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NEW EVIDENCE ON TRUST AND WELL-BEING

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ABSTRACT

This paper first uses data from three large international surveys – the Gallup World Poll, the World Values Survey and the European Social Survey – to estimate income-equivalent values for social trust, with a likely lower bound equivalent to a doubling of household income.

Second, the more detailed and precisely measured trust data in the European Social Survey (ESS) show that social trust is only a part of the overall climate of trust. While social trust and trust in police are the most important elements, there are significant additional benefits from trust in three aspects of the institutional environment: the legal system, parliament and politicians. Thus estimates of the total well-being value of a trustworthy environment are larger than those based on social trust alone.

Third, the ESS data show that living in a high-trust environment makes people more resilient to adversity. Being subject to discrimination, ill-health or unemployment, although always damaging to subjective well-being, is much less damaging to those living in trustworthy environments. These results suggest a fresh set of links between trust and inequality. Individuals who are subject to discrimination, ill-health or unemployment are typically concentrated towards the lower end of any national distribution of happiness. Thus the resilience-increasing feature of social trust reduces well-being inequality by channeling the largest benefits to those at the low end of the well-being distribution.

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A Statistical appendix is available at http://www.nber.org/data-appendix/w22450

1. Introduction

In this paper we report existing and fresh evidence on some of the direct and indirect linkages between trust and subjective well-being. There are four main sections. First we survey a range of previous key results on the empirical linkages between trust and subjective well-being. Then we proceed in the subsequent three sections to present new research on three separate topics. First we use the European Social Survey, the World Values Survey and the Gallup World Poll to prepare new estimates of the effects of social trust on satisfaction with life. Second, we present new results from the European Social Survey showing how the relative importance for well-being of trust depends on both the type and radius of trust. Third, we shall present some new individual-level evidence on how social trust increases the resilience of individuals affected by adverse events. Finally, the concluding section will summarize the results and present some evidence that improvements are possible within policy-relevant time horizons.

2. Summary of Previous Findings

Trust of many types matters for subjective well-being

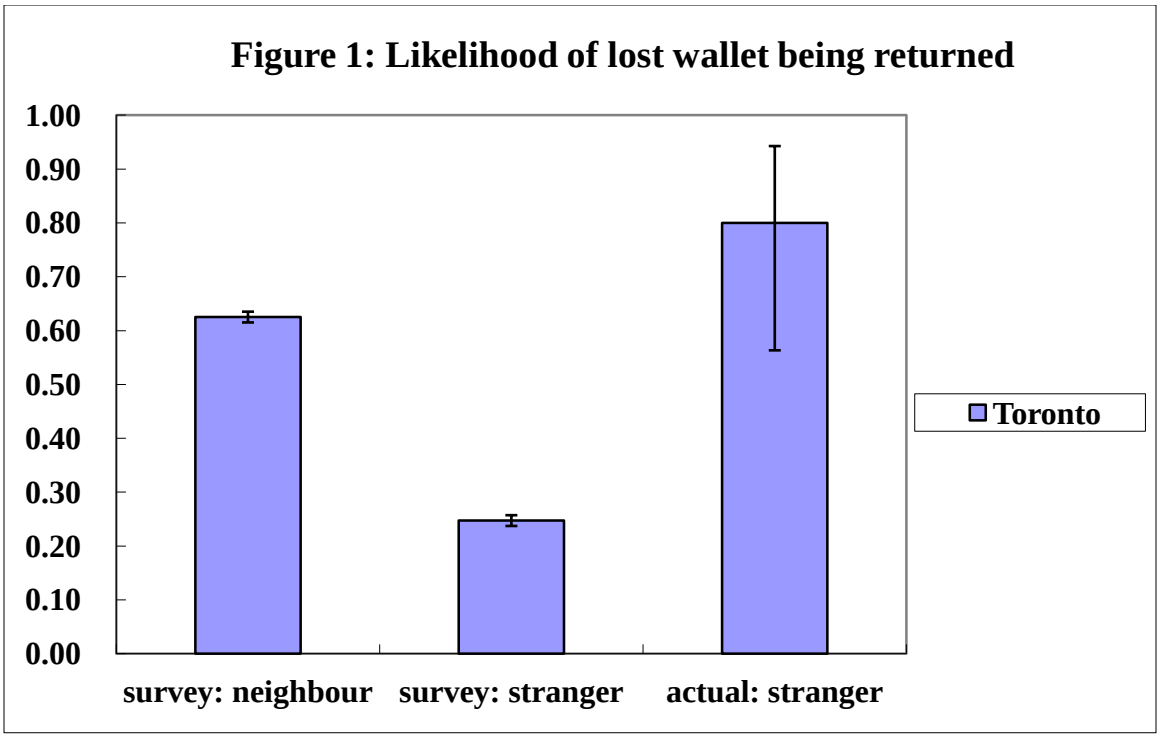
Several types of trust are independently important to well-being, as evidenced by large income-equivalent compensating differentials. Much early research, starting from Almond and Verba (1963) made use of what has come to be seen as the classic social trust question: "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?". This was initially, and is mainly still, asked with only two possible answers. More recently, and desirably, the European Social Survey has asked for responses on an eleven-point scale ranging from 0 to 10. This permits not only a more subtle gradation of perceived trust levels by each respondent, but then also provides a meaningful distribution of responses, and hence a measure of trust inequality within the community or nation. Subsequent research has embraced trust measures of many types, and covering various aspects of life, social groupings, institutions and ranges of geography. Once distinctions are made about the locus, radius, and type of trust, the evidence shows that several different types of trust can be simultaneously important. We shall discuss the radius of trust more fully later in this section. As for different types of trust, large samples US and Canadian data have shown large effects linking interpersonal differences in several measures of subjective well-being to workplace trust, trust in police, and trust in neighbours, in addition to the standard measure of social trust (Helliwell & Putnam, 2004). We shall present in section 4 some new estimates, from the European Social Survey, of the relative importance of several types of trust.

