

The Relationship between Attitudes toward Work and Suicide in Sweden

Julianne Ohlander
Department of Sociology and Population Research Institute
Pennsylvania State University

Version 03.01.2006 to be presented at Population of Association of America, Los Angeles, 2006

Introduction

Sweden has experienced an unprecedented decline in its suicide rate in the last 30 years. Sweden once had one of the highest suicide rates in the world. Suicide peaked around 1978, when approximately 35 Swedish males and 15 females committed suicide per 100,000 inhabitants. By 2000, 22 Swedish males and 9 females per 100,000 inhabitants committed suicide. The suicide rate has declined by more than one-third between the years 1970 and 2000. The direction of this trend has not changed in more than 30 years. During the same period, no other European or Westernized country had a similar decline. Countries such as Hungary, Estonia, Finland, and Denmark have experienced declines in their suicide rates, but their declines began 10 to 25 years after Sweden's started.

The decline in Swedish suicide may be the result of changes in economic and work-related attitudes within Sweden. Suicide has often been associated with various components of work and employment in Sweden and around the world (Beautrais, Joyce, and Mulder, 1998; Breault, 1986; Breed, 1963, 1967; Claussen, 1998; Crepet, et al., 1991; Dickstra, 1989; Dooley, et al., 1989a, 1989b; Lester, 1994; Lester and Yang, 1993; Moesler, et al., 1990, 1991; Platt, 1984; Pritchard, 1988, 1992; Snyder, 1990; Stefansson and Wicks, 1993). In Sweden, for example, the unemployed generally have higher suicide rates (Johansson and Sundquist, 1997). This is also found in other industrialized countries, such as the United States and Austria (Langley and Johnston, 1990; Platt, 1984; Pritchard, 1992; Schony and Grausgruber, 1987).

But, the associations between unemployment and suicide mask great differences. For example, in Japan, higher suicide rates among males aged 25-54 (but lower suicide rates among those aged 55-74) are generally found during times of high unemployment (Snyder, 1990). Usually, the association is stronger for men than it is for women (Crombie, 1990; Hassan and

Tan, 1989; Morrell, et al., 1993; Platt, et al., 1992a, 1992b; Trovato, 1986). Others have found no association between the unemployment rate and the suicide rate, but these studies are much fewer in number than those finding a positive correlation (Ancarani, Rondinini, and Bellini, 1990; Bille-Brahe, et al., 1996; Schmidtke, 1997). Others have found that the relationship between unemployment and suicide depends on the time period of study (Platt, 1984). That is, suicide and unemployment can be positively related in one period of time and negatively related during another period of time. While there is overwhelming evidence of a relationship between unemployment and suicide, the causal mechanisms are unclear. Usually, the association is viewed through the lens of mental disorder and depression; that is, work affects mental health, which leads to suicide (Brenner, 1983).

Suicide is also associated with other aspects of work, such as the work environment (Dreber, et al., 1995), job-related stress (Henry and Short, 1954), retirement (Lewis and Sloggett, 1998), and the meaning of employment (Dreber, et al., 1995). Individuals who are fired from their jobs tend to experience feelings of worthlessness, depression, and stress (Brenner, 1987; Goodchilds and Smith, 1977; Kasl, 1979; Kasl and Cobb, 1979).

The Importance of Work in Sweden

Job instability was rare in Sweden. Young Swedes made decisions about their educational trajectories at age 14, which determined, to a large extent, their occupations. Swedes then went to work after high school and typically spent their entire employment careers with one company. In the past, suicides among the working-age population might well have been an outgrowth of attacks on individual identity. Losing one's job or being unable to perform satisfactorily at work would have greatly undermined one's self perception as a worthy and

useful society member. This tendency would have been felt much more by men than women. Women had other identities to which they could turn, such as housewife or mother.

There is evidence that 40 years ago work played a significant role in the identity of Swedish males and may have contributed to their high suicide rate. Herbert Hendin (1964), drawing on interviews and observations of hospital in-patients who attempted suicide in the 1950s, described Swedish men who attempted suicide as being preoccupied with work performance and success. He concluded, "His emotional tie to life was largely a tie to work" (Hendin, 1964: 47). Hendin (1964: 124) labeled Swedish suicides as "performance" types of suicide. Failure to fulfill the work identity led them to attempt to take their own lives. In contrast, Danish men were more likely to attempt suicide as a result of a breakup of a love relationship, which Hendin labeled "dependency loss" suicides (Hendin, 1964: 124). Swedish men, Hendin (1964) noted, seldom committed suicide solely because of a failed love relationship. Rather, what played a larger role in their suicide attempt was the failure to reach goals that were too ambitious or that had too rigid of standards. Swedish male suicide attempters, in comparison to their Danish counterparts, also suffered from greater anxiety problems. Anxiety difficulties were attributable to frustration due to a lack of success and impossible demands placed on the self. Those who lost their jobs or who had difficulties at work experienced greater anxiety.

The importance of work in Sweden after World War II is reflected in initial welfare state policies. Following the war, the policies favored work-oriented programs rather than cash compensations for the unemployed and sick. The unemployed were offered jobs rather than employment checks.

Today, work has a much different meaning in Sweden than it did in the mid-20th century. People commonly switch jobs. Unemployment is more common. On any given workday, 14 percent of Swedes are away from work collecting sick leave (Rae, 2005). Parental leave, once only utilized by women, has become increasingly common among fathers who are willing to trade in their work identity for that of parent.

