

Self-esteem and Suicide Rates in 55 Nations

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Abstract

Using recent data from the International Sexuality Description Project (ISDP), we examined whether national differences in self-esteem across 55 nations are reflected in suicide rates. Results indicate that suicide is especially common in nations with relatively low levels of self-esteem. This relation is consistent across sex lines, age of suicide and independent from several other relevant factors such as economic affluence, transition, individualism, subjective well-being, and neuroticism. These findings provide support for the predictive validity of self-esteem scores as assessed in the ISDP survey. They also contribute to a growing body of research documenting negative consequences associated with low self-esteem. Possible implications for suicide prevention strategies are discussed. Copyright © 2008 John Wiley & Sons, Ltd.

Key words: suicide; self-esteem; national differences; economic affluence; transition; individualism; subjective well-being; neuroticism; prevention

INTRODUCTION

Suicide is a leading cause of death worldwide. Yet, there are considerable variations in national suicide rates (World Health Organization, 1996). Traditionally, suicide rates are higher in nations with higher levels of economic development and quality of life (e.g. Lester, 1996). Since the communist collapse, they are also especially high in eastern European transition nations such as Lithuania, Slovenia, Latvia, and Estonia (e.g. Baudelot & Establet, 2006). Taking advantage of a recent survey investigating self-esteem across a wide range of nations (the International Sexuality Description Project, ISDP, Schmitt & Allik, 2005), the present ecological study attempts to examine whether it is associated with national differences in suicide rates over and above the effects of other economic (e.g. GDP), historical (e.g. transition) and cultural (e.g. individualism) factors. The current paper is focused on self-esteem because it appears as an important risk factor for suicide ideation and suicide attempts in a number of longitudinal studies conducted at

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the individual level, and because no research to date has sought to examine the associations between self-esteem and national suicide rates.

Self-esteem and suicide at the individual level

Self-esteem refers to a person's global evaluation of his/her worth as a human being (Rosenberg, 1965; see also Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). A number of correlational studies have found that self-esteem is negatively related to suicidal thoughts and attempts, even after control for other factors such as depression (for a review, see Emler, 2001). There is also evidence from longitudinal studies that relatively low self-esteem is a risk factor for health problems, including social isolation (Stinson et al., 2008), depression (Orth, Robins, & Robert, 2008), suicide ideation (Goldney, Smith, Winefield, Tiggerman, & Winefield, 1991; McGee & Williams, 2000), suicide attempts (Lewinsohn, Rohde, & Seeley, 1994) and completed suicide (Kjelsberg, Neegaard, & Dahl, 1994). For instance, McGee and Williams (2000) found that both global self-esteem and academic self-esteem predicted suicide ideation in a longitudinal study of adolescents. In the same way, Lewinsohn et al. (1994) surveyed 1508 high school students, among whom 26 made a suicide attempt during the year following their entry into the study. Low self-esteem at entry predicted these attempts. Kjelsberg et al. (1994) followed up 1792 adolescents who have had psychiatric problems and found that about 2% had committed suicide over a 15-year period. Those who did had lower self-esteem than the average at the time they were first studied. Thus, research at the individual level supports the notion of low self-esteem as a risk factor for suicide.

Self-esteem and suicide at the national level

Global self-esteem is usually measured with the Rosenberg self-esteem scale (Rosenberg, 1965), a relatively simple 10-item instrument. Low self-esteem, as assessed with this scale, is quite rare. However, there are variations in self-esteem across nations and in some of them self-esteem is close to the midpoint of the scale (Schmitt & Allik, 2005). In particular, Asian nations, in which self-effacement prevails over self-enhancement (Heine, Lehman, Markus, & Kitayama, 1999), show relatively low self-esteem compared to the United States (i.e. a culture of self-worth, *cf.* Baumeister, Campbell, Krueger, & Vohs, 2003).

Relatively little is known about how self-esteem and suicide rates are related at the national level. The individual and national levels of analysis are, of course, quite different. The correlation between two variables at the national level is not necessarily similar to the correlation at the individual level; it may be larger, smaller, and even of opposite sign (e.g. Nezlek, 2008; Ostroff, 1993). For instance, while suicide rates are higher in nations with higher levels of economic development, within nations suicide is more frequent in poor regions and among people from low socioeconomic backgrounds (Baudelot & Establet, 2006). Indeed, a negative relation may be found at the individual level when a positive relation is observed at the national level. Thus, knowing that self-esteem is negatively related to suicide ideation and attempts at the individual level does not allow, *a priori*, predicting the relation between self-esteem and suicide rates at the national level.

