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An Interrupted Time-Series Analysis of Durkheim's Social Deregulation Thesis: The Case of the Russian Federation

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Abstract

The dissolution of the Soviet Union resulted in sudden, widespread, and fundamental changes to Russian society. The former social welfare system-with its broad guarantees of employment, healthcare, education, and other forms of social support-was dismantled in the shift toward democracy, rule of law, and a free-market economy. This unique natural experiment provides a rare opportunity to examine the potentially disintegrative effects of rapid social change on deviance, and thus to evaluate one of Durkheim's core tenets. We took advantage of this opportunity by performing interrupted time-series analyses of annual age-adjusted homicide, suicide, and alcohol-related mortality rates for the Russian Federation using data from 1956 to 2002, with 1992-2002 as the postintervention time-frame. The ARIMA models indicate that, controlling for the long-term processes that generated these three time series, the breakup of the Soviet Union was associated with an appreciable increase in each of the cause-of-death rates. We interpret these findings as being consistent with the Durkheimian hypothesis that rapid social change disrupts social order, thereby increasing the level of crime and deviance.

Keywords

homicide; time-series analysis; Durkheim; social deregulation; Russian Federation

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Introduction

This paper is concerned with macrosocial integration and rates of deviant behavior. Most cross-national analyses of antisocial behavior based on Durkheimian theory focus on the disruptive effects of population growth and structural differentiation on the collective conscience of a society (i.e., the developmental or modernization hypothesis). Our research, which is also based on Durkheimian thought, seeks to examine the disintegrative effects of rapid social change on the social cohesion of complex social systems (i.e., the social deregulation hypothesis).

Durkheim, Societal Evolution, and the Division of Labor

In his seminal work *The Rules of Sociological Method*, Durkheim (1938, p. 110) asserts that the "… . determining cause of a social fact should be sought among the social facts preceding it and not among the states of individual consciousness." From a Durkheimian perspective, crime is a social fact; one that is inextricably tied to the manner in which a society adapts to the dual exigencies of growth and change.

According to Durkheim (1933), simple societies are bound together by commonly shared norms and values (i.e., mechanical solidarity). In contrast, complex societies achieve unity through the differentiation of the roles and statuses of their members and the mutual interdependence that this division of labor typically engenders (i.e., organic solidarity). Each type of macrosocial integration is linked to the size of the populace within the geographic boundaries of the social system (see also Parsons, 1977; Spencer, 1972). Small populations tend to be homogeneous with respect to the basic dimensions of social life (e.g., the cultural, ethnic, religious, and economic spheres). It is this similarity in both the form and content of social relations that produces a ubiquitous value system that promotes macrosocial integration and conformity (Durkheim, 1933, pp. 70-110). However, as social systems experience growth in population size and density, they must develop more efficient means of producing and distributing goods and services among their members (Parsons, 1977, pp. 38-50). For Durkheim (1933, pp. 111-132), the solution to this dilemma is the transformation of society from one that is relatively homogeneous and undifferentiated to one that is progressively more heterogeneous and differentiated (i.e., an elaboration of the division of labor).

While the progressive elaboration of the division of labor enhances the capacity of society to handle the pressures of population growth and to adapt to changing environments, it simultaneously has a disruptive influence upon mechanical solidarity. Insofar as social differentiation promotes a rise in individualism at the expense of the collective conscience, it weakens the mechanisms that had in simple societies led to macrosocial integration. Thus, it would seem that as social systems mature they could expect to become less cohesive and thus experience higher rates of deviance. This outcome, though possible, is anticipated by Durkheim to be exceptional rather than normative (see O'Brien and Stockard's (2006) discussion of Durkheim's ideas about how anomie and egoism were associated with homicide, as well as Pridemore and Kim's (2006) discussion of Durkheim's ideas about the effects of collective sentiments and the religion of the individual (or of humanity) on homicide rates).

Paradoxically, what is hypothesized to produce macrosocial integration and conformity in simple societies (i.e., similarities across individuals) has no bearing on macrosocial integration and conformity in complex societies. According to this view, a highly developed division of labor forces each individual to become mutually dependent upon others for basic needs and desires. Thus, not unlike the manner in which the biological differentiation of cells within higher-order organisms becomes essential for survival, social differentiation within populous and complex social systems fosters macrosocial integration and conformity (Durkheim, 1933, pp. 130-131).

To summarize, the transformation of small and undifferentiated social aggregates into large and complex social systems does not necessarily engender macrosocial disintegration. Societies that can generate and sustain a normal division of labor-that is, one that is based upon merit, achievement, and norms of reciprocity-can generate new bases for macrosocial integration and conformity (Blau, 1964; Durkheim, 1933; Gouldner, 1960). However, not all social aggregates can readily make the transition from one form of social solidarity to another. As we will discuss in the next section, the failure to develop an equitable means of allocating social roles and responsibilities can have profound deleterious effects on the social order, especially in the context of sudden transitions and rapid social change.

Division of Labor, Social Deregulation, and Crime

If the elaboration of the division of labor is essential for the maintenance of macrosocial integration in modern societies, then how can it also engender crime? For Durkheim (1933, 1951), the resolution of this paradox rests with the differential effects of normal and abnormal forms of the division of labor on macrosocial institutions. In book three of *The Division of Labor in Society*, Durkheim (1933, pp. 353-409) enumerates three pathological forms of the division of labor. These include (1) the anomic division of labor-where the structural and cultural systems are out of equilibrium (p. 370), (2) the forced division of labor-where the tasks assigned to individuals do not match their natural talents (p. 375), and (3) inefficiency-where the division of labor fails to provide enough material for individual activity (pp. 389, 395). The first abnormal form, anomie, was the focus of our investigation.

