Journal of Family Issues

Recency of Divorce, Depression and suicide risk

Abstract:	Previous individual level research on the association between the status of divorce and suicide risk has been marked by two recurrent limitations: (1) it is not clear if the timing of divorce (recent vs. distal) affects risk of completed suicides and (2) it is not clear if the association between divorce and suicide completions will withstand controls for a series of risk and protective factors. The present study addresses these two gaps in the literature. Data are from the National Mortality Follow Back Survey and refer to 13,897 deaths including 1,169 suicides. A model is estimated which controls for major alternative predictors of suicide completions including depression and sociological factors. The results of a multivariate logistic regression analysis determined that, controlling for the psychiatric, social and economic predictors of suicide completions, recent divorce increases the odds of death by suicide 1.6 times, compared to 1.3 times for distal divorce.

1

Recency of Divorce, Depression and Suicide Risk

Durkheim (1897/1966) demonstrated that married persons had a lower risk of suicide completions than single persons in 19th century France. Married persons were thought to be higher in social integration, higher in ties and mutual responsibilities to a spouse, than non married persons. Such bonds, in turn, lowered suicide risk.

Following up on this insight, investigations from the 20th century explored individual level data on suicide rates among marital status groups (for reviews see Agerbo, Stack & Petersen, 2011; Lester, 1992, 2000; Stack, 1982, 2000b). A systematic review of the literature from 1880 through 1994 on suicide completions found 37 such studies based on individual level data, and all supported Durkheim's basic premise of the protective effect of marriage (Stack, 2000b). Work since 1994 continues to demonstrate a link between divorce and completed suicide at the individual level (e.g., Agerbo, Sterne, & Gunnell, 2007; Kposowa, 2000; Luoma & Pearson, 2002; Yeh et al., 2008; Yip & Thorburn, 2004). This association has persisted in a variety of social contexts through time and space. That divorced people are at a risk for completed suicide that is greater than that of age matched, married peers is close to a sociological law.

However, there are two recurrent limitations of this body of research: (1) little is known about the timing of the impact of divorce on risk of completed suicide. Specifically, are the recently divorced at the same, more, or less risk than the long-term divorced? Does the influence of divorce affect suicide completions among the divorced only in the short term? (2) Does the status of being divorced have an independent effect on suicide risk? According to the selection hypothesis (e.g., Wade & Pevalin, 2004), mental disturbances precede marital disruption. Such mental disturbances select people

out of marriage for divorce. Rates of major depression among the divorced are

reportedly as much as nine times higher for men and three times higher for women

compared to their married counterparts (Wade & Pevalin, 2004). It is important to control

for psychiatric problems such as depression to determine if the stresses of occupying the

role of a divorced person affect suicide risk independent of depression. Once controls are

introduced for the covariates of divorce such as psychiatric morbidity and economic

strain, will the bivariate association between divorce and completed suicides hold up?

Does depression, in particular, cause both divorce and suicide?

The present paper contributes to the literature by addressing these two relatively

neglected issues. As such, it integrates a sociological with a psychiatric perspective. Such

integrated models have been advocated by writers such as Kposowa & Glyniadaki

(2012). It employs data from the National Mortality Follow – Back Survey, a national, in

depth study of 13,897 deaths including 1,169 suicides. This allows for the testing of two

central hypotheses: (1) The suicide risk of the recently divorced is greater than that of the

long term divorced, and (2) the impact of divorce on suicide risk is independent of

psychiatric and social covariates.

BACKGROUND AND THEORETICAL FRAMEWORK

Literature Review. Much of the sociological literature on divorce and suicide is

based on aggregate data on suicide rates and divorce rates (e.g., Barstad, 2008; Gundlach,

1990; Lester, 1994; Trovato 1986, 1987; for reviews see Lester, 2000; Stack 2000b). In

contrast, the present investigation focuses on individual level research where there is a

clearer link between divorce and suicide. Research that is based on concrete, individual

level data has demonstrated that divorced people have an elevated risk of suicide. A

review of 37 such studies, containing 493 findings and published from 1880 through

1994, found that 426/493 findings (86.4%) showed that divorced people had a higher

suicide risk than their married counterparts (Stack, 2000b). The magnitude of the

difference between the suicide rates of the married and the divorced is often substantial.

For example, in Austria the suicide rate of divorced persons was 128.6/100,000 compared

to 30.5/100,000 for married persons. The ratio of these two rates, the coefficient of

aggravation (COA), was 4.22. In the United States the COA varies mostly between 3.0

and 4.0 (Stack, 2000b).

A systematic epidemiological study by the World Health Organization (1968) still

provides the largest single set of relevant cross national data. In circa 1960, the COA's

for males, by nation, include: Denmark 6.2, Finland 4.2, France 2.2, West Germany 5.0,

Italy 3.6, Netherlands, 5.1, Norway 3.6, US 4.2, Sweden 3.8, Switzerland 4.5, England

3.8, and Australia 4.2. Corresponding female COA's were Denmark 4.6, Finland 2.9,

France 1.9, West Germany 3.1, Italy 17.0, Netherlands 3.6, Norway 2.9, Sweden 3.4,

Switzerland 3.4, England 2.6, and Australia 4.1 (World Health Organization, 1968).

These figures are summarized in Table 1. In most nations the divorced have a suicide rate

that is at least double that of the married population. There is substantial variation in the

COA across nations, but the COA is always greater than one.

(Table 1 about here)

While Stack (2000b) provides a systematic review of the evidence from 1880 through

1994, in order to assess any new fundamental change, a search was done through

databases (*Sociological Abstracts* and *MEDLINE*) using the subjects "suicide" and

"divorce," and years "1995-2011." The search was further limited to studies meeting two

additional criteria: suicidality was defined as suicide completions. Other forms of

suicidality such as suicide ideation and attempts were omitted. (b) The completed

suicides had to involve divorced persons themselves. Studies exploring the impact of

divorce on other groups (such as the children of divorced persons) were not included.

Another 24 relevant investigations, based on individual level data were found. Adding

these to the 37 from Stack (2000b) brings the total to 61 studies. Individual level

research done after 1994 has found the same general pattern. Table 1 includes

descriptions of representative suicide rates and risk ratios from many of these additional

investigations. It lists the investigations in order by nation. Suicide rates, when available,

are given for divorced vs. married persons. The coefficient of aggravation (ratio of the

suicide rates of divorced/married or the relative risk ratio), and a list of control variables,

if any, that are employed by the researchers are listed in the Table as well.

Findings from Europe and North America continue to document that the divorced

have a higher suicide risk than the married. For example, in England and Wales between

1982 and 1996 divorced males were 2.7 times and divorced females 2.5 times more apt to

die through suicide than their married counterparts (Yip & Thorburn, 2004). In Denmark,

divorced males between 41-60 years old are 3.9 times more apt than married males to die

through suicide, while the COA for Danish women, 41-60, is 3.7 (Agerbo et al., 2007). In

a longitudinal American study, Kposowa (2000) found that divorced men at baseline in

1979 were 2.4 times more apt than married men to suicide by 1989. Divorced women at

baseline were not at significantly elevated risk for suicide. However, this finding is

tenuous given a rather small number of divorced female suicides (n=10) (Kposowa,

2003).

5

Available data from developed nations in Oceania also confirm the divorce-suicide linkage. For example, in Queensland, Australia, a study of 6,062 suicides between 1994-2004, found high coefficients of aggravation. The median relative risk of divorced persons relative to married persons was 6.1 (Wyder, Ward & DeLeo, 2009).

Eastern nations tend to have a similar pattern. Divorce places both males and females at higher risk of suicide. In an overtime, longitudinal study in Taiwan, being divorced at baseline was associated with a greater risk of suicide by follow-up. For example, divorced persons aged 35-50 in 1997 were 2.7 times more apt to die through suicide by 2003 than their married counterparts. The relative risk ratios for divorced men and women of this age group were similar, being 2.7 for men and 2.9 for women (Yeh et al., 2008). In Hong Kong a study of suicide rates between 1981 and 1993 by Yip (1998) determined that divorced men had a suicide rate of 18.9, 1.4 times greater than that of married men, 13.7. Divorced women had a suicide rate 1.4 times higher than their married counterparts (17.9 vs. 13.2). In India the suicide rate of divorced men is quite high, 346/100,000, fully 20 times that of their married counterparts. The gap between divorced women and married women in India is also substantial, being 126 vs. 11.9/100,000, the corresponding COA is 10.6 (Mayer & Ziaian, 2002).

The last column of Table 1 presents a summary of control variables in the various studies. It is noteworthy that very few investigations of individual level data on divorce and suicide incorporate control variables. Many are epidemiological or descriptive studies. A few of the 61 studies reviewed included controls for alternative predictors of suicide (e.g., Agerbo, Sterne & Gunnell, 2007; Kposowa, 2000; and Yeh et al., 2008). None of the 61 studies included a control for depression.

It is noted that two papers not listed in Table 1 do examine the long term impact of parental divorce on the risk of suicide attempts among the children of divorced parents (Lizardi, Thompson, Keys, & Hasin, 2010a; 2010b). These papers do control for depression. However, they differ from the thrust of the present analysis in two ways. First, the present paper is concerned with the intragenerational impact of divorce on the divorced persons themselves, not their children. Our analysis is not dealing with very long term, intergenerational impacts of divorce on the children of divorced. Second, our analysis concerns suicide completions, not attempts. To the extent that the predictors of suicide completions are different from the predictors of attempts (Lester, 2000), for example men have higher rates of the former but lower rates of the latter than women, it is important to study these suicidal behaviors separately.

Theoretical Interpretations. Several sociological theories offer explanations for the connection between suicide and marital status (Cutright & Fernquist, 2005; Cutright, Stack & Fernquist, 2005; Gibbs, 2000; Stack, 2000b). The most often cited explanation is Durkheim's idea that marriage protects against suicide because of its promotion of social integration or bonds between husband and wife (e.g., Agerbo, Stack, & Petersen, 2011; Shiner, Scourfield, Fincham & Langer, 2009; Stack, 2000b). In this vein, bonds to a spouse reduce suicide through mechanisms including the giving and receiving of social support, companionship, and validation. The loss of these bonds through divorce contributes to suicide risk. Generally the literature on marital transitions finds that psychological distress increases after divorce (e.g., Strohschein, et al., 2005), which is consistent with the social integration view of divorce and suicide. Second, there is Gibbs and Martin's (1964) marital status integration hypothesis. Basically, statistically

infrequent status sets, such as being divorced and male relative to married and being

male, are assumed to be inherently stressful and, as such, contribute to suicide risk.

However, as the status sets such as divorced male become less infrequent, we would

anticipate a corresponding decline in suicide rates among persons in such status sets. As

divorce became more commonplace between 1960 and 1980, the gap between the suicide

rates of the married and divorced narrowed (Stack, 1990). As divorce became more

commonplace, the stigma associated with being divorced lessened and new institutions

developed such as personal ads which facilitated finding a new mate. A third perspective

focuses on marital status differences in suicide acceptability, with married people more

likely than divorced persons to regard suicide as a morally unacceptable act (Cutright,

Stack & Fernquist, 2005). Groups with negative attitudes towards suicide tend to have

lower suicide rates (Stack, 2000a). These explanations are not mutually exclusive.

Divorced persons lack ties to a spouse, are in a statistically infrequent status

configuration, and can have higher levels of suicide acceptability simultaneously. In

related work, marriage is also associated with better physical health and enhanced

economic resources (Stack, 1994; 2011). Each of these, in turn, is known to contribute to

lower suicide risk for married persons relative to divorced persons (Stack, 2000a, 2000b).

Limitations: Timing of Divorce. One recurrent limitation of the 61 concrete,

individual level studies is that the recency or the timing of suicide after divorce is largely

unexplored. This is often not the fault of the investigators, since some of the research is

based on secondary analysis of existing data, and the existing archival data simply does

not have any information on the timing of divorce (e.g., Kposowa 2000; Stack, 1998,

2004). Such investigations generally have no alternative but to lump together all divorced

persons who suicide regardless as to how long they have been divorced. Persons who

experienced divorce and suicided in the weeks following the divorce generally are

grouped with persons who suicide one year, two years, three years, and longer after their

divorces (e.g., Dzurova et al, 2006; Mayer & Ziaian, 2002; Phillips et al., 2002; Yip &

Thorburn, 2004). A key question is: is the link between divorce and subsequent suicide

time dependent? Are the recently divorced any more apt to suicide than persons who

divorced long ago?

