

SOCIAL NETWORKS, SOCIAL SUPPORT, AND MENTAL HEALTH IN CROSS-NATIONAL
COMPARATIVE PERSPECTIVE

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A DISSERTATION

in

Demography and Sociology

Presented to the Faculties of the University of Pennsylvania

in

Partial Fulfillment of the Requirements for the

Degree of Doctor of Philosophy

2014

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ACKNOWLEDGMENT

The dissertation on social support and mental health was inspired by all the support I received from friends, family, colleagues, and acquaintances across the globe during my graduate years. I appreciate their encouragement, patience, generosity, as well as constructive criticism. I am especially grateful to my mentors at Penn, Jason Schnittker, Emily Hannum, and Hans-Peter Kohler, for guiding me into a challenging yet exciting research career.

ABSTRACT

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The dissertation contributes to the sociology of mental health by demonstrating that institutional and cultural settings shape the level of social cohesion and its influence on mental well-being. The dissertation consists of three independent but complementary essays. The first essay examines the influence of contexts on the link between social cohesion and suicide risk across countries in Americas, East Asia, and Europe. Using multilevel analysis, I show that marriage, parenthood, co-residence with parents, religious participation, and general social trust are all differentially related to suicide rates by region of the world. Whether a cohesive relationship is protective against suicide depends on contextual factors such as stigma against marital dissolution, welfare state regime, and the strength of religious networks. This essay contests Durkheim's theory on social cohesion and suicide by showcasing the international variation in the "benefits" of social cohesion. In the second essay, I examine the role of social cohesion and economic security in the mental health disparity between two societies in transition—China and Russia. The results show that the lower level of depressive symptoms among Chinese is in part attributed to their higher economic security and social cohesion (e.g., trust and perceived safety in the neighborhood). The findings suggest that reform policy and institutional capacity of the state contribute to differences in social and economic resources and mental health outcomes between China and Russia. In the final essay, I compare the structure of core personal networks in three societies—China, Japan, and the U.S. The results show that structural aspects of social networks, including size, density, proportion of kin confidants, and frequency of contact, vary considerably between countries. Nevertheless, none of these countries seems to have a "better" social network structure than another. In fact, the findings challenge the conventional cultural notion of Eastern collectivism vs. Western individualism. The study suggests that the significantly lower prevalence of

mental disorders in China and Japan compared to the U.S. cannot be explained by country-level differences in the strength of personal networks.

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CHAPTER 1: SOCIAL RELATIONSHIPS AND SUICIDE IN COMPARATIVE PERSPECTIVE: A NEW LOOK AT DURKHEIM'S OLD INQUIRY

Introduction

Suicide is one of the crucial indicators of health and well-being. According to the WHO, it is among the top twenty leading causes of death for all ages worldwide, and among the three leading causes of death for people aged 15-44 in some countries (World Health Organization 2012). Not only is suicide linked to individuals' psychological and physiological health, but it is also a product of social and cultural conditions.

Sociological research, greatly influenced by Durkheim's theory on solidarity, emphasizes that disrupted social relationships are an important risk factor for suicide (Durkheim 1897; Wray, Colen, and Pescosolido 2011). In particular, Durkheimian studies argue that maintaining social ties, such as being married, having children, and belonging to a religious community, provide social support and social control that prevent individuals from feeling detached, frustrated, or despaired and from committing suicide.

Although social cohesion has been recognized as a crucial determinant of suicide, few studies have examined whether it contributes to the wide variation in suicide rates across regions and countries. In particular, the WHO Map of Suicide Rates suggests that suicide rates demonstrates a clear regional pattern (World Health Organization 2012). For example, East Asian and Eastern European countries have higher levels of suicide rates; U.S., Canada, Australia, and New Zealand have medium levels of suicide rates; Latin American countries generally show low levels of suicide rates. However, little is known

about whether differences in social cohesion, including marriage/cohabiting rates and frequency of religious participation, drive this regional pattern of suicide. Moreover, few studies have investigated the varying effects of social relationships on suicide risk across contexts. Due to different cultural and institutional practices, such as social acceptability of divorce, expectation of intergenerational transfers (e.g., adult children take care of elderly parents), and state welfare regime, societies may unequally benefit from social relationships. For instance, co-residence with parents may be more strongly associated with reduced suicide rates in places where public support for elderly care is scarce and (upward) intergenerational transfers are culturally expected. Because the majority of previous research focuses on a single context or a set of industrialized contexts with relatively similar cultural and/or institutional backgrounds (i.e., Western Europe and North America), how social contexts may shape the influence of social cohesion on suicide risk has been rarely discussed.

This article examines suicide rates in relation to social relationships, including marital relationship, intergenerational relationship, religious participation, and general social trust, across 42 countries in 7 regions of the world. The study investigates whether the “protective” effects of cohesive relationships on suicide risk vary across regions and whether the level of social cohesion explains regional variation in suicide rates. From a comparative perspective, the study challenges the simplicity of Durkheim’s theory on solidarity and suicide by arguing that not all types of cohesive relationships are linked to lower suicide risk in all settings, and that institutional and cultural factors shape the association between social relationships and suicide.

Social Relationships and Suicide

Research based on Durkheim's (1897) theoretical proposition argues that cohesive social relationships may reduce suicide risk through two major mechanisms: social integration and social regulation (Berkman and Glass 2000; House, Umberson, and Landis 1988; Van Tubergen, Grotenhuis, and Ultee 2005; Wray, Colen, and Pescosolido 2011). On the one hand, social integration provides a sense of belonging and sources of emotional and instrumental support that may enhance mental well-being. On the other hand, social regulation provides moral guidance and monitoring that restrain personal desires and deviant behavior, which in turn may lead to failure, frustration, and despair. Studies following Durkheim's tradition mostly focus on his egoistic and anomic suicide, both of which suggest that suicide occurs more often when there is a lack of social interactions, shared beliefs, sentiments, and goals, and formal or informal rules that could hold individuals' behavior in check (Johnson 1965; Minagawa 2013; Wray, Colen, and Pescosolido 2011).

In order to elaborate, revise, or advance Durkheim's theory, many studies have examined the association between social relationships and suicide in contemporary settings. The majority of these studies focus on marital dissolution and religious affiliation. Overall, findings are mixed, demonstrating some geographical or temporal variation in the effects of social ties. In particular, while some studies claim that divorce and separation are positively related to suicide rates (Cutler, Glaeser, and Norberg 2001;

Gunnell et al. 2003; Luoma and Pearson 2002; Messner et al. 2006; Phillips et al. 2002), others argue that the effects of marital dissolution are not significant (Kposowa, Breault, and Singh 1995; Norström 1995). Several studies further indicate that whether divorce encourages suicide ideation or attempt may depend on the prevalence of divorce in a region or a period (Pampel 1998; Stack 1990). As divorce becomes more common and socially accepted, the gap of suicide rates between the divorced and the married narrows. In other words, the potential harmful effects of marital dissolution on suicide risk may be attenuated in contexts where divorced individuals are less stigmatized.

Likewise, the religion-suicide association may also be contingent on local settings. Although the protective effects of religious affiliation against suicide are richly documented (Duberstein et al. 2004; Neeleman and Lewis 1999; Stack and Kposowa 2011; Van Tubergen, Grotenhuis, and Ultee 2005), the strength and direction of the effects may vary. Specifically, religious homogeneity is associated with reduced suicide rates (Ellison, Burr, and McCall 1997), and the availability of religiously similar individuals in local areas defines the protectiveness of a religion, no matter it is Catholicism, Protestantism, or Judaism (Ellison, Burr, and McCall 1997; Pescosolido 1990; Pescosolido and Georgianna 1989; Wray, Colen, and Pescosolido 2011). Even Catholicism, which is historically well-known for its strong protection against suicide, can be linked to elevated suicide rates in the American South because the region lacks an integrated and supportive community for Catholics (Pescosolido 1990). Overall, the key issue is not whether individuals formally identify themselves as a believer, but whether

they (can) actively involve themselves in a religious community that provides strong social support and social control.

In addition to marital dissolution and religious participation, a few studies have also shown that other types of relationships, such as familial integration, friendship, and general trust are negatively associated with suicide risk. Specifically, parenthood is negatively related to suicide rates particularly for women. Among married women, number of children predicts lower suicide rates, independent of socioeconomic status (Hoyer and Lund 1993). Further, married women who commit suicide tend to do so later than their male counterparts (Cantor and Slater 1995). These studies suggest that women are more protected against suicide by their greater responsibilities for child rearing and their closer ties to children. In addition, friends provide another source of social support that may enhance mental health and lower suicide risk. Having more friends is associated with fewer depressive symptoms (Ueno 2005). In contrast, isolation from friends and a friendship network of lower density (i.e., one's friends are not friends with each other) are both linked to more suicide thoughts (Bearman and Moody 2004). Lastly, general trust or perception that most people can be trusted, an indicator of cohesion between individuals and society at large, is also associated with lower suicide rates (Helliwell 2006).

As the majority of previous studies focus on a single context or a set of homogeneous settings, there is a limited understanding regarding how cultural and institutional factors may shape the relationship between social cohesion and suicide. In particular, few studies have compared suicide risk between countries outside the

Western/Industrialized boundary even if non-Western or less industrialized countries disproportionately show the highest or the lowest suicide rates (World Health Organization 2012). By leaving out these comparison cases, the literature misses an important opportunity to test the dominant theory of Durkheim from a perspective of diversity. While a number of studies have explored the contextual variation in the effects of marital dissolution and religious affiliation on suicide rates, more research on a broader range of national/cultural settings using various social cohesion indicators is required to expand our understanding of how contexts interact with social relationships to restrain or encourage suicide risk.

Hypotheses

- I. Globally or generally, cohesive social relationships are associated with lower risk of suicide.
- II. Even though the global (general) effects of social relationships are protective against suicide as described in Hypothesis I, the effects vary significantly across regions of the world because of different institutional and cultural practices.
- III. Considering the varying effects of social cohesion on suicide across regions (according to Hypothesis II), level of social cohesion such as marital dissolution rate does not explain the cross-regional disparities in suicide risk.

Data and Methods

Data and Settings

The data come from three different sources. Age-gender-country-specific suicide rates (dependent variable) for people aged 15 and above come from the WHO Mortality Database¹. In most cases, a country has 14 observations of suicide rates in a year (2 genders x 7 age groups²). Further, the variables of social relationships come from the World Values Survey (WVS). Unlike suicide rates being aggregate data, social relationships from the WVS are individual-level data. Therefore, I calculated the mean of each relationship variable for every age-gender-country group so that the indicators of social relationships can be matched with suicide rates at the same level of analysis. Finally, GDP per capita, a country-specific control variable, are collected from the World Bank.

The study includes 42 countries from 7 regions of the world³: East Asia (Hong Kong, Japan, Singapore, South Korea, Taiwan), English-speaking countries (Australia, Canada, Ireland, New Zealand, the United Kingdom, and the United States), Latin America (Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay, and Venezuela), Northern Europe (Denmark, Finland, Norway, and Sweden), Western Europe (Austria, Belgium, France, Germany, and the Netherlands), Southern Europe (Bulgaria, Croatia, Greece, Italy, Macedonia, Portugal, and Spain), and Eastern Europe (Czech, Hungary, Moldova, Poland, Romania, Slovakia, Slovenia).

¹ The only exception is that the age-gender-country-specific suicide rates in Taiwan come from the Department of Health, Executive Yuan, Taiwan.

² Age groups are defined as follows: 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, and 75 and above.

³ The major criterion for country selection is the availability of complete and comparable data of both suicide rates and social relationships.

While this regional classification is mainly based on United Nation's geographical definition (except for English-speaking countries), the classification has more than a geographical meaning. In particular, countries classified in the same region are relatively proximal on cultural dimensions, including language, religious belief, and expectation of intergenerational transfers within a household. Further, the state welfare policy is also roughly aligned with the regional categorization. Specifically, Esping-Anderson (1990, 1999) argues that Anglophone countries tend to provide relatively modest and means-tested social benefits (the liberal welfare state). In contrast, Northern European countries pursue the principle of universal social rights, promoting an equality of high living standard rather than an equality of minimal need (the social democratic welfare state). Between these two welfare regimes, some Western and Southern European countries adopt a welfare policy that neither heavily relies on the market nor on the state; the policy preserves both social stratification and the tradition of family, that is, social rights are granted according to class and status and after the family's capacity of caring is exhausted (the conservative welfare state). In addition, Haggard and Kaufman (2008) also suggest that countries in East Asia, Latin America, and Eastern Europe have developed distinctive social-welfare models. Particularly, welfare systems in East Asia offered minimal social security; rather, many growth- or development-oriented states in this region prioritize investment in education. Many Latin American countries provide generous but unequal entitlements; their welfare system protects formal-sector workers including urban middle class and some blue-collar workers, but excludes peasants and informal-sector workers. Finally, due to the Communist legacy, Eastern European

welfare systems aim to provide comprehensive benefits to almost all of their citizens even though the value of protections and the quality of services have deteriorated with the state's financial capacity. Overall, the classification of region allows the study to examine how institutional and cultural circumstances shape the link between social cohesion and suicide risk.

The period of study spans from 1981 to 2006, during which the World Values Survey conducted its first five waves of data collection⁴. However, because the countries may participate in different waves of data collection for an unequal number of times, the years and the number of observations vary across countries. On average, each country is involved in three WVS surveys throughout the period (see Appendix). The final sample includes 1,687 observations of age-gender-country groups over time.

Statistical Approach

I first use OLS linear regression to test whether social integration is negatively related to suicide rates in general (Hypothesis I). The OLS regression models assume that the effects of social relationships on suicide are the same across regions of the world. The assumption that all social relationships are equally “protective” against suicide, however, may not be reasonable. Given that values, norms, and institutions vary widely across social contexts, the “beneficial” effects of social cohesion may differ significantly by region. To address this concern, I then use multilevel linear regression with random-slope specification to test the Hypotheses II and III. The random-slope models allow coefficient

⁴ The World Values Survey collected five waves of data in 1981-1984, 1989-1993, 1994-1998, 1999-2004, and 2005-2007.

estimates to vary across regions. Therefore, these models can test whether the direction and magnitude of the association between social relationships and suicide risk differ from region to region (Hypothesis II). Moreover, I use the same models to test whether the level of social cohesion explains regional differences in suicide rates (Hypothesis III).

The random-slope models have two levels, with age-gender-country groups (the lower level) nested in seven world regions (the higher level). I use region rather than country as the higher unit of analysis for a few reasons. First, a significant proportion of the between-country variation in suicide rates can be attributed to the between-region variation. Specifically, controlling for regional difference in suicide rates reduces the between-country variation by 68%. This not only demonstrates the salience of region over country, but also supports the regional clustering of suicide rates shown by the WHO Map of Suicide Rates (World Health Organization 2012). Additionally, region is much more statistically powerful than country as a higher unit of analysis simply because a region contains more age-gender-country-specific observations ($125 \leq n \leq 349$) than a country does ($14 \leq n \leq 84$). For these reasons, region rather than country is chosen to be the higher level in the multilevel linear regression model.

Variables

Suicide rates are measured by the number of deaths resulted from intentional self-harm per 100,000 person-years (approximated by per 100,000 mid-year population). The rates are calculated by age group, gender, country, and year. According to the International Classification of Diseases (ICD), deaths caused by intentional self-harm include, for

example, intentionally self-inflicted poisoning, hanging, drowning, firearm discharge, jumping from a high place, and crashing of motor vehicle; these causes of death are coded as X60-X84 in the ICD 10th revision and as E950-E959 in the ICD 9th revision. Previous studies argue that official suicide statistics may suffer from the misclassification and underreport of suicide deaths (Douglas 1967; Kapusta et al. 2011; Pescosolido and Mendelsohn 1986; Timmermans 2013; Whitt 2006). In particular, deaths of intentional self-harm may be misclassified as deaths of injury with undetermined intent, unintentional poisoning, and unintentional drowning (O'Carroll 1989; Rockett 2010; Rockett and Thomas 1999; Värnik et al. 2010). Because the extent of misreporting also depends on cultural and institutional factors, such as stigma against suicide, resources for forensic death investigations, and the adoption of a coronial or medico-legal system (Douglas 1967; Kapusta et al. 2011; Timmermans 2013; Whitt 2006; Värnik et al. 2010), the undercount of suicide deaths could significantly bias results from cross-nationally comparative research. To address this concern, I conduct a sensitivity analysis that considers the death rates of injury with undetermined intent, unintentional poisoning, and unintentional drowning.

Social relationships, from the strongest to the weakest social ties, are examined in this study. First, marital relationship represents the most inner layer of relational structure. I use *the percentage of people currently divorced or separated* (in a age-gender-country group) to measure the strength of this intimate relationship. Intergenerational relationships are the next layer of social connection. They are measured by two variables: *the number of children and the percentage of people living with parents*. Further,

religious participation may provide additional social support and social regulation outside family circle. *The percentage of people attending religious services at least once a month* is used to measure this layer of relationship. Lastly, general social trust indicates the relationship between individuals and society at large; it represents the weakest tie that shapes the outer layer of social networks. Trust is measured by *the percentage of people reporting that most people can be trusted*.

All the regression analyses in this study control for gender, age group, time trend, version of the International Classification of Diseases (ICD), and GDP per capita.

Results

Descriptive Statistics

Both suicide rates and social relationships vary significantly across world regions (Table 1.1). Overall, Eastern Europe has the highest suicide rates, followed by East Asia, Western Europe, Northern Europe, Southern Europe, English-speaking countries, and finally Latin America. Regional difference is significant: suicide rates in Eastern Europe are about 3 times higher than those in Latin America. Moreover, levels of social cohesion, represented by marital dissolution, number of children, co-residence with parents, religious participation, and general trust, also vary significantly from region to region. In particular, East Asians are the least likely to be currently divorced or separated (2.4%); in contrast, Northern Europeans are the most likely to be in this marital status (8.2%). Further, Latin Americans on average have a relatively high number of children (2.7 persons), especially compared to Northern Europeans (1.7 persons). In addition, co-

residence with parents is quite common in East Asia (31.2%); however, the prevalence in Northern Europe (8.4%) is relatively low. Also, regular attendance at religious services is much more prevalent in Latin American (55.8%) than in Northern Europe (12.8%); on the contrary, the majority of Northern Europeans express trust in most people (62.0%), whereas only a minority of people in Latin America does so (17.7%).