During periods of normalcy, the division of labor progresses at a rate that allows the culture to adapt to changes in the social structure. Under these circumstances, two interrelated mechanisms appear to be at work. First, a slow and deliberate process of social differentiation provides sufficient time for new norms and values to replace those that no longer function to temper the passions of societal members. Second, a slow and deliberate process of social differentiation enmeshes societal members in mutual bonds of obligation, trust, and dependence that militate against selfish individualism (Durkheim, 1933, pp. 200-229).

During periods of rapid social change, however, there is not enough time for the social system to adjust to the new macrostructural arrangements. Commenting on the transition from agrarian to industrial economies (i.e., the "rapid social change" that captures his attention in *The Division of Labor in Society)*, Durkheim (1933, p. 370) laments that "[t]hese new conditions of industrial life naturally demand a new organization, but as these changes have been accomplished with extreme rapidity, the interests in conflict have not yet had time to be equilibrated." Norms and values that clearly define social roles and expectations within agricultural communities quickly become obsolete. As a result, they lose much of their power to hold in check the rising aspirations and expectations of societal members facing fundamental changes in the social and economic order. Until new norms and values can emerge to replace the old, a state of anomie emerges that extricates individuals from the external constraints of society and frees them to pursue their singular wants and desires, including acts of crime and deviance (Durkheim, 1933, pp. 353-373; Durkheim, 1951, pp. 246-257).

To summarize, rapid social change generates high rates of crime and deviance by reducing the capacity of the society to regulate the escalating aspirations and expectations of its citizenry. This state of normlessness continues to foster crime and deviance until the cultural system adapts to the new social order, thereby reestablishing social equilibrium (for a similar interpretation see Liska, 1987, pp. 30-31). The metamorphosis of an agricultural into an industrial society, though of considerable interest to Durkheim, is less of a concern in the twenty-first century. This is not to suggest, however, that social deregulation theory cannot be evaluated with modern data. On the contrary, as we discuss below, we believe that the

dissolution of the Soviet Union produced the sort of rapid social change that would allow us to empirically evaluate social deregulation theory.

Social Change and Social Deregulation: The Case of Russia

Russia began an economic reform package of privatization and shock therapy in the early 1990s in order to convert the centrally planned command economy to a free market. However, the legal, political, regulatory, and social institutions necessary for a properly functioning market economy were and continue to be underdeveloped in the country (Goldman, 1996; Hanson, 1998; Intriligator, 1994). The ensuing political instability and economic collapse had far-reaching implications. Durkheim (1951) argued that during periods of rapid social change norms become unclear, and society's hold over individuals lessens as their aspirations become less limited. This appears to be occurring in Russia, where there has been a transition from a top down paternalistic, controlling, communist state to a capitalist economy and a freer democratic system with increased opportunities and individual freedoms. This normative dissonance is exacerbated further, since political leaders are widely believed to be corrupt, and those who have succeeded economically under the new system assumed to have done so by illegal means. Shlapentokh (2003, p. 151), for example, revealed the high level of acceptance of corruption by Russian citizens, who view it as “a normal part of economic and political life,” and Beck and Lee's (2002) survey of elite police officers and recruits showed that many of them believe corruption to be morally acceptable and justifiable in a range of circumstances. According to Durkheim, such blurring of norms between what is right and wrong should result in increased deviance, including higher rates of homicide and suicide.

Since the dissolution of the command economy and the transition toward a free market and greater individual freedoms began in the early 1990s, Russian citizens have experienced continued economic, social, and political instability that have permeated and deeply affected all dimensions of social life. The unemployment rate of 10.5 percent in 2000 was twice as high as it was in 1992, and nearly 30 percent of the population are living in poverty (Goskomstat, 2001). The transition also had an alarming impact on demographic trends, which are often indicators of abnormal conditions (Kingkade, 1997). Declining birth rates and increasing death rates, for example, led to a shrinking population. Increases in mortality rates were highest among middle-aged males (Leon & Shkolnikov, 1998), and in less than a decade male life expectancy declined nearly 8 years, to around 60 years.

As disruptive as the political and economic transformation was to the legal and economic order, its effect on the cultural and normative climate may have been even more profound. The collapse of the Soviet Union undermined a social contract that had been in place for almost 70 years. Since the 1920s, the government had provided a wide array of social services to its population, including full employment, price controls for essential goods and services, universal health care and educational opportunities, and a broad safety net to guarantee a minimum level of financial security (e.g., old-age and military pensions, paid maternity leave). Soviet citizens could feel safe in the knowledge that the state would be there to meet their basic needs, regardless of any misfortunes they might experience. For a variety of reasons, however, including the economic difficulties and the incompatibility of totalitarian controls and communist economic programs with democratic freedoms and free markets, the Russian government was unable to continue its beneficence following the dissolution of the Soviet Union (Hass, 1999; Liu, 1993). According to Shkolnikov and Meslé (1996), marketization led to a failure of Soviet state paternalism that had disastrous effects for the population. Russian citizens were left unsheltered in the face of the transition and the new market economy.

In addition, a flood of foreign values carried by Western media has eroded already battered traditional norms, leaving many Russians culturally disoriented and uncertain about the future (Frisby, 1998). Russians are being asked to embrace norms and values that were anathema less

than a generation ago, with many formerly revered values now scorned. The group-oriented and collective norms and values of the past came under fire virtually overnight with an inundation of Western ideals and values that stressed individual freedoms and goals. The cohesive effects provided by family and friendship networks on social, economic, and moral stability were threatened by the transition and the new capitalistic emphasis on self-reliance and cash accumulation. All this occurred in a society where ideas, aspirations, and liberties had been limited from above and where communitarian ideas run deeper and go back much further than twentieth-century Soviet communism (Kharkhordin, 1999). Traditional societal institutions were quickly subordinated to the economy, and many Russians began to feel alienated by their quest for personal financial security, since the search for it includes independence from, and even competition with, those on whom they once depended (Frisby, 1998).