A case can be made that the recently divorced may be most at risk for suicide.

One might contend that the initial social, psychological and economic shocks of divorce

would place the recently divorced person at high risk. The initial strains of divorce such

as the creation of two households where there had been one, the financial pressures,

strains with old in-laws, and custody issues may fade with time. People need time to

adjust to disruptions in their social and economic relationships. To the extent that divorce

happens too quickly, it can produce sociological anomie (Durkheim 1897/1966;

Kposowa, 2000). Possibly the subsets of divorced persons most prone to suicide include

those whose personalities make them less adaptable, with fewer ties to extended family

and friends for social support, and with meager financial resources. With time new

intimate others can be found, possibly cohabitation can be initiated, expenses shared with

a roommate or mate, and so on. Over time divorced persons can adjust to their new

station in life and suicide risk can decline. Given such considerations, divorce would

have its strongest impact on suicide in the near term (Roskar, Podlesek, Kuzmanic, et al.,

2011).

On the other hand, a case can be made for distal effects of divorce on suicide. It may take a long time for the stresses associated with the role of the divorce to wear down the divorced person before they give up the struggle and suicide. Suicide risk can increase over time due to the cumulative effect of strains such as many false starts in dating relationships that ultimately fail, the loss of physical attractiveness – often a key asset in mate selection, diminished hopes for finding a new partner, the grind of years of loneliness, pressures from single parenting, and economic downward mobility often brought about by inability to replace an affluent spouse (Stack 1994; 2011). It may simply take many divorced people a long time to give up after enduring many years of adversity.

Only one study was found which assessed the recency of divorce on suicide risk. Its findings need to be taken with some caution for at least two reasons. It is based on Slovenia, a less developed nation with a small population of two million people, and one of the lowest divorce rates in Europe (Roskar, Podlesek, Kuzmanic et al, 2011). It is not clear if the results based on this type of social and economic context can be generalized to the contemporary U.S. Further, a limitation of this investigation is that it restricted the sample to persons who died within five years of their divorce. Persons who were divorced and suicided, but who had been divorced for more than five years were excluded. Hence, this precluded the detection of very long term (more than five years) distal impacts of divorce on suicide. Nevertheless, the distribution for those suiciding within five years of their divorce by the timing of their suicide was as follows: 37% less than one year, 22% two years afterwards, 19% three years afterwards, 11% four years afterwards, and 11% five years after the divorce. This distribution suggests that the

10

recently divorced (e.g., 1-3 years) are at greater risk of suicide than those who have been

divorced for 4-5 years.

In a related research stream, the timing of widowhood on suicide is explored.

Ajdacic-Gross *et al*. (2008) found that the annualized suicide rates in widowed people

were highest in the first week after bereavement and that in the first months after

bereavement, the suicide rates decreased, first rapidly and then gradually. Also

Erlangsen, Jeune, Bille-Brahe & Vaupel (2004) noted a significant increase in the suicide

risk during the first year after a bereavement, especially for men.

Limitations: Model Specification. A second limitation of the individual based

research on divorce and completed suicide is that it tends not to control for the covariates

of divorce such as psychiatric morbidity and economic strain (Stack, 2011). It should be

noted that it is very difficult to come upon data that is publicly available which contain

both measures of divorce and psychiatric morbidity (e.g., Kposowa & Glyniadaki, 2012).

It is not the fault of researchers who use secondary data analysis. Some previous such

work is based on datasets which simply do not have measures of psychiatric constructs

(e.g., Kposowa, 2000; Stack, 1998, 2004). This is due, in part, to a relative lack of a

generalized integration of psychiatric and sociological models of suidicidality (Kposowa

& Glyniadaki, 2012). Psychiatric morbidity is of particular concern. Completed as well

as attempted suicide is related to depression (e.g., Lester, 2000; Lizardi et al., 2010a).

According to a Meta analysis of 23 relevant studies, persons suffering from major

depression are, for example, fully 20.4 times more apt to die through completed suicide

than non depressed persons (Stack, 2009). In turn, divorced persons have a relatively

high incidence of depression and related psychiatric disorders.

The reader should note that there is a related literature, not fully reviewed here, on

suicide attempts among the children of divorced parents which has some relevance to the

issues at hand. Lizardi et al. (2010a) analyzed suicide attempts using the National

Epidemiological Survey on Alcohol and Related Conditions (NESARC) and determined

that depression affected the risk of suicide attempts. In addition, parental divorce affected

the risk of attempted suicide of the subjects (children of divorce) in the survey. While the

constructs of both suicidality and divorce in Lizardi et al's (2010a) research (attempts,

parental divorce) differ from those in the present study (completed suicides, divorce of

subjects, not parents of subjects), they add additional evidence for links between divorce

and suicidality independent of depression.

It is plausible that there are selection effects that influence both divorce and

suicide. There has been a long standing debate between the selection and social causation

perspectives concerning marital transitions (e.g., Wade & Pevalin, 2004; Stack &

Eshleman, 1998). The social causation thesis argues that marital disruption leads to poor

mental health, while the social selection hypothesis argues that poor mental health leads

to marital disruption. For example, being difficult to live with, depressed individuals

would be expected to have a higher rate of divorce, as well as a higher incidence of

suicide.

None of the 61 individual level studies to date on divorce and suicide completions

control for either pre divorce or post divorce depression. Hence, individual level analyses

of divorce's impact on completed suicide generally do not control for such selection

biases; that is, they do not control for depression and related psychiatric disorders that

may cause both divorce and completed suicide (e.g., Mayer & Ziaian, 2002; Trovato,

1991; World Health Organization, 1968; Yeh et al., 2008). Many investigators who use

secondary data are simply not able to control for psychiatric morbidity since measures of

that construct are not available in the data source (e.g., Kposowa, 2000; Stack, 1998,

2004). The present investigation is the first to be able to add a measure of depression.

However, while in a related literature on suicide attempts among the children of divorce,

there has been a control for depression (Lizardi et al., 2010a), no one to date has been

able to explore the impact of divorce on the risk of suicide completions among the

divorced persons themselves. It should be noted, however, that we cannot fully test the

selection hypothesis since we lack data on pre divorce depression levels.

While they omit depression as a control, a few of the 61 previous studies have

been able to control for some covariates of divorce that contribute to suicide risk (see

Table 1). For example, using the data in the National Longitudinal Mortality Study,

Kposowa (2000) was able to control for socio-economic status indicators (education and

household income), but not psychiatric morbidity. Stack (1998) was able to control for

education, but not income. Such analysis of secondary data are necessarily limited to the

availability of measures of important constructs in such datasets. Using data from the

National Mortality Follow back Survey, the present investigation is able to add a control

for depression in order to sort out the independent effects of divorce on suicide risk.

Whilst in principle many suicide researchers accept the value of a psycho-social

or bio-psycho-social model, in practice most studies are discipline-specific (e.g.,

Kposowa & Glyniadaki, 2012). The consideration of both sociological and psychological

variables is not common, and Kposowa & Glyniadaki (2012) call for such integrated

models. While there is some relevant work on suicide attempts among the children of

13

divorce (e.g., Lizardi et al., 2010a), there is no such work on suicide completions among

the divorced themselves. The present paper fills this gap in the literature. We include both

a measure of depression as well as a structural social factor, the timing of divorce.

METHODOLOGY

All data are from the National Mortality Follow back Survey (NMFBS) (US

Public Health Service, 2000). The NMFBS is based on psychological autopsies of a

representative sample of deaths in the United States. Significant others of the deceased

were contacted and interviewed by trained professionals. Standard questions regarding

the psychiatric, medical, treatment-centered and other issues regarding the deceased were

asked of the significant others. Some questions regarding the social context of the

deceased were also included. The NMFBS is the largest, publicly available psychological

autopsy dataset on suicide. Complete data were available on 13,897 deaths including

1,169 suicides.

Some caution needs to be exercised in interpreting the results of the present study

since it uses psychological autopsy data. Such data rely on retrospective opinions of

informants about the deceased. In this line of work, the opinions cannot be directly

measured from the deceased person themselves, as in typical social science survey

research. While psychological autopsy studies of suicide have their limitations, they are

considered by many suicide researchers as the gold standard in the investigation of

completed suicides where the subject is not available for interviews (Connor, Beautrais,

Brent, et al, 2011, 2012).

The dependent variable is a dichotomy where 1=death by suicide and 0=deaths from all other causes. Since the dependent variable is a dichotomy, logistic regression techniques are appropriate (Menard, 2002).

Marital status and the timing of marital transitions are measured by four binary (0,1) dichotomous variables. Two measures of the timing of divorce are included. The first is the experience of a recent divorce before death. A recent divorce is defined as one that occurred during the year of the survey (1993) and/or during 1991-1992. It is coded either 0 (before 1991) or 1 (1991-1993). Long term divorce is defined as a one which occurred prior to 1991. Widowhood status is also coded as two variables in relation to the recency of that status. Recent widowhood refers to deaths of spouses that occurred between 1991-1993, and long term status as a widow refers to cases where the death happened before 1991. All four measures are binary variables (0,1). The benchmark or comparison marital status category consists of person in all other marital statuses including married, and single (never married). The benchmark group, then, consists of persons who have not lost a spouse through divorce or death.

Several additional sociological concepts are incorporated into the model. They relate to the religious and economic spheres of social life. Religiosity level, a protective factor (see Stack, 2000b; Stack & Kposowa, 2011), is measured in terms of the extent of religious activities, as indexed by the NMFBS item: "How often did the deceased participate in religious activities." The responses to this survey question ranged from never (0) through every day (5).

Economic strain is measured by two constructs. These measures refer to job loss (0,1), and job demotion during the last year of life (0,1). While job loss (unemployment)

has received attention in previous investigations (for reviews see Platt & Hawton, 2000, or Stack, 2000a), job demotion is an unstudied area in suicide studies. Platt and Hawton (2000) have called for new measures of economic strain, in addition to unemployment, a much studied measure. We answer this call.

A key psychiatric factor, depression, is measured using a scale of 8 items that are available in the NMFBS. These items tap feelings of worthlessness, withdrawal, problems in concentrating, a wish to die, changes in sleep patterns, changes in weight, crying spells, and sluggishness of the deceased. A distinction is made between the response category where the deceased reportedly had a condition often (=1), and all others (=0). Scores were summed and ranged from 0 to 8. The alpha reliability coefficient for the index was 0.7414. Finally, a control is entered for a key demographic factor, gender, where male=1 and female=0.

RESULTS

Table 2 provides the results of the multivariate logistic regression analysis. Controlling for depression and the other variables in the equation, from the odds ratio,

(Table 2 about here)

persons who were recently divorced were 1.64 times more apt to die through suicide than the reference group. However, persons who had been divorced longer were not at enhanced risk of suicide. While the odds ratio was positive indicating an 18% greater risk of suicide, it just missed the level of statistical significance (p = .06). Turning to relationship loss through widowhood, persons who had experienced the recent loss of a spouse through death were 1.37 times more apt to suicide than persons without a loss of a spouse. Long term widowhood was not associated with enhanced risk of suicide.

16

The findings on the economic strain indicators suggested that economic problems are associated with enhanced risk of self destruction. Persons experiencing loss of a job during the last year of life were 1.3 times more to die through suicide. Further, persons experiencing a demotion at work during the last 12 months of life were fully 7.63 times more apt to die of suicide than persons not experiencing such an employment setback.

Religiosity served as a protective factor. Controlling for the other independent variables, the higher the religiosity the lower the suicide risk. From the odds ratio, a one unit change in the five level religiosity index was associated with 19% drop in the odds of death by suicide.

Strong evidence for a psychiatric perspective was found. Controlling for all other risk and protective factors, depression increased the risk of suicide. A one unit change in the depression index was associated with an 18% rise in the risk for death through suicide. Further analysis determined that a majority of persons who had perfect scores (index score of 8) on depression died through suicide.

The model provided a reasonable fit for the data. The Nagelkereke r-squared indicated the presence of an adequate model. Importantly, using the model to predict death, the model correctly classified 91% of the deaths as either suicide or nonsuicide deaths.

CONCLUSION.