Recent data from the ISDP (Schmitt & Allik, 2005), which provides, self-esteem scores for 53 nations, allow the first examination of the relation between self-esteem and suicide rates at the national level. In the ISDP survey, the 10-item Rosenberg self-esteem scale was translated into 28 languages and administered to a total of 16 998 participants. In nearly all

nations, self-esteem scores showed adequate reliability and were uniformly related to personality variables, such as neuroticism and extraversion, providing evidence for cross-cultural equivalence (see Schmitt & Allik, 2005). However, the ISDP survey was based on convenient samples, that is, college student samples for the most part. Of course, this raises the question of the validity of self-esteem scores in the ISDP survey.

As researchers have emphasized, an important criterion in establishing the validity of personality measures is to see whether the trait scores predict actual behaviours (e.g. Gosling, Ko, Mannarelli, & Morris, 2002; Heine, Buchtel, & Norenzayan, 2008). Given that suicide can be considered as a behavioural correlate of self-esteem (Kjelsberg et al., 1994), in the present study we were able to further estimate the predictive validity of the ISDP self-esteem scores. On one hand, it is quite possible that these scores are representative of college students but not of the citizens of the nations as a whole. If this is the case, these scores would predict suicide rates of college-age, but not of older individuals. On the other hand, national self-esteem differences based on student samples may rank the nations in the same way that national self-esteem differences based on representative samples would. In other words, the ISDP self-esteem scores may actually reflect national self-esteem. If this is the case, they would predict behaviour (i.e. suicide) for all members of the nations (i.e. whatever the age of suicide). In sum, using suicide rates by age data, the present study allows examining the predictive validity of the ISDP self-esteem scores.

Predictors of suicide rates across nations

To estimate the relative contribution of self-esteem in predicting suicide rates, over and above the effect of economic, historical and cultural factors, several other variables were considered in the current study. *Economic affluence* (i.e. GDP) and *transition* (i.e. ex-communist nations vs. not) were taken into account because, as mentioned earlier, they strongly predict national suicide rates. In the same way, *sex* was included in the analyses because men have a higher suicide rate than women across all ages and most nations (WHO, 1996). *Subjective well-being* was included as a predictor due to its obvious relevance to suicide, which should be reflected in a negative relation between these two variables. However, uneven findings have been reported in the past. Some researchers have found a positive correlation (Inglehart, 1990), and others a negative correlation (e.g. Bray & Gunnell, 2006). We also included *individualism*, because the relatively self-focused character of individualist cultures/nations may foster suicidal behaviour, although previous research has failed to find such a relation (Lester, 2003, 2005a).

Finally, *neuroticism* was taken into account because self-esteem may be partly confounded with it. For instance, Judge, Erez, Bono, and Thoresen (2002) have argued that self-esteem and neuroticism assess essentially the same construct. Schmitt and Allik (2005) reported a significant negative correlation of $-.31$ between the two constructs across 51 nations in the ISDP survey. Although a correlation of such amplitude suggests that neuroticism and self-esteem are different constructs (i.e. they share only about 9% of the variance), it is important to disentangle their respective contributions in predicting suicide rates. Indeed, a positive relation between neuroticism and suicide at the national level has long been theorized (e.g. Lynn, 1982), but no support for it has been found in previous research (e.g. Lester, 2005b; Lynn & Martin, 1995). For instance, using data from the ISDP survey, Voracek (2006) recently found a non-significant correlation of $-.14$ between neuroticism and national suicide rates.

The aim of the present study was to examine whether the negative relation between self-esteem and suicide documented in previous research at the individual level is also found at the aggregate, national level. If low self-esteem is a risk factor for suicide at the individual level, it seems reasonable to expect that suicide rates would be the highest where the proportion of individuals with relatively low self-esteem is the highest. We thus expected a negative relation between self-esteem and national suicide rates across nations.

METHOD

Statistics on suicide rates are taken from the WHO and the Global Burden of Disease (GBD) databases (see Lopez, Mathers, Ezzati, Jamison, & Murray, 2006). The WHO provides suicide rates data (by age and sex) for several nations. The GBD series provides estimates of total suicide rates for most other nations. The methods used to estimate mortality data for each nation are explained in detail in volume one of the GBD series (Murray & Lopez, 1996). In the current study, suicide rates (by age and sex) were available from the WHO for 38 nations, and estimates of total suicide rates (all ages and both sexes) were available from the GBD series for 17 other nations. Suicide rates data from the WHO are based on the most recent data available. Estimates from the GBD series were for 2002. Suicide rates are indicated by the number of suicides per year for 100 000 habitants. Cross-national researchers on suicide regard the archival data from the WHO and the GBD series as the most valid sources of suicide information (e.g. Reza, Mercy, & Krug, 2001).