Because social relationships are not consistently more or less integrated in one region than another, it is indeed difficult to tell whether cohesive relationships are negatively associated with suicide rates by glancing over the descriptive statistics. However, the statistics seem to show that social cohesion is established on different types of relationships across region, and that people in all these regions are well-integrated by at least one or two types of relationships. Specifically, East Asians and Southern Europeans do relatively well on marital and intergenerational relationships (in terms of co-residence with parents); people from English-speaking countries have relative strengths in parenthood, involvement in religious communities, and general trust; Latin Americans maintain the strongest connection through religious participation and parenthood; Northern Europeans show their advantage in general trust. Finally, while Western and Eastern Europeans do not have relative strengths in specific social ties, neither do they show obvious weaknesses.

OLS Linear Regression

The OLS regression models support the Hypothesis I: cohesive social relationships are generally associated with lower risk of suicide (Table 1.2). First, the baseline model

demonstrates that East Asia, the reference region, has higher suicide rates than all the other regions except Eastern Europe when the control variables are held constant (Model 1). In particular, suicide rates in Latin America are only 32% (i.e., $\exp(-1.13)$) of the suicide rates in East Asia. Suicide rates in Southern Europe, English-speaking countries, Northern Europe, and Western Europe are 37%, 56%, 81%, and 84% of the rates in East Asia, respectively. Furthermore, maintaining cohesive relationships generally predicts lower risk of suicide. Specifically, an increase in divorce and separation rates by 1 percentage point is related to a 0.6% (i.e., $\exp(0.006)-1$) increase in suicide rates (Model 2). Also, having one more child is associated with an 24% (i.e., $1-\exp(-0.273)$) decrease in suicide rates (Model 3). Similarly, living with parents, attending religious services on a regular basis, and trusting people are all significantly related to lower suicide rates (Models 4-6). This pattern persists when the social relationship variables are examined altogether in a single model, except that the effect of marital dissolution turns insignificant (Model 7).

Overall, the OLS models suggest that marital dissolution predicts higher levels of suicide rates, and parenthood, co-residence with parents, participation in religious communities, and general social trust all predict lower levels of suicide rates. However, these models assume that the protective effects of social cohesion are the same across regions of the world, which is unjustified if there is significant variation in the effects of social relationships across regions. In the following section I use multilevel linear regression to relax this assumption.

Multilevel Linear Regression: Random-Slope Models

As Hypothesis II predicts, the random-slope models indicate that all the social relationships examined in this study are differentially associated with suicide rates across regions. This is demonstrated by that the standard deviations of the marginal effects of social relationships are all significantly different from zero (Table 1.3). Moreover, Figures 1.1 ranks the marginal effects by the direction and size of effect among the regions. Specifically, while marital dissolution is positively related to suicide rates in most regions, the variation in the magnitude of effect is rather wide (Figure 1.1a). Divorce and separation are not associated with suicide risk among English-speaking countries; in contrast, the association is significant, yet modest, in Latin America and Northern Europe, and it is the strongest in Southern Europe and East Asia. Further, parenthood is also unequally protective against suicide across regions (Figure 1.1b). Although having more children is strongly related to lower suicide rates in Latin America, English-speaking countries, and Northern Europe, this relationship is much weaker in Western Europe, Southern Europe, and East Asia. In addition, co-residence with parents is more strongly related to lower suicide risk in East Asia and Southern, Eastern, and Western Europe than in Northern Europe, Latin America, and English-speaking countries (Figure 1.1c).

Moreover, the effects of religious participation on suicide risk also vary significantly across regions (Figure 1.1d). Frequent attendance at religious services shows much stronger protective effects in Latin America than in any other regions. In contrast, involvement in religious activities does not seem protective in Western Europe and East

Asia; unexpectedly, it is associated with a higher risk of suicide. Finally, general social trust is related to lower suicide rates in Western and Southern Europe but not in other regions (Figure 1.1e); however, the cross-regional variation is less conspicuous compared to other social relationships.

In addition to the varying effects of social cohesion on suicide across regions, the random-slope models also suggest that most of the cross-regional variation in suicide rates is not driven by the level of social cohesion (Hypothesis III). Only number of children, frequency of religious participation, and level of trust explain some of the differences in suicide risk. Specifically, the gap in suicide rates between East Asia and Latin America is attenuated when number of children or religious participation is included in the analysis (this is shown by comparing Model 3 and Model 5, respectively, with Model 1 in Table 1.4). Also, the suicide gap between East Asia and Northern Europe turns insignificant when general social trust is taken into account (this is demonstrated by comparing Model 6 with Model 1). However, disparities in suicide rates between other regions are barely explained by any indicators of social cohesion. In fact, marital dissolution and co-residence with parents suppress, rather than explain, the suicide gaps between East Asia and Western Europe and between East Asia and Northern Europe (shown by comparing Model 2 and Model 4, respectively, with Model 1). This suggests that the cross-regional differences in suicide rates would be even larger when percentage of divorce/separation or percentage of co-residence with parents is held constant. Likewise, number of children and religious participation also suppress the suicide gap

between East Asia and Northern Europe (shown by comparing Model 3 and Model 5, respectively, with Model 1).

Sensitivity Analysis

Since suicide deaths are likely to be undercounted non-randomly (e.g., the extent of undercounting varies across social contexts), official suicide statistics may be artifacts lacking the value of theorization and policy implications. In particular, findings based on official rates may not correctly identify protective or risk factors for suicide. To address this concern, I consider deaths of three other causes—injury with undetermined intent, unintentional poisoning, and unintentional drowning—that likely include the most misclassified or hidden suicide cases. I re-estimate the multilevel regression models using “adjusted” suicide rates, which consist of the original suicide rates (reported by the WHO) and the death rates of injury with undetermined intent, unintentional poisoning, and unintentional drowning.

Table 1.5 shows the components of the “adjusted” suicide rates by region. Like suicide rates, death rates of injury with undetermined intent, unintentional poisoning, and unintentional drowning also vary across regions. Extremely high death rates of these three causes may signal underreports or misclassified cases of suicide deaths. Specifically, Latin America has exceptionally high death rates of injury with undetermined intent (13 deaths per 100,000) in contrast to all the other regions (ranging from 2 to 5 deaths per 100,000). In addition, Northern and Eastern Europe have relatively high death rates of unintentional poisoning, and East Asia and Eastern Europe show relatively high death

rates of unintentional drowning. Assuming that all deaths from the three causes are actually suicide cases (the worst scenario of suicide underreport), the regional ranking of the “adjusted” suicide rates is somewhat different from the ranking of the original suicide rates. The most notable difference is that Latin America no longer has the lowest level of suicide risk; its “adjusted” suicide rates are higher than those in English-speaking countries and Southern Europe. Another minor difference is that Northern Europe and Western Europe switch their ranks after the adjustment.

There are some changes in the results of multilevel regression models when the “adjusted” suicide rates are used. Nevertheless, most of these changes are moderate and do not overturn the original findings. Specifically, the marginal effects of divorce and separation maintain similar size and regional ranking as before, except that Latin America and Northern Europe switch their ranks (Figure 1.2a). Regarding parenthood, its marginal effects on suicide rates are attenuated, particularly for Latin America. The ranks also switch between Latin America and English-speaking countries and between Southern and Eastern Europe (Figures 1.2b). Moreover, the marginal effects of religious participation are attenuated, particularly for Latin America; however, the regional ranking remains the same (Figures 1.2d). In addition, the marginal effects of trust also maintain similar size and ranking except that East Asia and Southern Europe switch their ranks (Figures 1.2e). Finally, the regional pattern for the marginal effects of co-residence with parents is very similar as before (Figures 1.2c).

Overall, when suicide rates are considered together with the death rates of injury with undetermined intent, unintentional poisoning, and unintentional drowning, the

association between social cohesion and suicide only changes moderately. Indeed, the changes are mostly modest attenuation of the size of the effects and sometime involve rank switching between a couple of regions. Among all the regions, Latin America shows the most significant change when the “adjusted” rates are applied, particularly regarding the effects of religious participation and number of children. These shifts in Latin America may reflect its exceptionally high death rates of injury with undetermined intent, which possibly mask some misclassified suicide cases. Nevertheless, the changes found in the sensitivity analysis do not alter the major conclusion that the association between social relationships and suicide risk varies significantly across regions of the world.

Discussion

This study assesses the relationship between social cohesion and suicide from a comparative perspective. As Durkheim’s theory predicts, cohesive social relationships, including lower rates of marital dissolution and higher rates of parenthood, co-residence with parents, religious participation, and social trust are *generally* associated with lower risk of suicide. However, when stratifying the analysis by region, the study shows that the link between social cohesion and suicide varies significantly across contexts. In particular, findings from the multilevel random-slope models indicate that cohesive relationships are not always protective against suicide: the magnitude and, occasionally, the direction of the effects of social relationships differ from region to region.

The regional variation in the effects of social cohesion reflects the diversity of institutional and cultural practices. Specifically, divorce and separation strongly predict

higher suicide mortality in East Asia and Southern Europe. In contrast, marital dissolution has much weaker effects on suicide risk in Northern Europe and Latin America, and it even shows no deleterious effects among English-speaking countries. This regional pattern suggests that where marital dissolution is less common, such as in East Asia and Southern Europe (Table 1.1), it may encourage suicide attempts more. However, in places where stigma against divorce and unconventional family types (e.g., cohabitation and single parent family) is relatively weak, such as Northern Europe, Latin America, and English-speaking countries (Esteve, García-Román, and Lesthaeghe 2012; Esteve, Lesthaeghe, and López-Gay 2012; Lesthaeghe 2010; Lesthaeghe and Neidert 2006), marital dissolution does not exert the same level of positive effects on suicide risk. The regional pattern is consistent with previous findings that the gap in suicide mortality between divorced and married individuals is smaller when divorce is more socially accepted and prevalent (Pampel 1998; Stack 1990).

Likewise, parenthood strongly predicts lower suicide risk in Latin America, English-speaking countries, and Northern Europe; in contrast, the protective effects are much weaker in East Asia, Southern Europe, and Western Europe. The findings reflect that costs of parenting and institutional efforts for alleviating childrearing burdens vary across contexts. There are three relevant aspects: welfare state regime, the compatibility of childrearing and labor force participation, and the availability of day care for children. Specifically, Northern European countries are characterized by their strong public support for childcare such as tax allowances and direct transfers (Esping-Andersen 1990; Esping-Andersen 1999). Anglophone countries, while many of them being classified as

the liberal (means-tested) welfare regime, have relatively flexible labor market that accommodates the needs of women with young children, including opportunities to rejoin labor market after a childbirth and to work part-time (Diprete et al. 2003; Kohler, Billari, and Ortega 2006; Morgan 2003). Also, day care services are more widely available through private agencies in English-speaking countries (Rindfuss, Guzzo, and Morgan 2003). In contrast, countries in East Asia and Southern and Western Europe not only lack sufficient state support for childcare, but their labor market is also less friendly to women with children (Aspalter 2006; Holliday 2000; Kohler, Billari, and Ortega 2006). Besides, childcare mostly relies on family networks in part because private day care services are not widely accessible and the use of them is more often considered unfavorable to children (Kohler, Billari, and Ortega 2006; Rindfuss, Brewster, and Kavee 1996). Accordingly, parenting is related to extra financial, time, and career costs that may cancel out the benefits of raising children in these regions. Overall, the regional pattern of parenthood and suicide risk corresponds to Margolis and Myrskylä's (2011) argument that the relationship between fertility and unhappiness below age 40 is the strongest in countries with low public support for family. Parenting stress due to the lack of institutional support reflects not only on the lowest low fertility in East Asia and Southern Europe (notably including Japan, South Korea, Taiwan, Italy, and Spain), but also on the diminished beneficial effects of parenthood on mental well-being in the regions.

Further, there is also regional variation in the relationship between co-residence with parents and suicide. In particular, living with parents is significantly related to lower risk of suicide in East Asia and Southern, Eastern, and Western Europe; however, the

association turns weaker in Northern Europe and becomes insignificant in Latin America and English-speaking countries. The regional differences reflect economic insecurity among young adults, welfare state regime, as well as cultural expectation of intergenerational support. Specifically, among young adults in Eastern and Southern Europe and some countries in East Asia and Western Europe (e.g., Japan and France), high unemployment and economic insecurity due to market transition, economic stagnation, and/or industrial restructuring have been nation-wide concerns since the 90s (Kingston 2011; Kohler, Billari, and Ortega 2006; Szikra and Tomka 2009). Delayed home leaving or transition out of parental home may buffer the impact of economic stress on young adults and thus reduce their suicide risk. Moreover, for middle-aged adults in places of limited public support for elderly care and child care, such as East Asia and Southern Europe, the tradition of intergenerational transfers, facilitated by co-residence, may reduce their suicide risk (Aspalter 2006; Haggard and Kaufman 2008; Szikra and Tomka 2009). On the one hand, the sense of responsibility to take care of elderly parents may discourage suicide ideation and attempt; this cultural expectation could be reinforced when state intervention in elderly care is weak. On the other hand, financial or in-kind transfers from elderly parents to adult children may also help relieve the stress of child rearing and therefore reduce suicide risk. Downward transfers are especially needed when state does not provide sufficient support for childrearing.

In addition, the association between religious participation and suicide rates varies significantly across world regions. It is strongly negative in Latin America and moderately negative in Northern, Eastern, and Southern Europe and English-speaking

countries; surprisingly, the association is positive in East Asia and Western Europe. This wide variation in the effects of religious participation can be attributed to the strength of religious networks or the availability of integrated religious communities (Ellison, Burr, and McCall 1997; Pescosolido 1990; Pescosolido and Georgianna 1989; Wray, Colen, and Pescosolido 2011). In particular, the strength of religious networks may depend on the authority of religious institutions, the level of religiosity, and the ways in which religious practices are organized. In some regions of Christian tradition, the declining authority of religious institutions and clergy and the individualized pursuit of spirituality (e.g., the New Age spirituality movements that encourage practices of channeling, meditation therapy, and astrology) have undermined religious networks and communities (Norris and Inglehart 2011). Specifically, the decline of religiosity and participation in religious services is the most significant in many Catholic countries in Western and Southern Europe, including Belgium, France, the Netherlands, Portugal, and Spain. As the World Values Survey measures confidence in church (as an indicator of the status and authority of church) and level of religiosity, I conduct additional analyses to test whether these two factors explain the weak protective effects of religious participation in Southern Europe and the anomaly positive effects in Western Europe. Figure 1.3 shows that when confidence in church is controlled for, the protective effects of religious participation on suicide becomes stronger in Southern Europe, and the deleterious effects of religious participation in Western Europe are reversed. Likewise, when level of religiosity is taken into account, the deleterious effects of religious participation in Western Europe are reversed again (Figure 1.4). The evidence suggests that less integrated religious

communities in Western and Southern Europe, indicated by low confidence in church and religiosity, may be responsible for the lack of benefits of religious participation in the regions.

Moreover, how religious practices are usually organized—whether the practices tend to be individual or collective—may explain the deleterious effects of religious participation in East Asia. Specifically, religious beliefs in East Asia such as Buddhism, Confucianism, Taoism, and Shinto differ from Christianity in the notion of congregations (Norris and Inglehart 2011). Individual practices including prayer, meditation, and ancestor worship are considered equally or more important than collective services. Therefore, religious networks in East Asia may be less integrated and less effective in suicide prevention. Finally, suicide behavior is not sanctioned in East Asian faiths as much as in Christianity. Traditionally, Asian religions do not necessarily see suicide as evil: while it is not encouraged, it is morally acceptable in certain circumstances (Wasserman and Wasserman 2009). For example, suicide is justified in Confucianism and Shinto when it is committed for integrity, loyalty, and patriotism. This could be another reason why religious participation is linked to higher suicide rates in East Asia.

In addition to the varying effects of social cohesion on suicide, the study also finds that levels of social cohesion do not explain most of the suicide gaps between regions. Only number of children and frequency of religious participation may drive part of the suicide difference between East Asia and Latin America, and level of social trust explains the suicide gap between East Asia and Northern Europe. However, all other cross-regional differences in suicide rates remain significant when levels of social

cohesion are held constant. These results imply that as the protective types of social relationships differ from region to region, the amount of social resources from any specific type of relationship would not be a major factor in the suicide gap between regions.

Several limitations of the current study should be acknowledged. First, by focusing on between-region variation, the study ignores the between-country differences in suicide risk, social relationships, and institutional and cultural settings within a region. Although the between-region variation in suicide mortality accounts for almost 70% of the between-country variation, future research will benefit from exploring the unexplained proportion of the between-country variation when more observations for each country are available. Moreover, the study uses data of aggregate variables, with age-gender-country groups as the lowest unit of analysis. Therefore, the risk of making an ecological fallacy should be recognized. In particular, ecological fallacy refers to that correlations between two variables at the aggregate level may differ from the correlations between the same variables at the individual level (Robinson 2009). Since the current study uses aggregated data to demonstrate the association between social environment and suicide across world regions, results cannot be used to make inferences about cohesive social relationships and suicide risk for individuals. Finally, the official suicide statistics may suffer from non-random misclassification and underreport of suicide deaths. Specifically, the extent to which suicide mortality is underestimated may vary across social contexts, leading to a false conclusion of comparative suicide research. However, the sensitivity analysis in this study shows that findings regarding the relationship

between social cohesion and suicide across regions remain quite similar when the “adjusted” suicide rates are applied. Although suicide rates may be more likely to be underreported in certain regions, particularly Latin America, the potential underreports do not revise the conclusion that social relationships are linked to suicide risk in different ways between regions of the world. This finding is consistent with the argument by Pescosolido and Mendelsohn (1986) that misreporting in official suicide statistics has little impact on the effects of variables that are commonly used to test sociological theories of suicide.