While there have been 61 previous individual based, studies on the relationship between divorce and suicide published between 1880-2010, they have been marked by two recurrent limitations: (1) neglect of the timing of divorce and (2) neglect of incorporating psychiatric control variables into the analysis, including depression.

Only one study based in the small, Eastern European nation of Slovenia, has explored the timing of divorce (Roskar, Podlesek, Kuzmanic, et al., 2011). The previous investigation limited the analysis to persons divorced less than 5 years, thus leaving the effects of very long term distal effects an open question. It also lacked a control for a major determinant of both divorce and suicide: depression. The present paper explores the timing of divorce in a substantially different social context, the US, a developed, large nation with a much higher incidence of divorce. We also include all divorced persons, not just ones divorced in a five year window, in order to fully test for distal impacts of divorce on suicide. Finally, we introduce a series of control variables including depression.

In both social settings, Slovenia and the U.S., it is the recently divorced who are at the greatest risk for suicide. While one might anticipate distal effects, where the will to live may be ground down only after many years of post divorce stress, the greatest risk, in fact, involves those who are recently divorced. Professionals involved in suicide prevention might wish to direct a disproportionate amount of their resources towards this particular, at-risk group.

An important issue running though virtually all of the 61 existing studies on divorce and suicide completions among the divorced themselves is that typically, often due to the unavailability of data in secondary data sets, they are unable to control for the respondent's depression (as well as other dimensions of psychiatric morbidity). This leaves selection effects unaddressed. Depression may cause both divorce and suicide. A Meta analysis of 13 overtime studies, where psychiatric and personality variables were measured before divorces took place, determined that neuroticism (e.g., depression,

anxiety) was a significant predictor of who eventually became divorced (Roberts et al.,

2007). In a similar vein, analyses using the National Comorbidity Surveys have

determined that 11 out of the 14 psychiatric disorders investigated were predictive of

ultimate divorce (Kessler, Walters, & Forthofer, 1998; Stack, 2011). For example, the

manic disorder increased the odds of divorce by 3.2 times, while major depression

enhanced the risk of divorce by 1.7 times that of the general population. Both of these

disorders, in turn, are known, from other research, to increase suicide risk (Lester, 2000;

Wasserman & Wasserman, 2009).

The present inquiry controlled for depression levels and still found that recent

divorce increased the risk of suicide. Depression had, as expected, an independent impact

on the odds of suicide. However, in order to fully assess the merits of the social selection

and social causation hypotheses, measures of pre divorce depression are needed.

The findings on several control variables are noteworthy. Judging from the

relative sizes of the Chi Square statistics in table 2, religious activities were the strongest

predictor of suicide, more important than recent divorce, depression and other

independent variables. While divorce is the more commonly index of social integration,

religion is the next more commonly used index of bonds to a social group (Stack, 2000b).

Unfortunately, religious activities are the only measure of religiosity in the National

Mortality Follow back Survey. Religious activities can include time spent with

coreligionists as well as time spent attending religious services. Specific measures of

each type of activity are needed in order to test the religious integration and religious

networks perspectives on religion and suicide. Future work is also needed to weight this

19

factor against measures of still other constructs including commitment to core religious

beliefs (Stack & Kposowa, 2011).

The traditional indicator of economic strain, unemployment, exerted an

independent impact on the odds of suicide, as expected. In addition, a new construct, job

demotion, was also highly predictive of suicide. The paper also answers the call of Platt

and Hawton (2000) for the exploration of new measures of economic strain in research on

suicide.

Over the last 130 years there have been 61 studies on subject's divorce and

completed suicide at the individual level, but they represent a tiny fraction of research on

suicide. Since 1980 alone, there has been over 30,000 works on suicide published (Web

of Science, accessed, March 1, 2011). Emanuele (2009) noted this neglect and called for

research on the role of romantic disruption as a widespread, neglected contributing factor

to suicide. An analysis of recently released data on 30,593 completed suicides in the

recently released data set termed the National Violent Death Reporting System found that

at least 27% of the suicides involved intimate partner problems including divorce,

separation, and custody battles (Stack & Bowman, 2011, 160). The present investigation

answers the call of Emanuele (2009) for work on relationship loss, a key social factor.

The present paper, by including indicators from both the psychiatric and social

models, bridges the gap between those two paradigms on suicide. It finds, as expected,

that they compliment each other. There is strong evidence for including both a link

between depression and suicide, and divorce and suicide as well. While psychiatric

factors are clearly important predictors of suicide risk, they need to be combined with

social factors in order to fully understand suicide (Kposowa & Glyniadaki, 2012).

20

The question of the timing of relationship breakdown could be explored with respect to interaction effects with a character trait, impulsivity. Impulsivity is a known risk factor for suicide (Corruble, 1999; Kotler et al., 2001; Lester, 2000). Perhaps the odds of suicide among divorced persons in the immediate period following divorce would be relatively high among persons with impulse control problems. If so, persons involved in suicide prevention efforts might be able to fine tune a definition of the population most at risk of suicide following divorce, those with impulse control disorders.

The present paper is focused on the strains associated in the post legal divorce period. Future work is needed on "psychological divorce" or the stressful period of separation which precedes legal divorce. Divorce is not a single event but can be viewed as a culmination of strains which end in a legal divorce. Possibly the most painful period of persons enduring the suffering of divorce is the psychological divorce that develops before any legal adjudication for ending the marriage (Ide, Wyder, Kolves & DeLeo, 2010).

REFERENCES

AGERBO, E. (2005) Midlife suicide risk, partner's psychiatric illness, spouse and

child bereavement by suicide or other modes of death: a gender specific study. *Journal of*

Epidemiology and Community Health, 59: 407-412.

AGERBO, E. STERNE, J.A.C., & GUNNELL, D.J. (2007). Combining

individual and ecological data to determine compositional and contextual socio-economic

risk factors for suicide. *Social Science & Medicine*, 64, 451-461.

AGERBO, E., STACK, S. & PETERSEN, L. (2011). Social integration and

suicide in Denmark, 1906-2006. *The Social Science Journal*, 48, 630-640.

AJDACIC-GROSS, V. RING, M. GADOLA, E., LAUBER, C. BOPP, M.,

GUTZWILLER, F. & RÖSSLER, W. (2008). Suicide after bereavement: an overlooked

problem. *Psychological Medicine*, 38: 673-676.

BARSTAD, A. (2008). Explaining changing suicide rates in Norway 1948-2004:

The role of social integration. *Social Indicators Research*, 87 (1): 47-64.

CANTOR, C.H. & Slater, P. (1995). Marital breakdown, parenthood, and suicide.

Journal of Family Studies, 1, 91-102.

CONNOR, K.R., BEAUTRAIS, A.L., BRENT, D.A., CONWELL, Y.,

PHILLIPS, M.R., & SCHNEIDER, B. (2011). The next generation of psychological

autopsy studies: Part I, Interview Content. Suicide & Life Threatening Behavior, 41, 594-

613.

CONNOR, K.R., BEAUTRAIS, A.L., BRENT, D.A., CONWELL, Y.,

PHILLIPS, M.R., & SCHNEIDER, B. (2012). The next generation of psychological

22

autopsy studies: Part II, Interview Procedures. *Suicide & Life Threatening Behavior*, 42, 86-103.

CORCORAN, P. & NAGAR, A. (2010). Suicide and marital status in Northern Ireland. *Social Psychiatry & Psychiatric Epidemiology*, 45, 795-800.

CORRUBLE, E. (1999). Impulsivity: a relevant dimension in depression regarding suicide attempts? *Journal of Affective Disorders*, 53 (3): 211-215.

CUTRIGHT, P. & FERNQUIST, R.M. (2005). Marital status integration, psychological well-being, and suicide acceptability as predictors of marital status differentials in suicide rates. *Social Science Research*, 34, 570-590.

CUTRIGHT, P., STACK, S., & FERNQUIST, R. (2006). The age structures and Marital status differences of married and not married male suicide rates: 12 developed countries. *Archives of Suicide Research*, 10: 365–382.

DURKHEIM, E. (1897/1966). *Suicide: A Study in Sociology*. New York: Free Press.

DZUROVA, D., RUZICKA, L., & DRANGOMIRECKA, E. (2006). Demographic &social correlates of suicide in Czechoslovakia. *Sociologicky Ustav*, 42, 557-571.

EMANUELE, E. (2009). Of love and death: the emerging role of romantic disruption in suicidal behavior. *Suicide and Life Threatening Behavior*, 39: 240.

ERLANGSEN, A., JEUNE, B., BILLE-BRAHE, U. & VAUPEL, J. W. (2004). Loss of partner and suicide risks among oldest old: a population-based register study. *Age and Ageing*, 33: 378-383.

GIBBS, J. P. & MARTIN, W. T. (1964). *Status integration and suicide: A sociological study*. Eugene, OR: University of Oregon Books.

GIBBS, J. (2000). Status integration and suicide: occupational, marital, or both? *Social Forces*, 78, 949-968.

GUNDLACH, J. (1990). Absence of family support, opportunity, and suicide. *Family Perspective*, 24, 7-14.

IDES, N., WYDER, M., KOLVES, K., & DELEO, D. (2010). Separation as an important risk factor for suicide: A systematic review. *Journal of Family Issues*, 31, 1689-1716.

KESSLER, R., WALTERS, E.E., & FORTHOFER, M.S. (1998). The social consequences of psychiatric disorders, III: probability of marital stability. *American Journal of Psychiatry*, 155, 1092-1096.

KOTLER, M., IANCU, I., EFRONI, R. & AMIR, M. (2001). Anger, impulsivity, social support, and suicide risk in patients with posttraumatic stress disorder. *Journal of Nervous and Mental Disease*, 189 (3): 162-167.

KPOSOWA, A. J. (2000). Marital status and suicide in the National Longitudinal Mortality Study. *Journal of Epidemiology and Community Health*, 54: 254-261.

KPOSOWA, A. (2003). Divorce and suicide risk. *Journal of Epidemiology & Community Health*, 57, 993.

KPOSOWA, A. & Glyniadaki, A. (2012). Mental health and suicide: An ecological hierarchical analysis of U.S. counties and states. In Hogue, N. & Swanson, D.A. (eds). *Opportunities and Challenges for Applied Demography in the 21*st *Century,* New York: Springer.

LESTER, D. (1992). *Why People Kill Themselves: A 1990's Summary of Research Findings on Suicidal Behavior*. 3rd Edition, Springfield, IL: Charles C. Thomas.

LESTER, D. (1994). Domestic integration and suicide in 21 nations, 1950-1985. *International Journal of Comparative Sociology*, 35, 131-137.

LESTER, D. (2000). *Why People Kill Themselves: A 2000 Summary of Research on Suicide*. 4th Edition, Springfield, IL: Charles C. Thomas.

LIZARDI, D, THOMPSON, R.G., KEYES, K., & HASIN, D. (2010a). The role of depression in the differential effect of childhood parental divorce on male and female adult offspring suicide attempt risk. *The Journal of nervous and Mental Disease*, 198, 687-690.

LIZARDI, D, THOMPSON, R.G., KEYES, K., & HASIN, D. (2010b). The effect of parental remarriage following parental divorce on offspring suicide attempt. *Families in Society: Journal of Contemporary Social Services*, 91, 186-192.

LUOMA, J.B. & PEARSON, J.L. (2002). Suicide and marital status in the United States, 1991-1996: Is widowhood a risk factor? *American Journal of Public Health*, 92 (9): 1518-1522.

MASOCCO, M., POMPILI, M., VICHI, M., VANACORE, N., LESTER, D. & TATARELLI, R. (2008). Suicide and Marital Status in Italy. *Psychiatric Quarterly*, 79 (4): 275-285.

MAYER, P. & ZIAIAN, T. (2002). India suicide and marriage. *Journal of Comparative Family Studies*, 33, 297-305.

25

MENARD, S. (2002). *Applied Logistic Regresion Analysis*. Thousand Oaks, Ca.:

Sage.

PHILLIPS, M., YANG, G., ZHANG, Y., et al. (2002). Risk factors for suicide in

China: A national case-control psychological autopsy study. *The Lancet*, 360, 1728-1736.

PLATT, S. & HAWTON, K. (2000). Suicidal behavior and the labor market.   In

HAWTON, K., & VAN HEERINGEN, K. (Eds.) *The International Handbook of Suicide*

and Attempted Suicide. Pp. 309-384. London: Wiley.