In sum, the collapse of the Soviet Union appears to have resulted in a disequilibrium between the structural and cultural dimensions of social life (i.e., produced an anomic division of labor) as former governmental and social systems that stressed the importance of the group were forced into the background by new principles that highlight individual freedoms and opportunities. Thus, the dissolution of the Soviet Union provides us with a rare chance to take advantage of a unique large-scale natural experiment to evaluate Durkheim's social deregulation hypothesis with contemporary data.

Present Investigation

The relationship between anomie and crime-whether it arises from the process of modernization (i.e., the developmental hypothesis) or rapid social change (i.e., the deregulation hypothesis)-is inherently dynamic. Thus in order to evaluate Durkheimian theory, time-series data are most appropriate when available (for a similar view, see LaFree & Drass, 2002). Unfortunately, valid crime and mortality data from Russia were previously unavailable due to Soviet secrecy. However, the increased transparency of the Russian government has allowed researchers to gain access to such data for the first time in decades. This allows us to take advantage of the ongoing “natural experiment” in Russia to assess the Durkheimian hypothesis that rapid social change engenders increases in rates of crime and deviance.

Data

We used three sets of time-series data representing crime and deviance in Russia as our outcome variables: homicide, suicide, and alcohol-related deaths. These data were prepared for us by Russian colleagues based upon projects undertaken to reconstruct Russian cause-of-death data as described below (Meslé, Shkolnikov, Hertrich, & Vallin, 1996; Meslé, Vallin, Hertrich, Andreev, & Shkolnikov, 2003). All data were for Russia proper (i.e., the Russian Soviet Federated Socialist Republic pre-1992 and the Russian Federation 1992 to present), not the Soviet Union.

These vital statistics data were inaccessible until very recently. For most of the Soviet era, mortality data were provided only to government statisticians for creating classified reports (Shkolnikov & Meslé, 1996). From 1965 to 1987, homicides and suicides were among a group of ideologically sensitive causes of death that were extracted from the original statistical tables and put into a secret table, called “5B” (Andreev, Scherbov, & Willekens 1995). There was no pressure to falsify the initial cause-of-death decision, however, and so the underlying data still contained valid estimates of homicide and suicide deaths. Nevertheless, this count remained classified, and the deaths in table 5B were publicly reported in the “other and unknown causes” category. This secrecy ended in the late 1980s, and today homicide and suicide data are released annually in various publications available from the Russian State Committee for Statistics (Goskomstat) and Russian Ministry of Health (2001) annual publications. Further, a group of

researchers was provided access to the previously unpublished data and has been able to remove the homicide and suicide (and other) deaths from table 5B and correctly reclassify them into appropriate categories (Meslé et al., 1996). Until 1999, the Russian vital statistics registration system (*Zapis Aktov Grazhdanskogo Sostoyaniya*, or ZAGS) used the Soviet coding scheme to classify cause of death. Items 173 (suicide) and 174 (homicide) in this classification had the same case definitions of the World Health Organization's (WHO) International Classification of Diseases (ICD) codes E950-E959 and E960-E978, respectively (Andreev et al., 1995; Kingkade & Arriaga, 1997).

At nearly 15 l of pure ethanol alcohol per person per annum, Russian consumption is among the highest in the world (Nemtsov, 2000). Both alcohol and stress have been linked to the 1990s Russian mortality crisis (Leon & Shkolnikov, 1998; Vlassov, 1999), and Koposov, Ruchkin, Eisemann, and Sidorov (2002) have shown that young Russian male problem drinkers often use alcohol as a form of stress control. We thus used alcohol-related deaths as another outcome measure. There are four categories of death due directly to consumption: chronic alcoholism, alcohol psychosis (including encephalopathy and dementia), alcoholic cirrhosis, and alcohol poisonings. For this study, we combined these deaths into a single category.

The large increases in rates of homicide, suicide, and alcohol-related death immediately following the collapse of the Soviet Union represent actual patterns and are not artifacts of changing measurement systems. First, Soviet and Russian data on mortality in general (Anderson & Silver, 1997), and on violent death specifically (Wasserman & Värnik, 1998), have been subjected to various validation procedures with reassuring results. Second, the dramatic increases in these deaths follow similar patterns in other causes of death that are entirely unrelated to those we study here (Leon et al., 1997). Third, Russia did not change systems until the end of the 1990s. In 1993, the country initiated a transition to the use of WHO classifications, and only in 1999 did it begin reporting deaths using ICD codes, 10th Revision.

Method: Interrupted Time-Series Analysis

We used autoregressive integrated moving average (ARIMA) techniques to discover if the demise of the Soviet Union was associated with changes in homicide, suicide, and alcohol-related mortality rates per 100,000 residents within the Russian Federation. The data are annual, spanning the years 1956- 2002. While the length of the time series is less than optimal, it should be recognized that analysts are often faced with the dilemma of analyzing relatively short time series or using less appropriate cross-sectional data to study dynamic social processes (see, for example, Briggs et al., 2003). Statistically, the application of ARIMA procedures to a small number of observations tends to increase the size of the standard errors for the transfer function coefficients. Consequently, the shorter the time series, the lower the power of the test statistics (in our case the lower the probability of our rejecting the null hypothesis of a non-positive association between the collapse of the Soviet Union and each of the death rates). Thus, given the limited statistical power of the present investigation, our findings should be interpreted as a conservative test of social deregulation theory (McCleary & Hay, 1980; McDowall, Lizotte, & Wiersema, 1991).

The intervention is taken to occur at the beginning of 1992, following the collapse of the Soviet Union at the end of 1991. While political and economic change in the Soviet Union began in the mid- to late 1980s, there are several reasons for choosing 1992 as the key initial year for analysis of change. First, the changes of the 1980s were qualitatively different from those following the collapse of the Soviet Union. While liberalizing, the former sought to retain the underlying political framework, while the latter resulted in a paradigmatic shift that required discarding this framework. Second, an examination of available socioeconomic time-series data reveals that several indicators remained relatively stable until the collapse of the Soviet Union, then changed rapidly and dramatically. Third, while homicide, suicide, and alcohol-

related death rates did go up at the end of the 1980s, they were increasing from the artificial lows that occurred during Gorbachev's antialcohol campaign.[1] Finally, the formal shifts toward democratization and a free market officially and legally began in 1992.