Some scholars, worried about the possible vagueness of the social trust question, proposed what has come to be known as the wallet question: "Supposing that you lost your wallet with $200 in it, what is the likelihood of it being returned intact if found by…" (followed by a list of possibilities that differ across surveys, but generally including at least neighbors, a police officer, and a stranger.) This question was inspired by experiments run by the *Reader's Digest*, and analyzed by Knack (2001), where wallets containing cash were dropped in a number of cities in the US and 14 countries in Europe.

The cross-city variations in the fractions of wallets returned were highly correlated (r=0.65, Knack 2001) with differences among the respective countries in average answers to the classic social trust question. The wallet-dropping question, aside from permitting different directions of trust to be distinguished – for example the relative rankings of neighbors and police officers as likely wallet returners differ significantly among countries – also provides the potential for making direct comparisons between expected trust and actual trustworthiness, an asset we make use of under the next heading.

People are more trustworthy than you think

Should people be encouraged to be more trusting of others? Any informed answer to this question requires some knowledge about how trusting people are now, and about how trustworthy is the environment within which they live. To be too trusting in a dangerous environment is looking for trouble. But to be untrusting in a trustworthy environment needlessly reduces peoples' subjective well-being directly, and also diminishes their willingness to reach out to others in ways that will increase trust and well-being in the future. What has been generally lacking is evidence that permits a precise matching of expected and actual trustworthiness. Fortunately, the Canadian General Social Survey has used the wallet question in several rounds, providing large samples showing how likely people feel their cash-bearing wallet is to be returned if found by a stranger. A Toronto newspaper experimentally dropped cash-bearing wallets around the city. A direct comparison can thus be made between actual and expected trustworthiness by comparing the actual rate of wallet return to what people expected it to be. Figure 1 shows a dramatic gap between expected and actual trustworthiness, with the actual rate of wallet return, at 80%, being about three times what it was expected to be. Although the sample of dropped wallets was small, with a correspondingly wide 95% confidence region, the survey estimate was very tight, and the overall likelihood of the trust perceptions being consistent with the actual rate of wallet return is one in several billion.



These results are striking enough, and have sufficiently important implications for behavior and policy, that they deserve replication in other countries and social contexts. They imply that peoples' trust assessments are needlessly pessimistic, presumably because the information they see and read in the media is more skewed to reporting anti-social than pro-social behavior. This is probably true whether the information source is news, fictional dramas or reality shows. Only by running experiments like these in a broad range of communities and countries will it be possible to see if this undue pessimism is evident more generally, and to dig deeper into the sources of this undue pessimism wherever it may be found. If the situation elsewhere should match that in Toronto, there is ample scope for improving trust simply by improving information, with immediate benefits for current well-being, and future benefits likely to flow from the additional social connections and trust fueled by the realistic increases in expected trustworthiness.