In conclusion, the study challenges the simplicity of Durkheim’s theory on social cohesion and suicide by showing that the benefits of cohesive relationships vary by context. Findings imply that institutional and cultural factors, including stigma of marital dissolution, state welfare policy, strength of religious networks, and expectation of intergenerational transfers, may shape the protectiveness of social relationships. Broadly, people in East Asia, Southern Europe, and Western Europe benefit more from intact marital relationship and co-residence with parents. By contrast, people in English-speaking countries, Latin America, and Northern Europe may find parenting and religious participation more rewarding. Meanwhile, people in Eastern Europe modestly benefit from all types of cohesive relationships except social trust. Accordingly, the study suggests that there is no universal strategy for suicide prevention and that interventions should accommodate local norms, values, and institutional practices.

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Table 1.1: Descriptive statistics of suicide rates and social relationships by region

	Range	Overall	East Asia	English-speaking	Latin America	Northern Europe	Western Europe	Southern Europe	Eastern Europe
Suicide rates (per 100,000)	0.4-176.9	19.1	25.6	14.3	9.6	21.5	23.4	15.4	27.7
% Being currently divorced or separated	0-100	5.4	2.4	6.7	6.8	8.2	5.8	3.0	4.7
Number of children	0-6.5	2.0	2.0	2.2	2.7	1.7	1.8	1.8	1.8
% Living with parents	0-100	20.0	31.2	14.9	23.5	8.4	14.2	25.3	20.9
% Attending religious services at least once a month	0-100	38.5	22.6	46.3	55.8	12.7	29.6	39.4	40.7
% Reporting most people can be trusted	0-100	31.0	33.8	43.3	17.7	62.0	33.7	25.4	21.4
N	---	1,687	125	238	307	166	210	292	349

Note: The range refers to the minimum and maximum possible values at the level of age-gender-country group. All the variables differ across regions at the 1% significance level according to the non-parametric Kruskal Wallis test.

Table 1.2: OLS linear regression of logged suicide rates on social relationships

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Region (Ref: East Asia)							
English-speaking countries	-0.581** (0.049)	-0.599** (0.050)	-0.517** (0.048)	-0.667** (0.049)	-0.443** (0.050)	-0.537** (0.050)	-0.421** (0.054)
Latin America	-1.132** (0.067)	-1.158** (0.068)	-0.982** (0.066)	-1.190** (0.066)	-0.892** (0.069)	-1.199** (0.068)	-0.952** (0.072)
Northern Europe	-0.172** (0.060)	-0.196** (0.062)	-0.242** (0.058)	-0.333** (0.062)	-0.239** (0.059)	-0.036 (0.069)	-0.214** (0.069)
Western Europe	-0.208** (0.049)	-0.217** (0.050)	-0.258** (0.048)	-0.307** (0.050)	-0.166** (0.048)	-0.223** (0.049)	-0.330** (0.048)
Southern Europe	-1.000** (0.059)	-0.998** (0.059)	-1.050** (0.057)	-1.030** (0.058)	-0.847** (0.060)	-1.043** (0.060)	-1.018** (0.058)
Eastern Europe	-0.001 (0.063)	-0.014 (0.064)	-0.116+ (0.062)	-0.068 (0.063)	0.108+ (0.062)	-0.046 (0.064)	-0.140* (0.063)
% Divorced or separated		0.006+ (0.003)					-0.003 (0.003)
Number of children			-0.273** (0.024)				-0.236** (0.024)
% Living with parents				-0.009** (0.001)			-0.008** (0.001)
% Attending religious services at least once a month					-0.007** (0.001)		-0.005** (0.001)
% Reporting most people can be trusted						-0.005** (0.001)	-0.008** (0.001)
Constant	1.819** (0.071)	1.864** (0.075)	1.519** (0.073)	2.376** (0.099)	1.743** (0.069)	1.854** (0.071)	2.045** (0.099)
R-squared	0.724	0.724	0.743	0.734	0.739	0.726	0.765

+p<0.1, *p<0.05, **p<0.01. Standard errors are in parentheses. All the models control for age, sex, time trend, ICD version, and GDP per capita.

Table 1.3: Standard deviations of the marginal effects of social relationships across regions (multilevel random-slope models)

Variable	S.D. Estimate	S.E.	p value
% Being currently divorced or separated	0.010	0.003	<0.001
Number of children	0.152	0.043	<0.001
% Living with parents	0.005	0.001	<0.001
% Attending religious services at least once a month	0.011	0.004	0.002
% Reporting most people can be trusted	0.006	0.002	0.004

Table 1.4: Cross-regional suicide gaps by model of social cohesion (in logged suicide rates)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Region (Ref: East Asia)	Basic	Basic + Marital dissolution	Basic + Number of children	Basic + Coresidence with parents	Basic + Religious participation	Basic + Trust
English-speaking countries	-0.581** (0.049)	-0.624** (0.047)	-0.504** (0.045)	-0.633** (0.049)	-0.583** (0.048)	-0.569** (0.061)
Latin America	-1.132** (0.066)	-1.176** (0.064)	-0.878** (0.062)	-1.231** (0.065)	-0.650** (0.069)	-1.113** (0.074)
Northern Europe	-0.172** (0.060)	-0.249** (0.058)	-0.257** (0.057)	-0.325** (0.067)	-0.552** (0.123)	-0.169 (0.114)
Western Europe	-0.208** (0.049)	-0.280** (0.047)	-0.206** (0.045)	-0.341** (0.050)	-0.202** (0.048)	-0.201** (0.050)
Southern Europe	-1.000** (0.059)	-1.033** (0.057)	-0.990** (0.054)	-1.039** (0.058)	-1.055** (0.058)	-1.064** (0.061)
Eastern Europe	-0.001 (0.063)	-0.058 (0.061)	-0.036 (0.060)	-0.079 (0.062)	-0.087 (0.061)	-0.037 (0.068)

*p<0.05, **p<0.01. Standard errors are in parentheses. All the models use multilevel linear regression with random-slope specification, controlling for age, sex, time trend, the ICD version, and GDP per capita.

Table 1.5: Components of the "adjusted" suicide rates (deaths per 100,000)

	Overall	East Asia	English-speaking	Latin America	Northern Europe	Western Europe	Southern Europe	Eastern Europe
Suicide rates	19.1	25.6	14.3	9.6	21.5	23.4	15.4	27.7
Death rates of injury with undetermined intent	5.3	4.4	2.1	13.3	3.2	2.8	2.5	5.6
Death rates of unintentional poisoning	3.2	1.5	2.4	1.0	6.9	1.2	2.0	6.6
Death rates of unintentional drowning	2.7	4.4	1.5	2.9	2.0	1.1	2.1	4.3
"Adjusted" suicide rates (suicide rates + death rates of injury with undetermined intent, unintentional poisoning, and unintentional drowning)	30.2	35.9	20.2	26.9	33.6	28.5	22.0	44.2
N	1,687	125	238	307	166	210	292	349

Figure 1.1: Marginal effects of social relationships on logged suicide rates

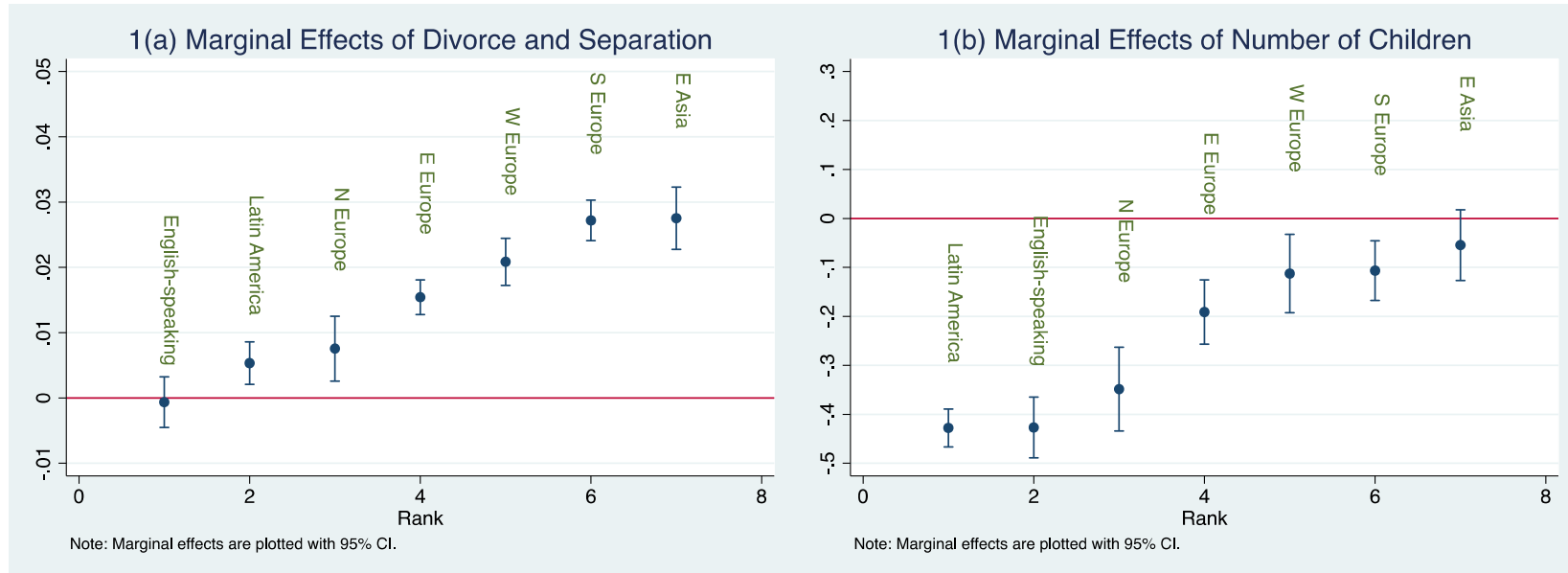


Figure 1.1 continued: Marginal effects of social relationships on logged suicide rates

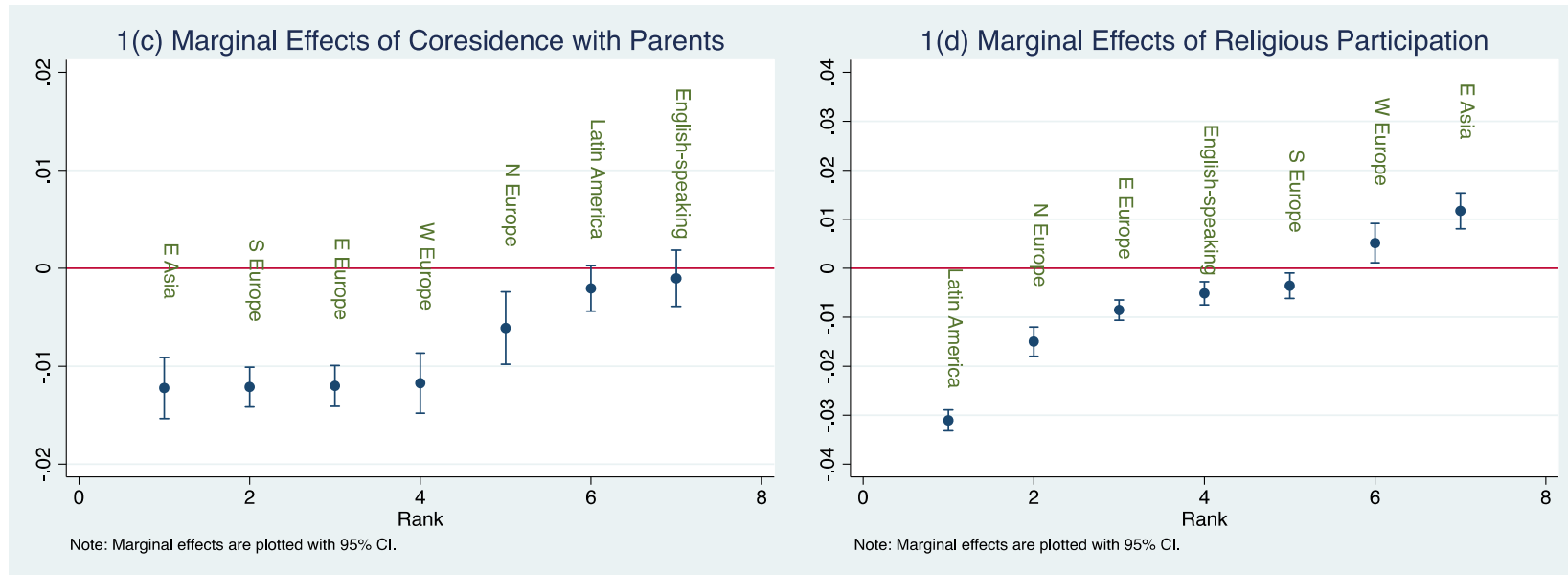
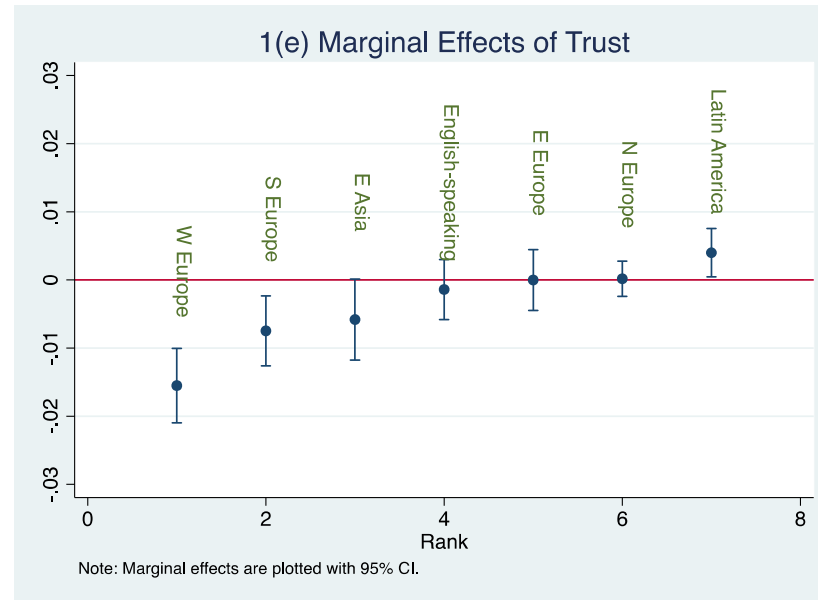


Figure 1.1 continued: Marginal effects of social relationships on logged suicide rates



Note: The marginal effects are obtained from the multilevel linear regression models (random-slope) that control for age, gender, time trend, the ICD version, and GDP per capita.

Figure 1.2: Marginal effects of social relationships on logged “adjusted” suicide rates

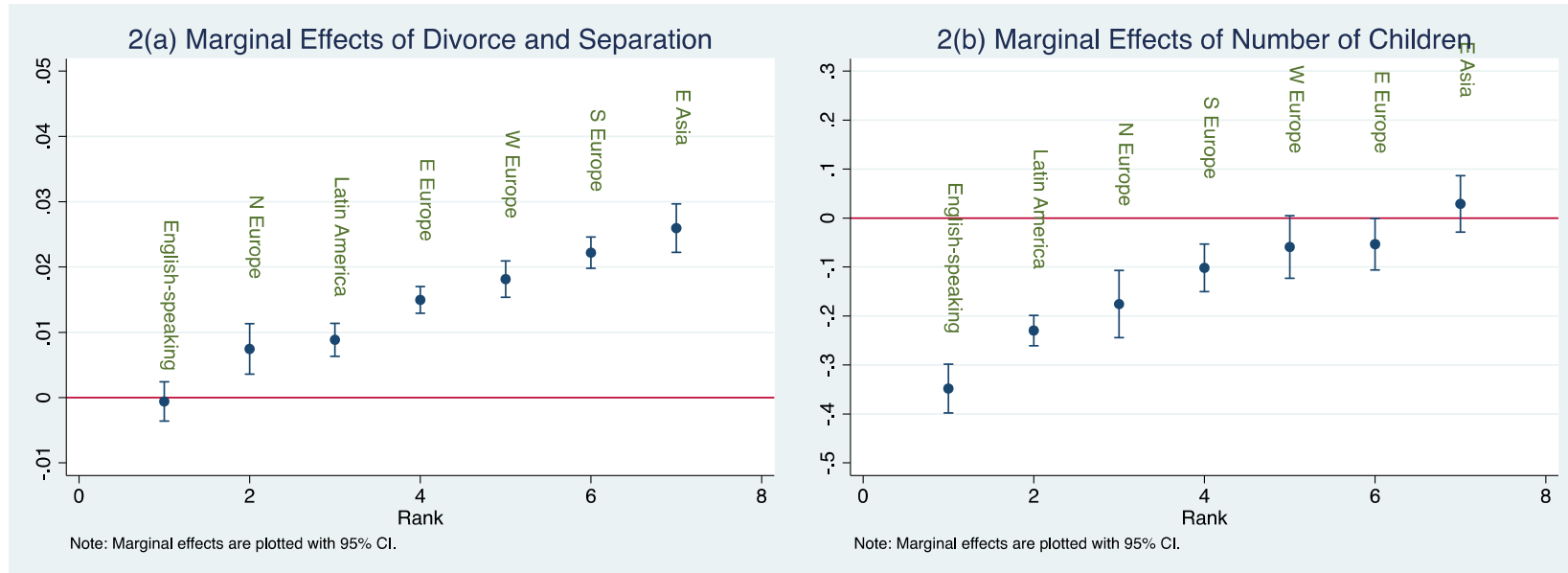


Figure 1.2 continued: Marginal effects of social relationships on logged “adjusted” suicide rates