Three basic steps are involved in developing a model to assess the causal impact of an intervention on a time series by use of ARIMA procedures. First, the dependent series (in this case, each cause of death series) is transformed into a new set of observations that are distributed independently and normally with a mean of zero and a constant variance (i.e., a white noise process). In the language of ARIMA modeling, this procedure is known as "prewhitening." Second, an appropriate transfer function is selected to estimate the impact of the intervention (in our case, the dissolution of the Soviet Union) on the prewhitened dependent series. Lastly, the final model is subjected to a number of diagnostic checks. If it is found to be inadequate, a new model is estimated. This procedure continues until a statistically adequate model is constructed.

Ideally, the selection of an appropriate transfer function should be rooted in theory. Although social deregulation theory allows us to predict the *direction* of the impact of the collapse of the Soviet Union on the cause-specific death rates (i.e., the sign of the coefficient should be positive), it speaks little to the possible functional form of this relationship. Fortunately, an appropriate transfer function can be derived empirically. One may choose from a variety of functional forms to estimate the effect of an intervention on a series of interest. In practice, the selection may be restricted to one of three common patterns, each determined by an alternative functional form (McDowall, McCleary, Meidinger, & Hay, 1980). These are (1) an abrupt, permanent change in the level of the series estimated by a zero-order transfer function ($\omega_o I_t$), where "permanent" is defined here as the length of the series under investigation, (2) a gradual permanent shift in the level of the series estimated by a first-order transfer function [$(\omega_o / (1 - \delta_1 B)) \times I_t$], and (3) an abrupt but temporary shift in the level of the series estimated by applying a first-order transfer function to a differenced intervention series, in other words a pulse function [$(\omega_o / (1 - \delta_1 B)) \times (1 - B) I_t$].

By successively estimating each of these transfer functions and subjecting them to a number of diagnostic tests, one can determine the most accurate model. While it is possible to fit higher-order transfer functions to the data in a mechanical fashion, the results of such dredging expeditions are usually uninterpretable. Moreover, previous research consistently reveals that most social science interventions can be represented effectively by the lower-order processes delineated above (Loftin et al., 1983; McCleary & Hay, 1980).

Results

Figures 1-3 present the scatter plots for each of the three cause-of-death time series as well as a vertical marker to distinguish between the pre- and postintervention periods. Inspection of these graphs suggests that the dissolution of the Soviet Union had an appreciable impact on the homicide, alcohol-related, and suicide death rates, respectively. However, the magnitudes and functional forms of these relationships are not readily discernible from these visual displays. To begin, consider the graphs of the homicide and suicide series. There is little doubt that Russian homicide and suicide rates are noticeably higher after the breakup of the Soviet

[1]For those unfamiliar with the Russian context, it is important to point out here that the increases that began in these time series in the late 1980s are largely the result of a completely unrelated phenomenon. The rates for all three of these causes of death were abnormally low at this time as a result of Gorbachev's antialcohol campaign, which began in 1985. The campaign lasted 2-3 years, during which overall mortality (and especially mortality from the causes of death examined here here) decreased substantially. Upon the campaign's demise, rates for homicide, suicide, and alcohol-related deaths began to increase (Nemtsov, 1998, 2002; Pridemore, 2003a; Pridemore & Spivak, 2003). Thus the upturn in the late 1980s is very likely a regression to the preantialcohol campaign mean following these artificial lows.

Union than before its demise. What cannot be determined from these graphical displays is whether or not the increases in these two causes of death are part of a pattern that began in the mid-1980s or a response to the social deregulation accompanying the Russian transition during the 1990s (see footnote 1). The graph for alcohol-related deaths is also open to conflicting interpretations. This series also evidences a postintervention increase in magnitude. However, there is a sharp positive "spike" in this series following the breakup of the Soviet Union that is followed by a smaller decrease. This would seem to indicate that the effects of the intervention might be short-lived (if they exist at all). In sum, while the changes over time in the three time series plots are consistent with a Durkheimian interpretation, one cannot reject the possibility that the pattern of postintervention increases in the death rates may be part of an ongoing process that began prior to the fall of the Soviet Union. Hence, we turn to the ARIMA models, which explicitly take into account, by means of the prewhitening procedure, any ongoing systemic processes that could confound the influence of the intervention on each of the dependent series (McCleary & Hay, 1980).[2]

Table 1 presents the final univariate ARIMA models for each of the dependent series. The table contains information concerning the form and the statistical adequacy of these models. The systematic variation (i.e., autocorrelation) in each of the death rate series can be accounted for by the same relatively simple ARIMA model: the application of first-order non-seasonal differencing to remove "drift," and the specification of a first-order moving average parameter. The Q statistic, which has a chi-square distribution, tests whether the model residuals differ as a whole from a white-noise process. All the final models meet this diagnostic criterion (i.e., none of the autocorrelation functions are significant at the .05 level).

Table 2 contains the final transfer function models for the influence of the break-up of the Soviet Union on each of the death-rate time series. The results are clear. Controlling (via prewhitening) for the long-term stochastic processes that are generating the dependent series, the dissolution of the Soviet Union is associated with significant increases in the rates of death for homicide, alcohol, and suicide mortality. The change in the level of both the homicide and the alcohol-related death series is well accounted for by a zero-order (step) function. Specifically, the Russian Federation experienced an immediate and permanent annual increase of approximately one homicide ($\omega_o = .812$, $p = .049$) and two alcohol-related deaths ($\omega_o = 1.730$, $p = .035$) per 100,000 persons, respectively.[3]

In contrast to the final models for homicide and alcohol-related deaths, the influence of the intervention series on the death rate for suicide series appears to fit a pulse function. In other words, there is a sharp increase in the suicide rate immediately following the collapse of the Soviet Union (5.3 suicides per 100,000). However, within 5 years, the series approaches its preintervention level (i.e., the postintervention increase in suicides falls to .027 suicides per 100,000 persons [$(\omega_0 = 5.3) * (\delta_1 = .488)^5$]).

