, personality variables and employment status as predictors. The resulting configuration explains 38% of the variance in the dependent variable and indicates clearly that behavior repertoire characteristics (previous suicidal behavior, drug/alcohol abuse) of the individual him/herself and/or of persons within the social context are the most powerful predictors of the dependent variable. Given the presence of a suicidal repertoire being unemployed almost doubles the risk of (future) suicidal behavior.

It is noteworthy that none of the personality variables appears in the resulting configuration as contributing significantly to its predictive power. A possible explanation for this finding might be that some of these variables are `hidden' under behavioral variables such as prior suicidal behavior, since there is for example a relatively high correlation between depressive mood disturbance and suicidal behavior.

3.4 Conclusions

The results of this second study seem to confirm our hypothesis that unemployment is not directly related to the occurrence of suicidal behavior. Although it is shown that being unemployed increases the probability of suicidal behavior, it does only so in the presence of a `suicidal behavior repertoire'. The most powerful predictive components of such a repertoire for future suicidal behavior are (in rank order): (1) previous suicide attempts, (2) previous threats with suicide, (3) behavior equivalent or similar to suicidal behavior, such as drug and alcohol abuse, (4) the presence of (1), (2) and (3) among significant others (particular family members). This finding indicates that (future) suicidal behavior as a response to life events or subjective experiences is learned `by practice' or vicariously (observation of others) or (more probable) by both.

In cultures (such as many western countries today) or subcultures (such as psychiatric institutions) where attitudes towards suicidal behavior are relatively permissive (see for a study of attitudes on population level Diekstra & Kerkhof, 1989) and the incidence and visibility of suicidal acts relatively great, any life event that involves an important loss with a concomitant high probability of dysphoric or depressive mood disturbance, economic recession causing an increase in unemployment will in turn cause an increase in fatal and non-fatal suicidal acts. This should not be taken to mean that personality characteristics do not play a role at all, for they influence the probability of work loss as well as of the occurrence and intensity of dysphoric mood disturbance following such a loss.

Table 1.

Mortality by suicide in countries reporting to WHO (1980 or later) per million of population

Country	M	F	Country	M	F	Country	M	F
Falklands/			Puerto Rico	176	23	Cape Verde	44	6
Maldives	1000	-	Scotland	166	60	Martinique	44	13
Hungary	661	259	Uruguay	159	-	Bahrain	40	6
Surinam	436	128	New Zealand	157	50	Mauritius	40	16
Finland	430	113	El Salvador	148	61	Paraguay	33	15
Austria	421	158	Singapore	147	107	Dominica	28	-
Sri Lanka	377	197	Netherlands	146	81	Mexico	25	7
Denmark	351	206	Korea	139	49	Barbados	25	15
France	331	127	Hong Kong	137	107	Panama	22	5
Switzerland	330	132	Portugal	136	51	Saint Vincent	20	0
Belgium	326	153	Northern Ireland	131	39	Grenadine	17	
Czechoslovakia	292	92	England and Wales	121	57	Santa Lucia	17	0
Japan	278	149	Trinidad & Tobago	121	50	Iran	16	4
Fed.Rep.Germany	266	12	Italy	110	43	Belize	13	-
Sweden	250	115	Chile	107	18	Kuwait	12	5
Bulgaria	232	94	Argentina	105	34	Bahamas	10	-
Yugoslavia	228	97	Ireland	92	39	Guatemala	9	1
Poland	220	44	Venezuela	76	20	Philippines	5	4
Norway	208	74	Israel	75	35	Syria	2	-
Luxembourg	207	74	Costa Rica	74	15	Papua New Guinea	1	2
Iceland	206	58	Thailand	69	62	Egypt	0	0
Canada	205	54	Spain	68	23	Malta	-*	6
United States	197	54	Greece	57	25	Dem.Rep.Germany	-*	-
Australia	182	51	Ecuador	55	36	Cuba		-

* no figures reported in WHO Statistics Annual 1987

Table 2.

Variables in AID-analysis

*1 - Personality variables -MMPI-scale-scores[1] (clinical scales, validity scales,Welsh's A- and R-scale and Barron's Es-scale, total of 16 scales)
- ABV-scale-scores[2] (neuroticism, neurotic-somatic reactivity, extraversion, test-taking-attitude, total of 4 scales)
- WAIS-subtest[3] and total-scores (total of 14 scores)

2 - demographic variables -Sex, age, marital status, sibling position, social class, taking-attitude, total education

3 - social history variables -Broken home, recent loss or problems of other kind, physical illness,`alcohol-, drug-, farmaca-abuse, delinquency, homosexuality,
previous suicidal behavior in subject or relatives', prior psychiatric admissions, recent psychiatric patients among relatives, ratings of problem areas by psychologist

4 - dependent variable -Admission in general hospital because of suicidal behavior.