The ISDP (Schmitt & Allik, 2005) provides self-esteem scores for 53 nations (see Table 1). Self-esteem scores for two nations (Côte d'Ivoire and Kosovo)¹ not included in the ISDP survey were derived from our own work. These data were collected with a lot of care and following the same procedure used in the ISDP survey.² In the current sample, complete data for suicide and self-esteem were thus available for 55 nations. Self-esteem data were based on sample sizes which varied from 59 to 2782 across nations ($M = 312.41$, $SD = 385.75$). The reliability of the self-esteem scores varied from .45 to .90 across nations ($M = .80$, $SD = .08$). The issue of measurement errors in self-esteem scores will be addressed in the results section.

As in previous research, economic affluence was based on the GDP *per capita* (United Nations Development Programme, 2001). GDP *per capita* was available for the 55 nations. In line with the classification proposed in the GBD series, 11 nations in transition were classified as 'formerly socialist economies of Europe': Croatia, Czech Republic, Estonia, Kosovo, Latvia, Lithuania, Poland, Romania, Serbia, Slovakia, and Slovenia. For the most part, the other nations have 'established market economies'. The cultural value of individualism was derived from Geert Hofstede's cultural dimensions (Hofstede, 1980, 2001), with data available for 39 nations. Subjective well-being scores (based on combined happiness and life satisfaction scores) were derived from the World Values Survey (Inglehart, 2004). These scores were available for 45 nations. Finally, neuroticism scores were derived from the ISDP survey (Schmitt, Allik, McCrae, Benet-Martínez, Alcalay &

¹The data from Côte d'Ivoire (Africa) are based on a sample size of 125 (96 men and 29 women, $M_{age} = 28.18$, $SD = 3.24$). The data from Kosovo (Eastern Europe) are based on a sample size of 60 (13 men and 47 women, $M_{age} = 24.61$, $SD = 5.28$). University students completed the Rosenberg self-esteem scale (Cronbach's $\alpha = .73$, and $.61$, respectively). The means (corrected for sex) were used in the present study ($M = 32.06$, $SD = 4.12$ and $M = 32.23$, $SD = 3.63$, respectively).

²The exclusion of these two nations does not change the results reported in this paper.