In sum, the implications of the interrupted time-series analyses are straightforward. After the dissolution of the Soviet Union, the Russian Federation experienced a statistically significant increase in three forms of deviance that could *not* be accounted for by their prior levels. We interpret these results as supportive of the Durkheimian social deregulation thesis that rapid

[2]Prewhitening indirectly controls for the effects of unmeasured factors that affect the level, over time, of a dependent series prior to occurrence of the intervention (e.g., the Russian death rates prior to the fall of the Soviet Union in December 1991). The intervention component reveals whether or not there is any systematic change in the level of each of the death-rate series after the dissolution of the Soviet Union once the influence of the these unmeasured factors is partialled out. In the absence of tangible indicators of variables derived from competing explanations, this is the most efficacious strategy for establishing a causal relationship between an "historical event" and an outcome of interest (Box & Tiao, 1975; Hibbs, 1977).

[3]Given that our hypothesis is unidirectional (i.e., we predict that the intervention will produce an increase in each of the death rate series), we used a one-tailed test of statistical significance.

social change produces a state of anomie that in turn is associated with an increase in rates of deviant behavior.

Discussion

Auguste Comte (1896), in the five volumes of *The Course of Positive Philosophy,* attempted to formally establish the science of society (social physics). In doing so, he also identified the primary subject matter of sociology from which all subsequent sociological inquiries can be derived: the dual questions of social order (social statics) and social change (social dynamics). What was evident to Comte, and has been continuously reaffirmed since, was the complex interplay of these two fundamental social processes. Too much or too little of either can have detrimental consequences for society.

This interplay of order and change is also the driving force behind Durkheim's (1933, 1938, 1951) creative insights concerning the disruptive anomic effects of rapid social change. That rapid change is socially disruptive is an inherently important sociological postulate. That the disruption it produces includes dramatic increases in the level of deviance is an equally important criminological postulate that, in our view, has not received the amount of attention it deserves. In this study, we have taken advantage of newly available data and a unique natural experiment in order to subject Durkheim's social deregulation hypothesis to an empirical test. Specifically, we employed ARIMA modeling techniques to examine how the dissolution of the Soviet Union was associated with rates of homicide, alcohol-related deaths, and suicide.

Consistent with social deregulation theory, we found that the Russian Federation experienced significant permanent increases in the level of homicides and alcohol-related deaths and a more dramatic, though short-lived, increase in the suicide rate in the years following the breakup of the Soviet Union. The reasons behind the differences in the functional forms of these relationships is beyond our capacity to determine with these data. Nonetheless, regardless of the functional form of the relationship between the intervention series and the various death rates, there can be no doubt that the breakup was associated with a rise in the level of deviant behavior within the Russian Federation.

Ambiguous Boundaries and Social Deregulation in Post-Soviet Russia

According to Pokrovsky, “Russian society has made a dramatically fast transition to conditions in which there is a complete vacuum in cultural goals … This transitional period in Russian society has brought the theory of anomie to the fore” (Pokrovsky, as cited in Merton, 1997). The dissolution of the Soviet state occurred nearly overnight and led to unprecedented freedoms for Russians. The limits of these freedoms have yet to be fixed, however, thereby resulting in the social deregulation that is common when the boundaries between right and wrong are blurred. Under these conditions, the former solidarity loses its power to control behavior while a new solidarity remains underdeveloped, thus leaving individuals free to follow selfish pursuits. We should not be surprised, then, that Russia's rapid switch from tight top-down control over aspirations to deregulated desires appears to be associated with greater rootlessness and increased deviance.

Soviet Russia was characterized by a “sameness” in thought and action that stemmed from a government-enforced homogeneity and ubiquitous value system. Just as importantly, a strong collective conscience, communitarian ideals, and a social system that privileged the collective relative to the individual were characteristics of Russian culture well before the arrival of the Soviets. These values are at odds with the free market to which the country now aspires. To make way for new values, many values of the past had to be delegitimized. Similarly, symbols of group pride and faith that earlier generated collective sentiments disappeared or exist in a weakened state. Former cultural traditions and the Soviet state were replaced by the individual

goals of freedom, autonomy, and economic opportunities that were repressed and publicly derided during the Soviet era. Thus Russian citizens are being asked to abandon old notions of right and wrong and to supplant former goals and values with new ones that were demonized until very recently. In some cases, what had been regarded as criminal during the Soviet era-for example private entrepreneur-ship-is now central to success.[4]

This type of transformation, however, requires institutions that aid in developing and regulating civil society, economic competition, and government transparency that were largely absent at the end of the Soviet era and are still immature. Russians are being told that they must play according to new social, economic, and legal rules that are different from what they had been taught throughout much of their lives but also remain unclear and in flux.

Finally, attractive new goals and opportunities are being promoted by the market in Russia. It is widely believed, however, that the majority of the economic elite achieved success through ill-gotten gains. If the new standard is monetary success, and if those who have attained success are believed to have done so via illegitimate means, then it becomes unclear that these means are truly illegitimate paths of achieving desires. If society is facing a crisis of norms that confuses past and present wrongs and rights, then what behaviors are to be considered deviant? According to Durkheim, what is legal and illegal, allowed and prohibited, is not clearly defined in such situations. This is made worse in Russia by real and perceived beliefs about widespread corruption among the police, the legal system, government officials, and economic elites (Beck & Lee, 2002; Shlapentokh, 2003; Volkov, 2002). Crime and corruption become acceptable under these circumstances, or at least less unacceptable, and this culture of corruption and illegality fosters deviance in countless ways.