ROBERTS, B., KUNCEL, N., SHINER, R., CASPI, A., & GOLDBERG, L.

(2007). The power of personality: the comparative validity of personality traits,

socioeconomic status, and cognitive ability for predicting important life outcomes.

Perspectives on Psychological Science, 2, 313-345.

ROSKAR, S., PODELSEK, A., KUZMANIC, M., et al. (2011). Suicide risk and

its relationship to change in marital status. *Crisis*, 32, 24-30.

SHINER, M., SCOURFIELD, J., FINCHAM, B. & LANGER, S. (2009). When

things fall apart: Gender and suicide across the life course. *Social Science & Medicine*,

69: 738-746.

STACK, S. (1982). Suicide: A decade review of the sociological literature.

Deviant Behavior, 4, 41-66.

STACK, S. (1990). New micro level data on the impact of divorce on suicide,

1959-1980: A test of two theories. *Journal of Marriage & the Family*, 52, 119-127.

STACK, S. (1994). Divorce. Chapter in V.S. Ramachandran (ed.). *Encyclopaedia*

of Human Behaviour, pp. 153-163, first edition, San Diego, Ca.: Elsevier.

26

STACK, S. (1998). Education and risk of suicide. *Sociological Focus*, 31, 295-302.

STACK, S. (2000a). Suicide: a 15 year review of the sociological literature: Part I: Cultural and economic factors. *Suicide and Life Threatening Behavior*, 30 (2): 145-162.

STACK, S. (2000b). Suicide: a 15 year review of the sociological literature: Part II: Modernization and social integration perspectives. *Suicide and Life Threatening Behavior*, 30 (2):163-76.

STACK, S. (2004). Suicide risk among physicians: A multivariate analysis. *Archives of Suicide Research*, 8, 287-292.

STACK, S. (2009). Suicide: Adulthood. Chapter in Carr, D. *Encyclopaedia of the Life Course and Human Development, Volume 2*, pp. 461-466, Farmington Hills, MI: Cengage Learning Publishing.

STACK, S. (2011). Divorce. Chapter in V.S. Ramachandran (ed.). *Encyclopedia of Human Behavior*, second edition, San Diego, Ca. Elsevier.

STACK, S. & BOWMAN, B. (2011). *Suicide Movies: Social Patterns, 1900-2009.* Cambridge, Ma.: Hogrefe.

STACK, S. & ESHLEMAN, R. (1998). Marital status and happiness: A 17 Nation study. *Journal of Marriage & the Family*, 60, 527-536.

STACK, S. & KPOSOWA, A.J. (2011). Religion and suicide: Integrating four theories cross nationally. In O'Connor, R. & Platt, S. (Eds.), *International Handbook of Suicide Prevention: Research, Policy, and Practice.* Pp. 235-252. London: Wiley-Blackwell.

STROHSCHEIN, L., MCDONOUGH, P., MONETTE, G. & SHAO, Q. (2005). Marital transitions and mental health: Are there gender differences in the short-term effects of marital status change? *Social Science & Medicine*, 61: 2293–2303.

TORRE, E., CHIEPPA, N., IMPERATORI, F., et al. (1999). Suicide and attempted suicide in the province of Turin from 1988 to 1994: Epidemiological analysis. *European Journal of Psychiatry*, 13, 77-86.

TROVATO, F. (1986). The relationship between marital dissolution and suicide. The Canadian case. *Journal of Marriage & the Family*, 48,341-348.

TROVATO, F. (1991). Sex, marital status, and suicide in Canada: 1951-1981. *Sociological Perspectives*, 34, 427-445.

TROVATO, F. (1987). A longitudinal analysis of divorce and suicide in Canada. *Journal of Marriage and the Family*, 49, 193-203.

U.S. PUBLIC HEALTH SERVICE. (2000). *National Mortality Followback Survey, Codebook.* Ann Arbor, Mi.: Inter University Consortium for Political and Social Research.

WADE, T.J. & PEVALIN, D.J. (2004). Marital transitions and mental health. *Journal of Health and Social Behavior,* 45, 155-170.

WASSERMAN, D. & WASSERMAN, C. (2009). *Oxford Textbook of Suicidology and Suicide Prevention: A Global Perspective.* New York: Oxford University Press.

WORLD HEALTH ORGANIZATION (1968). World Health Statistics Report (Volume 21, no. 6). Geneva, Switzerland: author.

28

WYDER, M., WARD, P. & DE LEO, D. (2009). Separation as a suicide risk factor. *Journal of Affective Disorders*, 116 (3): 208-213.

YEH, J.Y., XIRASAGAR, S., LIU, T.C., LI, C.Y., & LIN, H.C. (2008). Does marital status predict the odds of suicidal death in Taiwan? A seven year population based study. *Suicide & Life Threatening Behavior*, 38, 302-310.

YIP, P. (1998). Age, sex, marital status and suicide: An empirical study of east and west. *Psychological Reports*, 82,311-322.

YIP, P. & THORBURN, J. (2004). Marital status and risk of suicide: Experience from England and Wales, 1982-1996. *Psychological Reports*, 94, 401-407.

29

Table 1. Selected Findings from Previous Investigations on the Relationship between Divorce and Suicide: First Author (date), Nation/Group, Year, Suicide Rate of Divorced, Suicide Rate of Married, Coefficient of Aggravation (Divorced/Married Suicide Rate), & Control Variables.

Author (date)	Nation/Group	Year	Suicide Rate Divorced	Suicide Rate Married	C.O.A.	Control Variables
WHO (1968)	Australia/M	1961	90.6	20.5	4.4	none
WHO (1968)	Australia/M	1961	37.7	9.3	4.1	none
Cantor (1995)	Australia/M	1991	na	na	2.8	None
Cantor (1995)	Australia/Fem	1991	na	na	3.1	none
Wyder (2009)	Australia	1999	na	na	8.0	none
Wyder (2009)	Australia	1999	na	na	2.5	none
Dzurova (2006)	Czechoslovakia Males, 25-44	2001	71.7	25.0	2.9	none
Dzurova (2006)	Czechoslovakia Females, 25-44	2001	14.5	7.5	1.9	none
WHO (1968)	Denmark/Males	1960	163.7	26.5	6.2	none
WHO (1968)	Denmark/Fem	1960	55.0	12.1	4.6	none
Agerbo (2007)	Denmark, Males 41-60	1990	Na	Na	3.9	ES,$
Agerbo (2007)	Denmark, females 41-60	1990	na	na	3.7	ES,$
WHO (1968)	Finland/Males	1960	175.8	41.4	4.2	none
WHO (1968)	Finland/Fem	1960	30.6	10.4	2.9	none
WHO (1968)	France/Males	1962	65.7	29.6	2.2	none
WHO (1968)	France/Fem	1962	15.6	8.1	1.9	none
WHO (1968)	Germany/Males	1961	146.7	28.9	5.0	none
WHO (1968)	Germany/Fem	1961	41.9	13.6	3.1	none
Yip (1998)	Hong Kong/M	1987	18.9	13.7	1.4	none
Yip (1998)	Hong Kong/F	1987	17.9	13.2	1.3	none
Mayer (2002)	India	1995	197.9	14.6	13.6	none
Mayer (2002)	India/Males	1995	346.8	17.3	20.0	none
Mayer (2002)	India/Fem	1995	126.4	11.9	10.6	none
WHO (1968)	Italy/Males	1961	35.7	10.0	3.6	none
WHO (1968)	Italy/Fem	1961	61.2	3.6	17.0	none
Masocco(2008)	Italy/males	2001	13.3	9.9	1.3	none
Masocco(2008)	Italy/females	2001	5.67	3.33	1.7	none
WHO (1968)	Netherlands/Males	1960	54.0	9.9	5.1	none
WHO (1968)	Netherlands/Fem	1960	22.1	6.2	3.6	none
WHO (1968)	New Zealand/M	1961	23.3	16.4	1.4	none
WHO (1968)	New Zealand/F	1961	12.0	6.6	1.8	none
Corcoran (2010)	N. Ireland/M	2000	na	na	2.61	none
Corcoran	N. Ireland/Fem	2000	na	na	2.57	none

(2010)						
WHO (1968)	Norway/Males	1960	46.9	12.8	3.6	none
WHO (1968)	Norway/Fem	1960	10.0	3.5	2.9	none
WHO (1968)	Sweden/Males	1960	107.9	28.4	3.8	none
WHO (1968)	Sweden/Fem	1960	29.5	8.8	3.4	none
WHO (1968)	Switzerland/M	1960	128.7	28.3	4.5	none
WHO (1968)	Switzerland/F	1960	35.0	10.3	3.4	none
Yeh (2008)	Taiwan, 35-50	2000	Na	Na	2.73	ES
Yeh (2008)	Taiwan, M35-50	2000	na	na	2.7	ES
Yeh (2008)	Taiwan, F 35-50	2000	na	na	2.9	ES
WHO (1968)	U.K., England & Wales/ M	1961	49.8	13.4	3.7	none
WHO (1968)	U.K., England & Wales/ Fem	1961	24.6	9.4	2.6	none
Yip (2004)	UK-England & Wales M 40-49	1989	29.9	11.9	2.5	none
Yip (2004)	UK-England & Wales F 40-49	1989	9.4	4.1	2.3	none
WHO (1968)	USA/males	1960	88.0	21.1	4.2	none
WHO (1968)	USA/females	1960	20.0	6.2	3.2	none
Gibbs (2000)	USA,black F,35-44	1980	7.8	3.2	2.4	none
Stack (2004)	USA	1990	Na	Na	1.4	O,R,U
Stack (1998)	USA-white M	1990	Na	Na	2.5	Ed
Stack (1998)	USA-black M	1990	Na	Na	1.2	Ed
Cutright (2005)	USA/M 35-54	1979	70.6	17.0	4.2	none
Cutright (2005)	USA/F 35-54	1979	25.2	8.7	2.9	none
Cutright(2005)	USA/M 35-54	1993	54.0	15.4	4.0	None
Cutright(2005)	USA/F 35-54	1993	14.6	4.4	3.3	None
Kposowa(2000)	USA	1984*	Na	Na	2.1	Ed,$
Kposowa(2000)	USA/males	1984*	na	Na	2.4	Ed,$
Kposowa(2000)	USA/females	1984*	na	na	1.3	Ed,$
Luoma (2002)	USA/M,40-44	1993	62	18	3.4	none
Luoma (2002)	USA/F, 40-44	1993	18	5	3.6	none

Notes: In some cases the Year of the data being analyzed is the midpoint of a range (e.g., for N. Ireland, 2000, for 1996-2005). *Longitudinal study based on 1979-1989. Control Variable: D=physical disability; Ed=education Level; ES=employment status; O=occupation; R=race; $= income; U=urban vs. rural residence. None: no economic, religious, psychiatric, and related control variables. Age and gender suicide rates may be explored. For space considerations, in studies with many suicide rates for various age groups (e.g., Luoma et al., 2002), one from the midlife range (which typically includes most suicides) is provided.

31

Table 2. The Association between Proximal and Distal Relationship Loss and Suicide
Risk, Controlling for Other Social and Psychiatric Factors, National Mortality Follow
back Survey (N=13,897 deaths including 1,169 suicides).

Variable	Logistic Regression Coefficient	Wald Chi Square	Odds Ratio	95% Confidence Interval, Odds Ratio
Relationship Loss				
Recent Divorce	.49*	6.89	1.64	1.20 - 2.24
Distal Divorce	.17	2.62	1.18	.99 - 1.41
Recent Widowhood	.31*	3.02	1.37	1.01 - 1.84
Distal Widowhood	-.79*	47.43	.45	.37 - .54
All other Marital Statuses (reference)	1.00			
Economic Strain				
Job Loss	.26*	3.41	1.30	1.02 - 1.65
Job Demotion	2.03*	41.59	7.63	4.54 - 12.82
Religious Activities	-.20*	78.9	.81	.78 - .84
Depression Index	.13*	69.84	1.14	1.11 - 1.17
Gender (male)	.16*	5.48	1.18	1.05 - 1.32
Constant	-2.40*	922.23	-----	----- -----
* p < .05				
-2 log likelihood	7693.5 *			
Nagelkerke r-squared	.054			
Deaths Correctly predicted by model	91.66%			

Recency of Divorce, Depression and Suicide Risk

Abstract

Previous individual level research on the association between the status of divorce and suicide risk has been marked by two recurrent limitations: (1) it is not clear if the timing of divorce (recent vs. distal) affects risk of completed suicides and (2) it is not clear if the association between divorce and suicide completions will withstand controls for a series of risk and protective factors including psychiatric morbidity. The present study addresses these two gaps in the literature. Data are from the National Mortality Follow Back Survey and refer to 13,897 deaths including 1,169 suicides. A model is estimated which controls for major alternative predictors of suicide completions including psychiatric predictors (depression scale), and sociological risk and protective factors (job loss, job demotion, and religiosity). The results of a multivariate logistic regression analysis determined that, controlling for the psychiatric, social and economic predictors of suicide completions, **recent divorce increases the odds of death by suicide 1.6 times, compared to 1.3 times for distal divorce. The study provides the first systematic, U.S. based results that show that the timing of divorce influences risk of completed suicides independent of depression.**

Recency of Divorce, Depression and Suicide Risk

Durkheim (1897/1966) demonstrated that married persons had a lower risk of

suicide completions than single persons in 19th century France. Married persons were

thought to be higher in social integration, higher in ties and mutual responsibilities to a

spouse, than non married persons. Such bonds, in turn, lowered suicide risk.