Table 1. Suicide rates (all ages), neuroticism and self-esteem by country

| Countries | Suicide rates | Suicide rates (male) | Suicide rates (female) | Source of suicide data | Year of suicide data | Neuroticism | Self-esteem |
|-----------------|---------------|----------------------|------------------------|------------------------|----------------------|-------------|-------------|
| Argentina | 6.40 | 9.90 | 3.00 | WHO | 1996 | 55.05 | 31.24 |
| Australia | 12.70 | 20.10 | 5.30 | WHO | 2001 | 50.82 | 31.07 |
| Austria | 17.90 | 27.10 | 9.30 | WHO | 2003 | 49.69 | 31.78 |
| Bangladesh | 12.20 | — | — | GBD | 2002 | 51.20 | 27.80 |
| Belgium | 21.10 | 31.20 | 11.40 | WHO | 1997 | 53.60 | 29.66 |
| Bolivia | 2.00 | — | — | GBD | 2002 | 50.29 | 31.24 |
| Bostwana | 5.00 | — | — | GBD | 2002 | 48.61 | 30.85 |
| Brazil | 4.10 | 6.60 | 1.80 | WHO | 1995 | 53.14 | 30.34 |
| Canada | 11.90 | 18.70 | 5.20 | WHO | 2001 | 50.58 | 30.22 |
| Chile | 5.70 | 10.20 | 1.40 | WHO | 1994 | 51.39 | 33.12 |
| Congo | 6.30 | — | — | GBD | 2002 | 44.58 | 31.28 |
| Côte d'Ivoire | 10.90 | — | — | GBD | 2002 | — | 32.06 |
| Croatia | 19.60 | 30.20 | 9.80 | WHO | 2004 | 46.16 | 31.94 |
| Cyprus | 0.70 | — | — | GBD | 2002 | 51.44 | 31.17 |
| Czech Republic | 15.50 | 25.90 | 5.70 | WHO | 2004 | 51.02 | 28.47 |
| Estonia | 20.30 | 35.50 | 7.30 | WHO | 2005 | 46.99 | 32.63 |
| Ethiopia | 3.50 | — | — | GBD | 2002 | 46.12 | 29.24 |
| Fiji | 2.90 | — | — | GBD | 2002 | 48.03 | 28.91 |
| Finland | 20.30 | 31.70 | 9.40 | WHO | 2004 | 47.84 | 31.76 |
| France | 18.00 | 27.50 | 9.10 | WHO | 2003 | 52.29 | 29.86 |
| Germany | 13.50 | 20.40 | 7.00 | WHO | 2001 | 50.29 | 31.73 |
| Greece | 2.90 | 4.70 | 1.20 | WHO | 2002 | 53.19 | 31.29 |
| Hong Kong | 18.60 | 25.20 | 12.40 | WHO | 2004 | 52.41 | 27.54 |
| India | 10.70 | 12.20 | 9.10 | WHO | 1998 | 50.00 | 30.44 |
| Indonesia | 11.30 | — | — | GBD | 2002 | 49.73 | 29.88 |
| Israel | 6.20 | 10.40 | 2.10 | WHO | 2003 | 49.27 | 33.03 |
| Italy | 7.10 | 11.40 | 3.10 | WHO | 2002 | 51.66 | 30.56 |
| Japan | 24.00 | 35.60 | 12.80 | WHO | 2004 | 57.87 | 25.50 |
| Kosovo | 2.60 | — | — | GBD | 2002 | — | 32.23 |
| Latvia | 24.30 | 42.90 | 8.50 | WHO | 2004 | 51.11 | 29.88 |
| Lebanon | 6.10 | — | — | GBD | 2002 | 53.35 | 30.52 |
| Lithuania | 38.60 | 68.10 | 12.90 | WHO | 2005 | 51.87 | 29.60 |
| Malaysia | 6.60 | — | — | GBD | 2002 | 48.14 | 29.83 |
| Malta | 5.00 | 8.60 | 1.50 | WHO | 2003 | 52.35 | 29.53 |
| Mexico | 3.10 | 5.40 | 1.00 | WHO | 1995 | 48.00 | 32.04 |
| Morocco | 2.30 | — | — | GBD | 2002 | 50.87 | 29.13 |
| The Netherlands | 9.20 | 12.70 | 5.90 | WHO | 2003 | 48.61 | 31.60 |
| New Zealand | 11.90 | 19.80 | 4.20 | WHO | 2000 | 49.59 | 30.24 |
| Peru | 0.90 | 1.10 | 0.60 | WHO | 2000 | 53.39 | 33.01 |
| Philippines | 2.10 | 2.50 | 1.70 | WHO | 1993 | 51.41 | 29.98 |
| Poland | 15.50 | 26.60 | 5.00 | WHO | 2002 | 51.80 | 30.34 |
| Portugal | 11.70 | 18.90 | 4.90 | WHO | 2002 | 50.21 | 31.30 |
| Romania | 14.10 | 23.90 | 4.70 | WHO | 2002 | 48.03 | 29.54 |
| Serbia | 19.30 | 28.80 | 10.40 | WHO | 2002 | 50.17 | 33.59 |
| Slovakia | 13.30 | 23.60 | 3.60 | WHO | 2002 | 51.57 | 28.94 |
| Slovenia | 28.10 | 45.00 | 12.00 | WHO | 2002 | 45.28 | 31.74 |
| South Korea | 5.00 | — | — | GBD | 2002 | 53.99 | 29.17 |
| Spain | 8.20 | 12.60 | 3.90 | WHO | 2002 | 54.03 | 31.52 |
| Switzerland | 17.40 | 23.70 | 11.30 | WHO | 2004 | 48.72 | 29.16 |
| Taiwan | 9.90 | — | — | GBD | 1980 | 53.13 | 28.77 |

(Continues)

Table 1. (Continued)

| Countries | Suicide rates | Suicide rates (male) | Suicide rates (female) | Source of suicide data | Year of suicide data | Neuroticism | Self-esteem |
|----------------|---------------|----------------------|------------------------|------------------------|----------------------|-------------|-------------|
| Tanzania | 2.30 | — | — | GBD | 2002 | 47.73 | 29.52 |
| Turkey | 6.70 | — | — | GBD | 2002 | 49.88 | 32.14 |
| United Kingdom | 7.00 | 10.80 | 3.30 | WHO | 2004 | 51.39 | 30.55 |
| United States | 11.00 | 17.90 | 4.20 | WHO | 2002 | 50.00 | 32.21 |
| Zimbabwe | 7.90 | 10.60 | 5.20 | WHO | 1990 | 48.26 | 30.77 |

Hoffman, 2007). Thus, self-esteem and neuroticism scores, assessed in the same samples, were available for a total of 53 nations.