The Importance of Solidarity in Sweden

Solidarity may have weakened individual males' identities associated with work and offered them alternative identities. Sweden has become a social democratic country with a strong sense of solidarity. In Sweden today one finds a sense of community which is illustrated by their universal health care coverage, parental leave, old age pensions, and numerous other domestic programs. The concept of "solidarity" is a major component of the welfare state (Bergmark, 2000; Baldwin, 1996; Lesthaeghe, 1983: 415). Democratic socialism in Sweden stresses equal access to health care, social resources, and equality of incomes. As a group-oriented ideology, meeting the basic physical needs of the citizens is institutionalized (Graubard, 1986).

Fifty years ago in Sweden when the work identity was much more prevalent, individuals were much more left to their own resources. The importance of work and one's identity as a worker were tied directly, not only to the need to make a living, but also to ideals of the Protestant religion (Max Weber). Solidarity has replaced the individual orientation, noted by Max Weber. The Protestant was individualistic, he argued, alone before God (Weber, 1958/1930). In Western capitalist culture, work has been an important component of one's identity. This has been an outgrowth of the Calvinist-Protestant work ethic that Max Weber described as necessary to facilitate modern capitalist competition and achievement-oriented

behavior (Weber, 1958/1930). Early Protestant religious ideology taught that people were alone before God; individuals should not trust others because one did not know if fellow citizens were destined for heaven or hell (Weber, 1958/1930). This concept of predestination was central to the religion. It presented, however, major psychological complications for Christian believers (Weber, 1958/1930). The individual was plagued with an inner loneliness (Weber, 1958/1930). Individuals were rightly concerned about their own fates – whether they were bound for heaven or hell upon their deaths. Because people were unusually preoccupied with their future after death, self-doubt was always present and could only be alleviated through success at work (Weber, 1958/1930). Weber (1958/1930) argued that such individuals were able to in part alleviate their anxiety over their fates by constant work and intense social activity. The daily routine activity of work and the fulfillment of one's "ordained" social position provided the inner confidence necessary to overcome anxiety fostered by the belief in predestination.

There is evidence to support a change in attitudes toward work. Analyses of the European Value Surveys in 1990 found that the Nordic countries (such as Sweden, Finland, and Denmark) were characterized by weak emphasis on self-centered achievement values (de Moor and Halman, 1994). Halman and Vloet (1994) published a report that compared values in 16 Western countries between 1981 and 1990. Using the European Values Study, they report changes in work orientations, deriving three main factors from 15 survey items about the importance of job characteristics. Respondents were asked to indicate which of the items they considered important in their jobs. Sweden experienced more change than any other country in the mean values of all three work orientation factors. For example, the mean of "personal development" increased from -.047 to .605. A change in values may have undermined the need to perform at work as an indicator of one's identity. It may well be that these changes toward

work are associated with the decline in the suicide rate.

The social democratic system in Sweden, accompanied by the growth in solidarity, decreased the attitude of "alone before God". The welfare state provides greater stability over the life course (Dahrendorf, 1988; Inglehart, 1990: 177; Zimmerman, 1995). It diminishes the need for people to worry about the security of the future. The welfare state, through its work policies, created the possibility for people to be absent from work, through sick leave, parental leave, and unemployment benefits.

The change in parental leave perhaps has also contributed to undermining the work identity and allowing individuals to have other identities. The Social Democratic party in Sweden has continued to support working parents. Parents are allowed to take leave from their work for up to 15 months after the birth of a child. Evidence of a decline in the work identity exists among an increasing number of new fathers, who are willing to take parental leave. That is, women, who are more likely to leave the labor market upon the birth of a child, have both work and family orientations (Girard, 1993). Their greater tendency to leave the labor market suggests a stronger identity with family. Men, on the other hand, who are less likely to leave the labor market upon the birth of a child, are more strongly tied to an identity associated with success in the labor market (Girard, 1993). In taking a leave, one can assume that males are placing their identities as fathers ahead of their occupational identities. Furthermore, a loss in employment may no longer mean a loss of one's identity, because Swedes increasingly have alternative identities from which to choose. One may be less likely to enter anomie upon the loss of employment.

Methodology

The central model evaluated in this paper is the relationship between labor force participation, work ethic, solidarity, and suicide. These relationships are illustrated in Figure 1.

The following hypotheses are tested:

Hypothesis 1a: There is a relationship between a group's attachment to the labor force and its suicide rate.

Hypothesis 1b: The relationship between labor force participation and suicide has weakened over time.

Hypothesis 2a: Work has become less important in Sweden.

Hypothesis 2b: Solidarity has risen in Sweden.

Hypothesis 2c: A change in attitudes about work is associated with an increase in solidarity.

Hypothesis 3a: The growth of solidarity has facilitated a decline in public support for the importance of work, which results in a lower suicide rate.

Hypothesis 3b: Identity and commitment to work mediate the impact of unemployment on suicide.

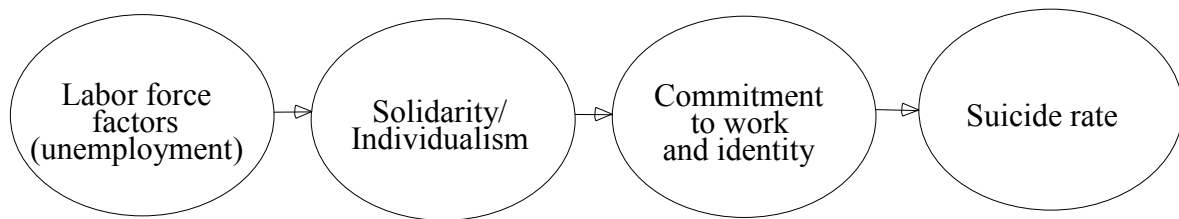


Figure 1. A Conceptual Model of the Relationship between Work and Suicide

This paper utilizes individual level survey data from the World Value Surveys conducted in 1981, 1990, 1996, and 2000 and aggregate level data from various branches of Statistics Sweden (the national central bureau of statistics) to evaluate the relationship between unemployment, solidarity, attitudes about the importance of work, identity, and suicide. The focus is on the group of individuals with the greatest declines in their suicide rates in Sweden, the working-age population.