Number of predictors is 57

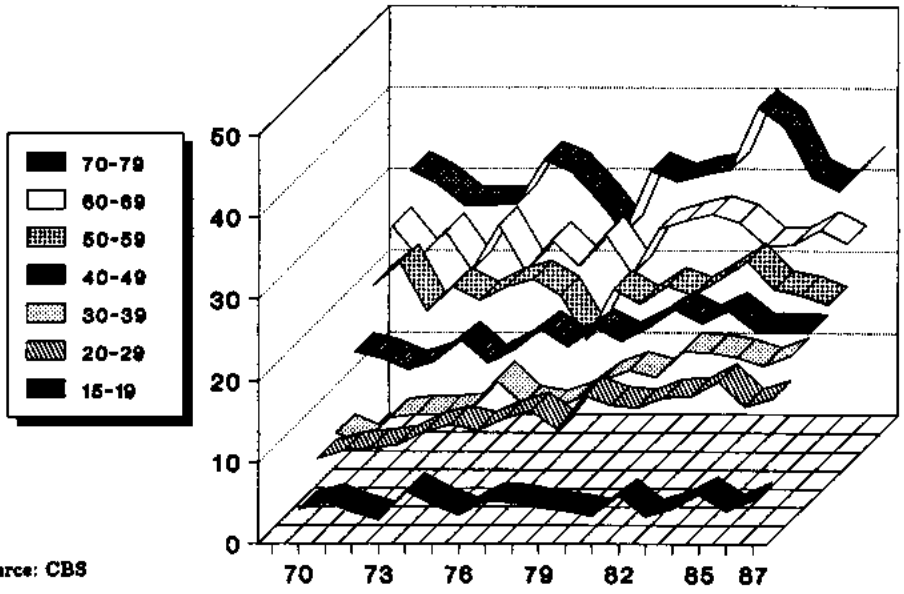
[1] Minnesota Multiphasic Personality Inventory
[2] Amsterdamse Biografische Vragenlijst (Amsterdam Biographical Inventory)
[3] Wechsler Adult Intelligence Schedule (Subtest Blockdesign).
* for list of item-definitions write to author.

Table 3.

Demographic characteristics of suicidal, non-suicidal and total group

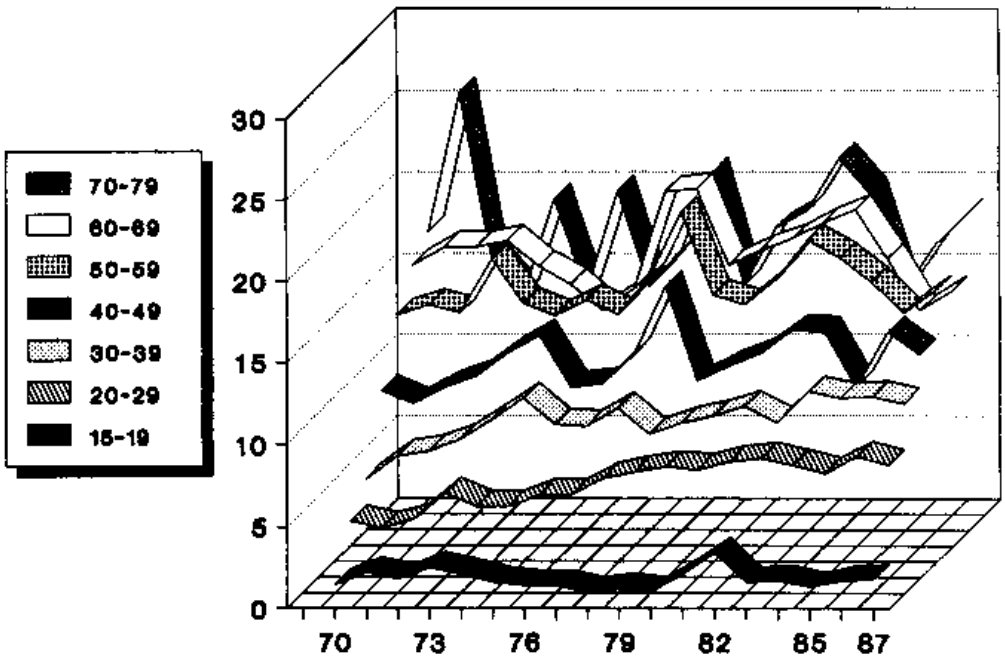
	Total group (n-580)	Suicidal group (n=109)	Non-suicidal group (n=471)
1. mean age	34.9	29.3	40.6
	%	%	%
2. male/female ratio	43.1/56.3	30.6/67.2	45.9/53.8
3. marital status:			
- single	48.5	62.2	45.6
- married	47.3	35.7	49.7
- divorced	1.2	2.0	1.1
- widowed	3.0	0.0	3.6
4. employment status:			
- employed	78.9	77.0	79.2
- unemployed	21.1	23.0	20.8
5. previous suicidal behavior			
- suicidal attempts	15.1	59.0	4.9
- suicidal threats	2.5	2.2	2.6
- suicidal thoughts	10.4	17.3	9.2