RESULTS

Table 1 presents the list of nations included in the present study as well as the means of suicide rates, self-esteem, and neuroticism for each nation.

Preliminary analyses

Measurement errors in self-esteem scores might attenuate the expected relation between self-esteem and suicide rates. To examine this issue, we first checked the reliability coefficients of the self-esteem scores. There were only four nations with low reliability coefficients ($<.70$): Congo, Kosovo, Tanzania, and Ethiopia, and the results reported below were virtually identical when these nations were removed from the sample. However, there were considerable variations across nations in the sample size of self-esteem data. One might expect stronger relations between self-esteem and suicide rates in nations with the highest sample sizes (i.e. the lowest measurement error). We thus conducted separate correlation analyses on the nations with the highest versus lowest sample size (based on a median split, $Med = 211$). As Table 2 indicates, the correlations were stronger and more reliable in the nations with the highest sample size. The fact that self-esteem is negatively related to national suicide rates, especially when considering the nations with the highest sample sizes, is consistent with our prediction.

Table 3 depicts the correlations between self-esteem scores and suicide rates, by age and sex. A close inspection of this table reveals that self-esteem scores are systematically and negatively related with suicide rates in all ages and for both sexes. All but two correlations were negative and most of them (18 out of 27) reached significance, at least at the marginal level. The fact that suicide rates are negatively related to suicide in all age groups is consistent with the view that self-esteem, as assessed here in student samples, provides a reliable indication of the national self-esteem level. In other words, the present findings provide evidence in favour of the predictive validity of self-esteem scores as assessed in the ISDP survey.

Main analyses

As shown in Table 4, self-esteem was unrelated to other predictors of suicide rates included in this study (with the exception of neuroticism). However, the predictors of suicide rates

Table 2. Pearson correlations between suicide rates and self-esteem in the nations with the lowest and highest sample sizes

| | Suicide rates (male) | Suicide rates (female) | Suicide rates (total) |
|---------------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Nations with the lowest sample sizes | -.29 <i>N</i> = 16 | -.16 <i>N</i> = 16 | -.07 <i>N</i> = 28 |
| Nations with the highest sample sizes | -.44* <i>N</i> = 22 | -.45* <i>N</i> = 22 | -.34* <i>N</i> = 27 |

Note: The *p*-values are one-tailed.

The nations with the lowest sample sizes were Brazil, France, Hong Kong, India, Italy, Latvia, Lithuania, Mexico, Slovakia, Zimbabwe, Estonia, Finland, Peru, Serbia, Slovenia, Switzerland, Taiwan, Congo, Kosovo, Tanzania, Bangladesh, Bolivia, Côte d'Ivoire, Fiji, Indonesia, Malaysia, Morocco, and Cyprus. The nations with the highest sample sizes were Argentina, Canada, Chile, Japan, Philippines, Romania, Spain, Australia, Austria, Belgium, Croatia, Czech Republic, Germany, Greece, Israel, Malta, The Netherlands, New Zealand, Poland, Portugal, United Kingdom, United States, Ethiopia, Botswana, Lebanon, South Korea, and Turkey.

**p* < .05.

Bolded type *p* < .10.

were highly intercorrelated. In particular, GDP *per capita* was strongly related with subjective well-being and individualism. In addition, the nations in transition have lower levels of subjective well-being and higher suicide rates than the other nations (especially for males).

To test the relationship between self-esteem and suicide rates after control for other variables, we ran multiple hierarchical regression analyses. Economic affluence and transition, considered as structural factors, were entered in a first step. Individualism and subjective well-being, considered as cultural variables, were entered in a second step. Finally, the individual variables (neuroticism and self-esteem) were entered in a third step. The results of these analyses are presented in Table 5.