Bivariate correlations and cross-tabulations of the value survey data are used to establish a relationship between measures of solidarity and attitudes toward work. The measures are examined over four waves of the value surveys and by age-sex groups. Because it is difficult to arrive at perfect measures of attitudes toward work and solidarity, and because the value surveys ask different variables in different years, multiple measures of these concepts are used to evaluate the relationship between solidarity and work ethic. *Attitudes toward work* are measured with questions that ask respondents about the importance of work (see first set of variables in Table 1). All work ethic variables are recoded such that higher scores indicate a stronger work ethic and lower scores represent a weaker work ethic. *Solidarity* is measured with trade union membership and attitude variables that indicate the level of solidarity-individualism (see second set of variables in Table 1). These variables were coded such that higher values represent greater solidarity and lower values indicate greater individualism.

Table 1. Summary of Work Ethic and Solidarity Variables in World Value Surveys

Variable Description	Range	Coding
Decrease in importance of work a good or bad thing	1-2	1=a good thing & do not mind 2=a bad thing
Job respected is important	0-1	0=not mentioned 1=mentioned
A responsible job is important	0-1	0=not mentioned 1=mentioned
Importance of work	1-4	1=not at all important 2=not very important 3=quite important 4=very important
Do you belong to a trade or labor union?	0-1	0=no 1=yes
Individuals versus state should take more responsibility to ensure everyone is provided for	1-3	1=individuals (responses 1-3) 2=responses 4-6 3=state (7-10)
Greater emphasis on the individual	1-2	1=a good thing & do not mind (combined) 2=a bad thing
Incomes more equal	1-3	1=greater incentives (responses 7-10) 2=responses 4-6 3=incomes more equal (1-3)
Accumulate wealth	1-3	1=at expense of others (responses 1-3) 2=responses 4-6 3=enough for everyone (7-10)
Private versus government ownership of business	1-3	1=private ownership (responses 1-3) 2=responses 4-6 3=government ownership (7-10)
Confidence in trade/labor unions	1-4	1=none at all 2=not very much confidence 3=quite a lot of confidence 4=a great deal of confidence

Time series regressions evaluate the relationship between the rate of unemployment, solidarity, work ethic, identity, and suicide rates for age-sex groups over the period 1970-2000 at the aggregate level. The *dependent variable* is the yearly age-sex, three-year moving average suicide rate from 1970 to 2000. The suicide rate is calculated per 100,000 inhabitants at the mid-year population. Added to the number of suicides are 35 percent of the number of deaths due to uncertain intention from 1970 to 1972 and 70 percent from 1973 to 2000, to account for potential misclassification of suicides when this category was added to the International Classification of

Diseases in 1969. The majority of these uncertain deaths in Sweden are due to poisoning (as are the majority of suicides), and it is estimated that 70 percent of these deaths would be classified as suicides had the undetermined category not existed (Allebeck, Allgulander, and Fisher, 1988; Åsgård, Nordström, and Råbäck, 1987; Hörte, 1983).

The *independent variables* include measures of unemployment, attitudes toward work, identity, and solidarity. At the aggregate level, the *unemployment* rate for males and females and the percentage of the population not in the labor force by age-sex groups are used. Sickness absenteeism from work, measured as the number of sickness benefit days per insured person by age and sex, is used to measure *work ethic*. Health professionals I talked with in Sweden mentioned that the high rate of sick leave from work among young people reflected a change in attitudes about work. On any given workday, 14 percent of Swedes are away from work collecting sick leave. This has become a major concern in Sweden. Their high rates of absenteeism may be reflective of the fact that they do not need a strong work identity, and as a result have lower rates of suicide. I measure work-related *identity* with the percentage of males using days of parental cash benefit and temporary parental cash benefit combined. Work provides a main source of social identity, especially for males (Prete and Miotto, 1999). Increased use of parental leave by fathers might indicate a departure from a strong work identity. Decreased use of parental leave by mothers might indicate a rise in their work identities. *Solidarity* is measured by the percentage of members in the two largest unions within the Swedish Federation of Trade Unions by sex. Trade unions, along with the Social Democratic Party, are primarily responsible for obtaining social welfare benefits in Sweden.

Results

The Relationship between Labor Force Attachment and Suicide Rates

The trends in the relationship between unemployment and suicide in Sweden support the hypothesis that work identity is less important in Sweden. Previous research has generally indicated that as unemployment rates rise, suicide rates also rise. In Sweden, unemployment and suicide rates are highly associated, but the direction of the relationship depends on the time period (**Hypothesis 1a**). Figure 2 displays the trends in suicide and unemployment for Swedes since the early 1960s. In the 1960s, both suicide and unemployment rates were rising. Unemployment, however, remained very low throughout the 1960s, 70s, and 80s. In the early 1990s, Sweden experienced a severe recession and as a result, its unemployment rose over 10 percent. At the same time, however, the decline in the suicide rate accelerated (Figure 2).

Unemployment is more strongly associated with male suicide rates than female suicide rates. For males, as their suicide rate declines, their unemployment rates rise ($r = -.811^{***}$) (Table 2). This is also true for females, but the relationship is slightly weaker ($r = -.686^{***}$). Labor force participation rates also indicate the same pattern. As males participate less in the labor force, their suicide rates decline ($r = +.693$). The relationship for female labor force participation and suicide rates is statistically insignificant.