FIGURE 1
Suicide in the Netherlands. Trends for Males 1980 - 1987
(rate per 100,000)



Source: CBS

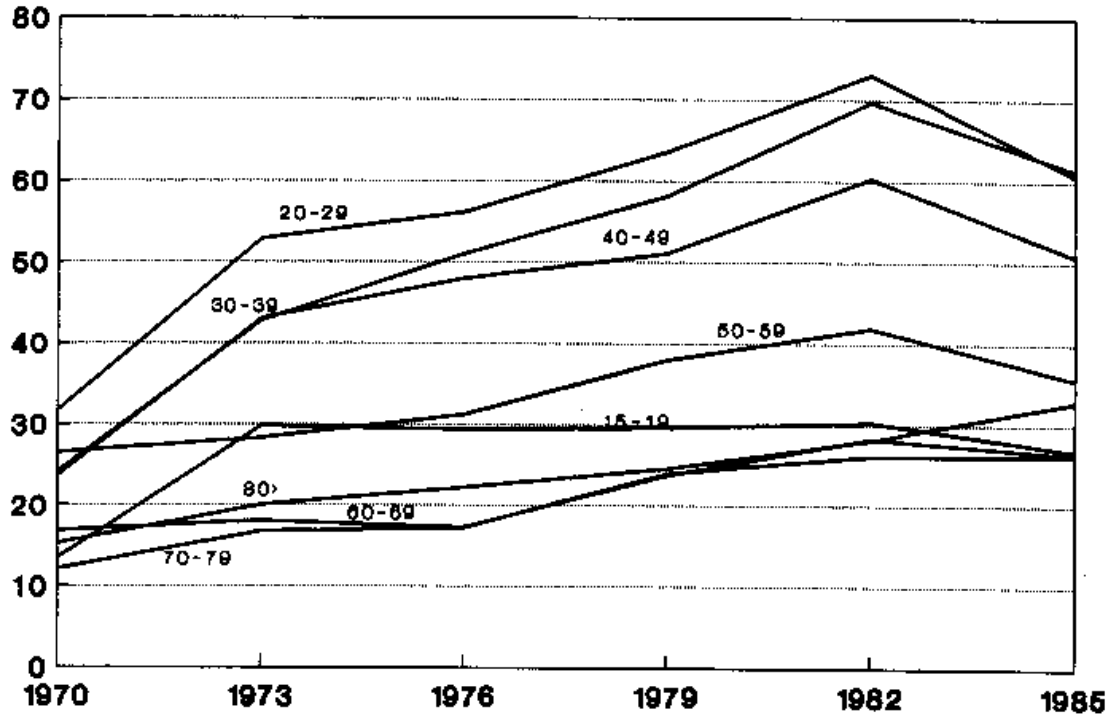
FIGURE 2
Suicide in the Netherlands. Trends for Females 1980 - 1987
(rate per 100,000)