Limitations

It is normally considered more difficult to demonstrate the existence of causal relationships with ARIMA interrupted time series designs than it is with traditional multiple regression techniques (McDowall et al., 1991; Pierce, 1977). After all, the prewhitening procedure removes most of the within series variation prior to the estimation of the transfer function parameters. Hence, it seems fair to conclude that our findings cannot be discounted easily as mere statistical artifacts. However, there are potential threats to the validity of studies that focus on a single jurisdiction.

The basic threat to the internal validity of quasi-experimental designs such as interrupted time-series analysis is history (Campbell & Stanley, 1963). It is possible that other events occurring at the same time as the intervention are responsible for the reported effects. We can think of no contemporaneous incident that could rival the dissolution of the Soviet Union as an explanation for the observed changes in the death-rate series. This is not to suggest, however, that Durkheim's social deregulation thesis represents the only conceivable intervening mechanism that links the fall of the Soviet Union to increases in crime and deviance. One alternative explanation (at least in terms of crime and homicide, though not suicide and alcohol-related mortality) is the decrease in deterrence associated with the collapse of the government and the disarray, underfunding, and corruption of the police during this time.

Perhaps an even more compelling alternative explanation is one that we extrapolated from the cross-national homicide literature. In brief, this body of research indicates that measures of

[4]We wish to make it clear, however, that we do not believe it is individualism (or, in Durkheimian terms, egoism) that is associated with increases in rates of violence and other forms of deviance. O'Brien and Stockard (2006), for example, carefully show that Durkheim did not expect egoistic and anomic homicides to move in parallel directions since they result from opposing forces. Instead, we believe that the anomie and social deregulation brought about by the sudden transition and rapid social change is associated with the increase in rates of crime and deviance.

economic deprivation (poverty, inequality, unemployment) are the best predictors of variations in cross-national homicide rates (Avison & Loring, 1986; Neapolitan, 1998). Thus a reasonable alternative hypothesis is that the material hardships associated with the dissolution of the Soviet Union, rather than a breakdown in norms and values, are responsible for the postintervention increase in the death rates revealed by the ARIMA analyses. Ideally, we would explicitly examine the contemporaneous influence of annual indicators of economic vitality, as well as other structural predictors, on each of the death rate series. Unfortunately, valid preintervention macrosocial data for the Russian Soviet Federated Socialist Republic are largely unavailable. In the absence of direct measures that would allow us to rule out alternative explanations, we relied on an indirect supplementary analysis to address this question. To do this, we examined the postintervention annual changes in the gross domestic product for the Russian Federation. As might be expected, the Russian economy suffered a marked decline in productivity during the first 4 years after the dissolution of the Soviet Union. However, by 1996, the economy began to show signs of recovery. Further, following the second economic collapse in 1998, and during the last 4 years under investigation here (1999-2002), the Russian Federation averaged a 6.5 percent annual growth in its gross domestic product (World Bank, 2004).

The implications of this pattern of economic development seem clear. If the impact of the dissolution of the Soviet Union were primarily material, then we would have expected to find a decline in death rates in response to the recent economic recovery. Instead, the ARIMA analyses indicate that there was a stable increase in both the homicide and alcohol-related death rates throughout the 1990s and early 2000s. Further, the results for the suicide series (i.e., the pulse function) indicate that the Russian suicide rate began to return to its preintervention level *before* the resurgence in the economy. Thus, we think that it is unlikely that the findings from the interrupted time-series analyses easily fit a non-cultural, economic deprivation interpretation.[5]

Finally, in terms of measurement, we note that in the 1990s, there was a disproportionate increase in the number of deaths recorded as "violent, cause unknown," which was item 175 in the Soviet codes and corresponds to E980-E989 in the ICD-9 codes (see Gavrilova, Semyonova, Evdokushkina, Ivanova, & Gavrilov, 2005; Pridemore, 2003b). Many of these deaths are undoubtedly homicides and suicides. However, since the outcome of this situation is to underestimate homicide and suicide deaths in the country *following the collapse of the Soviet Union* (i.e., *after* the "intervention" in our analysis), the effect of this undercount is to make our estimates more conservative.

Conclusion

During times of rapid social change from one type of social species to another, people are freer to follow individual desires, and so we should expect higher rates of deviance until the social system adapts new mechanisms of control and reaches a new equilibrium. This appears to be occurring in Russia. A state facing repeated crises was able to do little to respond when Russian citizens were left unprotected following the collapse of the welfare state and during the ensuing political chaos and accompanying anomic conditions. Drug use rose sharply (Paoli, 2002), a mortality crisis followed (Bobadilla, Costello, & Mitchell, 1997), and we have shown in this study that there were significant increases in rates of homicide, suicide, and deaths directly

[5]Admittedly, the relatively swift return of the Russian suicide rate to its late-Soviet level is also problematic for social deregulation theory. We are hesitant to speculate as to why the functional form for the transfer model for the suicide series differs from that reported for the homicide and alcohol-related death series. Nonetheless, it is important to recall that the intervention produced a positive and lasting effect (as indicated by the zero-order transfer function) on the homicide and alcohol-related death series. Further, we note that in the years following 2002 (i.e., the final year of our analyses undertaken here), rates of all three causes of death have either increased or remained stable at their high levels. Thus, viewed in their totality, we conclude that it is appropriate to interpret the results from the ARIMA analyses as being more consistent with a social deregulation relative to a material hardship explanation.

related to alcohol consumption. Further, we again note that two factors are likely attenuating the estimates and making ours a conservative test of Durkheim's hypothesis. First, very recent degradation in the violent mortality data almost certainly resulted in underenumeration of homicide and suicide deaths in our postintervention period. Second, the short postintervention time series decreased the power of the test statistics, meaning that we had a lower probability of rejecting our null hypothesis of a nonpositive association between the collapse of the Soviet Union and each of the death rates. That we find significant results under these conservative conditions strengthens our conclusions.