Following up on this insight, investigations from the 20th century explored

individual level data on suicide rates among marital status groups (for reviews see

Agerbo, Stack & Petersen, 2011; Lester, 1992, 2000; Stack, 1982, 2000b). A systematic

review of the literature from 1880 through 1994 on suicide completions found 37 such

studies based on individual level data, and all supported Durkheim's basic premise of the

protective effect of marriage (Stack, 2000b). Work since 1994 continues to demonstrate

a link between divorce and completed suicide at the individual level (e.g., Agerbo,

Sterne, & Gunnell, 2007; Kposowa, 2000; Luoma & Pearson, 2002; Yeh et al., 2008; Yip

& Thorburn, 2004). This association has persisted in a variety of social contexts through

time and space. That divorced people are at a risk for completed suicide that is greater

than that of age matched, married peers is close to a sociological law.

However, there are two recurrent limitations of this body of research: (1) little is

known about the timing of the impact of divorce on risk of completed suicide.

Specifically, are the recently divorced at the same, more, or less risk than the long-term

divorced? Does the influence of divorce affect suicide completions among the divorced

only in the short term? (2) Does the status of being divorced have an independent effect

on suicide risk? According to the selection hypothesis (e.g., Wade & Pevalin, 2004),

mental disturbances precede marital disruption. Such mental disturbances select people

3

out of marriage for divorce. Rates of major depression among the divorced are

reportedly as much as nine times higher for men and three times higher for women

compared to their married counterparts (Wade & Pevalin, 2004). It is important to control

for psychiatric problems such as depression to determine if the stresses of occupying the

role of a divorced person affect suicide risk independent of depression. Once controls are

introduced for the covariates of divorce such as psychiatric morbidity and economic

strain, will the bivariate association between divorce and completed suicides hold up?

Does depression, in particular, cause both divorce and suicide?

The present paper contributes to the literature by addressing these two relatively

neglected issues. As such, it integrates a sociological with a psychiatric perspective. Such

integrated models have been advocated by writers such as Kposowa & Glyniadaki

(2012). It employs data from the National Mortality Follow – Back Survey, a national, in

depth study of 13,897 deaths including 1,169 suicides. This allows for the testing of two

central hypotheses: (1) The suicide risk of the recently divorced is greater than that of the

long term divorced, and (2) the impact of divorce on suicide risk is independent of

psychiatric and social covariates.

BACKGROUND AND THEORETICAL FRAMEWORK

Literature Review. Much of the sociological literature on divorce and suicide is

based on aggregate data on suicide rates and divorce rates (e.g., Barstad, 2008; Gundlach,

1990; Lester, 1994; Trovato 1986, 1987; for reviews see Lester, 2000; Stack 2000b). In

contrast, the present investigation focuses on individual level research where there is a

clearer link between divorce and suicide. Research that is based on concrete, individual

level data has demonstrated that divorced people have an elevated risk of suicide. A

review of 37 such studies, containing 493 findings and published from 1880 through 1994, found that 426/493 findings (86.4%) showed that divorced people had a higher suicide risk than their married counterparts (Stack, 2000b). The magnitude of the difference between the suicide rates of the married and the divorced is often substantial. For example, in Austria the suicide rate of divorced persons was 128.6/100,000 compared to 30.5/100,000 for married persons. The ratio of these two rates, the coefficient of aggravation (COA), was 4.22. In the United States the COA varies mostly between 3.0 and 4.0 (Stack, 2000b).

A systematic epidemiological study by the World Health Organization (1968) still provides the largest single set of relevant cross national data. In circa 1960, the COA's for males, by nation, include: Denmark 6.2, Finland 4.2, France 2.2, West Germany 5.0, Italy 3.6, Netherlands, 5.1, Norway 3.6, US 4.2, Sweden 3.8, Switzerland 4.5, England 3.8, and Australia 4.2. Corresponding female COA's were Denmark 4.6, Finland 2.9, France 1.9, West Germany 3.1, Italy 17.0, Netherlands 3.6, Norway 2.9, Sweden 3.4, Switzerland 3.4, England 2.6, and Australia 4.1 (World Health Organization, 1968). These figures are summarized in Table 1. In most nations the divorced have a suicide rate that is at least double that of the married population. There is substantial variation in the COA across nations, but the COA is always greater than one.

(Table 1 about here)

While Stack (2000b) provides a systematic review of the evidence from 1880 through 1994, in order to assess any new fundamental change, a search was done through databases (*Sociological Abstracts* and *MEDLINE*) using the subjects "suicide" and "divorce," and years "1995-2011." The search was further limited to studies meeting two

additional criteria: suicidality was defined as suicide completions. Other forms of

suicidality such as suicide ideation and attempts were omitted. (b) The completed

suicides had to involve divorced persons themselves. Studies exploring the impact of

divorce on other groups (such as the children of divorced persons) were not included.

Another 24 relevant investigations, based on individual level data were found. Adding

these to the 37 from Stack (2000b) brings the total to 61 studies. Individual level

research done after 1994 has found the same general pattern. Table 1 includes

descriptions of representative suicide rates and risk ratios from many of these additional

investigations. It lists the investigations in order by nation. Suicide rates, when available,

are given for divorced vs. married persons. The coefficient of aggravation (ratio of the

suicide rates of divorced/married or the relative risk ratio), and a list of control variables,

if any, that are employed by the researchers are listed in the Table as well.

Findings from Europe and North America continue to document that the divorced

have a higher suicide risk than the married. For example, in England and Wales between

1982 and 1996 divorced males were 2.7 times and divorced females 2.5 times more apt to

die through suicide than their married counterparts (Yip & Thorburn, 2004). In Denmark,

divorced males between 41-60 years old are 3.9 times more apt than married males to die

through suicide, while the COA for Danish women, 41-60, is 3.7 (Agerbo et al., 2007). In

a longitudinal American study, Kposowa (2000) found that divorced men at baseline in

1979 were 2.4 times more apt than married men to suicide by 1989. Divorced women at

baseline were not at significantly elevated risk for suicide. However, this finding is

tenuous given a rather small number of divorced female suicides (n=10) (Kposowa,

2003).

6

Available data from developed nations in Oceania also confirm the divorce-suicide linkage. For example, in Queensland, Australia, a study of 6,062 suicides between 1994-2004, found high coefficients of aggravation. The median relative risk of divorced persons relative to married persons was 6.1 (Wyder, Ward & DeLeo, 2009).

Eastern nations tend to have a similar pattern. Divorce places both males and females at higher risk of suicide. In an overtime, longitudinal study in Taiwan, being divorced at baseline was associated with a greater risk of suicide by follow-up. For example, divorced persons aged 35-50 in 1997 were 2.7 times more apt to die through suicide by 2003 than their married counterparts. The relative risk ratios for divorced men and women of this age group were similar, being 2.7 for men and 2.9 for women (Yeh et al., 2008). In Hong Kong a study of suicide rates between 1981 and 1993 by Yip (1998) determined that divorced men had a suicide rate of 18.9, 1.4 times greater than that of married men, 13.7. Divorced women had a suicide rate 1.4 times higher than their married counterparts (17.9 vs. 13.2). In India the suicide rate of divorced men is quite high, 346/100,000, fully 20 times that of their married counterparts. The gap between divorced women and married women in India is also substantial, being 126 vs. 11.9/100,000, the corresponding COA is 10.6 (Mayer & Ziaian, 2002).

The last column of Table 1 presents a summary of control variables in the various studies. It is noteworthy that very few investigations of individual level data on divorce and suicide incorporate control variables. Many are epidemiological or descriptive studies. A few of the 61 studies reviewed included controls for alternative predictors of suicide (e.g., Agerbo, Sterne & Gunnell, 2007; Kposowa, 2000; and Yeh et al., 2008). None of the 61 studies included a control for depression.

It is noted that two papers not listed in Table 1 do examine the long term impact

of parental divorce on the risk of suicide attempts among the children of divorced parents

(Lizardi, Thompson, Keys, & Hasin, 2010a; 2010b). These papers do control for

depression. However, they differ from the thrust of the present analysis in two ways.

First, the present paper is concerned with the intragenerational impact of divorce on the

divorced persons themselves, not their children. Our analysis is not dealing with very

long term, intergenerational impacts of divorce on the children of divorced. Second, our

analysis concerns suicide completions, not attempts. To the extent that the predictors of

suicide completions are different from the predictors of attempts (Lester, 2000), for

example men have higher rates of the former but lower rates of the latter than women, it

is important to study these suicidal behaviors separately.

Theoretical Interpretations. Several sociological theories offer explanations for

the connection between suicide and marital status (Cutright & Fernquist, 2005; Cutright,

Stack & Fernquist, 2005; Gibbs, 2000; Stack, 2000b). The most often cited explanation is

Durkheim's idea that marriage protects against suicide because of its promotion of social

integration or bonds between husband and wife (e.g., Agerbo, Stack, & Petersen, 2011;

Shiner, Scourfield, Fincham & Langer, 2009; Stack, 2000b). In this vein, bonds to a

spouse reduce suicide through mechanisms including the giving and receiving of social

support, companionship, and validation. The loss of these bonds through divorce

contributes to suicide risk. Generally the literature on marital transitions finds that

psychological distress increases after divorce (e.g., Strohschein, et al., 2005), which is

consistent with the social integration view of divorce and suicide. Second, there is Gibbs

and Martin's (1964) marital status integration hypothesis. Basically, statistically

8

infrequent status sets, such as being divorced and male relative to married and being

male, are assumed to be inherently stressful and, as such, contribute to suicide risk.

However, as the status sets such as divorced male become less infrequent, we would

anticipate a corresponding decline in suicide rates among persons in such status sets. As

divorce became more commonplace between 1960 and 1980, the gap between the suicide

rates of the married and divorced narrowed (Stack, 1990). As divorce became more

commonplace, the stigma associated with being divorced lessened and new institutions

developed such as personal ads which facilitated finding a new mate. A third perspective

focuses on marital status differences in suicide acceptability, with married people more

likely than divorced persons to regard suicide as a morally unacceptable act (Cutright,

Stack & Fernquist, 2005). Groups with negative attitudes towards suicide tend to have

lower suicide rates (Stack, 2000a). These explanations are not mutually exclusive.

Divorced persons lack ties to a spouse, are in a statistically infrequent status

configuration, and can have higher levels of suicide acceptability simultaneously. In

related work, marriage is also associated with better physical health and enhanced

economic resources (Stack, 1994; 2011). Each of these, in turn, is known to contribute to

lower suicide risk for married persons relative to divorced persons (Stack, 2000a, 2000b).

Limitations: Timing of Divorce. One recurrent limitation of the 61 concrete,

individual level studies is that the recency or the timing of suicide after divorce is largely

unexplored. This is often not the fault of the investigators, since some of the research is

based on secondary analysis of existing data, and the existing archival data simply does

not have any information on the timing of divorce (e.g., Kposowa 2000; Stack, 1998,

2004). Such investigations generally have no alternative but to lump together all divorced

9

persons who suicide regardless as to how long they have been divorced. Persons who

experienced divorce and suicided in the weeks following the divorce generally are

grouped with persons who suicide one year, two years, three years, and longer after their

divorces (e.g., Dzurova et al, 2006; Mayer & Ziaian, 2002; Phillips et al., 2002; Yip &

Thorburn, 2004). A key question is: is the link between divorce and subsequent suicide

time dependent? Are the recently divorced any more apt to suicide than persons who

divorced long ago?