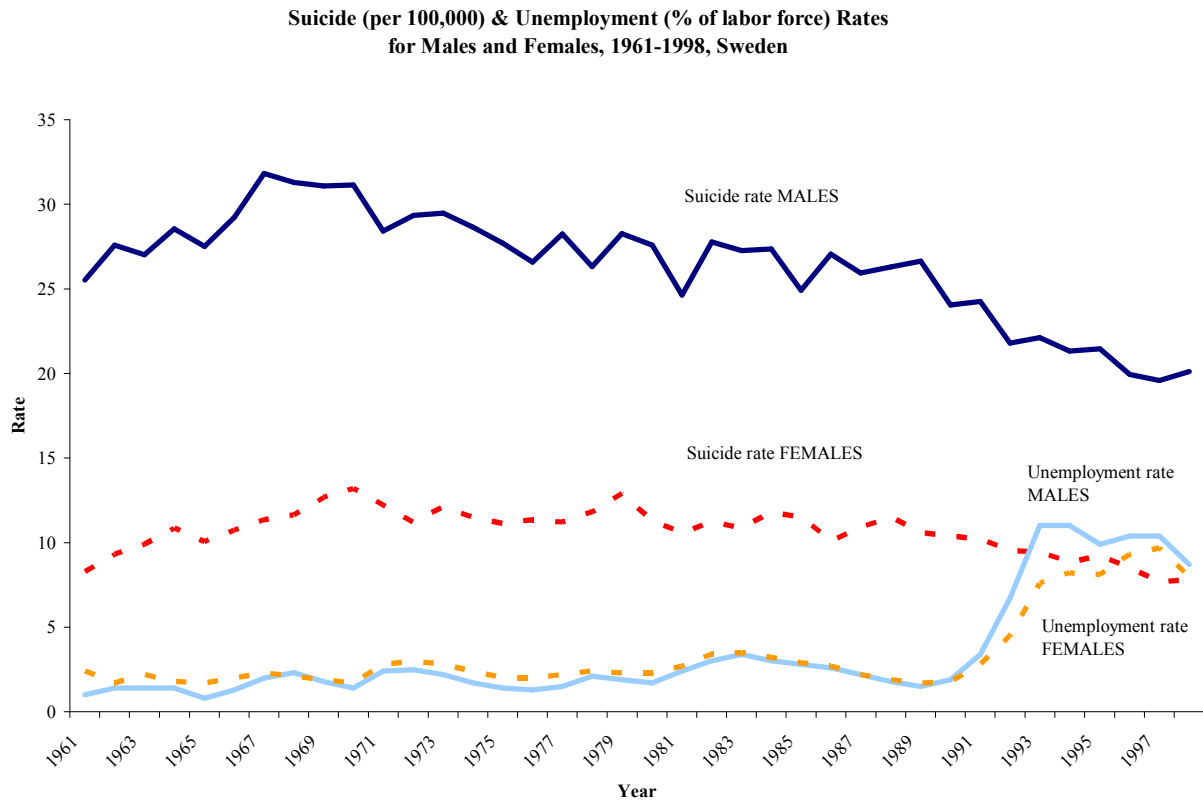


Figure 2. Suicide (per 100,000) and Unemployment (% of labor force) Rates for Males and Females, 1961-1998, Sweden

The relationship between suicide and unemployment has changed over time, as predicted. The bivariate correlations of suicide and unemployment measures are examined by different time periods (Table 2). The relationship between suicide and labor force attachment has reversed in Sweden for males. During the period of the rise in the Swedish suicide rate (1960s), the unemployment rate was also rising for males (positive correlation). But, as suicide rates began to decline, unemployment rates rose (negative correlation). Looking at the relationship between the suicide rate and civilian labor force participation rate, a different pattern is observed for females. In the 1960s, as females participated more in the labor force, their suicide rates rose. In the 1980s and 1990s, as the labor force participation of females declined so did their suicide rates.

The relationship between suicide and unemployment measures has not only changed over time, but has also weakened (**Hypothesis 1b**). A comparison of the bivariate correlations of these two variables for the time periods 1959-1970 and 1971-1998 (the first and last columns of correlations in Table 2) shows that the correlations overall have decreased in magnitude and statistical significance.

Table 2. Bivariate Correlations of Suicide Rate with Unemployment and Labor Force Participation Rates by Sex and Time Period

<i>Suicide Rate & Unemployment Rate</i>					
	1959-1970	1971-1985	1986-1998	1959-1998	1971-1998
<i>Males</i>	+ .776**	-.168(ns)	-.899***	-.811***	-.027(ns)
<i>Females</i>	-.335(ns)	-.144(ns)	-.907***	-.686***	+.140(ns)
<i>Total population</i>	+.494(ns)	-.135(ns)	-.897***	-.766***	-.855***
<i>Suicide Rate & Civilian Labor Force Participation Rate</i>					
	1959-1970	1971-1985	1986-1998	1959-1998	1971-1998
<i>Males</i>	-.911***	+.612*	+.926***	+.693***	+.891***
<i>Females</i>	+.829**	-.274(ns)	+.914***	-.135(ns)	-.309(ns)
<i>Total population</i>	-.891***	-.681**	+.919***	+.036(ns)	+.458*

*** p<.001, ** p<.01, * p<.05, ns = non-significant

Examining the Relationship between Work Ethic and Solidarity

Turning to the World Value Surveys, has the meaning of work changed in Sweden? Furthermore, have Swedes become less individualistic and more oriented toward the welfare of their citizens? The foregoing analyses evaluate two hypotheses, that work has become less important in Sweden (**Hypothesis 2a**) and that solidarity has risen (**Hypothesis 2b**). Table 3 presents bivariate correlations of measures of work ethic and solidarity with survey year. All measures of work ethic indicate that work has become less important in Sweden, at least since 1981 (the first survey). This decline in work ethic has even continued through the 1990s. Measures of solidarity indicate that solidarity has risen since 1981, and has continued to rise through the 1990s.