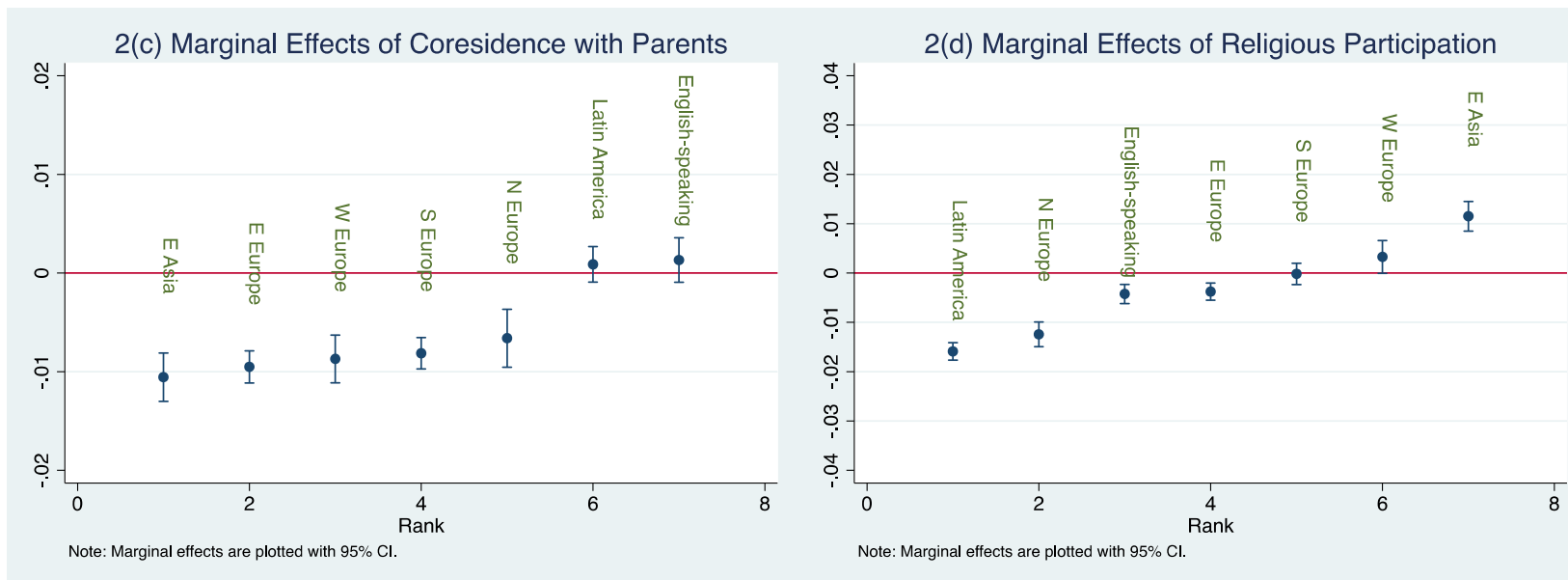
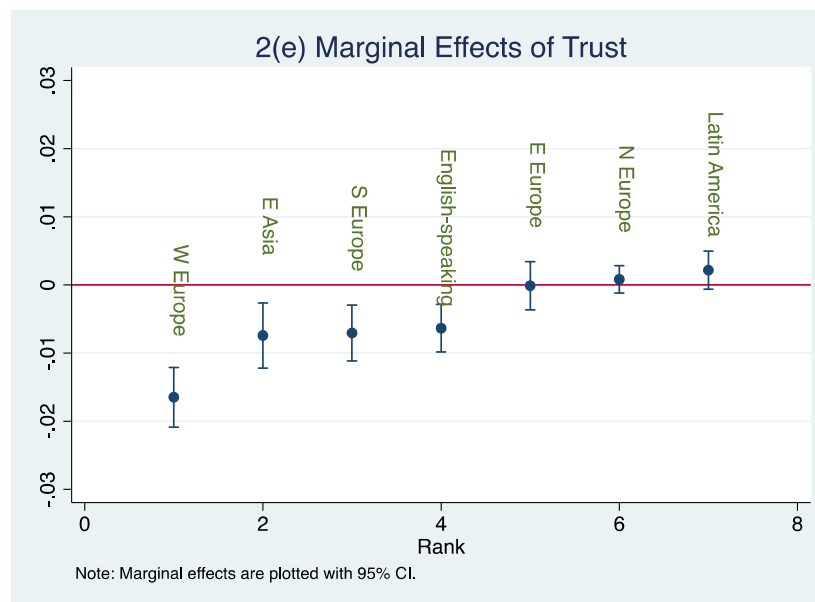


Figure 1.2 continued: Marginal effects of social relationships on logged “adjusted” suicide rates



Note: The “adjusted” suicide rates include suicide rates reported by the WHO and death rates of injury with undetermined intent, unintentional poisoning, and unintentional drowning. The marginal effects are obtained from the multilevel linear regression models (random-slope) that control for age, gender, time trend, the ICD version, and GDP per capita.

Figure 1.3: Marginal effects of religious participation with or without confidence in church as a control variable

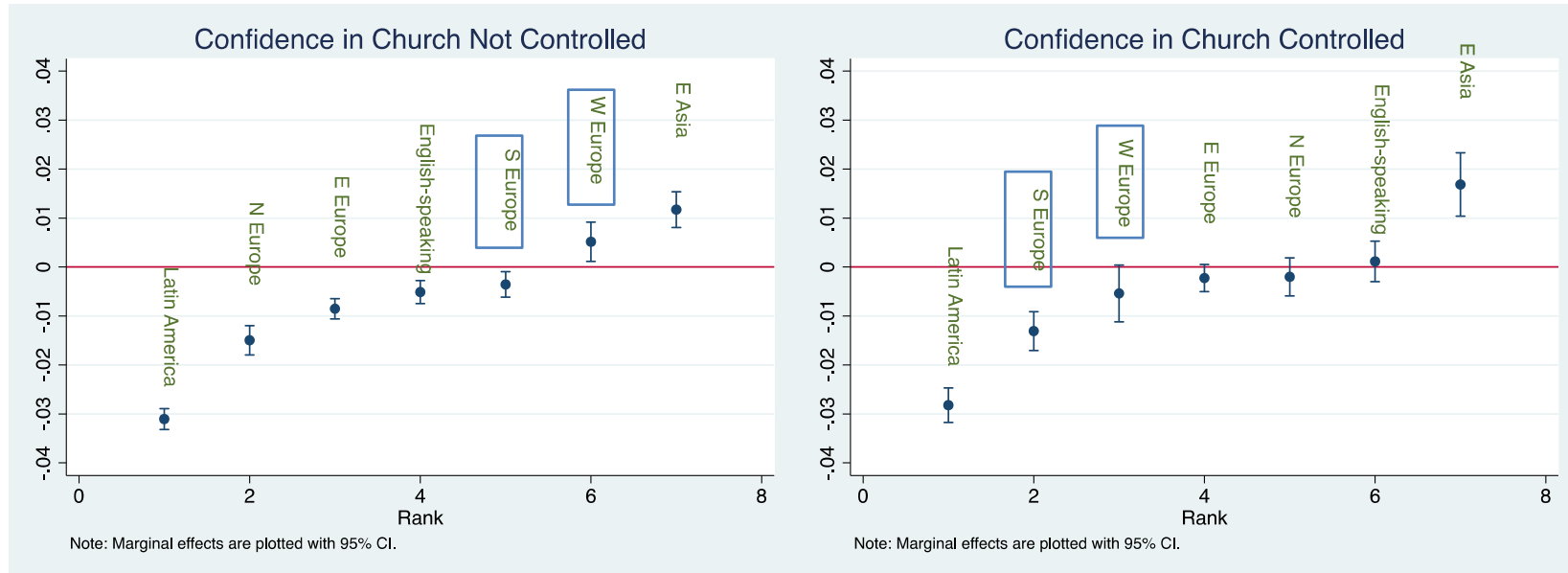
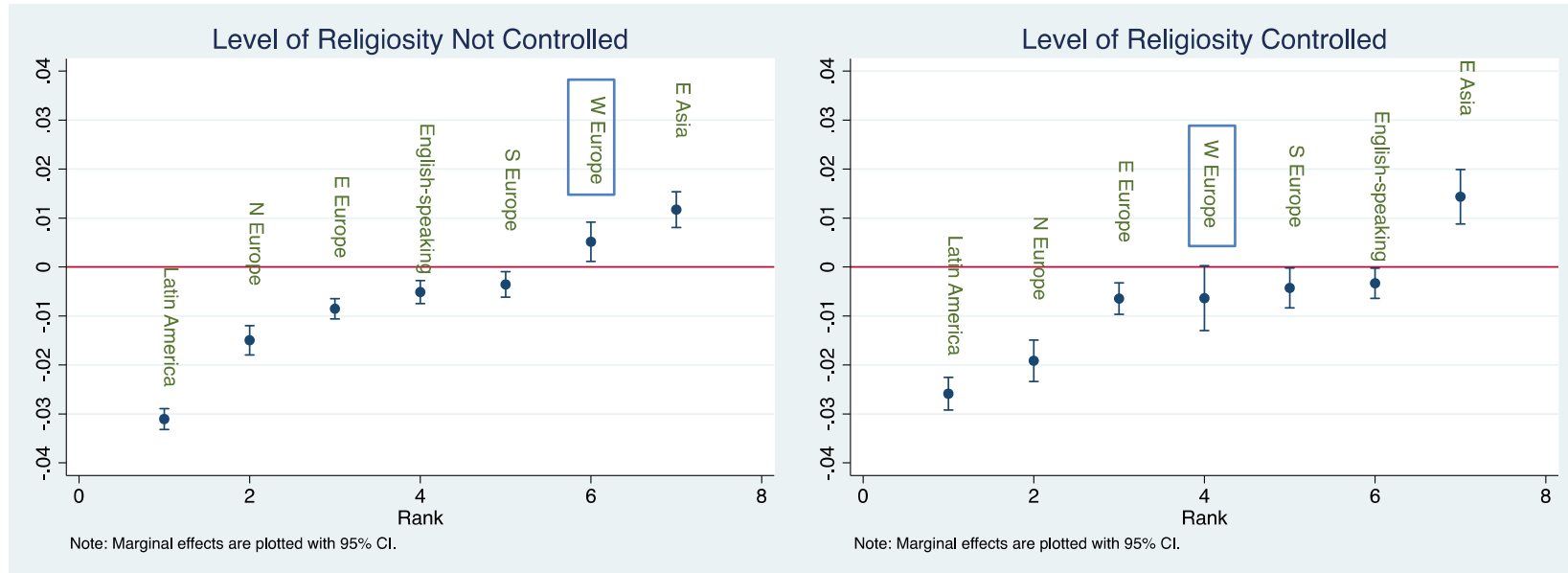


Figure 1.4: Marginal effects of religious participation with or without level of religiosity as a control variable



Appendix

Table A1.1: Number of World Values Surveys participated by sample countries

Country	Wave of the World Values Survey					Total number of surveys participated by each country
	1981-1984	1989-1993	1994-1998	1999-2004	2005-2007	
Argentina	0	1	1	1	1	4
Australia	0	0	1	0	1	2
Austria	0	1	0	1	0	2
Belgium	1	1	0	1	0	3
Brazil	0	1	1	0	1	3
Bulgaria	0	1	1	1	1	4
Canada	1	1	0	1	0	3
Chile	0	1	1	1	1	4
Colombia	0	0	2	0	0	2
Croatia	0	0	1	1	0	2
Czech	0	2	1	1	0	4
Denmark	0	0	0	1	0	1
Finland	0	1	1	1	1	4
France	1	1	0	1	0	3
Germany	0	1	1	1	1	4
Greece	0	0	0	1	0	1
Hong Kong	0	0	0	0	1	1
Hungary	0	1	1	1	0	3
Ireland	1	1	0	1	0	3
Italy	1	1	0	1	1	4
Japan	0	1	1	1	1	4
South Korea	0	0	0	0	1	1
Macedonia	0	0	1	1	0	2
Mexico	0	1	1	1	1	4
Moldova	0	0	1	1	1	3
Netherlands	1	1	0	1	0	3
New Zealand	0	0	1	0	1	2
Norway	0	1	1	0	1	3
Peru	0	0	1	1	0	2
Poland	0	2	1	1	1	5
Portugal	0	1	0	1	0	2
Romania	0	0	1	1	1	3
Singapore	0	0	0	1	0	1
Slovakia	0	1	1	1	0	3
Slovenia	0	1	1	1	1	4
Spain	1	1	1	2	1	6
Sweden	0	1	1	1	1	4
Taiwan	0	0	1	0	1	2
UK	1	1	0	1	0	3
Uruguay	0	0	1	0	1	2
US	1	1	1	1	0	4
Venezuela	0	0	1	1	0	2
Total number of surveys in each wave	9	28	29	34	22	122

CHAPTER 2: ECONOMIC SECURITY, SOCIAL COHESION, AND MENTAL HEALTH DISPARITIES IN TRANSITIONAL SOCIETIES: A COMPARISON OF OLDER ADULTS IN CHINA AND RUSSIA

Introduction

Mental and substance use disorders are major contributors to the global burden of disease, accounting for the largest share (23%) of years lived with disability worldwide as of 2010 (Whiteford et al. 2013). Depression, in particular, is a common mental illness and the leading cause of disability. Depressive symptoms are prevalent among older adults partly due to decline in physical and cognitive health, transition out of social roles (e.g., retirement and widowhood), and shrinkage of social networks (Ross and Mirowsky 2008; Yang 2007). Moreover, the burden of mental and substance use disorders increasingly affects people in less developed countries because of the scarcity, the inequitable distribution, and the inefficient use of mental health resources (Knapp et al. 2006; Saxena et al. 2007). For instance, low- and middle-income countries (LMIC) on average spend less than 2% of their entire health budgets on mental health. As the disease burden is predicted to rise in the foreseeable future, the lack of evidence-based research on mental health in LMIC will become a major obstacle to policy formulation and health intervention (Sharan et al. 2007; Whiteford et al. 2013).

Using data from the WHO Study on Global Ageing and Adult Health, this study examines the prevalence and severity of depressive symptoms among older adults in two middle-income countries, China and Russia. While these two countries have both gone

through drastic social changes due to market reform since 1978 and 1991, respectively, only the population of Russia has experienced severe deterioration in mental and physical health after its structural adjustment, including increased mortality rates attributable to suicide, alcohol consumption, and cardiovascular diseases and consequently shortened life expectancies (Cockerham 2007; Shkolnikov et al. 1998). In contrast, China has made steady progress in various dimensions of population health (Liu, Rao, and Fei 1998). Further, although the general health condition in Russia has gradually recovered to its pre-transition level in the late 2000s, the current health disparity between China and Russia, indicated by their life expectancies, is still large (Figure 1). In particular, the disease burden attributable to mental and substance use disorders is significantly higher in Russia than in China according to the Global Burden of Diseases, Injuries, and Risk Factors Study 2010 (Whiteford 2013)⁵.

As previous studies have shown, market transition weakens individuals' economic security based on guaranteed employment and benefits such as housing, health care, and pension (Carlson 2004; Haggard and Kaufman 2008). Meanwhile, market transition also disrupts social cohesion including trust and sense of community due to elevated uncertainty and competition over economic resources (Kennedy, Kawachi, and Brainerd 1998; Latusek and Cook 2012; Shlapentokh 2006). Since economic and social resources are both critical determinants of health and well-being (Berkman and Glass 2000; House, Landis, and Umberson 1988; Marmot and Wilkinson 2006), this study aims to investigate how these two factors are linked to depression in contemporary China and Russia and

⁵ Russia is among the countries with the highest age-standardized DALY rate per 100,000 individuals, and China is among the countries with the lowest age-standardized DALY rate. DALY refers to disability-adjusted life year.

whether the levels of economic security and social cohesion explain the wide disparity in depression between these two settings.

The rest of the paper is organized as follows. I will first discuss previous findings concerning the importance of economic conditions and social resources in mental health, with special attention given to societies in transition. This discussion will lead to the hypotheses of the current study. Then I will describe the data, variables, and methods used for the empirical analyses. Finally, I will present the results of bivariate and multivariate analyses and discuss their implications and limitations.

Literature Review

Economic Security and Mental Health

In general, individuals with lower socioeconomic status experience higher rates of mental disorders (Eaton, Muntaner, and Sapag 2010). Specifically, lack of financial resources and chronic economic strain are important factors that explain a higher level of perceived stress and depressive symptoms, independent of the effects of education and/or occupation (Hamad et al. 2008; Pearlin et al. 1981; Skapinakis et al. 2006). Previous studies on unemployment and mental well-being have also shown that unemployment reduces security and self-esteem and increases depressive symptoms (Lennon and Limonic 2010). In particular, deprivation of economic means, along with loss of social connection and identity, is linked to the detrimental effects of unemployment. Evidence based on longitudinal and prospective studies suggests that selection processes (i.e., individuals predisposed to mental distress are more likely to become unemployed) only

explain part of the connection between unemployment and mental illness, thereby confirming the existence of a causal relationship (Murphy and Athanasou 1999).

Poverty has been a major barrier to the enhancement of mental well-being in low- and middle-income countries (Patel and Kleinman 2003). Poor living conditions, insecurity of maintaining a self-sufficient life, shame of poverty, and illiteracy or poor education are all related to elevated rates of mental disorders. The lack of access to mental health services further deteriorates the mental well-being of population in a less resourceful context (Collins et al. 2011; Knapp et al. 2006; Saxena et al. 2007). Specifically, government funding on mental health is far lower than is needed: shortages of community-based care, mental health professionals, and effective medications and other treatments are very common. In addition, the low priority of mental health in the public health agenda—due to under-recognition of the prevalence and impact of mental health needs—certainly aggravates the mental health prospect of people in a poorer country.