A case can be made that the recently divorced may be most at risk for suicide.

One might contend that the initial social, psychological and economic shocks of divorce

would place the recently divorced person at high risk. The initial strains of divorce such

as the creation of two households where there had been one, the financial pressures,

strains with old in-laws, and custody issues may fade with time. People need time to

adjust to disruptions in their social and economic relationships. To the extent that divorce

happens too quickly, it can produce sociological anomie (Durkheim 1897/1966;

Kposowa, 2000). Possibly the subsets of divorced persons most prone to suicide include

those whose personalities make them less adaptable, with fewer ties to extended family

and friends for social support, and with meager financial resources. With time new

intimate others can be found, possibly cohabitation can be initiated, expenses shared with

a roommate or mate, and so on. Over time divorced persons can adjust to their new

station in life and suicide risk can decline. Given such considerations, divorce would

have its strongest impact on suicide in the near term (Roskar, Podlesek, Kuzmanic, et al.,

2011).

On the other hand, a case can be made for distal effects of divorce on suicide. It

may take a long time for the stresses associated with the role of the divorce to wear down

the divorced person before they give up the struggle and suicide. Suicide risk can

increase over time due to the cumulative effect of strains such as many false starts in

dating relationships that ultimately fail, the loss of physical attractiveness – often a key

asset in mate selection, diminished hopes for finding a new partner, the grind of years of

loneliness, pressures from single parenting, and economic downward mobility often

brought about by inability to replace an affluent spouse (Stack 1994; 2011). It may

simply take many divorced people a long time to give up after enduring many years of

adversity.

Only one study was found which assessed the recency of divorce on suicide risk.

Its findings need to be taken with some caution for at least two reasons. It is based on

Slovenia, a less developed nation with a small population of two million people, and one

of the lowest divorce rates in Europe (Roskar, Podlesek, Kuzmanic et al, 2011). It is not

clear if the results based on this type of social and economic context can be generalized to

the contemporary U.S. Further, a limitation of this investigation is that it restricted the

sample to persons who died within five years of their divorce. Persons who were

divorced and suicided, but who had been divorced for more than five years were

excluded. Hence, this precluded the detection of very long term (more than five years)

distal impacts of divorce on suicide. Nevertheless, the distribution for those suiciding

within five years of their divorce by the timing of their suicide was as follows: 37% less

than one year, 22% two years afterwards, 19% three years afterwards, 11% four years

afterwards, and 11% five years after the divorce. This distribution suggests that the

11

recently divorced (e.g., 1-3 years) are at greater risk of suicide than those who have been divorced for 4-5 years.

In a related research stream, the timing of widowhood on suicide is explored. Ajdacic-Gross *et al*. (2008) found that the annualized suicide rates in widowed people were highest in the first week after bereavement and that in the first months after bereavement, the suicide rates decreased, first rapidly and then gradually. Also Erlangsen, Jeune, Bille-Brahe & Vaupel (2004) noted a significant increase in the suicide risk during the first year after a bereavement, especially for men.

Limitations: Model Specification. A second limitation of the individual based research on divorce and completed suicide is that it tends not to control for the covariates of divorce such as psychiatric morbidity and economic strain (Stack, 2011). It should be noted that it is very difficult to come upon data that is publicly available which contain both measures of divorce and psychiatric morbidity (e.g., Kposowa & Glyniadaki, 2012). It is not the fault of researchers who use secondary data analysis. Some previous such work is based on datasets which simply do not have measures of psychiatric constructs (e.g., Kposowa, 2000; Stack, 1998, 2004). This is due, in part, to a relative lack of a generalized integration of psychiatric and sociological models of suidicidality (Kposowa & Glyniadaki, 2012). Psychiatric morbidity is of particular concern. Completed as well as attempted suicide is related to depression (e.g., Lester, 2000; Lizardi et al., 2010a). According to a Meta analysis of 23 relevant studies, persons suffering from major depression are, for example, fully 20.4 times more apt to die through completed suicide than non depressed persons (Stack, 2009). In turn, divorced persons have a relatively high incidence of depression and related psychiatric disorders.

12

The reader should note that there is a related literature, not fully reviewed here, on suicide attempts among the children of divorced parents which has some relevance to the issues at hand. Lizardi et al. (2010a) analyzed suicide attempts using the National Epidemiological Survey on Alcohol and Related Conditions (NESARC) and determined that depression affected the risk of suicide attempts. In addition, parental divorce affected the risk of attempted suicide of the subjects (children of divorce) in the survey. While the constructs of both suicidality and divorce in Lizardi et al's (2010a) research (attempts, parental divorce) differ from those in the present study (completed suicides, divorce of subjects, not parents of subjects), they add additional evidence for links between divorce and suicidality independent of depression.

It is plausible that there are selection effects that influence both divorce and suicide. There has been a long standing debate between the selection and social causation perspectives concerning marital transitions (e.g., Wade & Pevalin, 2004; Stack & Eshleman, 1998). The social causation thesis argues that marital disruption leads to poor mental health, while the social selection hypothesis argues that poor mental health leads to marital disruption. For example, being difficult to live with, depressed individuals would be expected to have a higher rate of divorce, as well as a higher incidence of suicide.

None of the 61 individual level studies to date on divorce and suicide completions control for either pre divorce or post divorce depression. Hence, individual level analyses of divorce's impact on completed suicide generally do not control for such selection biases; that is, they do not control for depression and related psychiatric disorders that may cause both divorce and completed suicide (e.g., Mayer & Ziaian, 2002; Trovato,

13

1991; World Health Organization, 1968; Yeh et al., 2008). Many investigators who use

secondary data are simply not able to control for psychiatric morbidity since measures of

that construct are not available in the data source (e.g., Kposowa, 2000; Stack, 1998,

2004). The present investigation is the first to be able to add a measure of depression.

However, while in a related literature on suicide attempts among the children of divorce,

there has been a control for depression (Lizardi et al., 2010a), no one to date has been

able to explore the impact of divorce on the risk of suicide completions among the

divorced persons themselves. It should be noted, however, that we cannot fully test the

selection hypothesis since we lack data on pre divorce depression levels.

    While they omit depression as a control, a few of the 61 previous studies have

been able to control for some covariates of divorce that contribute to suicide risk (see

Table 1). For example, using the data in the National Longitudinal Mortality Study,

Kposowa (2000) was able to control for socio-economic status indicators (education and

household income), but not psychiatric morbidity. Stack (1998) was able to control for

education, but not income. Such analysis of secondary data are necessarily limited to the

availability of measures of important constructs in such datasets. Using data from the

National Mortality Follow back Survey, the present investigation is able to add a control

for depression in order to sort out the independent effects of divorce on suicide risk.

    Whilst in principle many suicide researchers accept the value of a psycho-social

or bio-psycho-social model, in practice most studies are discipline-specific (e.g.,

Kposowa & Glyniadaki, 2012). The consideration of both sociological and psychological

variables is not common, and Kposowa & Glyniadaki (2012) call for such integrated

models. While there is some relevant work on suicide attempts among the children of

14

divorce (e.g., Lizardi et al., 2010a), there is no such work on suicide completions among

the divorced themselves. The present paper fills this gap in the literature. We include both

a measure of depression as well as a structural social factor, the timing of divorce.

METHODOLOGY

All data are from the National Mortality Follow back Survey (NMFBS) (US

Public Health Service, 2000). The NMFBS is based on psychological autopsies of a

representative sample of deaths in the United States. Significant others of the deceased

were contacted and interviewed by trained professionals. Standard questions regarding

the psychiatric, medical, treatment-centered and other issues regarding the deceased were

asked of the significant others. Some questions regarding the social context of the

deceased were also included. The NMFBS is the largest, publicly available psychological

autopsy dataset on suicide. Complete data were available on 13,897 deaths including

1,169 suicides.

Some caution needs to be exercised in interpreting the results of the present study

since it uses psychological autopsy data. Such data rely on retrospective opinions of

informants about the deceased. In this line of work, the opinions cannot be directly

measured from the deceased person themselves, as in typical social science survey

research. While psychological autopsy studies of suicide have their limitations, they are

considered by many suicide researchers as the gold standard in the investigation of

completed suicides where the subject is not available for interviews (Connor, Beautrais,

Brent, et al, 2011, 2012).

The dependent variable is a dichotomy where 1=death by suicide and 0=deaths from all other causes. Since the dependent variable is a dichotomy, logistic regression techniques are appropriate (Menard, 2002).

Marital status and the timing of marital transitions are measured by four binary (0,1) dichotomous variables. Two measures of the timing of divorce are included. The first is the experience of a recent divorce before death. A recent divorce is defined as one that occurred during the year of the survey (1993) and/or during 1991-1992. It is coded either 0 (before 1991) or 1 (1991-1993). Long term divorce is defined as a one which occurred prior to 1991. Widowhood status is also coded as two variables in relation to the recency of that status. Recent widowhood refers to deaths of spouses that occurred between 1991-1993, and long term status as a widow refers to cases where the death happened before 1991. All four measures are binary variables (0,1). The benchmark or comparison marital status category consists of person in all other marital statuses including married, and single (never married). The benchmark group, then, consists of persons who have not lost a spouse through divorce or death.

Several additional sociological concepts are incorporated into the model. They relate to the religious and economic spheres of social life. Religiosity level, a protective factor (see Stack, 2000b; Stack & Kposowa, 2011), is measured in terms of the extent of religious activities, as indexed by the NMFBS item: "How often did the deceased participate in religious activities." The responses to this survey question ranged from never (0) through every day (5).

Economic strain is measured by two constructs. These measures refer to job loss (0,1), and job demotion during the last year of life (0,1). While job loss (unemployment)

16

has received attention in previous investigations (for reviews see Platt & Hawton, 2000, or Stack, 2000a), job demotion is an unstudied area in suicide studies. Platt and Hawton (2000) have called for new measures of economic strain, in addition to unemployment, a much studied measure. We answer this call.

A key psychiatric factor, depression, is measured using a scale of 8 items that are available in the NMFBS. These items tap feelings of worthlessness, withdrawal, problems in concentrating, a wish to die, changes in sleep patterns, changes in weight, crying spells, and sluggishness of the deceased. A distinction is made between the response category where the deceased reportedly had a condition often (=1), and all others (=0). Scores were summed and ranged from 0 to 8. The alpha reliability coefficient for the index was 0.7414. **Finally, controls are entered for two key demographic factors: gender, where male=1 and female=0 and age in years.**

RESULTS

Table 2 provides the results of the multivariate logistic regression analysis. Controlling for depression and the other variables in the equation, from the odds ratio,

(Table 2 about here)

persons who were recently divorced were **1.60** times more apt to die through suicide than the reference group. **In addition, persons who had been divorced longer were 1.29 times more apt to die through suicide than the reference group.** Turning to relationship loss through widowhood, persons who had experienced the recent loss of a spouse through death were **1.7** times more apt to suicide than persons without a loss of a spouse. **Long term widowhood was associated with reduced risk of suicide.**

The findings provided mixed support for economic strain constructs. Persons experiencing loss of a job during the last year of life were not significantly more apt than others to die through suicide (Wald=2.39, p = 0.06). However, persons experiencing a demotion at work during the last 12 months of life were fully 7.29 times more apt to die of suicide than persons not experiencing such an employment setback.

Religiosity served as a protective factor. Controlling for the other independent variables, the higher the religiosity the lower the suicide risk. **From the odds ratio (.81), a one unit change in the five level religiosity index was associated with 19% drop in the odds of death by suicide ((100*(.81-1)) (De Maris, 1992).**

Strong evidence for a psychiatric perspective was found. Controlling for all other risk and protective factors, depression increased the risk of suicide **(odds ratio=1.14). A one unit change in the depression index was associated with a 14% rise in the risk for death through suicide ((100* (1.14-1)).** Further analysis determined that a majority of persons who had perfect scores (index score of 8) on depression died through suicide.

In order to estimate the relative importance of the predictors of suicide, standardized coefficients were assessed (Walker & Maddan, 2013), and are shown in the last column of Table 2. The variable with the largest absolute value of its standardized coefficient is religious activities (-.32) followed by depression (.25).