To be sure, levels of violence (directed against the self and against others) and of alcohol consumption and alcohol-related mortality were already high in Russia before the dissolution of the Soviet Union. Following this collapse, however, rates of homicide and suicide and alcohol consumption have risen to among the highest in the world. Thus we conclude that the results from the interrupted time-series analyses undertaken here provide considerable support for Durkheim's social deregulation hypothesis.

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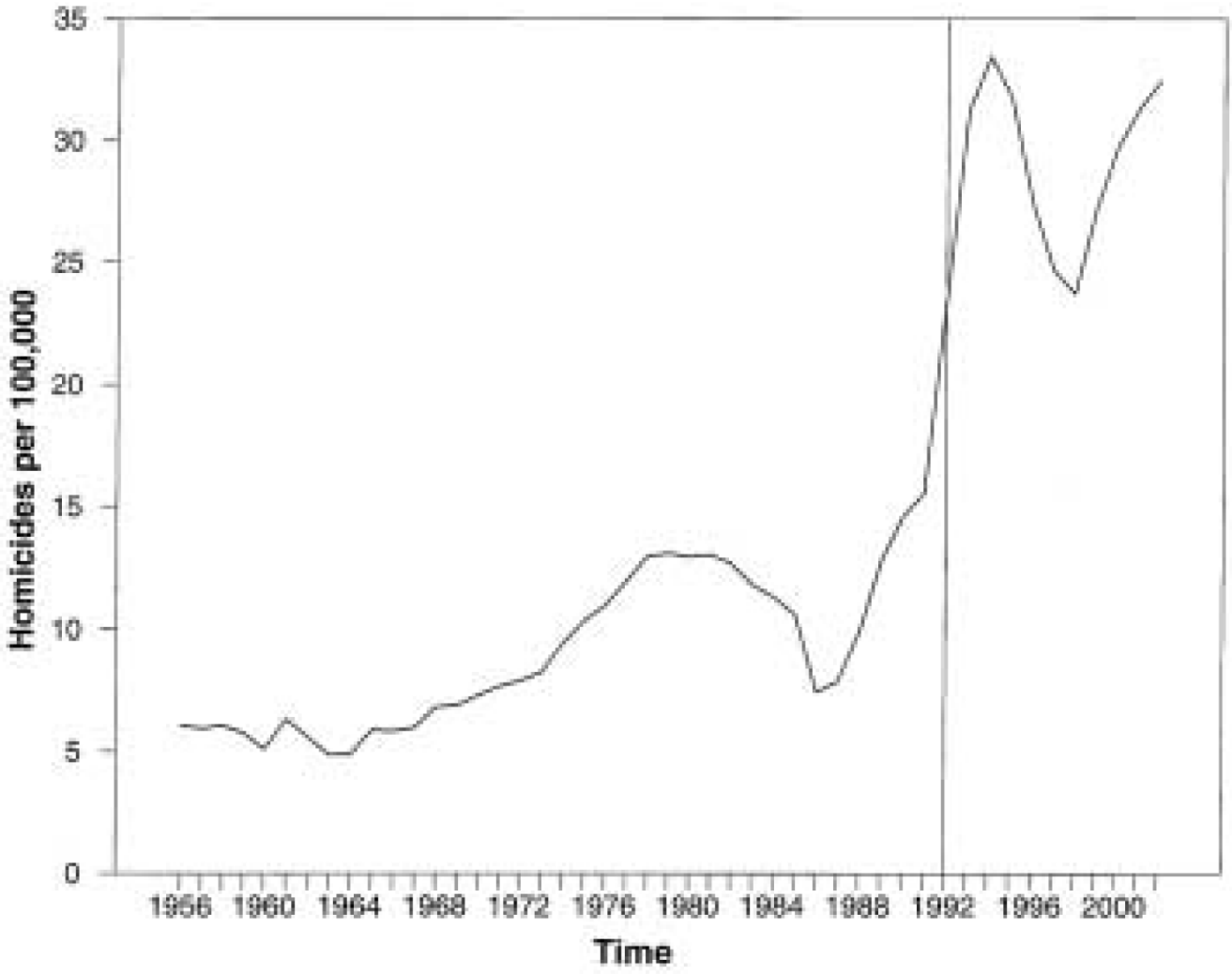

Figure 1.
Cause of death series: homicide.