**Table 3. Bivariate Correlations of Survey Year with
Multiple Measures of Work Ethic and Solidarity (two-tailed)**

Variable	Correlation with Year	N	Years covered
Work ethic			
Decrease in importance of work good or bad thing	-.424***	3951	1981-2000
Importance of work scale (not at all to very important)	-.116***	3050	1990-2000
A job that is respected is important	-.049**	4025	1981-2000
A responsible job is important	-.003(ns)	4025	1981-2000
Solidarity			
Member of trade/labor union	+.034*	4005	1981-2000
State (not individuals) should take more responsibility for welfare of citizens	+.469***	3037	1990-2000
Do unpaid work for trade unions	+.203***	2634	1981-2000
Incomes should be made more equal	+.116***	2031	1990-1996

*** p<.001, ** p<.01, * p<.05, ns=non-significant

Is the decline in work ethic or work commitment associated with the increase in solidarity? Overall, measures of work ethic and solidarity are negatively related (**Hypothesis 2c**). That is, respondents who feel that work is very important tend to be more individualistic and less oriented toward solidarity. Bivariate correlations of 14 work ethic variables and 8 solidarity variables reveal more negative correlations than positive ones (results reported in Table 4). Of the 98 correlations that result from these 22 variables, 19 were negative and statistically significant at the .05 level. Only 8 were positive and statistically significant. The remaining correlations were non-significant (52) or non-existent (19). The negative correlations range from -.032* to -.276***. On average, the negative correlations (average = -.125) are stronger than the positive correlations (+.083). The evidence for a negative relationship between measures of work ethic and measures of solidarity is stronger than the evidence for a positive correlation between the two concepts. The positive correlations are important to note, however, because it is difficult to arrive at perfect measures of the concepts of work ethic and solidarity. Although the bivariate correlations cannot pinpoint the exact time when work began to be less

important in Sweden, they do illustrate that the rise in attitudes of solidarity among the public does coincide with a weakening emphasis on work.

Table 4. Number of Positive and Negative Correlations by Statistical Significance for 14 Work Ethic and 8 Solidarity Variables

# of correlations	Significant at .05 level	Non-significant	Total
Negative	19	31	50
Positive	8	21	29
Total	27	52	79
No correlation (no cases in common)			19

One measure of solidarity-individualism asks respondents on a scale of 1 to 10 whether individuals or the state should take more responsibility to ensure that everyone is provided for (Table 5). The cross-tabulation of this variable with survey year indicates a clear decline in the percentage of respondents who say that individuals should take greater responsibility, from 63% in 1990 to 8% in 2000. Similarly, the percentage who said that the state should take more responsibility has risen from 11% in 1990 to 53% in 2000. This supports the belief that attitudes of solidarity have risen in Sweden.

Table 5. Percentage of Respondents Answering Whether Individuals or the State Should Take More Responsibility for the Welfare of Society by Year of Survey

Year of Survey	1990	1996	2000
Individuals take more responsibility (responses 1-3)	63.2%	52.4%	7.9%
Responses 4-6	26.0%	34.8%	39.0%
State take more responsibility (responses 7-10)	10.8%	12.8%	53.1%

Evidence also supports the belief that attitudes about work have changed in Sweden. The respondents with the strongest work ethics are those who answered that a decrease in the importance of work is a bad thing. In 1981, over 77 percent of respondents expressed their dismay at a decrease in the importance of work in society (Table 6). But, by the year 2000, only 17 percent of respondents said this. In contrast, an overwhelming majority said that less emphasis on work was a good thing or that they did not mind it.

**Table 6. Percent of Respondents within Year of Survey Answering whether
a Decrease in the Importance of Work was a Good or Bad Thing**

	1981	1990	1996	2000
A Bad Thing	77.2%	58.7%	42.0%	16.6%
A Good Thing	15.0%	27.2%	38.5%	50.5%
Do Not Mind	7.7%	14.1%	19.5%	32.8%

The decline in the importance of work has occurred for males and females of all age groups (Table 7). The percentages of respondents in all age-sex groups who answered that less emphasis on work was a bad thing (the high work ethic group) have declined. In 1981, males of all age groups had slightly stronger feelings than females about the importance of work, particularly for those aged 65+. By the year 2000, this situation changed. In 2000, females under age 65 had slightly stronger feelings about work than did their male counterparts. This is not true for those aged 65 and older. Only 6.5 percent of females aged 65 and older felt that a decrease in the importance of work was a bad thing whereas 12 percent of males aged 65 and older felt this way. This suggests perhaps a cohort effect, that males and females of the older cohorts had more traditional attitudes about work than today's younger cohorts. In 1981, 1990, and 1996, males generally had stronger work ethics than females. But, by 2000, it is the females who have the stronger work ethics than males, except for those 65+. Though all groups' work ethics have declined, there is the suggestion of cohort influences (this is further explored in a longer version of this paper). The data in Tables 6 and 7 clearly illustrate the declining emphasis on work in Swedish society.