Trust saves lives

There is a large literature linking social trust to a range of health outcomes both within and among countries, as surveyed by Kawachi (2016). Many of these studies are derived from within-country direct linkages from social trust to subjective well-being, e.g. Yip, Subramanian, Mitchell, Lee, Wang, and Kawachi (2007). And at the national level, healthy life expectancy is in turn a well-established contributor to average life evaluations, through its impact in explaining international differences in life evaluations (Helliwell, Huang, & Wang, 2016, Table 2.1). Beyond these linkages, social trust has been found to be correlated with international differences in mortality rates for two major

sources of mortality, suicide (Helliwell, 2007) and traffic accidents. The effects of social trust on traffic fatalities has been found both internationally (Helliwell, 2007) and across states in the United States (Nagler, 2013), with the US effects appearing mainly in urban traffic (Nagler & Ward, 2016). Suicide and traffic fatalities are roughly tied as the tenth leading causes of death worldwide, and the effects of national-level social trust on both rates are estimated to be equal (Helliwell, 2007, Table VI), so the projected lives saved by higher social trust in the two cases are similar. The estimated effects are large. For example, if the level of social trust in France were as high as that in Norway the projected rate of traffic fatalities would be halved, to about the Norwegian rate (Helliwell & Wang 2011, p. 51).

Footprints of trust and well-being after migration

There is a long-standing literature, dating at least from Fischer (1991), that migrants from Europe to the United States brought many aspects of their culture, including social trust and other social norms, with them, and that these norms, including especially social trust (Rice & Feldman 1997) had footprints that could extend over generations, even surviving subsequent internal migration (Uslaner, 2008). If so, and if these social norms themselves have causal linkages to subjective well-being, then we might also expect to find a post-migration footprint for subjective well-being. The migration footprint of trust, mainly studied with respect to immigration from other countries to the industrial countries, is extensively surveyed in Dinesen & Sonderskov (2016). Evidence from more symmetric samples of global migration also show that trust and other social norms (e.g. generosity) adjust with some lag when people migrate from one society to another, providing evidence of a trust footprint from their countries of origin. By contrast, confidence in national institutions shows no such footprint. For both results see Helliwell, Wang, and Xu (2015).

As for the happiness of migrants, there is evidence from some countries of migrants being less happy than non-migrants. Because most of the migrant samples studied are in countries whose immigrants came from less happy source countries, it is hard to tell how much of their post-migration happiness deficit is a footprint effect. Recent evidence from immigrants to Canada from 100 different source countries, with national average source-country life satisfaction averages varying by a factor of two, shows that immigrants from all countries tend to report life satisfaction levels almost equal to those of all Canadian residents, whether or not allowance is made for differences in education, age and health. See Frank, Hou, and Schellenberg (2015) for research based on 54 countries, and Helliwell, Bonikowska, and Shiplett (2016) for the larger samples. There is a very small footprint effect for life satisfaction, perhaps consistent with the trust footprint weighted by a plausible estimate of the effects of social trust on life evaluations.

Inequality and trust

If inequality matters for social trust, then this presumably provides one of the channels through which inequality affects well-being. Rothstein and Uslaner (2005) argue that two types of inequality – economic inequality and inequality of opportunity – are both damaging to social trust. Their empirical work, and that of Bjørnskov (2007), emphasizes the role of income inequality, finding it to be one of the strongest variables used to

explain international differences in social trust. Algan and Cahuc (2014) find significant negative correlations between social trust and income inequalities both internationally and among states of the United States. But if subjective well-being provides a broader and more relevant indicator of welfare than does income, we might also expect that the inequality of well-being would be a relevant measure of inequality, perhaps even more than is the inequality of income.

One way of testing this would be to see which of the two measures of inequality has a stronger link to social trust. For both types of inequality, there is a strong likelihood that their correlation with social trust has causal arrows that run both ways, and also reflect their joint dependence on other aspects of a nation's or a community's culture and institutions. In some sense this does not matter, since both equality and social trust have independently established positive effects on well-being, so that any successful attempt to improve one will thereby have positive spillover effects on the other, with experimentation serving to reveal the most efficient ways of improving both. In any case, since these reverse linkages are no more likely for one type of inequality than the other, they should not influence the outcome of a horse race run to see which measure is a better predictor of social trust. What is the evidence? Goff, Helliwell, and Mayraz (2016) have shown, using all three of the international surveys that we are using here, that the negative link between inequality and social trust is even stronger and more robust when inequality is measured in terms of overall subjective well-being rather than in terms of income or wealth.

Radius of trust matters

What sorts of trust are more likely to support well-being? Fukuyama (2001) makes the distinction between the strength and the radius of trust, with the radius covering social, ethnic and linguistic as well as geographic distances. Narrow-radius trust is sometimes referred to as in-group trust, which may build on the in-group/out-group boundary, and hence be at the expense of the out-group. In such cases, collaborative action in response, for example, to a natural disaster may increase trust and well-being among the high-trust group, but perhaps also lead to further marginalization of out-groups (Aldrich, 2011). Narrow-radius trust is similar to what Putnam has called bonding social capital, as distinct from the bridging social capital typified by the canonical social trust question. There is some evidence of difference across cultures in the extent to which answers to the social trust question are based on broader or narrower social contexts (Delhey, Newton, & Welzel, 2011).