Because market transition immediately led to a deep recession in Russia but set up sustained economic growth in China, the reform process has severely weakened economic stability in Russia rather than in China (Gang 2001; Liu et al. 1998; Popov 2001). Unemployment and inflation rates rise significantly in post-transition Russia, particularly throughout the 90s. Moreover, the post-transition Russian government has relatively weak financial capacity to maintain an extensive welfare system, including universal health care and pension (Haggard and Kaufman 2008; Popov 2001). Specifically, health management becomes decentralized and health care is under-funded;

supply of health care providers, hospital beds, and medications are unable to meet the needs (Liu et al. 1998; Tulchinsky and Varavikova 1996). Overall, living standards for the majority of Russians have severely deteriorated since the market reform in the early 90s, which is followed by another economic crisis in the late 90s. Studies have indicated that stress from economic turmoil has impaired the mental and physical health of the Russian population (Carlson 2004; Cockerham, Hinote, and Abbott 2006).

Social Cohesion and Mental health

A large body of research has shown that social bonds and supportive relationships are associated with better mental health outcomes (Berkman and Glass 2000; House et al. 1988; Lin, Ye, and Ensel 1999; Turner and Brown 2010). Specifically, cohesive social relationships promote mental health through providing individuals with instrumental, emotional, and informational assistance. Since support from social ties helps individuals cope with crises and adapt to major life transitions, it may be particularly beneficial in stressful circumstances (Cassel 1976; Cobb 1976). In addition, cohesive relationships foster a sense of meaning and belonging and facilitate health-promoting behaviors such as regular exercise, healthy diet, and limited consumption of tobacco and alcohol.

Because societies in transition usually experience drastic socioeconomic and/or political transformation, social cohesion can be severely disrupted and thus the mental health of individuals can be compromised during the transition (Minagawa 2013; Rose 2000). As Durkheim's (1897) theory on anomie has indicated, structural change of a society undermines social integration and social regulation that constrain individuals'

deviant behavior and thus prevent the occurrence of failure, frustration, and despair. Other research in transitional settings has also suggested that new challenges to the development of a civic society emerge right after the collapse of a repressive socialist regime. In countries of former Soviet Union, institutional capacities including enforcement of the rule of law, delivery of public goods such as health care and social security, and control of consumer prices all significantly declined during the transformation (Popov 2001). This was closely followed by the loss of trust in public institutions and a growing sense of alienation from political power among civilians (Cornia and Popov 2001; Raiser et al. 2002; Shlapentokh 2006). In particular, trust in bureaucracy, law enforcement agencies, and “democratic” institutions are extremely low in contemporary Russia. Although trust among family and close friends may remain high, trust in institutions, communities, and strangers is generally low in Russia (Freitag and Traunmüller 2009; Latusek and Cook 2012). Finally, even if the number of non-governmental organizations has grown in Russia since the fall of Soviet Union, participation rates in such organizations remain low (Ferlander and Mäkinen 2009).

In China, trust in public institutions is much higher in part because the transition takes a slower pace, the economic boom raises standards of living, and the communist government carefully controls the social and political order (Steinhardt 2012; Tan and Tambyah 2011). However, the market reform has also brought a more fragmented society. Specifically, the privatization or bankruptcy of state-owned enterprises has changed individuals’ relationship with the state and their work communities (Ruan et al. 1997). Individuals nowadays shoulder more responsibilities of their basic needs including

housing, medical care, and education, which used to be state-sponsored. Concomitant with the de-collectivized institutions is a moral change: pursuit of personal desires is no longer always submissive to group interest for family, neighbors, rural communes or urban work units, and the state (Kleinman et al. 2011). In addition, rapid economic growth with unequal development between rural and urban areas have encouraged large-scale internal migration, which alters the living arrangements of migrant families and most likely weakens social support from family ties (Lu, Hu, and Treiman 2012).

Studies on Russia and China have demonstrated that various indicators of social cohesion are associated with health and well-being. In particular, trust, confidence in public institutions, membership in organizations, and formal or informal networks that individuals can turn to when they need help generally predict better physical and mental well-being in Russia (Carlson 2004; D'Hombres et al. 2010; Ferlander and Mäkinen 2009; Kennedy et al. 1998; Rose 2000). Similar results have also been found in research on East Asian societies, including China (Yamaoka 2008; Yip et al. 2007). However, several studies have further indicated that trust is more consistently related to self-rated health, mental health, or subjective well-being; in contrast, organizational membership less consistently predicts levels of health and well-being (D'Hombres et al. 2010; Yip et al. 2007). Lastly, although the association between cohesive social relationships and mental health is confirmed in Russia and China, respectively, few studies have examined whether social cohesion is one of the major factors that explain the mental health disparity between these two societies.

Hypotheses

- I. Lower levels of economic security among Russians, compared to Chinese, partly explain their relatively high levels of depressive symptoms. In particular, economic crises in Russia since its market reform have significantly reduced the living standards of the Russian majority, causing chronic strains and, in turn, poorer mental health. By contrast, the Chinese economy has grown steadily and rapidly since its reform, which reflects on individuals' higher satisfaction with their financial situations and thus explains their better mental health.
- II. Lower levels of social cohesion experienced by Russians, compared to Chinese, also partly explain their relatively high prevalence and severity of depression. While market transition has introduced drastic socioeconomic and/or political transformation in both societies, social integration and social regulation seem to be more disrupted in contemporary Russia. In general, Russians have much lower confidence in public institutions and less trust in people outside their immediate social circles (i.e., family and close friends), which is linked to their poorer mental well-being.

Data and Methods

Data

The study uses data from the first wave (2007-2010) of the WHO Study on Global AGEing and Adult Health (SAGE). The SAGE drew nationally representative samples of

older adults aged 50+ years in six low- and middle-income countries, including China and Russia (Kowal et al. 2012).⁶ Samples were selected using multi-stage random sampling with stratification by province/oblast and area (urban/rural). The analytical sample includes 12,634 and 3,829 older adults in China and Russia, respectively. Finally, the face-to-face interviews conducted by the SAGE survey team have generally high response rates: 93% in China and 83% in Russia.

Measures

Depression is measured by two variables based on self-reported depressive symptoms that closely match the diagnostic criteria for major depressive disorder in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV). One variable is a categorical screening measure, with 0 indicating that during the last 12 months the respondent has never had a period lasting several days when he or she either “felt sad, empty, or depressed (depressed mood)”, “lost interest in most thing he or she usually enjoy (loss of interest)”, or “felt energy decreased or tired all the time (low energy)”, 1 indicating that the respondent has experienced any of these three symptoms for several days, and 2 indicating that the respondent has experienced any of these three symptoms nearly everyday for more than 2 weeks. The other variable is a count of 16 depressive symptoms during the last 12 months, including depressed mood/loss of interest/low energy, experience of depressed mood/loss of interest/low energy for more than 2 weeks, experience of depressed mood/loss of interest/low energy most of the day nearly

⁶ The SAGE also drew samples of younger adults aged 18-49 years for comparison purposes. However, the sample size of younger adults is much smaller, accounting for only about 10% of the entire sample in China and Russia.

everyday, loss of appetite, slowing down in thinking, slowing down in moving around, feeling worried and anxious, feeling restless or jittery, having problems falling asleep, waking up too early, having difficulties to concentrate, feeling negative about oneself or loss of confidence, feeling hopeless, decrease in interest in sex, thoughts of death, and suicide attempts.

Several studies suggest that cross-national variation in the levels of mental disorders may be attributed to the under-report of mental illness in one country relative to another due to unawareness of or reluctance to admit mental illness (Kessler et al. 2007; The WHO World Mental Health Survey Consortium 2004). Other studies on health-reporting styles also argue that the way in which individuals rate their health may differ significantly across cultures, with some being more “health-optimistic” than others, which partly explains the health differences observed between countries (Grol-Prokopczyk, Freese, and Hauser 2011; Zimmer et al. 2000). To address this reporting bias, I will use anchoring vignettes to test if mental health differences between Chinese and Russians are largely attributed to different rating styles. Anchoring vignettes for intergroup health comparison are short texts depicting the health conditions of hypothetical individuals. Assuming that survey respondents use the same rating standard to evaluate the health of hypothetical characters (typically with various levels of health and functional abilities) and their own health, anchoring vignettes account for the effects of rating styles to reflect the “true” intergroup health difference (For methodological details, see Grol-Prokopczyk et al. (2011) and King et al. (2004)). The SAGE asked two questions of self-assessed psychological well-being that have corresponding anchoring

vignettes: “overall in the last 30 days, how much of a problem did you have with (1) feeling sad, low, or depressed and (2) worry or anxiety? (none, mild, moderate, severe, or extreme)”. These questions cover two of the symptoms that are used to measure the depression variables described earlier, and they have different response categories (5 instead of 2 categories) and time frame (the last 30 days rather than 12 months). For the vignettes used in this study, see the Appendix.

Economic security is measured by a standardized scale that includes three components regarding household and personal finances: whether the respondent believes that his/her household income is enough to cover his/her daily living, how the respondent perceives his/her household’s financial situation, and the degree to which the respondent reports he/she has enough money to meet his/her own needs ($\alpha=0.71$).

Social cohesion is measured by a set of variables from the inner to the outer social circle, including marital/cohabiting status, whether having a confidant, trust in neighbors and coworkers, community participation, perceived safety in one’s residential neighborhood, and general social trust. Marital/cohabiting status indicates whether an individual is currently married/cohabiting or not. Whether having a confidant indicates whether an individual has someone to trust and confide in. Trust in neighbors and coworkers is a scale combining two items: trust in people in the respondent’s neighborhood and trust in people whom the respondent works with ($\alpha=0.82$). The scale is standardized for the convenience of interpretation. Community participation is also a standardized scale that indicates the frequency of involvement in community activities in the last 12 months. It includes nine items: attending public meetings in

which there was discussion of local or school affairs, meeting personally with a community leader, attending any group, club, society, union, or organization meeting, working with people in the neighborhood to fix or improve something, having friends over to one's home, being in the home of someone who lives in a different neighborhood, socializing with coworkers outside of work, attending religious services (excluding weddings and funerals), and getting out to attend social meetings, activities, programs or events or to visit relatives or friends ($\alpha=0.72$). Perceived safety is another standardized scale that represents two items: how safe from crime and violence does the respondent feel when he or she is alone at home and how safe the respondent feels when walking down his/her street alone after dark ($\alpha=0.78$). Finally, general social trust indicates that an individual believes that most people can be trusted.

Control variables include gender and age. According to previous research, women tend to have higher rates of mental distress than men, particularly depression and anxiety, partly due to greater constraints on personal advancement (e.g., work-family tensions)(Mirowsky and Ross 1995). Moreover, age is associated with mental health due to life-cycle factors. In particular, levels of depression increase from middle age to old age, reflecting widowhood, retirement, deterioration of physical functions, and other changes in late adulthood (Mirowsky and Ross 2010).

Methods

I first used bivariate analysis to examine cross-national differences in the levels of depression, economic security, and social cohesion. I then adopted ordered logistic

regression and negative binomial regression (for the ordinal variable and the count variable of depression, respectively) to study whether social cohesion and economic security explain country differences in the level of depression. Moreover, I tested whether the effects of social cohesion and economic security vary between countries by interacting country variable with social cohesion and economic security variables. Finally, I conducted a separate analysis using anchoring vignettes to assess the extent to which health-rating style accounts for mental health disparities between China and Russia. Hierarchical ordinal probit (hopit) regression is used in this analysis (Grol-Prokopczyk et al. 2011; Rabe-Hesketh and Skrondal 2002). Hopit regression, by rescaling the thresholds of standard ordered probit regression, can minimize the effects of rating styles on cross-national differences in self-rated health.

Results

Country Differences in Depression, Economic Security, and Social Cohesion

There are significant country differences in the level of depression, economic security, and social cohesion. Table 2.1 shows that Russians are much more depressed than Chinese. Specifically, Russians are more likely to feel sad, empty, or depressed (depressed mood), to lose interest in most things they usually enjoy (loss of interest), or to feel energy decreased or tired all the time (low energy) for several days or for more than two weeks during the past 12 months. They also report a higher number of depressive symptoms than Chinese in the past 12 months. These results are consistent with the other two indicators of psychological well-being, which are used to assess the effects of health-

rating styles with anchoring vignettes. In particular, Russians report feeling sad, low, or depressed more severely than Chinese in the last 30 days; they also have more problems with worry and anxiety in the last 30 days.

Moreover, Russians perceive lower levels of economic security than Chinese: only 23.6% of Russians report that her/his household income is enough to cover daily living; in contrast, 70.6% of Chinese report having enough household income (Table 2.2). Likewise, Russians are more likely to report having a bad or very bad household financial situation than Chinese. Regarding personal finance, Russians are also more likely to report having insufficient amount of money to meet their own needs. Overall, the score that summarizes the above three indicators suggests that Russians are significantly less satisfied with their household and personal economic situations than Chinese.

In addition, various social cohesion indicators demonstrate that Russian society is generally less cohesive than Chinese society. First, a smaller proportion of people are married or cohabiting in Russia than in China (57.1% versus 83.5%). Further, Russians are less likely to report having a confidant or someone to trust and confide in than Chinese (78.2% versus 98.2%). Likewise, trust in neighbors and coworkers, perceived safety in the neighborhood, and general social trust (belief that most people can be trusted) are all significantly lower in Russia than in China. The only exception is that Russians report participating in community activities more frequently than Chinese.

Explaining the Cross-National Disparity in Depression

According to results from multivariate regression models, the country difference in depression is attributable to both economic security and social cohesion. Table 2.3 shows that these two factors explain a significant proportion of the different levels of three screening symptoms (depressed mood, loss of interest, and low energy) between countries. Specifically, the odds of experiencing more severe depressive symptoms are 4.1 times higher in Russia than in China (Model 1). This mental health disparity in odds ratio is reduced to 3.3 times when economic security is taken into account (Model 2). In particular, satisfaction with household and personal financial conditions is strongly related to a lower level of depression: an increase in economic security by a standard deviation is related to a decrease in the odds of depression by 37% (odds ratio=0.63). The effects of economic security explain about 20% of the country difference in depression. Furthermore, when the social cohesion indicators are considered, the mental health disparity between Russia and China also narrows: the odds ratio is reduced from 4.1 to 2.9 (Model 3). This demonstrates that social cohesion explains about 30% of the country difference in depression. Finally, the joint effects of economic security and social cohesion are responsible for about 40% of the depression gap between countries (Model 4).

A similar pattern is found in the analysis of the count of depressive symptoms (Table 2.4). All the economic security and social cohesion variables are negatively associated with number of depressive symptoms. In particular, economic security and marital/cohabiting status have the strongest negative relationship with depression. Moreover, the inclusion of the economic security variable reduces the mental health gap

between countries from 3.1 to 2.5 (incidence rate ratio), a 19% reduction (Model 2). Also, the social cohesion variables together close the depression gap from 3.1 to 2.0 (incidence rate ratio), a 35% reduction (Model 3). Lastly, economic security and social cohesion jointly reduce the country ratio of the incidence rates from 3.1 to 1.8, explaining 42% of the depression disparity between China and Russia (Model 4).

In fact, the role of economic security and social cohesion in the cross-national depression gap is not only attributed to the lower level of economic and social resources in Russia relative to China, but also to the weaker effects of economic and social resources in Russia than in China. Table 2.5 demonstrates that an increase in the economic security scale by a standard deviation is related to 43% decrease in the incidence rate of depressive symptoms in China, but only 27% decrease in Russia. Also, having a confidant and reporting most people can be trusted are both more strongly associated with lower incidence rates of depressive symptoms in China compared to Russia. Specifically, having a confidant is linked to 52% reduction in the incidence rate of depressive symptoms in China, but it has no significant relationship with depression in Russia. Similarly, a standard-deviation increase in general social trust is linked to 36% reduction in the incidence rate of depressive symptoms in China but, again, no significant reduction in Russia. Overall, economic security and social cohesion seem to be less beneficial to mental health in Russia than in China.

The Role of Health-Rating Style

The lower prevalence and severity of depression among Chinese relative to Russians may result from more optimistic health-rating styles in China due to, for example, unawareness of mental illness and reluctance to admit mental illness. Anchoring vignettes help assess the role of reporting bias in the depression gap between countries. Table 2.6 shows that health-rating style only contributes to a small proportion of country differences in mental well-being. In particular, Russians are more likely to report feeling sad, low, or depressed than Chinese in the past 30 days regardless of health-rating styles. This gap remains significant in the hopit model, where rating styles are taken into account using anchoring vignettes. In comparison to the ordered probit model (rating styles are unadjusted), the magnitude of the depression gap is attenuated by only 15%. Likewise, Russians report more worry and anxiety than Chinese in the past 30 days. However, this cross-national gap is barely explained by the way in which people rate their mental well-being: the magnitude of the worry/anxiety gap decreases by just 5% after health-rating style is adjusted). As a result, a more optimistic health-reporting fashion is unlikely to be a major factor in the higher levels of mental health reported by Chinese relative to Russians.

Discussion

Mental and substance use disorders, particularly depression, are the leading causes of disability worldwide. The disease burden is predicted to affect individuals in low- and middle-income countries more severely over time in part because of their insufficient access to and inefficient use of mental health resources. The current study examines

depression among adults aged 50 and above in two emerging societies, China and Russia, focusing on the roles of economic security and social cohesion in their mental health disparity. The study shows that, while these two countries have both recently gone through drastic social and economic transformation due to market reform, people in China are significantly less depressed than their counterparts in Russia. In particular, the significant lower levels of depressive symptoms among Chinese is in part attributed to their higher satisfaction with personal and household finances and their more cohesive social relationships. Moreover, using anchoring vignettes, the study demonstrates that being more or less health-optimistic only contributes to a small proportion of the cross-national difference in mental well-being.