The model provided a reasonable fit for the data. The Nagelkereke r-squared indicated the presence of an adequate model. Importantly, using the model to predict death, the model correctly classified 91% of the deaths as either suicide or nonsuicide deaths.

CONCLUSION.

While there have been 61 previous individual based, studies on the relationship between divorce and suicide published between 1880-2010, they have been marked by two recurrent limitations: (1) neglect of the timing of divorce and (2) neglect of incorporating psychiatric control variables into the analysis, including depression.

Only one study based in the small, Eastern European nation of Slovenia, has explored the timing of divorce (Roskar, Podlesek, Kuzmanic, et al., 2011). The previous investigation limited the analysis to persons divorced less than 5 years, thus leaving the effects of very long term distal effects an open question. It also lacked a control for a major determinant of both divorce and suicide: depression. The present paper explores the timing of divorce in a substantially different social context, the US, a developed, large nation with a much higher incidence of divorce. We also include all divorced persons, not just ones divorced in a five year window, in order to fully test for distal impacts of divorce on suicide. Finally, we introduce a series of control variables including depression.

In both social settings, Slovenia and the U.S., it is the recently divorced who are at the greatest risk for suicide. While one might anticipate distal effects, where the will to live may be ground down only after many years of post divorce stress, the greatest risk, in fact, involves those who are recently divorced. Professionals involved in suicide prevention might wish to direct a disproportionate amount of their resources towards this particular, at-risk group.

An important issue running though virtually all of the 61 existing studies on divorce and suicide completions among the divorced themselves is that typically, often

due to the unavailability of data in secondary data sets, they are unable to control for the

respondent's depression (as well as other dimensions of psychiatric morbidity). This

leaves selection effects unaddressed. Depression may cause both divorce and suicide. A

Meta analysis of 13 overtime studies, where psychiatric and personality variables were

measured before divorces took place, determined that neuroticism (e.g., depression,

anxiety) was a significant predictor of who eventually became divorced (Roberts et al.,

2007). In a similar vein, analyses using the National Comorbidity Surveys have

determined that 11 out of the 14 psychiatric disorders investigated were predictive of

ultimate divorce (Kessler, Walters, & Forthofer, 1998; Stack, 2011). For example, the

manic disorder increased the odds of divorce by 3.2 times, while major depression

enhanced the risk of divorce by 1.7 times that of the general population. Both of these

disorders, in turn, are known, from other research, to increase suicide risk (Lester, 2000;

Wasserman & Wasserman, 2009).

The present inquiry controlled for depression levels and still found that recent

divorce increased the risk of suicide. Depression had, as expected, an independent impact

on the odds of suicide. However, in order to fully assess the merits of the social selection

and social causation hypotheses, measures of pre divorce depression are needed.

The findings on several control variables are noteworthy. **Judging from the**

relative sizes of the standardized logistic regression coefficients in table 2, religious

activities were the strongest predictor of suicide, more important than recent divorce,

depression and other independent variables. While divorce is the more commonly index

of social integration, religion is the next more commonly used index of bonds to a social

group (Stack, 2000b). Unfortunately, religious activities are the only measure of

religiosity in the National Mortality Follow back Survey. Religious activities can include time spent with coreligionists as well as time spent attending religious services. Specific measures of each type of activity are needed in order to test the religious integration and religious networks perspectives on religion and suicide. Future work is also needed to weight this factor against measures of still other constructs including commitment to core religious beliefs (Stack & Kposowa, 2011).

The traditional indicator of economic strain, unemployment, did not exert an independent impact on the odds of suicide. However, a new construct, job demotion, was also highly predictive of suicide. The paper also answers the call of Platt and Hawton (2000) for the exploration of new measures of economic strain in research on suicide.

Over the last 130 years there have been 61 studies on subject's divorce and completed suicide at the individual level, but they represent a tiny fraction of research on suicide. Since 1980 alone, there has been over 30,000 works on suicide published (Web of Science, accessed, March 1, 2011). Emanuele (2009) noted this neglect and called for research on the role of romantic disruption as a widespread, neglected contributing factor to suicide. An analysis of recently released data on 30,593 completed suicides in the recently released data set termed the National Violent Death Reporting System found that at least 27% of the suicides involved intimate partner problems including divorce, separation, and custody battles (Stack & Bowman, 2011, 160). The present investigation answers the call of Emanuele (2009) for work on relationship loss, a key social factor.

The present paper, by including indicators from both the psychiatric and social models, bridges the gap between those two paradigms on suicide. It finds, as expected,

21

that they compliment each other. There is strong evidence for including both a link between depression and suicide, and divorce and suicide as well. While psychiatric factors are clearly important predictors of suicide risk, they need to be combined with social factors in order to fully understand suicide (Kposowa & Glyniadaki, 2012).

The question of the timing of relationship breakdown could be explored with respect to interaction effects with a character trait, impulsivity. Impulsivity is a known risk factor for suicide (Corruble, 1999; Kotler et al., 2001; Lester, 2000). Perhaps the odds of suicide among divorced persons in the immediate period following divorce would be relatively high among persons with impulse control problems. If so, persons involved in suicide prevention efforts might be able to fine tune a definition of the population most at risk of suicide following divorce, those with impulse control disorders.

The present paper is focused on the strains associated in the post legal divorce period. Future work is needed on "psychological divorce" or the stressful period of separation which precedes legal divorce. Divorce is not a single event but can be viewed as a culmination of strains which end in a legal divorce. Possibly the most painful period of persons enduring the suffering of divorce is the psychological divorce that develops before any legal adjudication for ending the marriage (Ide, Wyder, Kolves & DeLeo, 2010).

22

References

Agerbo, E. (2005) Midlife suicide risk, partner's psychiatric illness, spouse and child

bereavement by suicide or other modes of death: a gender specific study. *Journal*

of Epidemiology and Community Health, 59: 407-412.

Agerbo, E., Sterne, J.A.C., & Gunnell, D.J. (2007). Combining individual and

ecological data to determine compositional and contextual socio-economic risk

factors for suicide. *Social Science & Medicine*, 64, 451-461.

Agerbo, E., Stack, S. & Petersen, L. (2011). Social integration and suicide in Denmark,

1906-2006. *The Social Science Journal*, 48, 630-640.

Ajdacic-Gross, V., Ring, M., Gadola, E., Lauber, C., Bopp, M., Gutzwiller, F., &

Rosser, W. (2008). Suicide after bereavement: an overlooked problem.

Psychological Medicine, 38: 673-676.

Barstad, A. (2008). Explaining changing suicide rates in Norway 1948-2004: The role of

social integration. *Social Indicators Research*, 87 (1): 47-64.

Cantor, C.H., & Slater, P. (1995). Marital breakdown, parenthood, and suicide. *Journal of*

Family Studies, 1, 91-102.

Connor, K.R., Beautrais, A.L., Brent, D.A., Conwell, Y., Phillips, M.R., &

Schneider, B. (2011). The next generation of psychological autopsy studies: Part

I, Interview Content. *Suicide & Life Threatening Behavior*, 41, 594-613.

Connor, K. R., Beautrais, A. L., Brent, D.A., Conwell, Y., Phillips, M.R., & Schneider,

B. (2012). The next generation of psychological autopsy studies: Part II, Interview

Procedures. *Suicide & Life Threatening Behavior*, 42, 86-103.

Corcoran, P. & Nagar, A. (2010). Suicide and marital status in Northern Ireland. *Social*

23

Psychiatry & Psychiatric Epidemiology, 45, 795-800.

Corruble, E. (1999). Impulsivity: a relevant dimension in depression regarding suicide attempts? *Journal of Affective Disorders*, 53 (3): 211-215.

Cutright, P., & Fernquist, R. M. (2005). Marital status integration, psychological well-being, and suicide acceptability as predictors of marital status differentials in suicide rates. *Social Science Research*, 34, 570-590.

Cutright, P., Stack, S., & Fernquist, R. (2006). The age structures and Marital status differences of married and not married male suicide rates: 12 developed countries. *Archives of Suicide Research*, 10: 365–382.

Durkheim, E. (1897/1966). *Suicide: A Study in Sociology*. New York: Free Press.

Dzurova, D., Ruzicka, L., & Drangomirecka, E. (2006). Demographic &social correlates of suicide in Czechoslovakia. *Sociologicky Ustav*, 42, 557-571.

Emanuele, E. (2009). Of love and death: the emerging role of romantic disruption in suicidal behavior. *Suicide and Life Threatening Behavior*, 39: 240.

Erlangsen, A., Jeune, B., Bille-Brahe, U., & Vaupel, J. W. (2004). Loss of partner and suicide risks among oldest old: a population-based register study. *Age and Ageing*, 33: 378-383.

Gibbs, J. P., & Martin, W. T. (1964). *Status integration and suicide: A sociological study*. Eugene, OR: University of Oregon Books.

Gibbs, J. (2000). Status integration and suicide: occupational, marital, or both? *Social Forces*, 78, 949-968.

Gundlach, J. (1990). Absence of family support, opportunity, and suicide. *Family Perspective*, 24, 7-14.

24

Ides, N., Wyder, M., Kolves, K., & DeLeo, D. (2010). Separation as an important risk

    factor for suicide: A systematic review. *Journal of Family Issues*, 31, 1689-1716.

Kessler, R., Walters, E.E., & Forthofer, M.S. (1998). The social consequences of

    psychiatric disorders, III: probability of marital stability. *American Journal of*

    Psychiatry, 155, 1092-1096.

Kotler, M., Iancu, I., Efroni, R., & Amir, M. (2001). Anger, impulsivity, social support,

    and suicide risk in patients with posttraumatic stress disorder. *Journal of Nervous*

    and Mental Disease, 189 (3): 162-167.

Kposowa, A. J. (2000). Marital status and suicide in the National Longitudinal Mortality

    Study. *Journal of Epidemiology and Community Health*, 54: 254-261.

Kposowa, A. (2003). Divorce and suicide risk. *Journal of Epidemiology & Community*

    Health, 57, 993.

Kposowa, A., & Glyniadaki, A. (2012). Mental health and suicide: An ecological

    hierarchical analysis of U.S. counties and states. In Hogue, N. & Swanson, D.A.

    (eds). *Opportunities and Challenges for Applied Demography in the 21st Century,*

    New York: Springer.

Lester, D. (1992). *Why People Kill Themselves: A 1990's Summary of Research Findings*

    on Suicidal Behavior. 3rd Edition, Springfield, IL: Charles C. Thomas.

Lester, D. (1994). Domestic integration and suicide in 21 nations, 1950-1985.

    International Journal of Comparative Sociology, 35, 131-137.

Lester, D. (2000). *Why People Kill Themselves: A 2000 Summary of Research on Suicide*.

    4th Edition, Springfield, IL: Charles C. Thomas.

Lizardi, D, Thompson, R.G., Keyes, K., & Hasin, D. (2010a). The role of depression in

25

the differential effect of childhood parental divorce on male and female adult offspring suicide attempt risk. *The Journal of nervous and Mental Disease*, 198, 687-690.

Lizardi, D, Thompson, R.G., Keyes, K., & Hasin, D. (2010b). The effect of parental remarriage following parental divorce on offspring suicide attempt. *Families in Society: Journal of Contemporary Social Services*, 91, 186-192.

Luoma, J. B. & Pearson, J. L. (2002). Suicide and marital status in the United States, 1991- 1996: Is widowhood a risk factor? *American Journal of Public Health*, 92 (9): 1518-1522.

Masocco, M., Pompili, M., Vichi, M., Vancore, N., Lester, D., & Tatarelli, R. (2008). Suicide and Marital Status in Italy. *Psychiatric Quarterly*, 79 (4): 275-285.

Mayer, P., & Ziaian, T. (2002). India suicide and marriage. *Journal of Comparative Family Studies*, 33, 297-305.

Menard, S. (2002). *Applied Logistic Regresion Analysis*. Thousand Oaks, Ca.: Sage.

Phillips, M., Yang, G., Zhang, Y., et al. (2002). Risk factors for suicide in China: A national case-control psychological autopsy study. *The Lancet*, 360, 1728-1736.

Platt, S., & Hawton, K. (2000). Suicidal behavior and the labor market.   In Hawton, K., & Van Heeringen, K. (Eds.) The *International Handbook of Suicide and Attempted Suicide. Pp. 309-384.* London: Wiley.