Table 7. Percent of Respondents within Year of Survey Answering that a Decline in the Importance of Work was a Bad Thing by Age and Sex

	1981	1990	1996	2000
Males – all	78.3	61.6	46.0	15.3
25-44	77.9	59.2	31.9	16.6
45-64	80.1	64.7	54.5	14.1
65+	88.3	70.0	60.0	12.1
Females – all	76.1	55.5	37.9	18.0
25-44	75.6	52.4	24.6	21.1
45-64	77.4	66.9	42.6	17.2
65+	79.7	58.0	65.3	6.5

Time Series Analysis of Unemployment, Solidarity, Work Identity, and Suicide

A matrix of zero-order correlations among the variables is given in Table 8 for males only (I will have this table available for females by the time of the PAA presentation). All variables are highly associated with the suicide rate. A decline in the suicide rate is associated with a rise in unemployment; an overall decline in trade union membership (which peaked in the early to mid 1980s, then declined); an overall decline in the use of sick leave (which mainly occurred after the early 1990s recession); and an increase in the use of parental benefits by males.

The matrix indicates possible multi-collinearity between the unemployment rate and the use of sick leave from work ($r = -.913$, $p < .001$). The use of sick leave is a potentially promising measure of work ethic among Swedes. Swedish experts have described the increase in work absenteeism as reflective of larger changes in Swedish society, that work has become a lower priority than it used to be (personal interviews). But, sick leave is heavily influenced by policy decisions. Many changes have occurred in the policies regarding the use of sick leave, and these policies are meant to influence behavior (i.e., to reduce the use of sick leave). Identity is the hypothesized key mechanism linking work and suicide. Identity is expected to mediate the impact of work on suicide. A loss of employment is a loss of identity. Thus, sick leave will be

dropped the analysis at this point because it is heavily influenced by the unemployment rate, particularly after the beginning of the severe recession in Sweden in the early 1990s.

Table 8. Pearson Correlations for Time Series Variables, Males

	Year	Unemploy- ment	Trade union	Sickness benefits	Parental benefits
Suicide rate	-.847***	-.881***	+.712***	+.819***	-.751***
Year		+.759***	-.392*	-.562**	+.908***
Unemployment rate			-.497**	-.913***	+.652***
Trade union membership				+.825***	-.634***
Sickness cash benefit					-.547**

*** $p < .001$, ** $p < .01$, * $p < .05$ (two-tailed)

The time series regression models presented here for males and females are preliminary (Tables 9 and 10). At this point, I have not properly dealt with the interpretation of the autocorrelation coefficients and have not decided whether and how variables should be lagged. The Durbin-Watson d-statistic test, a conventional test for determining the presence of autocorrelation, is given in these non-lagged models. Autocorrelation, or correlated error terms, is a severe hindrance to the correct interpretation of times series regression model terms (Ostrom, 1990). Autocorrelation will be worked out by the time of the PAA presentation.

The preliminary results indicate differences for males and females and for age groups. A decline in the suicide rate for males is associated with increased unemployment among males (Table 9). This supports the prediction that the relationship between unemployment and suicide has changed. Trade union membership, as a measure of solidarity, was expected to be negatively associated with the suicide rate. It is not, however, and this is likely due to union membership reaching its peak in the early 1980s. Membership has declined somewhat since then. But, in the regressions, the inclusion of trade union membership and the use of parental benefits by males reduced the effect of the unemployment rate on the suicide rate (**Hypotheses 3a and 3b**). The

use of parental benefits was the weakest of the three predictors for males of all both age groups, however.

These are relatively simple models, containing only three predictors. Other factors that have been shown to be related to suicide rates, such as alcohol consumption, have not been controlled for in these models. The addition of other factors related to suicide will be included in future models.

Table 9. The Effects of Unemployment, Solidarity, and Work Identity on MALE Suicide Rates in Sweden, 1970-2000 (n=31)

	All Males		Males 25-44		Males 45-64	
Unemployment	-.752***	-.207*	-.665***	-.173	-.485**	-.162
Trade Union Membership		+.713***		+.553*		+.455*
Parental Benefits Use		-.102		-.099		-.249
Autocorrelation coefficient Rho (standard error)	.492 (.165)	-.108 (.195)	.308 (.180)	.149 (.194)	.708 (.133)	.520 (.168)
R-Squared	.566	.945	.443	.615	.236	.627
Standard error	1.877	1.221	3.163	3.030	2.845	2.611
Durbin-Watson	1.720	2.011	1.907	1.913	2.430	2.073

*** p<.001, ** p<.01, * p<.05

The situation differs for females. For females aged 25-44, their unemployment was not a statistically significant predictor of their suicide rates. For females aged 45-64, however, their decline in suicide was related to a decline in their unemployment statistics. A positive correlation between unemployment and suicide is the expected relationship in most studies of suicide. This suggests that perhaps the relationship between suicide and unemployment has not changed for women in their mid-forties to retirement age as it has changed for men. Trade union membership of women was not a statistically significant predictor of their suicide rates. But, as women belonged more and more to trade unions, the relationship of unemployment with suicide became stronger for women in their 40s, 50s, and 60s. Perhaps women have moved more toward

stronger work identities. The models for females (at the PAA) will include parental benefit use by females (the current models include the use of parental benefits by males).

Table 10. The Effects of Unemployment, Solidarity, and Work Identity on FEMALE Suicide Rates in Sweden, 1970-2000 (n=31)

	All Females		Females 25-44		Females 45-64	
Unemployment	-.769***	-.591***	-.067	-.097	+.679***	+.736*
Trade Union Membership		+.224		+.170		+.315
Parental Benefits Use		-.437†		-.454†		-.297
Autocorrelation coefficient Rho (standard error)	.377 (.175)	.289 (.188)	.694 (.136)	.559 (.163)	.264 (.182)	.154 (.194)
R-Squared	.591	.690	.004	.136	.461	.567
Standard error	.914	.894	1.725	1.701	1.758	1.764
Durbin-Watson	1.813	1.852	1.992	1.800	1.913	1.927

*** p<.001, * p<.05, † p<.10

Conclusions

I have tested a model of suicide that combines unemployment, solidarity, attitudes about work, and work identity. Strong evidence suggests that attitudes about work have declined in Sweden. That is, work is no longer as central to one's life as it once was. Attitudes about solidarity have also changed in Sweden. Solidarity has replaced the individual orientation found in individuals with such strong commitments to their work. Time series models provide some support to the hypotheses that solidarity and work identity have altered the relationship between unemployment and suicide at the aggregate level. But differences are found for males and females.