Source: CBS

FIGURE 3

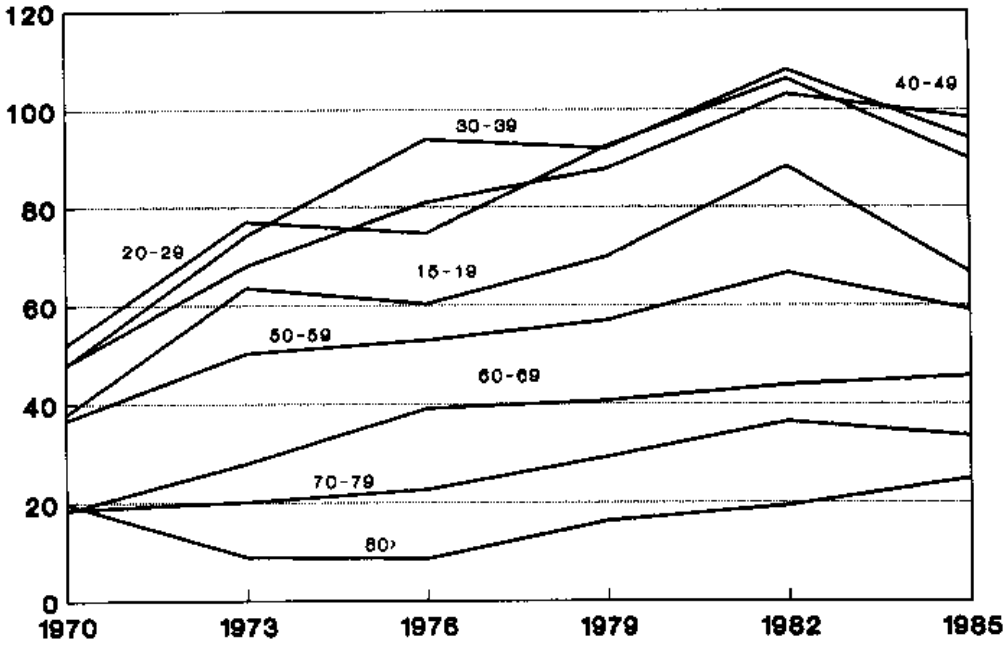
Attempted suicides in the Netherlands by age. Trends for Males 1970 - 1985 (hospital discharges)



Source: SIG, Utrecht

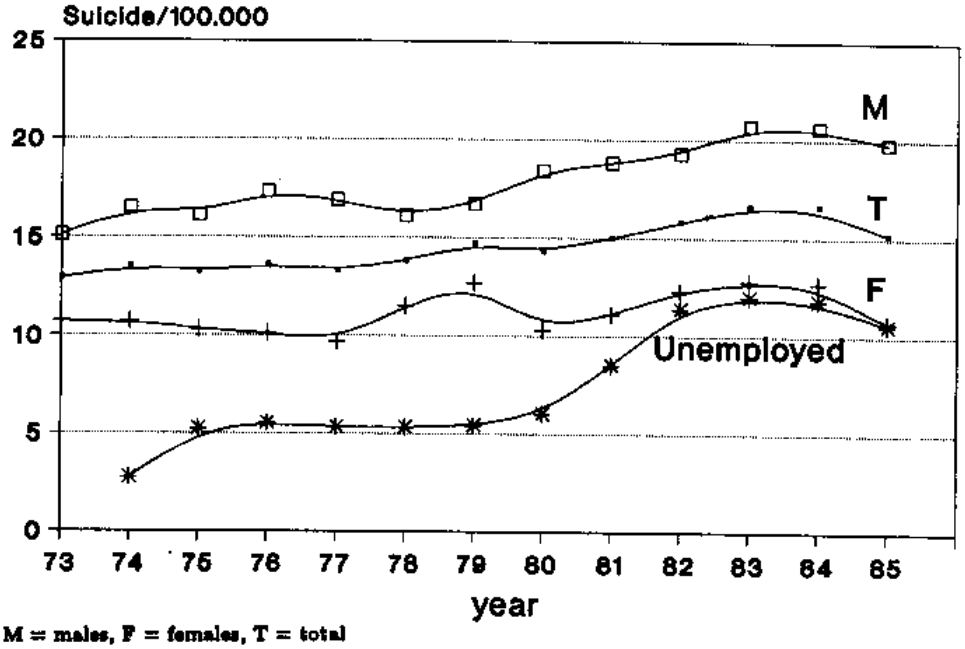
FIGURE 4

Attempted suicides in the Netherlands. Trends for Females 1970 - 1985 (hospital discharges)