Roberts, B., Kuncel, N., Shiner, R., Caspi, A., & Goldberg, L. (2007). The power of personality: the comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on Psychological Science*, 2, 313-345.

26

Roskar, S., Podelsek, A., Kuzmanic, M., et al. (2011). Suicide risk and its relationship to

change in marital status. *Crisis*, 32, 24-30.

Shiner, M., Scourfield, J., Fincham, B., & Langer, S. (2009). When things fall apart:

Gender and suicide across the life course. *Social Science & Medicine*, 69: 738-

746.

Stack, S. (1982). Suicide: A decade review of the sociological literature. *Deviant

Behavior*, 4, 41-66.

Stack, S. (1990). New micro level data on the impact of divorce on suicide, 1959-1980: A

test of two theories. *Journal of Marriage & the Family*, 52, 119-127.

Stack, S. (1994). Divorce. Chapter in V.S. Ramachandran (ed.). *Encyclopaedia of Human

Behaviour*, pp. 153-163, first edition, San Diego, Ca.: Elsevier.

Stack, S. (1998). Education and risk of suicide. *Sociological Focus*, 31, 295-302.

Stack, S. (2000a). Suicide: a 15 year review of the sociological literature: Part I: Cultural

and economic factors. *Suicide and Life Threatening Behavior*, 30 (2): 145-162.

Stack, S. (2000b). Suicide: a 15 year review of the sociological literature: Part II:

Modernization and social integration perspectives. *Suicide and Life Threatening

Behavior*, 30 (2):163-76.

Stack, S. (2004). Suicide risk among physicians: A multivariate analysis. *Archives of

Suicide Research*, 8, 287-292.

Stack, S. (2009). Suicide: Adulthood. Chapter in Carr, D. *Encyclopaedia of the Life

Course and Human Development, Volume 2*, pp. 461-466, Farmington Hills, MI:

Cengage Learning Publishing.

Stack, S. (2011). Divorce. Chapter in V.S. Ramachandran (ed.). *Encyclopedia of Human*

Behavior, second edition, San Diego, Ca. Elsevier.

Stack, S., & Bowman, B. (2011). *Suicide Movies: Social Patterns, 1900-2009*.

Cambridge, Ma.: Hogrefe.

Stack, S., & Eshleman, R. (1998). Marital status and happiness: A 17 Nation study.

Journal of Marriage & the Family, 60, 527-536.

Stack, S., & Kposowa, A.J. (2011). Religion and suicide: Integrating four theories cross

nationally. In O'Connor, R. & Platt, S. (Eds.), *International Handbook of Suicide*

Prevention: Research, Policy, and Practice. Pp. 235-252. London: Wiley-

Blackwell.

Strohschein, L., McDonough, P., Monette, G., & Shao, Q. (2005). Marital transitions and

mental health: Are there gender differences in the short-term effects of marital

status change? *Social Science & Medicine*, 61: 2293–2303.

Torre, E., Chieppa, N., Imperatori, F., et al. (1999). Suicide and attempted suicide in the

province of Turin from 1988 to 1994: Epidemiological analysis. *European*

Journal of Psychiatry, 13, 77-86.

Trovato, F. (1986). The relationship between marital dissolution and suicide. The

Canadian case. *Journal of Marriage & the Family*, 48,341-348.

Trovato, F. (1991). Sex, marital status, and suicide in Canada: 1951-1981. *Sociological*

Perspectives, 34, 427-445.

Trovato, F. (1987). A longitudinal analysis of divorce and suicide in Canada. *Journal of*

Marriage and the Family, 49, 193-203.

U.S. Public Health Service. (2000). *National Mortality Followback Survey, Codebook.*

Ann Arbor, Mi.: Inter University Consortium for Political and Social Research.

28

Wade, T.J., & Pevalin, D.J. (2004). Marital transitions and mental health. *Journal of Health and Social Behavior*, 45, 155-170.

Wasserman, D., & Waserman, C. (2009). *Oxford Textbook of Suicidology and Suicide Prevention: A Global Perspective.* New York: Oxford University Press.

World Health Organization (1968). World Health Statistics Report (Volume 21, no. 6). Geneva, Switzerland: author.

Wyder, M., Ward, P., & De Leo, D. (2009). Separation as a suicide risk factor. *Journal of Affective Disorders*, 116 (3): 208-213.

Yeh, J.Y., Xirasagar, S., Liu, T.C., Li, C.Y., & Lin, H.C. (2008). Does marital status predict the odds of suicidal death in Taiwan? A seven year population based study. *Suicide & Life Threatening Behavior*, 38, 302-310.

Yip, P. (1998). Age, sex, marital status and suicide: An empirical study of east and west. *Psychological Reports*, 82,311-322.

Yip, P., & Thorburn, J. (2004). Marital status and risk of suicide: Experience from England and Wales, 1982-1996. *Psychological Reports*, 94, 401-407.

29

Table 1. Selected Findings from Previous Investigations on the Relationship between Divorce and Suicide: First Author (date), Nation/Group, Year, Suicide Rate of Divorced, Suicide Rate of Married, Coefficient of Aggravation (Divorced/Married Suicide Rate), & Control Variables.

Author (date)	Nation/Group	Year	Suicide Rate Divorced	Suicide Rate Married	C.O.A.	Control Variables
WHO (1968)	Australia/M	1961	90.6	20.5	4.4	none
WHO (1968)	Australia/M	1961	37.7	9.3	4.1	none
Cantor (1995)	Australia/M	1991	na	na	2.8	None
Cantor (1995)	Australia/Fem	1991	na	na	3.1	none
Wyder (2009)	Australia	1999	na	na	8.0	none
Wyder (2009)	Australia	1999	na	na	2.5	none
Dzurova (2006)	Czechoslovakia Males, 25-44	2001	71.7	25.0	2.9	none
Dzurova (2006)	Czechoslovakia Females, 25-44	2001	14.5	7.5	1.9	none
WHO (1968)	Denmark/Males	1960	163.7	26.5	6.2	none
WHO (1968)	Denmark/Fem	1960	55.0	12.1	4.6	none
Agerbo (2007)	Denmark, Males 41-60	1990	Na	Na	3.9	ES,$
Agerbo (2007)	Denmark, females 41-60	1990	na	na	3.7	ES,$
WHO (1968)	Finland/Males	1960	175.8	41.4	4.2	none
WHO (1968)	Finland/Fem	1960	30.6	10.4	2.9	none
WHO (1968)	France/Males	1962	65.7	29.6	2.2	none
WHO (1968)	France/Fem	1962	15.6	8.1	1.9	none
WHO (1968)	Germany/Males	1961	146.7	28.9	5.0	none
WHO (1968)	Germany/Fem	1961	41.9	13.6	3.1	none
Yip (1998)	Hong Kong/M	1987	18.9	13.7	1.4	none
Yip (1998)	Hong Kong/F	1987	17.9	13.2	1.3	none
Mayer (2002)	India	1995	197.9	14.6	13.6	none
Mayer (2002)	India/Males	1995	346.8	17.3	20.0	none
Mayer (2002)	India/Fem	1995	126.4	11.9	10.6	none
WHO (1968)	Italy/Males	1961	35.7	10.0	3.6	none
WHO (1968)	Italy/Fem	1961	61.2	3.6	17.0	none
Masocco(2008)	Italy/males	2001	13.3	9.9	1.3	none
Masocco(2008)	Italy/females	2001	5.67	3.33	1.7	none
WHO (1968)	Netherlands/Males	1960	54.0	9.9	5.1	none
WHO (1968)	Netherlands/Fem	1960	22.1	6.2	3.6	none
WHO (1968)	New Zealand/M	1961	23.3	16.4	1.4	none
WHO (1968)	New Zealand/F	1961	12.0	6.6	1.8	none
Corcoran (2010)	N. Ireland/M	2000	na	na	2.61	none
Corcoran	N. Ireland/Fem	2000	na	na	2.57	none

30

(2010)						
WHO (1968)	Norway/Males	1960	46.9	12.8	3.6	none
WHO (1968)	Norway/Fem	1960	10.0	3.5	2.9	none
WHO (1968)	Sweden/Males	1960	107.9	28.4	3.8	none
WHO (1968)	Sweden/Fem	1960	29.5	8.8	3.4	none
WHO (1968)	Switzerland/M	1960	128.7	28.3	4.5	none
WHO (1968)	Switzerland/F	1960	35.0	10.3	3.4	none
Yeh (2008)	Taiwan, 35-50	2000	Na	Na	2.73	ES
Yeh (2008)	Taiwan, M35-50	2000	na	na	2.7	ES
Yeh (2008)	Taiwan, F 35-50	2000	na	na	2.9	ES
WHO (1968)	U.K., England & Wales/ M	1961	49.8	13.4	3.7	none
WHO (1968)	U.K., England & Wales/ Fem	1961	24.6	9.4	2.6	none
Yip (2004)	UK-England & Wales M 40-49	1989	29.9	11.9	2.5	none
Yip (2004)	UK-England & Wales F 40-49	1989	9.4	4.1	2.3	none
WHO (1968)	USA/males	1960	88.0	21.1	4.2	none
WHO (1968)	USA/females	1960	20.0	6.2	3.2	none
Gibbs (2000)	USA,black F,35-44	1980	7.8	3.2	2.4	none
Stack (2004)	USA	1990	Na	Na	1.4	O,R,U
Stack (1998)	USA-white M	1990	Na	Na	2.5	Ed
Stack (1998)	USA-black M	1990	Na	Na	1.2	Ed
Cutright (2005)	USA/M 35-54	1979	70.6	17.0	4.2	none
Cutright (2005)	USA/F 35-54	1979	25.2	8.7	2.9	none
Cutright(2005)	USA/M 35-54	1993	54.0	15.4	4.0	None
Cutright(2005)	USA/F 35-54	1993	14.6	4.4	3.3	None
Kposowa(2000)	USA	1984*	Na	Na	2.1	Ed,$
Kposowa(2000)	USA/males	1984*	na	Na	2.4	Ed,$
Kposowa(2000)	USA/females	1984*	na	na	1.3	Ed,$
Luoma (2002)	USA/M,40-44	1993	62	18	3.4	none
Luoma (2002)	USA/F, 40-44	1993	18	5	3.6	none

Notes: In some cases the Year of the data being analyzed is the midpoint of a range (e.g., for N. Ireland, 2000, for 1996-2005). *Longitudinal study based on 1979-1989. Control Variable: D=physical disability; Ed=education Level; ES=employment status; O=occupation; R=race; $= income; U=urban vs. rural residence. None: no economic, religious, psychiatric, and related control variables. Age and gender suicide rates may be explored. For space considerations, in studies with many suicide rates for various age groups (e.g., Luoma et al., 2002), one from the midlife range (which typically includes most suicides) is provided.

31

Table 2. The Association between Proximal and Distal Relationship Loss and Suicide Risk, Controlling for Other Social and Psychiatric Factors, National Mortality Follow back Survey (N=13,897 deaths including 1,169 suicides).

Variable	Logistic Regression Coefficient	Wald Chi Square	Odds Ratio	95% Confidence Interval, Odds Ratio	Standardized Regression Coefficient (BETA)
Relationship Loss					
Recent Divorce	.47*	6.14	1.60	1.10 - 2.32	.06
Distal Divorce	.25*	5.41	1.18	1.04 - 1.59	.07
Recent Widowhood	.53*	8.08	1.37	1.18 - 2.47	.08
Distal Widowhood	-.49*	13.34	.61	.47 - .79	-.18
All other Marital Statuses (reference)	1.00				
Economic Strain:					
Job Loss	.22	2.39	1.30	.94 - 1.65	.04
Job Demotion	1.98*	39.62	7.29	3.92 - 13.53	.11
Religious Integration:					
Religious Activities	-.21*	80.51	.81	.77 - .84	-.32
Psychiatric Morbidity:					
Depression Index	.14*	77.54	1.15	1.11 - 1.18	.25
Demographics:					
Gender (male)	.16*	4.93	1.17	1.01 - 1.34	.08
Age	-.007*	20.16	.99	.98 - .99	-.19
Constant	-2.00*	403.21	-----	----- -----	
* p < .05					
-2 log likelihood	7672.6 *				
Nagelkerke r-squared	.057				
Deaths Correctly predicted by model	91.65%				

{stack&Scourfield.110512K}