A major criticism of any aggregate analysis of suicide is the ecological fallacy, or the use of aggregate level associations to infer individual level behavior. In this study, I have utilized both individual level and aggregate level data to evaluate whether changes in attitudes about work and solidarity have changed amongst Swedes, and whether, using aggregate measures of these concepts, the relationship between unemployment and suicide rates has changed. Overall,

this study does not attempt to predict individual level suicides. Rather, I seek to learn about societal trends in Sweden that are influencing the decline in the suicide rate. Unfortunately, however, death records cannot be linked to the individual level data found in the World Value Surveys. A study that could link such data would provide better tests of these ideas.

References

- Allebeck, P., Allgulander, C., and Fisher, L.D. 1988. Predictors of completed suicide in a cohort of 50 465 young men: role of personality and deviant behaviour. *British Medical Journal*, 297, 176-178.
- Ancarani, A., Rondinini, C., and Bellini, M. 1990. Fifteen-year survey of suicides in the 37th Health Service District of Emilia Romagna region. In: Ferrari, G., Bellini, M., and Crepet, P. (Eds.), *Suicidal behavior and risk factors* (pp. 249-253). Bologna, Monduzzi Editore.
- Åsgård, U., Nordström, P., and Råbäck, G. 1987. Birth cohort analysis of changing suicide risk by sex and age in Sweden 1952 to 1981. *Acta Psychiatrica Scandinavica*, 76, 456-463.
- Baldwin, P. 1996. Can we define a European welfare state model? In: B. Greve (Ed.), *Comparative welfare systems*. London, Macmillan.
- Beautrais, A.L., Joyce, P.R., and Mulder, R.T. 1998. Unemployment and serious suicide attempts. *Psychological Medicine*, 28, 209-218.
- Bergmark, Å. 2000. Solidarity in Swedish welfare – standing the test of time? *Health Care Analysis*, 8, 395-411.
- Bille-Brahe, U., Kerkhof, A., De Leo, D., Schmidtke, A., Crepet, P., Lönnqvist, J., Michel, K., Salander-Renberg, E., Stiles, T.C., Wasserman, D., and Egebo, H. 1996. A repetition-prediction study on European parasuicide populations. Part II of the WHO/EURO Multicentre Study on Parasuicide in cooperation with the EU concerted action on attempted suicide. *Crisis*, 17(1), 22-31.
- Breault, K.D. 1986. Suicide in America: a test of Durkheim's theory of religious and family integration, 1933-1980. *American Journal of Sociology*, 92(3), 628-656.
- Breed, W. 1963. Occupational mobility and suicide among white males. *American Journal of Sociology*, 28, 178-188.
- Breed, W. 1967. Suicide and loss in social interaction. In: Shneidman, E.S. (Ed.), *Essays in self-destruction* (pp.188-202). New York, Science House.
- Brenner, M.H. 1983. Mortality and economic instability; detailed analysis for Britain and comparative analysis for selected countries. *International Journal of Health Services*, 13, 563-620.
- Brenner, M.H. 1987. Relation of economic change to Swedish health and social well-being, 1950-1980. *Social Science and Medicine*, 25(2), 183-195.
- Claussen, B. 1998. Suicidal ideation among the long-term unemployed: a 5-year follow-up. *Acta Psychiatrica Scandinavica*, 98, 480-486.
- Crepet, P., Caracciolo, S., Casoli, R., Fabbri, D., Florenzo, F., Grassi, G.M., Jonus, A., and Tomelli, A. 1991. *Suicidal behavior in Italy. Suicide and Life-Threatening Behavior*, 21, 263-278.
- Crombie, I.K. 1990. Can changes in the unemployment rates explain the recent changes in suicide rates in developed countries? *International Journal of Epidemiology*, 19, 412-416.
- Dahrendorf, R. 1988. *The modern social conflict: an essay on the politics of liberty*. New York, Weidenfeld and Nicolson and Berkeley, University of California Press.
- de Moor, E.P.R. and Halman, L. 1994. *The individualizing society. value change in Europe and North America*. Tilburg, Tilburg University Press.