As shown in this table, structural variables were strongly associated with suicide rates. In contrast, cultural variables had no significant effects in the second step of the regression models. After control for structural and cultural variables, individual variables added little incremental variance in national suicide rates. This was primarily due to the fact that neuroticism did not predict national suicide rates. However, after control for all other

Table 3. Suicide rates (by age and sex) as predicted by self-esteem

| Age | Global suicide rates | Suicide rates (male) | Suicide rates (female) |
|-------------|----------------------|-------------------------|-------------------------|
| 5-14 | .02 | .08 | -.08 |
| 15-24 | -.17 | -.10 | -.30* |
| 25-34 | -.28* | -.23⁺ | -.47** |
| 35-44 | -.30* | -.28* | -.31* |
| 45-54 | -.28* | -.27⁺ | -.26⁺ |
| 55-64 | -.28* | -.26⁺ | -.25* |
| 65-74 | -.14 | -.06 | -.27* |
| 75 and more | -.14 | -.07 | -.23⁺ |
| All ages | -.29* | -.26⁺ | -.35* |

Note: *N* = 38. Entries are Pearson correlation coefficients (*p*-values are one-tailed).

⁺*p* < .10; **p* < .05; ***p* < .01.

Bolded type *p* < .10.

Table 4. Pearson correlations between the different predictors of national suicide rates

| | Global self-esteem | GDP per capita | Nations in transition | Individualism | Subjective well-being | Neuroticism | Suicide rates (male) | Suicide rates (female) |
|------------------------|--------------------|----------------|-----------------------|---------------|-----------------------|-------------------|----------------------|------------------------|
| Global self-esteem | — | | | | | | | |
| GDP (per capita) | | .07 | .07 | .05 | .10 | -.33** | -.26 ⁺ | -.35* |
| Nations in transition | | — | -.15 | .63*** | .69*** | .28* | .15 | .28* |
| Individualism | | | — | .03 | -.45*** | -.20 ⁺ | .63*** | .30* |
| Subjective well-being | | | | — | .46** | -.16 | .31* | .22 |
| Neuroticism | | | | | — | .08 | -.26 ⁺ | -.15 |
| Suicide rates (male) | | | | | | — | -.16 | -.12 |
| Suicide rates (female) | | | | | | | — | .80*** |

Note: *N* varies from 37 to 55 due to missing data. Entries are Pearson correlation coefficients (the *p*-values are one-tailed). Nations in transition were coded .50, the other nations were coded -.50.

⁺*p* < .10; **p* < .05; ***p* < .01; ****p* < .001.

Bolded type *p* < .10.

Table 5. Suicides rates as predicted from structural, cultural, and individual variables in multivariate analyses

| | Suicide rates (male) | | | Suicide rates (female) | | | Suicide rates (total) | | | | | |
|--------------------------------------|----------------------------|-----------|--------------------|------------------------|------------|-----------|-----------------------|----------|------------|-----------|------------------|------------|
| | β | $p <$ | CI ₉₅ < | Part r | β | $p <$ | CI ₉₅ | Part r | β | $p <$ | CI ₉₅ | Part r |
| Structural variables (step 1) | | | | | | | | | | | | |
| GDP per capita | .62 | .0001 | .00; .01 | .59 | .52 | .01 | .00; .00 | .50 | .57 | .0001 | .00; .01 | .56 |
| Transition | .63 | .0001 | 9.25; 23.79 | .60 | .18 | <i>ns</i> | -1.53; 4.86 | .17 | .48 | .001 | 3.53; 13.05 | .46 |
| R ² | .53 | | | .25 | | | | | .43 | | | |
| Cultural variables (step 2) | | | | | | | | | | | | |
| Well-being | -.19 | <i>ns</i> | -5.88; 2.11 | -.12 | -.40 | <i>ns</i> | -3.10; .33 | -.26 | -.10 | <i>ns</i> | -3.06; 1.82 | -.07 |
| Individualism | -.11 | <i>ns</i> | -.25; .15 | -.06 | -.02 | <i>ns</i> | -.09; .08 | -.01 | .04 | <i>ns</i> | -.09; .11 | .03 |
| R ² change | .02 | | | .07 | | | | | .00 | | | |
| F change | F(2, 26) = .68, $p = .51$ | | | | | | | | | | | |
| Individual variables (step 3) | | | | | | | | | | | | |
| Neuroticism | -.17 | <i>ns</i> | -2.12; .68 | -.13 | -.33 | .10 | -1.02; .07 | -.25 | -.21 | <i>ns</i> | -1.47; .31 | -.17 |
| Self-esteem | -.30 | .10 | -3.92; .13 | -.24 | -.54 | .01 | -1.96; -.37 | -.43 | -.32 | .05 | -2.50; -.02 | -.27 |
| R ² change | .06 | | | .18 | | | | | .07 | | | |
| F change | F(2, 24) = 1.85, $p = .17$ | | | | | | | | | | | |
| R ² (full model) | .61 | | | .51 | | | | | .51 | | | |