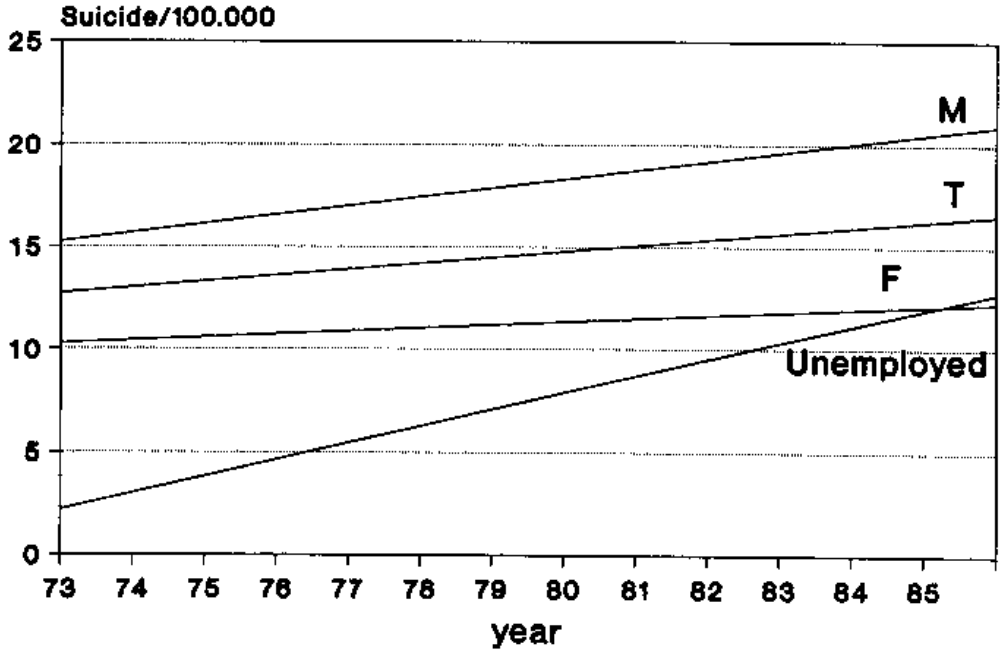
Source: SIG, Utrecht

FIGURE 5
Unemployment and Suicide 1974-1985 Trends
(unemployment as % of workforce)



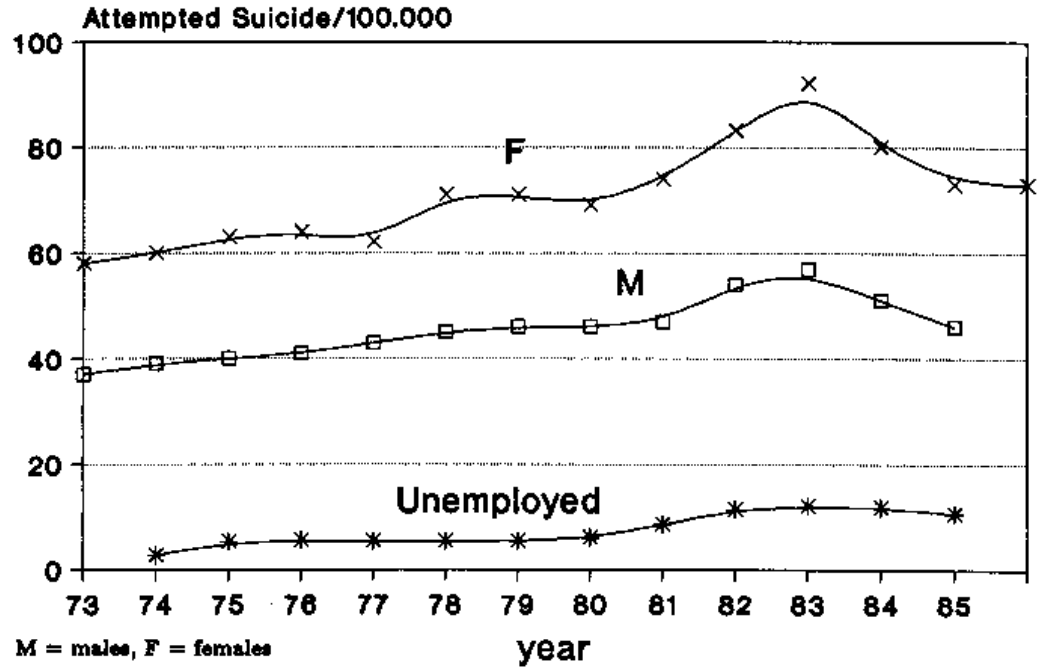
M = males, F = females, T = total

FIGURE 6
Unemployment and Suicide 1974-1985 Trends
(unemployment as % of workforce)