- Diekstra, R.F.W. 1989. Suicide and attempted suicide: an international perspective. *Acta Psychiatrica Scandinavica*, 80, 1-24.
- Dooley, D., Catalano, R., Rook, K., and Serxner, S. 1989(a). Economic stress and suicide: multilevel analyses. Part 1: aggregate time-series analyses of economic stress and suicide. *Suicide and Life-Threatening Behavior*, 19, 321-336.
- Dooley, D., Catalano, R., Rook, K., and Serxner, S. 1989(b). Economic stress and suicide: multilevel analyses. Part 2: cross-level analyses of economic stress and suicidal ideation. *Suicide and Life-Threatening Behavior*, 19, 337-351.
- Dreber, A., Wasserman, D., and Örtendahl, C. 1995. *Support in suicidal crises. The Swedish national programme to develop suicide prevention*. The National Council for Suicide Prevention.
- Girard, C. 1993. Age, gender and suicide: a cross-national analysis. *American Sociological Review*, 58, 553-574.
- Goodchilds, J.D. and Smith, E.E. 1977. The effects of unemployment as mediated by social status. *Sociometry*, 26, 287-295.
- Graubard, S.R. (Ed.), 1986. *Norden – The Passion for Equality*. Norwegian University Press, Oslo, Norway.
- Halman, L. and Vloet, A. 1994. *Measuring and Comparing Values in 16 Countries of the Western World*. Work and Organization Research Centre, Tilburg University, The Netherlands.
- Hassan, R. and Tan, G. 1989. Suicide trends in Australia: an analysis of sex differentials. *Suicide and Life-Threatening Behavior*, 19, 362-380.
- Hendin, H. 1964. *Suicide and Scandinavia. a psychoanalytic study of culture and character*. Garden City, New York, Anchor Books, Doubleday and Company, Inc.
- Henry, A.F. and Short, J.F. 1954. *Suicide and homicide*. New York, Free Press.
- Hörte, L-G. 1983. Ovisshet – ett problem i suicidstatistiken. *Hygiea*, 92, 251.
- Inglehart, R. 1990. *Culture shift in advanced industrial society*. Princeton, New Jersey, Princeton University Press.
- Johansson, S.E. and Sundquist, J. 1997. Unemployment is an important risk factor for suicide in contemporary Sweden. *Public Health*, 111(1), 41-45.
- Kasl, S. 1979. Changes in mental status associated with job loss and retirement. In: Barrett, J.E. (Ed.), *Stress and Mental Disorder*. Raven Press, New York.
- Kasl, S. and Cobb, S. 1979. Some mental health consequences of plant closing and job loss. In: Freeman, L and Gordus, J. (Eds.), *Mental Health and the Economy*. Upjohn, Kalamazoo, Michigan.
- Langley, J.D. and Johnston, S.E. 1990. Purposely self-inflicted injury resulting in death and hospitalization in New Zealand. *Community Health Studies*, 14, 190-199.
- Lester, D. 1994. Suicide and unemployment. *Psychological Reports*, 75, 602.
- Lester, D. and Yang, B. 1993. Anticipating the impact of the high rate of unemployment in Eastern Europe. *Current Politics and Economics of Europe*, 3, 33-35.
- Lesthaeghe, R. 1983. A century of demographic and cultural change in Western Europe: an exploration of underlying dimensions. *Population and Development Review*, 9(3), 411-435.
- Lewis, G. and Sloggett, A. 1998. Suicide, deprivation, and unemployment: record linkage study. *British Medical Journal*, 317, 1283-1286.

- Moesler, T.A., Pontzen, W., and Rummler, W. 1990. The relationship between suicidal acts and unemployment. In: Ferrari, G., Bellini, M., and Crepet, P. (Eds.), *Suicidal behavior and risk factors* (pp.189-193). Bologna, Monduzzi-Editore.
- Moesler, T.A., Rummler, W., Holl, R., and Lungerhausen, E. 1991. Correlations between suicidal actions and unemployment in the period between 1976 and 1985 in the municipal area of Nurnberg. *Psychiatria Danubina*, 3, 322-325.
- Morrell, S., Taylor, R., Quine, S., and Kerr, C. 1993. Suicide and unemployment in Australia 1907-1990. *Social Science and Medicine*, 36, 749-756.
- Platt, S. 1984. Unemployment and suicidal behavior: a review of the literature. *Social Science and Medicine*, 19(2), 93-115.
- Platt, S., Micciolo, R., and Tansella, M. 1992(a). Suicide and unemployment in Italy. *Social Science and Medicine*, 34, 1191-1201.
- Platt, S., Micciolo, R., and Tansella, M. 1992(b). Suicide and unemployment in Italy. In: Crepet, P., Ferrari, G., Platt, S., and Bellini, M. (Eds.), *Suicide behaviour in Europe* (pp. 63-77). Rome, John Libbey.
- Preti, A. and Miotto, P. 1999. Social and economic influence on suicide. *Archives of Suicide Research*, 5, 141-156.
- Pritchard, C. 1988. Suicide, gender and unemployment in the British Isles and the EEC 1974-85. *Social Psychiatry and Psychiatric Epidemiology*, 23, 85-89.
- Pritchard, C. 1992. Is there a link between suicide in young men and unemployment? A comparison of the U.K. with other European Community countries. *British Journal of Psychiatry*, 160, 750-756.
- Rae, D. 2005. How to reduce sickness absences in Sweden: lessons from international experience. OECD Economics Department Working Papers, No.442, OECD Publishing. Doi: 10.1787/157504218841.
- Schmidtke, A. 1997. Perspective: suicide in Europe. *Suicide and Life-Threatening Behavior*, 27(1), 127-136.
- Schony, W. and Grausgruber, A. 1987. Epidemiological data on suicide in upper Austria. *Crisis*, 8, 49-52.
- Snyder, M.L. 1990. Japanese male suicide before and after retirement. *Psychology*, 27(2), 47-52.
- Stefansson, C.-G. and Wicks, S. 1993. Själv mord i olika demografiska och social grupper 1960-1985 (Suicide in Different Demographic and Social Groups 1960-1985). In: Beskow, J., Allebeck, P., Wasserman, D., and Åsberg, M. (Eds.), *Själv mord i Sverige. En epidemiologisk översikt*.
- Trovato, F. 1986. A time series analysis of international immigration and suicide mortality in Canada. *International Journal of Social Psychiatry*, 32, 38-46.
- Weber, M. 1958 [original 1930]. *The Protestant ethic and the spirit of capitalism*. Translated by Parsons, T. New York, Scribner's Press.
- Zimmerman, S.L. 1995. Psychache in context: states' spending for public welfare and their suicide rates. *The Journal of Nervous and Mental Disease*, 183(7), 425-434.