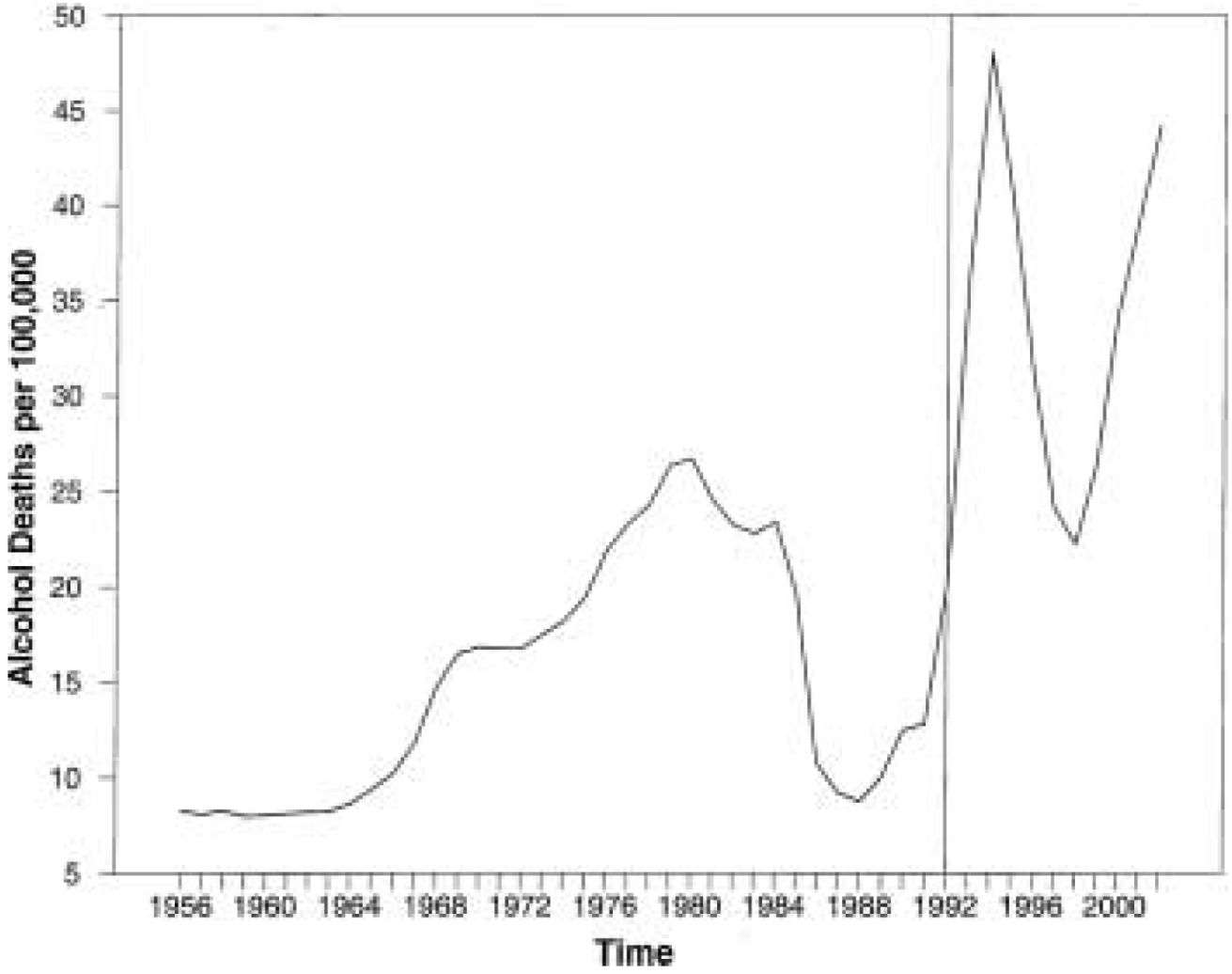

Figure 2.
Cause of death series: alcohol.

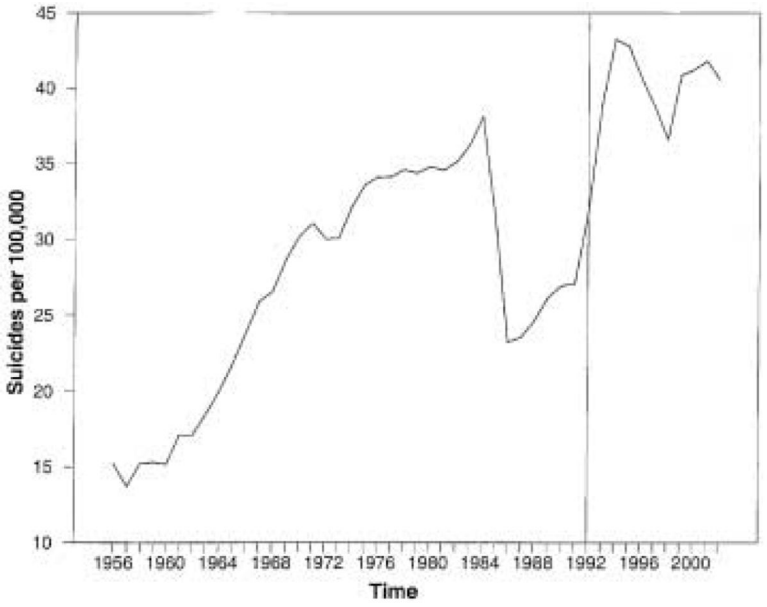

Figure 3.
Cause of death series: suicide.

Table 1

Final univariate models for homicide, alcohol-related, and suicide death rates

Series	Model	*Q* statistic
Homicide	(0,1,1)[a]	$Q = 9.1$; $df = 11$; $p < .63$
Alcohol	(0,1,1)	$Q = 15.9$; $df = 11$; $p < .16$
Suicide	(0,1,1)	$Q = 7.2$; $df = 11$; $p < .79$

[a]The general form of the non-seasonal ARIMA model is: (*p*,*d*,*q*): where *p* = the order of the autoregressive parameter, *d* = the order of differencing, and *q* = the order of the moving average parameter. *Q* = Box-Jenkin's test statistic for the null hypothesis that the model residuals are distributed as white noise.

Table 2

Final intervention models by cause of death

Series	Final model	Parameter estimates
Homicide	$Y_t = \omega_o/_t$	$\omega_o = 0.812$; $t = 1.68$
	$Q = 11.87$; df = 12	$p < .38$
Alcohol	$Y_t = \omega_o/_t$	$\omega_o = 1.730$; $t = 1.85$
	$Q = 18.08$; df = 12	$p < .12$
Suicide	$Y_t = (\omega_o / 1 - \delta_1 B)(1 - B)/_t$	$\omega_o = 5.343$; $t = 2.74$
		$\delta_1 = 0.488$; $t = 1.95$
	$Q = 5.027$; df = 11	$p < .93$

Note. ω_O = Zero-order input parameter of a transfer function. δ_1 = first-order output parameter of a transfer function. Q = test statistic for the null hypothesis that the model residuals are distributed as white noise. B = backward shift operator where $B(Y_t) = Y_{t-1}$. $/_t$ = intervention series.