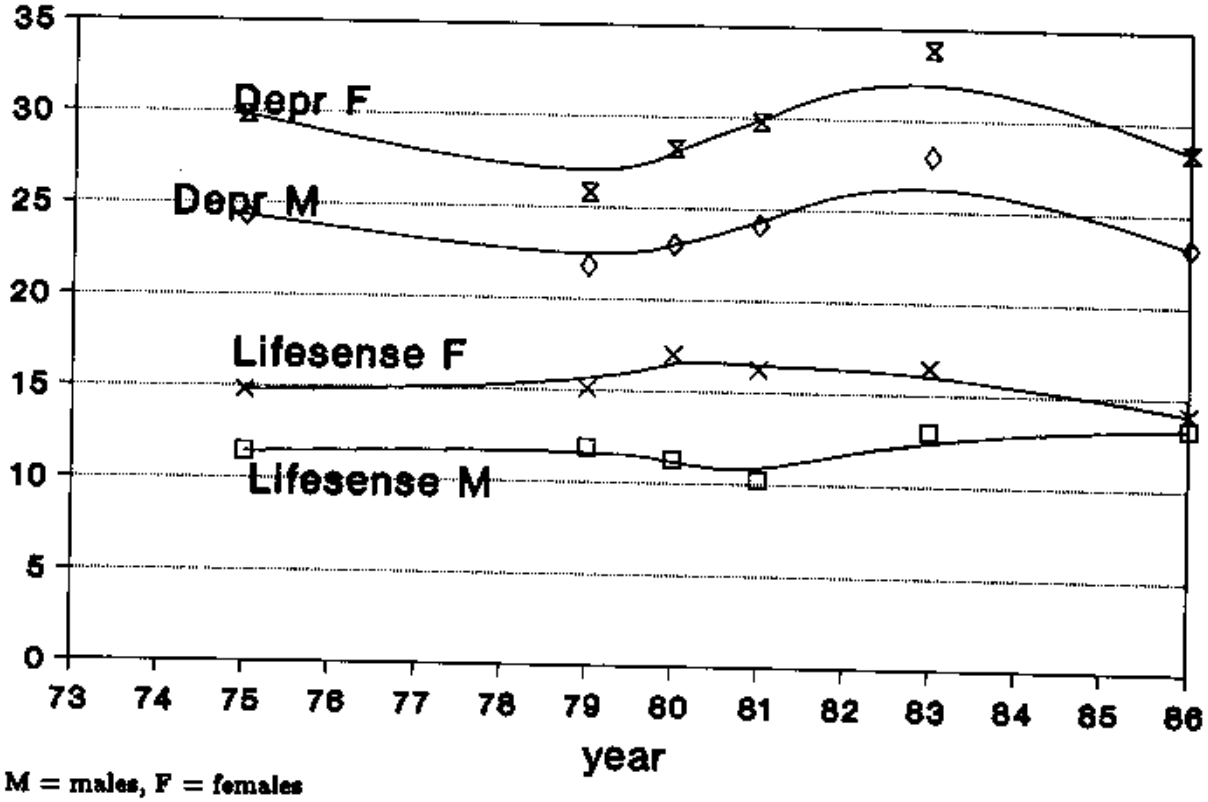
M = males, F = females, T = total

FIGURE 7
Unemployment and Attempted Suicide 1974-1985 Trends
(unemployment as % of workforce)



M = males, F = females

FIGURE 8
Emotional Disturbance 1975-1986 Trends (meanscores)



M = males, F = females

FIGURE 9

Suicide, Unemployment and Disturbance 1974-1985 Trends (unemployment as % of workforce, depression meanscore)