Notes: The p -values are two-tailed. Due to missing data, the analyses predicting male and female suicide rates are based on a sample size of 30, and the analysis predicting total suicide rates is based on a sample size of 35 (similar results appeared when missing values are replaced by means). Bolded type $p < .10$.

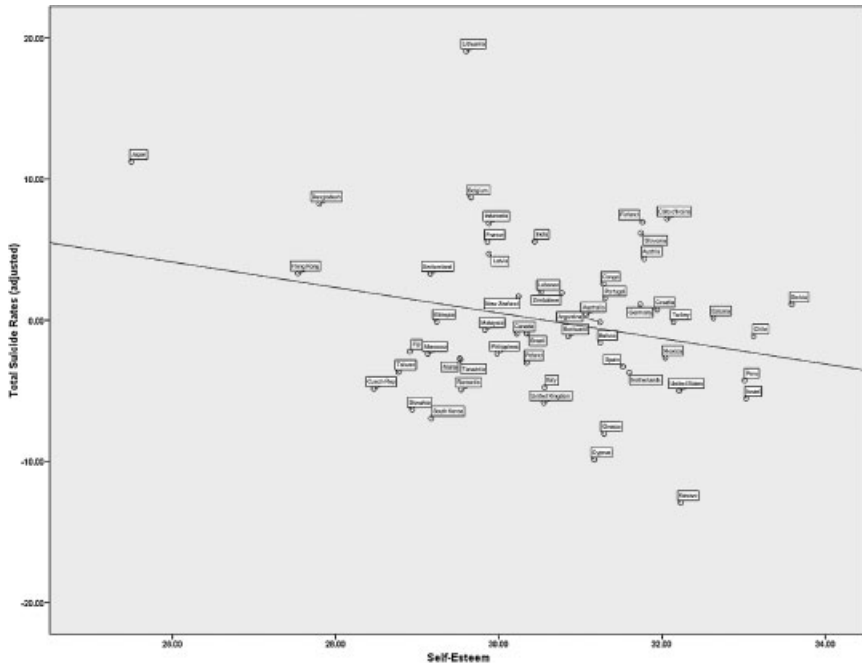


Figure 1. Self-esteem and total suicide rates in 55 nations. To plot this graph, total suicide rates were adjusted for all other variables included in the regression model (missing data were replaced by means).

predictors, national self-esteem was significantly related to male suicide rates (marginal), to female suicide rates, and to total suicide rates.³ Figure 1 shows the relation between self-esteem and total suicide rates (adjusted for all other variables in the model) across 55 nations.

Finally, we examined whether the relation between self-esteem and suicide rates was moderated by any of the other variables included in the regression models. To this aim, each variable was mean centred and we added the product term between self-esteem and each of the other predictors in a fourth step of the regression analyses. We found no significant moderations ($ps > .10$), suggesting that the relation between self-esteem and suicide rates was consistent across different levels of GDP, transition, individualism, subjective well-being, and neuroticism.

DISCUSSION

The main contribution of the present ecological study is to show that a nation's global suicide rate is directly related to its self-esteem level. People are more likely to commit

³In the precedent regression analyses, multicollinearity did not appear to be really problematic (all tolerance values were above .42, see Cohen, Cohen, West, & Aiken, 2003). However, because we cannot entirely dismiss it as a potential problem, we reproduced the analyses using each predictor's factorial scores. To this aim, the six predictors were first submitted to a principal component analysis with a varimax rotation. Six factors were extracted (all loadings $>.87$) and the residual scores were saved. These factorial scores, now independent from each other, were used in regression analyses. The results of these complementary analyses were very close to those depicted in Table 5. Self-esteem was negatively related to male suicide rates, $\beta = -.34$, $p < .02$, $CI_{95} = -5.97$; $-.77$, to female suicide rates, $\beta = -.48$, $p < .01$, $CI_{95} = -2.65$; $-.61$, and to total suicide rates, $\beta = -.32$, $p < .02$, $CI_{95} = -3.59$; $-.37$. In contrast, neuroticism was unrelated to national suicide rates (all $ps > .10$).