These findings have several implications. First, market transition has led to divergent trajectories of economic development in China and Russia, creating different levels of economic security and, in turn, mental health disparities. Specifically, in contrast to China's sustained growth since its market reform, the post-transition Russia has been struck by several severe recessions, throughout the early 90s, in 1998, and again in 2009, according to the World Development Indicators. The relatively unstable economy reflects on the lower level of economic security perceived by contemporary Russians. Previous studies have further suggested that the magnitude of the restructuring recession in Russia is partly due to its over-industrialization on the eve of the market reform: heavy investment in capital-intensive industries (e.g., machinery and defense) at the expense of the service sector (e.g., trade and financial services); in contrast, the degree of economic distortion in pre-transition China was much lower because the

economy still mostly relied on agriculture (Gang 2001; Popov 2001). At the same time, the unfavorable economic environment in Russia have weakened the financial capacity of the state, leading to increasingly strained and devalued health care and social security systems (Haggard and Kauman 2008). Corresponding to research arguing that economic strains impair mental and physical health during market transition (Carlson 2004; Cockerham 2006, 2007; Shkolnikov et al. 1998), this study argues that the lack of economic security also accounts for the higher levels of depression among Russians relative to Chinese in the post-transition era.

Further, social cohesion has been more severely disrupted in Russia than in China during the transition, which contributes to a higher level of depression in the former than the latter. In addition to deep recessions, the structural change in Russia has also generated concerns of social disorganization, including poor enforcement of law and order, increased crime rates, loss of trust in public institutions, communities, and strangers, and a growing sense of alienation from political elites among civilians (Cornia and Popov 2001; Freitag 2009; Latusek and Cook 2012; Raiser et al. 2002; Shlapentokh 2006). Although individualization and fragmentation also face the Chinese society in the transitional process, few studies have raised similar concerns about social trust and confidence in public institutions in China (Steinhardt 2012; Tan 2011). Moreover, as previous research has indicated that cohesive social relationships are linked to better mental and physical health in the respective countries (Carlson 2004; D'Hombres 2010; Kennedy, Kawachi, and Brainerd 1998; Minagawa 2012; Rose 2000; Yamaoka 2008; Yip et al. 2007), this study further demonstrates that difference in social cohesion is an

important factor in the between-country depression gap. The findings are consistent with Durkheim's (1897) notion of anomic suicide—large-scale change of the society undermines social integration and social regulation that protect individuals from feeling detached, frustrated, or despaired.

Finally, it is unlikely that a significant proportion of the depression gap between China and Russia is attributed to health-rating style. Several studies suggest that mental health disparities across countries should be interpreted with great caution because how people report their mental well-being is shaped by their awareness of and shame/stigma about mental illness (Kessler et al. 2007; The WHO World Mental Health Survey Consortium 2004); however, few studies have empirically assessed this argument. Using anchoring vignettes, the current study shows that systematic reporting bias plays a minor role in the different levels of depressive symptoms between Chinese and Russians. Although the data only allow testing for the effect of rating style for two depressive symptoms (sad/low/depressed mood and worry/anxiety), the study finds that rating style does not explain much of the cross-national variation in either of these symptoms.

Several limitations of the current study should be acknowledged. First, since the analyses use cross-sectional data, the study cannot make causal interpretations regarding the relationship between economic security and depression or between social cohesion and depression. In particular, the study cannot rule out the possibility of reverse causation—mental distress may weaken an individual's ability to work and to maintain social ties (Chen and Kaplan 2003; House et al. 1988; Wiesner et al. 2003). Further, without longitudinal observations dated back to a pre-transition period, the study does not

demonstrate that distinct processes of market transition lead to different levels of economic and social well-being, which then generate the current mental health gap between China and Russia. However, the implications of market transition for the link between economic stability, social capital, and health disparities are supported by the theory of anomie and empirical evidence since the 1990s (Carlson 2004; Cockerham 2006; D'Hombres 2010; Ferlander et al. 2009; Liu, Rao, and Fei 1998; Minagawa 2012; Rose 2000).

Another research limitation is that the models testing the roles of economic security and social cohesion and those testing the role of health-rating style in the mental health disparity are not integrated. This is because the depression measures in the former models differ from the measures of psychological well-being (or the anchoring vignettes) in the latter models. Specifically, the depression measures are adapted from the DSM-IV diagnostic criteria for the major depressive disorder, including multiple aspects/symptoms of depression. In contrast, the measures of psychological well-being cover only two of the depressive symptoms, which use a different response categorization and time frame. While the study cannot combine these two analyses to evaluate the relative importance of economic security and social cohesion versus health-rating style, a separate analysis of health-rating style still addresses a fundamental concern of comparative health research. That is, mental health disparities by country are not significantly driven by artifacts, at least in the context of China and Russia.

Despite these limitations, the study fills an important gap in the literature on the mental health of populations in emerging societies. As there is a lack of evidence-based

research on mental health in low- and middle-income countries, where the burden of mental disorders is insufficiently addressed (Sharan et al. 2007; Whiteford 2013), the current study examines a common and debilitating mental illness, depression, in two transitional countries. Particularly, the study explains the wide disparity in depression between China and Russia, both of which have recently experienced market reform. From the view of political economy and sociology, the study shows that economic security and social cohesion, shaped by the structural transformation, play a significant role in the cross-national mental health disparity. The findings suggest that by considering the social, economic, and political/historical circumstances of selected countries, future research will be able to expand the understanding of global mental health beyond descriptive epidemiology of mental illness.

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Table 2.1: Descriptive statistics of depressive symptoms by country

Variable	China	Russia
Screening for depression: depressed mood, loss of interest, and low energy (%)***		
Having none of the symptoms lasting for several days	85.3	58.0
Having any of the symptoms lasting for several days	13.4	36.5
Having any of the symptoms nearly everyday for more than 2 weeks	1.3	5.5
Number of depressive symptoms (0-16)***		
Mean	0.3	1.1
S.D.	0.0	0.0
Feeling sad, low, or depressed in the last 30 days***		
None	82.1	59.6
Mild	14.0	23.6
Moderate	3.1	12.4
Severe	0.8	3.9
Extreme	0.1	0.5
Worry or anxiety in the last 30 days***		
None	81.8	49.9
Mild	14.2	31.8
Moderate	3.3	13.7
Severe	0.7	4.1
Extreme	0.0	0.7
N	12,536	3,821

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (two-tailed).

Table 2.2: Descriptive statistics of economic security and social cohesion by country

Variable	China	Russia
<i>Economic security</i>		
HH income is enough to cover daily living (%)***	70.6	23.6
HH financial situation (%)***		
Very good	1.2	0.6
Good	13.7	11.6
Moderate	62.5	56.6
Bad	19.9	27.0
Very bad	2.9	4.4
Having enough money to meet one's own needs***		
Completely	13.0	9.9
Mostly	37.6	27.2
Moderately	28.7	31.4
A little	18.3	16.5
Not at all	2.4	15.0
Summary score, standardized***	0.2	-0.3
<i>Social cohesion</i>		
Married/cohabiting (%)***	83.5	57.1
Having a confidant (%)***	98.2	78.2
Trust in neighbors and coworkers (standardized summary score)***	0.4	-0.5
Community participation in the past 12 months (standardized summary score)***	-0.2	0.0
Perceived safety in the neighborhood (standardized summary score)***	0.2	-0.8
Reporting most people can be trusted (%)***	88.9	29.8
N	12,536	3,821

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (two-tailed).

Table 2.3: Ordered logit regression of depression screening on economic security and social cohesion (odds ratio)

	Model 1	Model 2	Model 3	Model 4
Russia	4.14** (0.17)	3.28** (0.14)	2.90** (0.17)	2.58** (0.15)
Female	1.49** (0.06)	1.45** (0.06)	1.33** (0.06)	1.35** (0.06)
Age	1.00* 0.00	1.01** 0.00	1.00 0.00	1.00 0.00
Economic security		0.63** (0.01)		0.65** (0.01)
Married/cohabiting			0.69** (0.03)	0.78** (0.04)
Having a confidant			1.08 (0.08)	1.13 (0.09)
Trust in neighbors and coworkers			0.88** (0.02)	0.90** (0.02)
Community participation in the past 12 months			0.91** (0.02)	0.96+ (0.02)
Perceived safety in the neighborhood			0.87** (0.02)	0.91** (0.02)
Reporting most people can be trusted			0.92 (0.05)	0.93 (0.05)
Constant (cut 1)	9.62** (1.28)	10.23** (1.39)	3.84** (0.69)	5.84** (1.07)
Constant (cut 2)	121.29** (17.33)	135.80** (19.71)	49.50** (9.21)	78.55** (14.91)
N	16,357	16,357	16,357	16,357

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (two-tailed). Standard errors are in parentheses.

Table 2.4: Negative binomial regression of number of depressive symptoms on economic security and social cohesion (incidence rate ratio)

	Model 1	Model 2	Model 3	Model 4
Russia	3.09** (0.15)	2.51** (0.12)	2.02** (0.13)	1.80** (0.11)
Female	1.54** (0.07)	1.49** (0.07)	1.35** (0.06)	1.35** (0.06)
Age	1.00* 0.00	1.01** 0.00	1.00 0.00	1.00 0.00
Economic security		0.60** (0.01)		0.63** (0.01)
Married/cohabiting			0.75** (0.04)	0.82** (0.05)
Having a confidant			0.84* (0.07)	0.89 (0.08)
Trust in neighbors and coworkers			0.92** (0.03)	0.95* (0.03)
Community participation in the past 12 months			0.83** (0.02)	0.87** (0.02)
Perceived safety in the neighborhood			0.81** (0.02)	0.86** (0.02)
Reporting most people can be trusted			0.86* (0.05)	0.83** (0.05)
Constant	0.21** (0.03)	0.17** (0.02)	0.63* (0.12)	0.41** (0.08)
Ln (alpha)	5.64** (0.15)	4.99** (0.13)	5.34** (0.14)	4.83** (0.13)
N	16,357	16,357	16,357	16,357

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (two-tailed). Standard errors are in parentheses.

Table 2.5: Effects of social cohesion and economic security on number of depressive symptoms by country (incidence rate ratio)

	China	Russia	Country Difference
Economic security	0.57***	0.73***	***
Married/cohabiting	0.81*	0.85*	
Having a confidant	0.48**	1.04	***
Trust in neighbors and coworkers	0.98	0.96	**
Community participation in the past 12 months	0.89**	0.87**	
Perceived safety in the neighborhood	0.84**	0.89**	**
Reporting most people can be trusted	0.64***	1.11	***

Note: Effects are all independent of gender, age, and the rest of the variables in the table. The coefficient estimates are in incidence rate ratio and tested against 1 (null effect). Country difference is tested using the interaction term between the country variable and a social cohesion or economic security variable.

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (two-tailed).

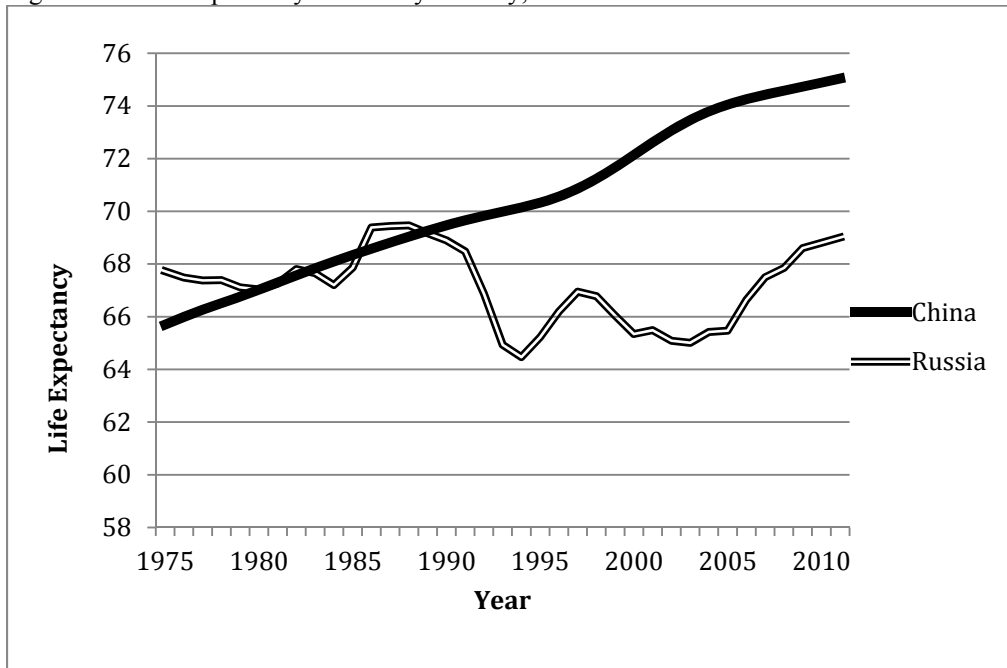
Table 2.6: Ordered probit and hopit regressions of psychological well-being on country and demographic variables

	Ordered probit		hopit (Health-rating style is adjusted across countries)	
	Coeff.	SE	Coeff.	SE
Feeling sad, low, or depressed				
Russia	0.80***	0.03	0.68***	0.07
Female	0.23***	0.02	0.22***	0.05
Age	0.01***	0.00	0.02***	0.00
Mother's education (Ref: no school)				
Some/completed primary school	-0.13***	0.03	-0.20**	0.07
Completed secondary school	-0.19***	0.05	-0.28*	0.12
Completed high school and more	-0.29***	0.05	-0.26*	0.10
Worry or anxiety				
Russia	0.96***	0.03	0.91***	0.07
Female	0.25***	0.02	0.27***	0.05
Age	0.01***	0.00	0.01***	0.00
Mother's education (Ref: no school)				
Some/completed primary school	-0.09**	0.03	-0.09	0.08
Completed secondary school	-0.10*	0.05	-0.14	0.12
Completed high school and more	-0.25***	0.05	-0.25*	0.11

Note: Mother's education rather than respondent's education is used to represent socioeconomic status because the Chinese sample includes many missing values for the respondent's own education.

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (two-tailed).

Figure 2.1: Life Expectancy at Birth by Country, 1975-2011



Source: World Development Indicators, The World Bank

Appendix

The WHO SAGE Anchoring Vignettes for Health State Descriptions

Introduction Text

This next section will require additional concentration. I will read to you some stories about people with varying levels of difficulties in different areas of health. I want you to think about these people's experiences as if they were your own. Once I have finished reading each story, I will ask you to rate what happened in the story.

I would like to know how you view each story and rate how much of a problem or difficulty the person described has in that area of health in the same way that you described your own health to me earlier. While giving the rating, think of the person in the story as someone who is of your age and background.

Affect Series

[Wen] feels nervous and anxious. He worries and thinks negatively about the future, but feels better in the company of people or when doing something that really interests him. When he is alone he tends to feel useless and empty.

[Manjima] enjoys her work and social activities and is generally satisfied with her life. She gets depressed every 3 weeks for a day or two and loses interest in what she usually enjoys but is able to carry on with her day to day activities.

[Lindiwe] feels depressed most of the time. She weeps frequently and feels hopeless about the future. She feels that she has become a burden on others and that she would be better dead.

[Arvind] loves life and is happy all the time. He never worries or gets upset about anything and deals with things as they come.

[Ang] has already had five admissions into the hospital because she has attempted suicide twice in the past year and has harmed herself on three other occasions. She is very distressed every day for the most part of the day, and sees no hope of things ever getting better. She is thinking of trying to end her life again.

These five vignettes about affect, with different levels of mental well-being, are presented to a random subsample of the SAGE respondents. After each vignette, respondents were asked the following two questions:

- (1) Overall in the last 30 days, how much a problem did [name/he/she] have with feeling sad, low, or depressed—none, mild, moderate, severe, or extreme?
- (2) Overall in the last 30 days, how much a problem did [name/he/she] have with worry or anxiety—none, mild, moderate, severe, or extreme?

**CHAPTER 3: INTERPERSONAL NETWORKS IN COMPARATIVE
PERSPECTIVE: THE CORE DISCUSSION NETWORKS IN CHINA, JAPAN,
AND THE U.S.**

Introduction

Research has widely acknowledged the significance of interpersonal networks. Through providing social support, a sense of belonging, and moral guidance and monitoring, interpersonal networks shape and are shaped by a broad range of life domains including employment and health and well-being (Berkman and Glass 2000; Bian 1997; Fiori, Antonucci, and Cortina 2006; Granovetter 1973; House, Umberson, and Landis 1988; Lin, Ye, and Ensel 1999; Umberson, Crosnoe, and Reczek 2010; Wethington and Kessler 1986). For example, weaker network ties may facilitate job search because they offer diverse sources of information beyond that available in one's social circles (Granovetter 1973), and stronger network ties may reduce depressive symptoms for their readiness to provide intense emotional support (Lin et al. 1999). Analysis of interpersonal networks improves our understanding of social environment and gives us insights into individuals' social, economic, physical, and mental well-being.

This study examines the structure of core interpersonal networks in three national contexts—China, Japan, and the U.S. It analyzes the extent to which broader social structure drives cross-national differences in interpersonal networks. In particular, China, Japan, and the U.S have very different socio-demographic profiles, including age structure, sex ratio, marriage rate, level of education, employment rate, and household

size, all of which imply unequal demand for and supply of relational resources and may explain the cross-national variation in network structure such as size, kin composition, and density. Moreover, results from the study are used to assess whether the cultural orientation of social relationships—individualism versus collectivism—shape the structure of interpersonal networks as previous studies suggest (Markus & Kitayama, 1991; Markus & Schwartz, 2010).

While research indicates the importance of social context in shaping individuals' personal networks, few studies have empirically tested the hypothesis perhaps because comparative data are rarely available. Indeed, the majority of research on social networks focuses on a single context, most likely an industrialized setting such as the U.S. In addition, among the few comparative works, none have considered the effects of broader social and demographic structure on cross-national variation in personal networks. To address these gaps in the literature, the current study uses population-level data to: (1) demonstrate the diversity of interpersonal networks across national contexts through comparing the core discussion networks of urban Chinese, Japanese, and Americans, (2) evaluate the role of socio-demographic structure in driving cross-national differences in network structure, and (3) assess the conventional cultural stereotypes regarding interpersonal relationships, specifically the contrast between Eastern collectivism and Western individualism.