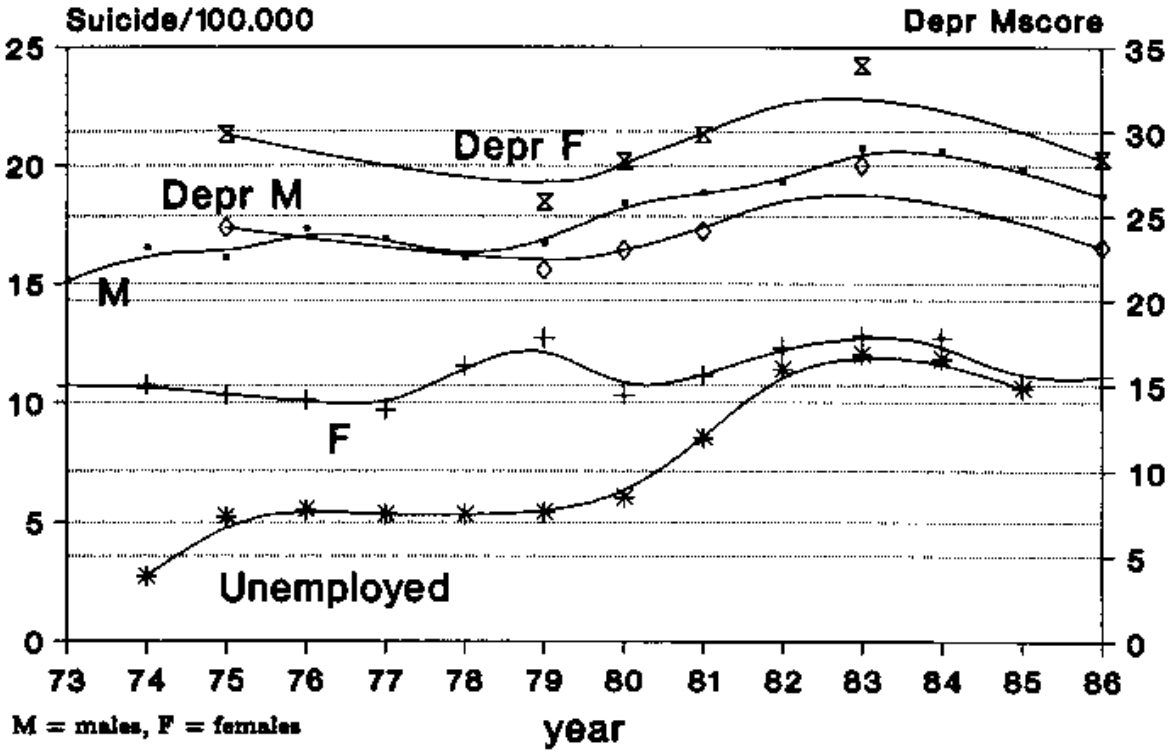


FIGURE 10

Attempted Suicide, Unemployment and Disturbance 1974-1985 Trends (unemployment as % of workforce, depression meanscore)