suicide in nations with relatively low levels of self-esteem, such as Asian nations, than in those with higher levels of self-esteem, such as the United States. This finding is generally consistent with research at the individual level that identifies self-esteem as a risk factor for suicide ideation and suicide attempts (Emler, 2001). However, the current study provides the first empirical evidence for a direct link between national self-esteem and national suicide rates. Such a relation is not trivial. As emphasized before, greater suicide rates could technically have been found in nations where the level of self-esteem is high compared to other nations. Interestingly, the negative relation between self-esteem and suicide rates documented in the present study was consistent across sex lines, age lines, and after control for a number of other relevant predictors of suicide.

The fact that self-esteem was related to national suicide rates in all ages attests to the predictive validity of self-esteem scores as assessed in the ISDP survey (see Schmitt & Allik, 2005). This finding does not support the idea that cross-national comparisons of personality traits are not valid because of inherent methodological problems (e.g. Heine et al., 2008). However, the present study also shows better predictive validity of self-esteem scores when assessed within larger samples. Thus, progress will now come from efforts at assessing self-esteem in larger and more representative samples.

Consistent with previous research, the current findings point out that suicide rate is especially likely in wealthy nations and in nations in transition (e.g. Baudelot & Establet, 2006; Lester, 1996). Relatively little is known about why this might be the case, but clearly economic affluence and transition were the two strongest predictors of suicide rates in the present study. Further research is thus needed to shed more light on this issue. The current study indicates, in addition, that individualism and subjective well-being did not predict suicide rates in multivariate analyses. We suggest that the inconsistent findings concerning the relation between each of these last two variables and suicide could be due to the fact that previous studies did not simultaneously control for economic affluence and transition (which are related to individualism and subjective well-being).

Also of interest, even though self-esteem was significantly negatively related to neuroticism, self-esteem, but not neuroticism predicted national suicide rates. No support is thus found in the present data for Lynn's (1982) hypothesis, whereby neuroticism would be positively related to suicide rates. A number of previous studies have also failed to find support for this hypothesis (e.g. Lester, 2005b; Lynn & Martin, 1995; Voracek, 2006). One possibility to account for such findings is that psychoticism, rather than neuroticism, predicts suicide. Indeed, previous research at the individual level provides preliminary support for this hypothesis. For instance, using a sample of 66 female suicide attempters, Lolas, Gomez, and Suarez (1991) found that psychoticism was positively related to hopelessness, suicide ideation, and number of previous suicide attempts. In contrast, neuroticism did not consistently predict such outcomes. In the same way, Voracek (2006) recently argued that psychoticism may be positively related to national suicide rates.

Identifying self-esteem as a risk factor for suicide at the national level may have implications for suicide prevention strategies. The present findings clearly suggest that special attention should be devoted to people with low self-esteem and that prevention programmes aimed at protecting and enhancing self-esteem should be developed in countries in which self-esteem is particularly low. Such enthusiasm should be tempered, however, by the fact that we do not know whether such programmes would be efficient in reducing suicide rates. To date, the only known effective methods in reducing rates of suicide and suicide attempt are physician education in depression recognition and treatment, and restricting access to lethal methods (see Mann et al., 2005). Further research

is thus needed to determine the efficacy of suicide prevention strategies based on raising self-esteem.

This brings us to the question of depression, a relevant parameter that was not controlled for in this study. Indeed, numerous studies show that depression is a major risk factor for suicide at the individual level (e.g. Brådvik, Mattisson, Bogren, & Nettelblatt, 2008). Unfortunately, we do not know of any research that reports national depression scores for a large sample of nations. However, we did control for national neuroticism level, which may partially overcome the shortcoming of not controlling for depression (neuroticism being strongly related to depression disorders, see for example, Schmitz, Kugler, & Rollnik, 2003). In addition, it has also been shown that self-esteem and depression make independent contributions to suicide ideation at the individual level (e.g. de Man & Becerril Gutiérrez, 2002). Finally, even if these two variables partially overlap, being negatively related, it has recently been shown that self-esteem causes depression at the individual level, rather than the other way around (Orth et al., 2008). Self-esteem thus appears to be a more primary determinant of suicide rates than depression.

In sum, our data show that self-esteem predicts national differences in suicide rates, over and above the influence of other structural and cultural variables. In light of this, self-esteem appears as an important variable that should not be neglected in suicide prevention programmes.

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