Core Discussion Networks

The 1985 General Social Survey (GSS) in the U.S. is the first national survey that studied interpersonal networks using standardized instruments (Burt 1984; Marsden 1987). The survey asked respondents to name up to five people with whom they discussed important matters in the past six months. In addition, respondents provided information about the socio-demographic characteristics of each discussion partner, relationship with each partner, and whether the partners know one another. With these egocentric questions, researchers can construct the so-called core discussion networks, which often include strong network ties that individuals use for sociality and advice and for emotional and instrumental support (McPherson, Smith-Lovin, and Brashears 2006). The 1985 GSS shows that Americans had small, kin-centered, relatively dense, and homogeneous interpersonal networks (Marsden 1987).

Twenty-years later, the 2004 GSS replicated the 1985 GSS network questions to assess changes in American discussion networks. The 2004 data show a significant shift in the network structure over the two decades. In particular, the average size of discussion networks shrank by nearly one person, from three to two confidants; consistently, the percentage of people who reported having no confidants to discuss important matters increased from 10% to 25% (McPherson et al. 2006). However, the increasing trend of social isolation turned out to be highly controversial because of the survey design in 2004 may induce fatigue and thus underreport of network ties (Fischer 2009). Some studies suggest that personal networks in the U.S. have not crumbled since the 1970s as many people believe (Fischer 2011).

There are only a few studies on core discussion networks in other societies, most of which were published in the 90s. Fischer and Shavit (1995) compared north Californian networks with Israeli networks in the Haifa region. They found that networks in these two contexts were similar in many aspects, only that the Israeli networks were denser than the American networks, which perhaps implies cultural distinction along the collectivism-individualism orientation. In addition, Blau, Ruan, and Ardel (1991) compared Chinese networks in Tianjin City of China in 1986 with the 1985 American networks. By examining the tendency of homophily, they found that Chinese networks are quite similar to American networks with regard to in-group choices⁷ and heterogeneity of network members. Using the same data, Ruan (1998) further showed that Chinese in Tianjin were more likely than contemporary Americans to include coworkers in their core discussion networks, which in part reflects that their living arrangements and daily needs were closely tied to workplace under the planned economy. In the mean time, interpersonal networks in urban China were also under transformation due to market reform and the privatization of state enterprises. As indicated by Ruan et al. (1997), networks in Tianjin became smaller and part of the family and work ties were replaced by friend ties from 1986 to 1993.

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China

⁷ In-group choices mean that ego tends to choose people similar to himself/herself as network members.

China has been greatly transformed since the market reform starting from 1978. Not only is the country, particularly the urban area, harvesting the fruits of rapid economic growth, but it is also undergoing concomitant changes in social relationships. For instance, the privatization or bankruptcy of state-owned enterprises has weakened the connection between urban laborers and their work units. Workplace networks have become less important since the market reform because individuals' basic needs such as housing and health care no longer fully or even partially rely on state-sponsored work units (Ruan et al. 1997). The de-collectivization has also brought a moral change: expression and pursuit of personal interest is no longer always submissive to group interest for family, neighbors, and work units or communes (Kleinman et al. 2011). Moreover, the rural-urban disparity of economic development has encouraged large-scale internal migration from rural to urban areas since the late 70s. Internal migration under the strict hukou system may weaken family ties as it often separates migrant workers from their children and elderly parents, particularly for rural households (Lu, Hu, and Treiman 2011). Lastly, the one-child policy, another strategy for economic development enforced since 1979, is partly responsible for the shrinkage of family size and population aging (Hesketh, Lu, and Xing 2005). The policy, together with son preference rooted in the patrilineal/patriarchal tradition, has severed sex imbalance and reduced the chance of establishing a family for some men. Overall, the Chinese society has become more fragmented and individualized in its recent history following the market transition.

Japan

Japan has received great influence from multiple cultures along its history. It shares Confucian values with China and other Asian societies, which emphasize loyalty, filial piety, moderation, and benevolence for communal welfare. Since the Meiji Restoration (1868-1912), Japan has also adopted a variety of Western technologies, social customs, as well as cultural styles (Tipton 2008). The mixture of foreign cultures with its traditional system has given Japan a peculiar position either among other Asian countries or among other industrialized economies (Ikeda and Richey 2011).

After WWII, Japan reconstituted under the U.S. occupation during 1945-1952. The post-war support from the U.S. established the foundation for Japan's economic miracle of sustained GDP growth from 1955 to 1973 (Kingston 2010). Urbanization, the expansion of higher education, and female labor force participation that came along with the economic development in part contributed to Japan's family change (Raymo, Iwasawa, and Bumpass 2009; Rindfuss et al. 2004). In particular, marriage and childbearing were postponed or even foregone while divorce rates were rising, leading to a more individualized society. The Lost Decade following the economic bubble burst in 1989 continued to encourage delayed home-leaving and marriage, meanwhile destabilizing families that lost economic security under the recession (Kingston 2010). Moreover, in response to the economic stagnation in the 1990s, the Koizumi administration (2001-2006) introduced neo-liberal market-oriented reforms, promoting deregulation and efficiency and shifting the burdens of risk from the state and employers to families and individuals (Ishida and Slater 2009). The neo-liberal policy widened income inequality and diminished job security by, for example, replacing lifetime

employment with part-time and short-term jobs. This has challenged many Japanese's collective identity and egalitarian mentality that used to maintain social trust and reciprocity in the society. Overall, after a century and a half of modernization/Westernization, the post-WWII economic miracle, and a long recession in the 90s, the Japanese society has become less integrated even if some traditional values such as filial piety may still prevail.

United States

Americans have long been described as unusually individualistic, even when compared people in other Western industrialized societies. However, Fischer (2010) argues that voluntarism, which has been incubated in the society since the colonial era, is probably a more accurate term than radical individualism to describe the prevailing American culture. He contends that Americans are not socially disconnected; on the contrary, they are quite group-oriented, at least as actively engaged in family, workplace, church, neighborhood and other communities as other Westerners. What makes them seem so individualistic is actually the freedom of choice to enter and exit any social groups, which he calls voluntarism. Throughout the American history, various social circumstances have contributed to the strengthening and spread of voluntarism, such as the pursuit of individual liberty by settlers, dissident Protestantism, population growth that encouraged migration west to new land, and the proliferation of various social groups.

Further, some studies suggest that the U.S. have experienced the decline of community since the second half of the 20th century (Putnam 1995, 2000). Civic

participation and other social engagement including joining voluntary organizations, voting, signing petitions, and socializing with family, friends, and neighbors, seem to take place less and less often. Part of this argument, however, has been contested by other research, for example, regarding the downward trend of memberships in associations and socializing in the private sphere (Fischer 2005, 2010; Paxton 1999; Wuthnow 2002). The critiques generally point out that community involvement changed rather than declined during the 20th century. In particular, new types of social groups emerged and gradually replaced some of the old ones; longer hours of work redistributed social and emotional investment between family members, neighbors, coworkers, and friends; technology advancement encouraged networking beyond geographical limitations. In the mean time, however, the structure of social networks has also turned looser and less densely-knitted when social circles become less nested and individuals can freely come and go (Fischer 2010; Pescosolido and Rubin 2000; Wellman 2001). Overall, social networks in the American society may not be shrinking or collapsing as many have worried, but they are likely becoming more fragmented, fragile, and insecure.

Individualism versus Collectivism

Cross-national comparative research in social science, particularly cross-cultural psychology, often argues that social relations are governed by cultural orientations that vary across societies (Kitayama & Markus, 2000; Markus & Kitayama, 1991; Markus & Schwartz, 2010). The most commonly discussed and cited cultural orientation is the *individualism versus collectivism* dimension. Specifically, individualism refers to a

worldview that centralizes the personal—personal goals, personal uniqueness, and personal control—and peripheralizes the social; collectivism refers to a worldview that stresses relatedness, belongingness, duty and harmony. Many studies contrast East Asian countries and the U.S. as two culturally distant entities, arguing that East Asians are generally more collectivistic or have an interdependent self-construal, and Americans, particularly European Americans, are generally more individualistic or have an independent self-construal (Hofstede, Hofstede, and Minkov 2010; Kitayama and Markus 2000; Markus and Kitayama 1991; Markus and Schwartz 2010; Triandis 1995). These studies also suggest that well-being is more often attained through the realization of positive social relationships in collectivistic Asian cultures, but more through personal achievement in individualistic European-American cultures. The notion implies that interpersonal networks may be larger and stronger among East Asians but smaller and weaker among Americans. However, this cultural contrast between the “East” and the “West” has also been challenged. A meta-analysis based on empirical evidence from 1980 to 1999 indicates that among East Asians, only Chinese are more collectivistic than European Americans, and Japanese and Koreans are no more collectivistic than European Americans (Oyserman, Coon, and Kemmelmeier 2002). The findings not only cast doubt on the East-West divide on the collectivism-individualism orientation, but also demonstrate that East Asia is a culturally diverse region.

As Takahashi et al. (2002) has suggested, the current study considers this cultural framework of social relations as a heuristic view rather than a theoretical assumption. In contrast to cross-cultural psychology that is rarely based on probability sampling

(Henrich, Heine, and Norenzayan 2010), the study systematically examines interpersonal relations across societies using population-representative samples.

Socio-Demographic Structure, 2003-2004

The contemporary socio-demographic profiles of urban population are considerably different between China, Japan, and the U.S. Some of these differences may correspond to the distinctive patterns of interpersonal networks across countries. Table 3.1 demonstrates the cross-national variation in socio-demographic characteristics.

First, the age structure in Japan is the oldest as expected, with a higher proportion of people in the 60-69 age group. However, China's mean age is not much younger than Japan's, which most likely reveals the consequence of one-child policy. In particular, the proportion of people aged 20-29 is smaller in China than either Japan or the U.S. by more than 5 percentage points of the urban population. Research suggests that an older population is expected to have smaller, more kin-centered, and denser networks because of retirement, bereavement, deterioration of health status, or other life-transition events (Cornwell, Laumann, and Schumm 2008; McPherson et al. 2006; Schnittker 2007).

Further, the sex distribution of the urban population varies moderately by country. The proportion of male respondents is the highest in the Chinese sample (49.1%) but the lowest in the U.S. sample (45.6%). The variation parallels the sex ratio of urban population in these countries⁸. Since men's networks tend to include less kin members

⁸ According to the United Nations Statistics Division, the female/male ratio of urban population, as of 2000, is 95.0, 103.8, and 105.2 (women per 100 men) in China, Japan, and the US, respectively.

but more non-kin members compared to women's networks (Marsden 1987), a higher male-to-female sex ratio implies a lower proportion of kin in the networks.

Moreover, the percentage of married people varies significantly across countries, with almost 88% of the urban Chinese being married in contrast to 70% in Japan and 62% in the U.S. Because marriage enlarges kin networks (by connecting in-laws) but shrinks friendship networks (by crowding out non-family activities), a population with a higher marriage rate is expected to have more kin-centered and denser networks (Kalmijn 2003; Wellman et al. 1997). The correlation between marriage and total network size, however, is unclear.

Education level also divides by country. On average, Americans and Japanese are much more educated than Chinese, who in majority do not graduate from high school. Previous research suggests that education is a strong predictor of network structure (Fischer 1982; Marsden 1987; McPherson et al. 2006). Specifically, more educated people may have both larger kin and non-kin networks. Meanwhile, the proportion of kin decreases with the level of education because the growth of kin networks slows down as education increases.

In addition, employment rate is higher in the U.S. and Japan than in China. The differential is greater than 20 percentage points. Employment may change the structure of personal networks by, for example, expanding non-kin networks (Brashears 2011). Also, involvement in paid work reallocates time and energy between family, work, and other social life; it may change the component and strength of social networks in addition to

network size (Bidart and Lavenu 2005; Degenne and Lebeaux 2005; Wellman et al. 1997).

Finally, the urban household size is larger in China and Japan (3.5 persons per household) than the U.S. (2.9 persons per household). Household size is shaped by multiple decisions including marriage/cohabitation, child rearing, and co-residence with elderly parents, all or some of which would jointly determine the structure of interpersonal networks (Bidart and Lavenu 2005; Wellman et al. 1997). Larger household size may be associated with larger and more kin-centered networks.

In sum, the socio-demographic profile of urban population differs significantly between China, Japan, and the U.S. According to previous research, all the dimensions, including age, gender, marital status, education, employment, and household size, are related to the distribution of relational resources and thus the structure of interpersonal networks. Therefore, when comparing networks across national contexts, it is important to take into account of cross-national differences in socio-demographic characteristics. Lastly, it should be noted that the link between network structure and socio-demographic variables may vary between contexts; however, the majority of the literature represents only perspectives from Western societies.

Data and Analyses

Data

The study uses data from the 2003 Chinese General Social Survey (CGSS), the 2003 Japanese General Social Survey (JGSS), and the 2004 U.S. General Social Surveys

(GSS). All the surveys include a section of core discussion networks that asked about people with whom the respondent discusses important matters. While the network modules are not exactly the same across countries, they bear high similarity to promise cross-national comparison. In addition, the surveys originally targeted populations with slightly different demographic characteristics. Specifically, the CGSS sampled the urban population of China aged 18-69⁹; the JGSS sampled the national population of Japan aged 20-89; the GSS sampled the U.S. national population aged 18-89. To make these samples comparable, the analysis includes only urban residents aged 20-69 from each country: 4,745 in the Chinese sample, 1,054 in the Japanese sample, and 1,043 in the American sample.

Measures

The measures of network structure used in the analysis are similar to those used by Marsden (1987) and McPherson et al. (2006). First, *total size* is the number of people with whom the respondent discussed important matters (hereafter referred to confidants) in the past six months¹⁰. Because the respondent only provided further information about each confidant for up to five confidants in China and the U.S. and up to four confidants in Japan, the rest of network measures are calculated based on the first four confidants nominated by the respondent. *Kin size* is the number of kin confidants, and *non-kin size* is the number of non-kin confidants. *Proportion kin* is the percentage of kin ties in the

⁹ The urban population of China includes residents with permanent urban hukou, valid local urban hukou (“blue-seal” hukou or “self-grain” hukou), and rural hukou. To avoid the complication of migrant selectivity, this study restricts its China sample to individuals with permanent urban hukou.

¹⁰ The 2003 JGSS does not specify the six-month period.

discussion networks. *Density* refers to the degree of network concentration: higher density indicates that confidants of the respondent are more likely to know one another, signaling higher network strength. Another indicator of tie strength, *frequency of contact*, is measured by summing up the number of daily contacts (per year) the respondent has with each of her/his confidants. Finally, the heterogeneity of confidants regarding gender, age, and education is measured by taking the standard deviation of confidants' age and by calculating the Index of Qualitative Variation (IQV)¹¹ of confidants' gender and education.

Analyses

The analyses begin with a comparison of network structure, including size, proportion of kin, density, frequency of contact, and heterogeneity, across countries. To evaluate the impact of socio-demographic profiles on the cross-national differences in network structure, I pool data from each country and conduct regression analyses that consider the effects of age, gender, marital status, education, employment, and household size for each network measure except heterogeneity¹². Specifically, I use negative binomial regression for total, kin, and non-kin network size and OLS regression for proportion of kin, density, and frequency of contact. Moreover, to assess whether the link between network structure and socio-demographic characteristics varies across contexts, I also test the interaction

¹¹ $IQV = (1 - \sum_{i=1}^k p_i^2) / (1 - 1/k)$, where p_i is the proportion of observations in the i th category, and k is the number of categories (Agresti and Agresti 1978).

¹² Regression analysis for network heterogeneity is not presented for two reasons. First, cross-national variation in network heterogeneity regarding age and education is small and simply aligns with population heterogeneity regarding age and education (as shown by Table 3.4). Second, socio-demographic characteristics barely explain any cross-national differences in network heterogeneity (results not shown). To save space, the study does not present regression results regarding heterogeneity.

between country and socio-demographic variables in the regression models. Finally, to correct underestimated standard errors, all the regression analyses are adjusted for clustering effects of country, geographical region, and size of city.

Results

Descriptive Statistics

Several structural features of core discussion networks differ significantly across countries. First, total network size is the largest in China (3.2 persons), followed by Japan (2.91 persons) and then the US (2.23 persons) (Table 3.2). Specifically, only about 5.5% of urban Chinese or urban Japanese are socially isolated (i.e., people who report having no confidants). In contrast, more than 20% of the urban Americans are isolated. Moreover, 34% of the Chinese report having 5 or more people with whom they can discuss important matters, but only about 14% of the Americans or Japanese report so. It is notable that very few Japanese have a network size of 5; the anomaly is possibly due to the different survey procedure of the JGSS¹³. In addition, differences in total network size are evenly contributed by differences in kin and non-kin networks. Chinese and Japanese both have a higher number of kin and non-kin confidants than Americans do. Finally, the difference in network size between Chinese and Japanese is mostly driven by the number of non-kin ties. That is, the size of their kin networks is equivalent, but

¹³ The JGSS first asked the respondent to nominate up to four confidants. For those who nominated four, a following question is asked about how many more confidants they have. The total number of confidants is calculated by summing up the answers to the two questions. However, the CGSS and GSS first asked the respondent to report a total number of confidants, which is followed by the nomination of up to five confidants.

Chinese have a slightly larger (yet statistically significant) non-kin networks than Japanese.

Although network size (either total, kin, or non-kin) is significantly different between countries, the variation in the proportion of kin is relatively small (Table 3.3). The average kin proportion is only slightly higher in the U.S. (59%) compared to Japan (57%) and China (56%). The result suggests that the importance of kinship in discussing important matters is likely to be equal across countries.

Further, network density varies greatly across countries. In particular, Chinese networks are the densest (0.93 on a scale of 1); that is, confidants are the mostly to know one another (Table 3.3). In contrast, Japanese networks are the least dense (0.74), which indicates weaker network strength. The result may be surprising to those who expect that Chinese and Japanese networks should look more alike because they share “collectivist” culture. In addition, the frequency of contact with confidants is also the highest among Chinese but the lowest among Japanese (Table 3.3). Nonetheless, the country difference is not statistically significant.