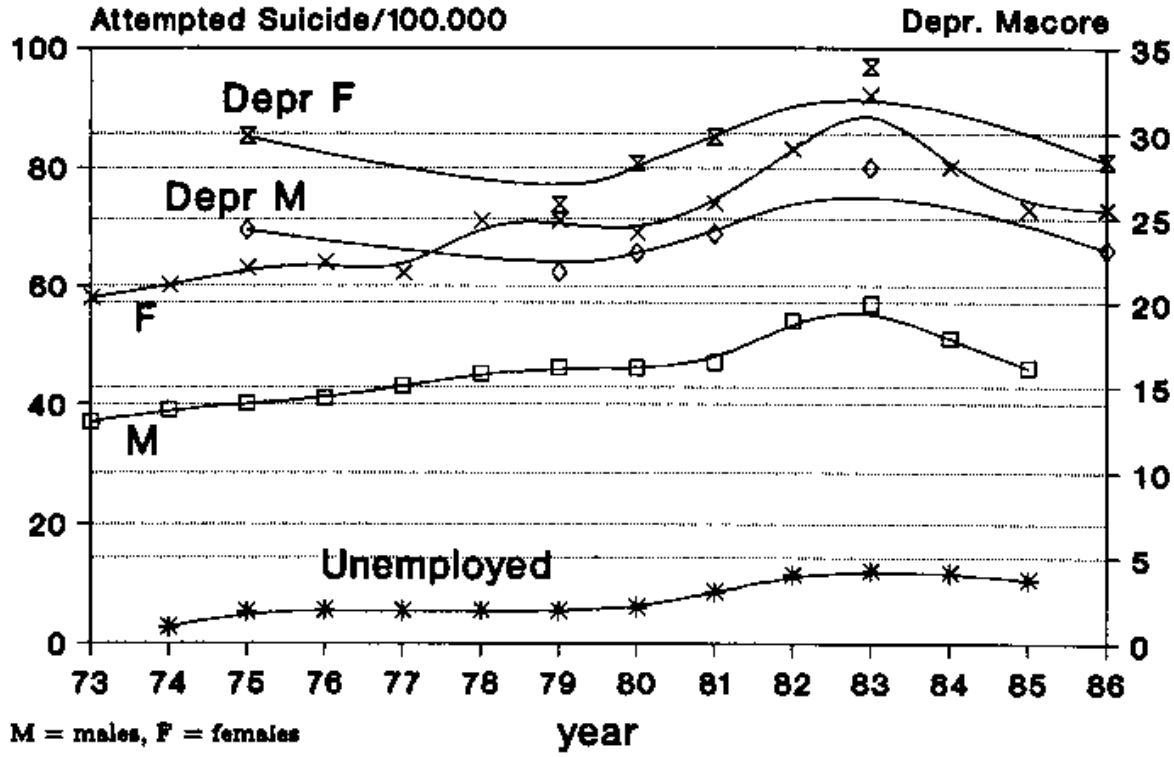
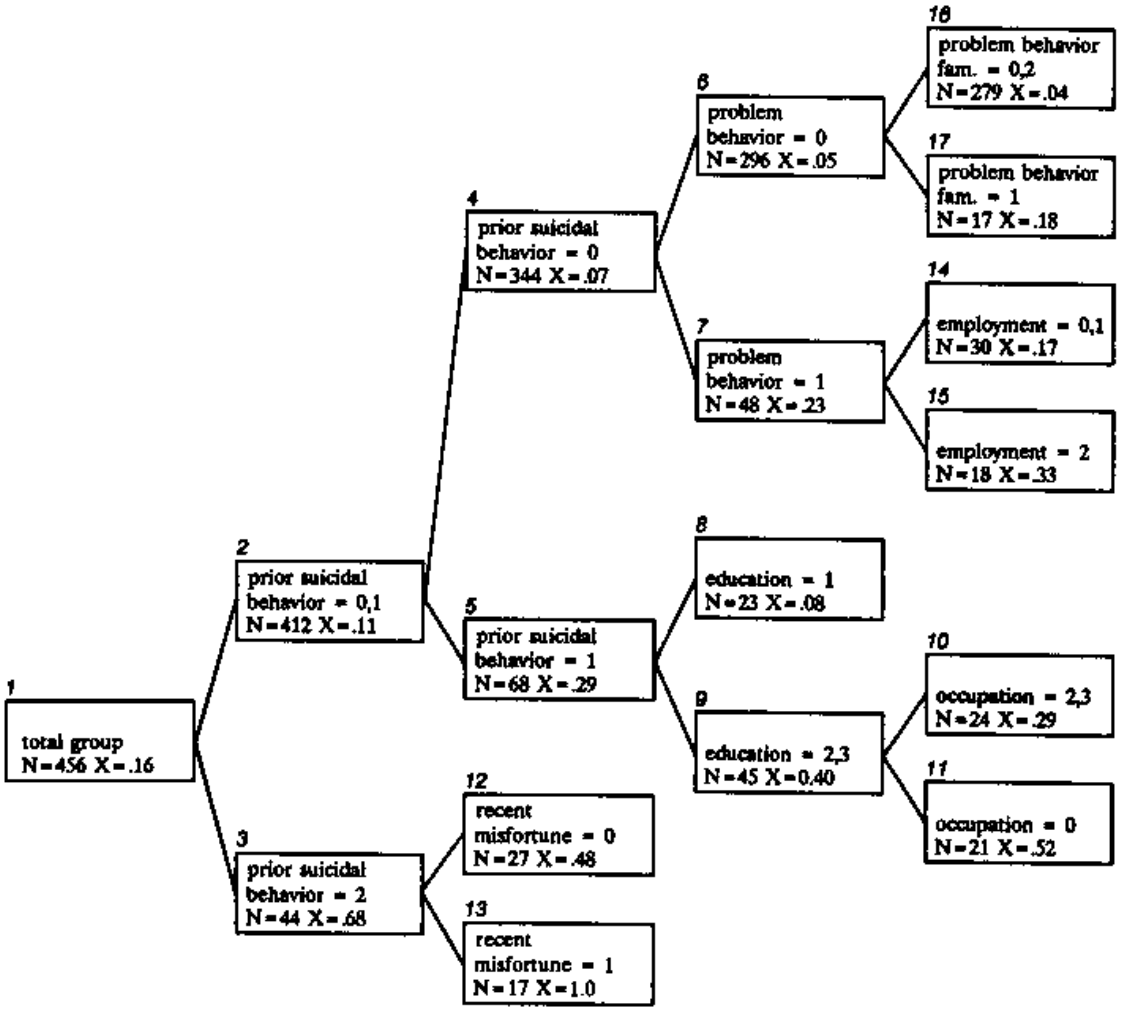


FIGURE 11

AID total group social history and demographic data



Addenda figure 11:

- **X means percentage of suicide attempts e.g.X = 16 means: 16% suicide attempts**
- **prior suicidal behavior:** 0 = no; 1 = threats/communications; 2 = attempts
- **problem behavior (Fam.):** 0 = no; 1 = drug-/farmaca-/alcohol addiction; 2 = suicide threats/attempts/death in relatives
- **unemployment:** 0 = not applicable; 1 = employed; 2 = unemployed
- **education:** 1 = high; 2 = intermediate; 3 = low
- **occupation:** 0 = no; 1 = high; 2 = intermediate; 3 = low
- **D-, Mf.scale (MMPI), Blockdesign (WAIS): distribution divided in five categories 1 - 5: low to high score.**

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