Lastly, the heterogeneity of core discussion networks along the dimension of gender, age, and education varies across countries (Table 3.4). China has the lowest network heterogeneity in all these dimensions, especially gender. Specifically, Chinese discussion networks are significantly more gender-segregated than American discussion networks. In addition, Chinese are also more likely to discuss important matters with those who resemble them in age and education; however, the cross-national differences

are not large. In fact, the variation in the network heterogeneity of age and education highly aligns with the variation in population heterogeneity of age and education.

Regression Analyses

Size

The cross-national differences in network size persist even after socio-demographic profiles are taken into account (Table 3.5). In fact, holding social-demographic characteristics constant makes the country differences in total network size and non-kin network size slightly larger (Models 2 and 8). Model 2 shows that compared to Americans (reference group), Chinese and Japanese have significantly larger discussion networks. As expected, network size is related to social-demographic status: the total size is smaller for older adults and men, but it is larger for those who are married, more educated, employed, and live in a larger household. Additionally, the relationship between size and social-demographic characteristics is mostly reversed for kin and non-kin networks (Models 5 & 8). For example, being male and being employed are related to smaller kin networks but larger non-kin networks. Also, being older, living in a marital relationship, and having a larger household are associated with larger kin networks but smaller non-kin networks. However, education is related to larger discussion networks regardless of the kinship status of networks although the relationship is much stronger for non-kin networks.

Furthermore, the relationship between network size and socio-demographic factors are not equal across countries. Models 3, 6, and 9 in Table 3.5 examine the

interaction between country and socio-demographic variables. Results suggest that only Chinese and Japanese have a smaller network size at older ages mainly because their non-kin networks shrink as they get older. Additionally, the education gradient in network size is much steeper among Americans. The level of education predicts a significantly larger size of kin networks and non-kin networks. In contrast, education more modestly expands individuals' discussion networks in China and Japan.

Proportion Kin and Density

As the descriptive statistics shown earlier, there is no significant variation in the kin proportion of discussion networks across countries. However, when socio-demographic characteristics are taken into account, Chinese and Japanese networks become less kin-oriented than their American counterparts (Table 3.6, Model 2). Moreover, most of the socio-demographic factors are linked to proportion of kin in an expected direction among all the countries. The exception is that in the U.S., age is not related to more kin-oriented networks and being employed does not predict a lower proportion of kin confidants (Table 3.6, Model 3).

Further, the cross-national variation in network density also persists after the socio-demographic profiles are taken into consideration (Table 3.6, Model 5). As discussed earlier, confidants who share the same ego are the most likely to know one another in China and the least likely to know one another in Japan. The effects of socio-demographic factors on network density are quite similar across countries (Table 3.6, Model 6). Only age and household size interact with country, which shows that American

networks are not denser among older adults or among individuals living in a larger household.

Frequency of Contact

The frequency of contact with confidants differs significantly between countries only when socio-demographic factors are adjusted (Table 3.7, Model 2). In particular, Chinese and Japanese contact their confidants less often than their American counterparts, by 38 and 27 daily contacts per year, respectively. Moreover, the interaction between country and network size, a significant correlate of total number of daily contacts, also suggests that Americans contact each of their confidants more frequently than their Chinese and Japanese counterparts (Table 3.7, Model 3). On average, having one more confidant is related to an increase in daily contacts by 94 times per year for Americans, but an extra confidant only predicts an increase in daily contacts by 77 times per year for Chinese and by 80 times per year for Japanese.

Discussion

The study compares core discussion networks between urban Chinese, Japanese, and Americans. It shows that structural aspects of discussion networks, including size, density, proportion of kin confidants, and frequency of contact, vary considerably between countries. However, differences in network structure are not attributable to cross-national variation in socio-demographic characteristics. In fact, network differences become even larger when the effects of socio-demographic characteristics are taken into account.

Specifically, the study demonstrates that Chinese and Japanese have larger networks than Americans do. This is true for both kin networks and non-kin networks. Also, Chinese networks are slightly larger than Japanese networks. Moreover, the kin proportion of discussion networks is the highest among Americans, followed by Japanese and then Chinese. The finding suggests that American networks may be more family-centered than networks in China and Japan. Further, Chinese networks are the most densely knitted, followed by American networks and then Japanese networks. Notably, in terms of network density, the gap between China and Japan is even larger than the gap between U.S. and China or between U.S. and Japan. In addition, Americans maintain the highest frequency of contact with their confidants, followed by Japanese and then Chinese. When network size is controlled for, both total number and marginal number of daily contacts per year are the highest among Americans. Finally, the relationship between socio-demographic characteristics and network structure are not always the same across contexts. The most notable examples include that higher level of education more strongly predicts larger networks in the U.S., and that age is related to smaller and more kin-centered networks in Japan and China only.

The findings based on core discussion networks do not support the conventional cultural notion of Eastern collectivism versus Western individualism. In particular, while Chinese have the largest and densest networks, they also contact their confidants the least frequently. In contrast, Americans may have the smallest networks but they contact their confidants most often. Indeed, none of the countries seems to have a “better” or stronger network structure than another. Additionally, significant differences in network structure

are found not only between “culturally distant” societies (between China/Japan and the U.S.) but also between “culturally proximate” societies (China and Japan). To be sure, the perception that East Asia is culturally homogeneous, particularly regarding the tendency of collectivism, is not supported by the empirical findings based on core discussion networks. A notable example is the comparison of network density across China, Japan, and the U.S. Therefore, the study argues that the prevalent cultural notion of social relations, Eastern collectivism versus Western individualism, is over-simplified and requires more network studies to verify.

The current study has several limitations. First, although the module of core discussion networks used by each country is highly comparable, the cross-national comparison may still suffer from systematic errors induced by different survey administration and questionnaire designs. For example, interviewer selection and training, number and types of questions preceding the network module, and overall response rate may all introduce measurement errors (Fischer, 2009). Second, the study is based on cross-sectional data collected in a specific period of time. Any exogenous shocks relevant to core discussion networks in a country at the time of survey administration may change the results of cross-national comparison. For example, Brashears (2011) suggests that the high level of social isolation in the 2004 GSS may be generated by exogenous shocks particular to that year: a substantial proportion of the social isolates may report having no confidants due to lack of discussion subjects rather than lack of people to discuss important matters. Future studies will benefit from tracking the same comparative cases (countries) over time with the same network measurement embedded in a similar

questionnaire. Third, the study only examines core discussion networks, which are part of an individual's broader social networks. Whether cross-national differences in core discussion networks are consistent with those in broader social networks will be an important topic to investigate in the future. Lastly, the study only covers urban population. Given that China, Japan, and the U.S. are unequally urbanized, with 43, 66, and 81 percent of the total population residing in urban areas as of 2005 respectively¹⁴, the urban samples may not be equally representative of their national populations. Particularly in the case of China, the rural-urban contrast is rather stark after decades of imbalanced development and restriction on rural-to-urban migration (Whyte 2010). Therefore, comparing urban populations between China, Japan, and the U.S. may underestimate the overall differences across countries.

Despite the limitations, the study contributes to the literature of social networks and comparative sociology in at least three aspects. First, it systematically examines the diversity of interpersonal networks across national contexts. Second, it shows that cross-national differences in the structure of interpersonal networks are barely explained by variation in socio-demographic characteristics. Finally, the study contests the conventional notion of Eastern collectivism vs. Western individualism, arguing that core discussion networks do not follow such a cultural typology in China, Japan, and the U.S.

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¹⁴ The statistics come from the UN World Urbanization Projects <http://esa.un.org/unpd/wup/index.htm>.

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Table 3.1: Socio-demographic characteristics by country (weighted)

	US	Japan	China
Age (%)			
20-29	20.4	20.9	14.7
30-39	20.1	22.5	25.8
40-49	27.0	17.7	25.0
50-59	20.8	21.0	20.7
60-69	11.7	17.8	13.9
Mean (year)	42.8	43.9	43.7
Male (%)	45.6	48.5	49.1
Married (%)	62.0	69.9	87.9
Education ^a (%)			
Less than high school	8.8	12.2	50.2
High school	46.7	45.7	30.1
Junior college	8.8	15.7	13.1
University or above	35.7	26.4	6.6
Employed ^b (%)	70.4	72.1	47.5
Household size (%)			
1	12.4	7.1	2.2
2	35.9	20.0	17.0
3	20.9	23.2	41.0
4	17.5	27.3	18.7
5+	13.3	22.4	21.1
Mean (person)	2.9	3.5	3.5

^a The education system is slightly different across countries. In Japan, "Junior college" includes those who graduated from 2-year college, college of technology, or vocational school. In China, "High school" includes people who graduated from high school, vocational high school, technical school, and professional school equivalent to high-school level. "Junior college" includes people who graduated from specialized college. ^b The employed includes those who work full-time and part-time.

Table 3.2: Size of core discussion networks by country (weighted)

Network size	Total Network			Kin Network			Non-kin Network		
	US	Japan	China	US	Japan	China	US	Japan	China
0	20.8%	5.6%	5.4%	37.2%	24.9%	31.2%	50.4%	39.2%	44.6%
1	18.5%	15.4%	17.1%	31.1%	31.9%	29.5%	22.5%	24.0%	14.8%
2	19.6%	23.2%	17.6%	17.4%	24.3%	17.5%	16.8%	19.0%	15.2%
3	18.3%	21.0%	16.7%	10.1%	13.1%	11.8%	6.6%	12.1%	11.9%
4	9.3%	20.5%	9.6%	4.0%	5.8%	10.1%	3.8%	5.7%	13.5%
5	7.3%	1.8%	18.6%	-	-	-	-	-	-
6+	6.1%	12.6%	15.1%	-	-	-	-	-	-
Mean Size	2.23	2.91	3.24	1.13	1.43	1.40	0.91	1.21	1.35
95% CI	2.11-2.35	2.80-3.02	3.18-3.30	1.05-1.21	1.35-1.50	1.36-1.44	0.83-0.99	1.13-1.29	1.30-1.40
Mode	0	2	5	0	1	0	0	0	0
N	1,043	1,054	4,745	1,043	1,054	4,745	1,043	1,054	4,745

Note: The size of kin and non-kin networks is calculated only based on the first four confidants nominated by the respondent. Because of this, the sum of kin size and non-kin size does not exactly match the overall network size.

Table 3.3: Proportion kin, density, and frequency of contact of core discussion networks by country (weighted)

	US	Japan	China
Proportion Kin^a			
0.00	20.8%	20.5%	27.4%
0.01-0.33	11.8%	14.3%	11.6%
0.34-0.66	23.5%	21.9%	13.9%
0.67-0.99	6.7%	7.7%	5.8%
1.00	37.2%	35.6%	41.3%
Mean proportion kin	0.59	0.57	0.56
95% CI	0.55-0.62	0.55-0.60	0.55-0.58
N	805	991	4,469
Network Density^b			
<0.25	5.6%	11.9%	2.1%
0.25-0.49	4.1%	10.0%	1.9%
0.50-0.74	14.1%	17.9%	7.1%
>0.74	76.2%	60.1%	88.9%
Mean density	0.85	0.74	0.93
95% CI	0.83-0.88	0.72-0.77	0.93-0.94
N	607	802	3,639
Frequency of Contact^a (daily contacts per year)			
4-156	25.1%	19.1%	22.2%
157-312	27.3%	29.8%	26.1%
312-468	23.9%	24.3%	20.0%
468-624	23.7%	26.8%	31.7%
Mean number of daily contacts per year	362.8	361.2	376.4
95% CI	349.6-375.9	349.6-372.7	370.0-382.7
N	805	991	4,469

^a Among those who nominate at least one confidant. ^b Among those who nominate at least two confidants.

Table 3.4: Heterogeneity of core discussion networks by country (weighted)

	US	Japan	China
Gender Heterogeneity (Index of Qualitative Variance)			
0	23.2%	31.0%	35.6%
0<IQV<0.90	42.3%	40.3%	37.3%
0.90<=IQV<=1	34.5%	28.8%	27.1%
Mean	0.70	0.62	0.57
95% CI	0.66-0.73	0.59-0.65	0.56-0.59
Population heterogeneity of gender	1.00	1.00	1.00
Age Heterogeneity (Standard deviation of confidants' age)			
<5	30.9%	33.0%	39.3%
5-<10	19.1%	12.3%	15.6%
10-<15	24.0%	22.2%	18.8%
>=15	26.0%	32.4%	26.3%
Mean	10.04	10.49	9.46
95% CI	9.39-10.69	9.96-11.02	9.22-9.71
Population heterogeneity of age	13.18	13.94	12.67
Education Heterogeneity (Index of Qualitative Variance)			
0	34.43%	28.93%	37.06%
0.5	13.87%	15.80%	18.65%
0.5<IQV<0.75	38.33%	40.78%	30.68%
0.75<=IQV<=1	13.38%	14.49%	13.62%
Mean	0.43	0.46	0.41
95% CI	0.39-0.46	0.44-0.49	0.39-0.42
Population heterogeneity of education	0.85	0.90	0.83

Note: Network heterogeneity is calculated only for those who had at least two confidants.

Table 3.5: Negative binomial regression of total, kin, and non-kin network size on country and social-demographic factors

	Total network size			Kin network size			Non-kin network size		
	1	2	3	4	5	6	7	8	9
China	0.387***	0.455***	1.006***	0.257***	0.156**	0.544***	0.389***	0.617***	1.006***
Japan	0.251***	0.254***	0.883***	0.295***	0.182***	0.540**	0.205***	0.315***	0.800**
Age		-0.003***	0.003		0.001	0.002		-0.007***	0.000
Male		-0.071***	-0.165***		-0.214***	-0.253***		0.078**	-0.072
Married		0.044**	0.023		0.300***	0.329***		-0.184***	-0.304***
High school		0.111***	0.401***		-0.024	0.269**		0.247***	0.401***
Junior college		0.186***	0.447***		0.055	0.160		0.293***	0.622***
University or above		0.247***	0.748***		0.102**	0.502***		0.383***	0.808***
Employed		0.058**	0.061		-0.047**	0.032		0.133***	0.061
Household size		0.019**	0.003		0.058***	0.038*		-0.028*	-0.033
China × Age			-0.007***			-0.002			-0.007**
Japan × Age			-0.011***			-0.002			-0.017***
China × Male			0.132***			0.045			0.221**
Japan × Male			-0.002			0.094			-0.089
China × Married			0.024			-0.055			0.159*
Japan × Married			-0.011			-0.031			0.094
China × High school			-0.315***			-0.320**			-0.183
China × Junior college			-0.289*			-0.125			-0.364*
China × University and above			-0.616***			-0.489***			-0.560***
Japan × High school			-0.073			-0.125			0.185
Japan × Junior college			-0.100			0.130			-0.199
Japan × University and above			-0.368***			-0.325**			-0.190
China × Employed			-0.004			-0.082			0.070
Japan × Employed			0.009			-0.114			0.181*
China × Household size			0.016			0.034			-0.009
Japan × Household size			0.013			-0.015			0.039

Constant	0.779***	0.686***	0.145	0.077	-0.183**	-0.561***	-0.100**	-0.033	-0.431**
N	6,805	6,805	6,805	6,805	6,805	6,805	6,805	6,805	6,805

*** p<0.01, ** p<0.05, * p<0.1

Table 3.6: OLS regression of proportion kin and density on country and socio-demographic factors

	Proportion kin			Density		
	1	2	3	4	5	6
China	-0.005	-0.097***	0.000	0.101***	0.075***	0.000
Japan	0.030	-0.029*	0.000	-0.069***	-0.086***	-0.340***
Age		0.002***	0.000		0.001**	-0.001
Male		-0.055***	-0.025		-0.006	-0.024
Married		0.140***	0.167***		0.046***	0.082***
High school		-0.078***	0.000		-0.017*	0.000
Junior college		-0.080***	0.000		-0.034***	0.000
University or above		-0.084***	0.000		-0.011	0.000
Employed		-0.041***	0.005		-0.020**	-0.011
Household size		0.016***	0.020**		0.008***	-0.005
China × Age			0.002			0.001
Japan × Age			0.004**			0.005***
China × Male			-0.046			0.021
Japan × Male			0.031			0.016
China × Married			-0.044			-0.052
Japan × Married			-0.016			-0.022
China × High school			-0.034			0.021
China × Junior college			0.024			0.044
China × University and above			0.013			0.019
Japan × High school			-0.074			-0.008
Japan × Junior college			0.055			0.018
Japan × University and above			-0.025			0.033
China × Employed			-0.047			-0.011
Japan × Employed			-0.077**			-0.038
China × Household size			0.001			0.014
Japan × Household size			-0.015			0.019*
Constant	0.573***	0.480***	0.482***	0.828***	0.770***	0.876***
N	6,269	6,269	6,269	5,020	5,020	5,020

*** p<0.01, ** p<0.05, * p<0.1

Table 3.7: OLS regression of frequency of contact on country and socio-demographic factors

	1	2	3
China	7.483	-38.405***	0.000
Japan	-10.143	-26.987***	0.000
Age		-0.479***	-1.431***
Male		-12.837***	-15.114***
Married		3.206	13.431*
High school		7.918**	0.000
Junior college		9.873**	0.000
University or above		2.712	0.000
Employed		1.046	-7.636
Household size		5.752***	2.665
Network size		79.449***	93.919***
China × Age			1.374***
Japan × Age			0.205
China × Male			7.830
Japan × Male			-21.431**
China × Married			-13.938
Japan × Married			-8.217
China × High school			1.646
China × Junior college			-17.196
China × University and above			14.286
Japan × High school			11.020
Japan × Junior college			1.276
Japan × University and above			15.260
China × Employed			14.268*
Japan × Employed			8.055
China × Household size			3.350
Japan × Household size			2.741
China × Network size			-16.741***
Japan × Network size			-13.815***
Constant	360.566***	139.645***	153.091***
N	6,263	6,263	6,263

*** p<0.01, ** p<0.05, * p<0.1