Although narrow-radius trust is sometimes thought to represent, and hence to breed, insularity and suspicion of others, previous evidence comparing the well-being effects of trust measures with different distance and scope has tended to show positive well-being effects from each (Helliwell & Putnam, 2004). Are these effects independent, or do the well-being advantages of narrow or in-group trust come at the expense of the strength or well-being benefits of broader trust? Unraveling that puzzle is difficult, as social identities and trust are likely to be co-determined, with trust more easily established among those who see themselves as sharing social identities. One way of interpreting this interdependence is to see shared social identities as representing a channel through which

high social trust supports happiness. For example, data from the Canadian General Social Survey shows that the estimated well-being effects of social trust are reduced where shared social identities are separately accounted for (Helliwell & Wang, 2011, Table 3). That evidence shows that trust and a sense of belonging contribute to subjective well-being, with local identities and trust mattering most. As for the crucial question of whether there is a conflict between the local and longer-distance belonging, that same Canadian evidence shows that while the well-being effects of local community belonging have a stronger well-being impact than does belonging to the province or country, all three contribute, and tests show a life satisfaction premium for those who have multiple overlapping senses of belonging (Helliwell & Wang, 2011, Table 3).

Resiliency

One important but less studied channel from social trust to well-being resides in the resilience that enables high-trust communities to respond more successfully to natural disasters or economic shocks. Where communities with initially high levels of social trust were faced with disaster- as in the examples of the 2011 earthquake and tsunami (Yamamura, Tsutsui, Yamane, Yamane, & Powdthavee, 2015) – the resulting efforts to cooperate in dealing with the suffering and damage led to post-disaster levels of trust and sometimes even happiness higher than before the disaster. Analyzing the same event using only a post-disaster survey, Homerich (2012) found social trust to differ across communities according to their degree of damage, significantly so for younger respondents, being higher in those prefectures that suffered more damage.

Looting in Chilean cities following the 2010 earthquakes was serious in low-trust regions and absent in high-trust regions. Social trust in Chile was estimated to have increased in regions with more damage, to an extent that was greater for regions with initially higher levels of social trust (Dussaillant & Guzman, 2014, 2015). Although changes from pre-disaster to post-disaster levels of trust are only recently being measured, there is evidence that pre-disaster levels of social trust, or related measures of social capital or institutional quality help to explain international differences in the death tolls from natural disasters (Kahn, 2005), differences among Tokyo wards in their ability to cope with the 1923 earthquake (Aldrich, 2012) and among communities in South India in the wake of the 2004 tsunami (Aldrich, 2011). Comparisons across communities with differing degrees of disaster damage show trust in strangers higher among those in the more disaster-damaged communities, based on trust experiments in various countries, including Thailand (Cassar, Healy, & Von Kessler, 2011), Honduras (Castillo & Carter, 2011) and Chile (Fleming, Chong, & Bejarano, 2014).

A corresponding case has been made that countries with higher levels of social capital had better well-being outcomes following the 2007-2008 financial crisis. The lower trust countries suffered worse economic consequences, and reductions in happiness much larger than would have been predicted on the basis of their reductions in income and employment (Helliwell, Huang, & Wang, 2014).

3. Updated Evidence on the Links between Trust and Well-being

In this section we use the largest available international samples of data to update some key basic results, emphasizing the links between social trust and life evaluations. To make our results as comprehensive as possible, we use all three large international surveys that have in some or all of their survey rounds asked the social trust question. These include six waves of the biennial European Social Survey (ESS, 2002 through 2012), six waves of the World Values Survey (WVS, covering1981-2014), and the Gallup World Poll (GWP), in which the social trust question was only asked in most countries for only a single year, usually 2009. We have attempted to set up our estimation so as to make the results as comparable as possible across the three surveys. Even so, there remain some differences in what is available for all three of the key variables: life evaluations, social trust, and income.

We first consider the differences in life evaluations. The European Social Survey asks two life evaluation questions with answers on a scale running from 0 to 10, one relating to satisfaction with life, and the second asking: "Taking all things together, how happy would you say you are?". We find here, as with our earlier research, that these two questions reveal the same underlying patterns of relative importance for the factors supporting subjective well-being, so much so that better-fitting equations are obtained by using an average of answers to the two questions. Hence we use this average life evaluation for the results reported in this paper. For the World Values Survey we use the answers to a question asking respondents to report their life satisfaction on a scale running from 1 to 10. Although there is also a happiness question in the WVS, it has a different scale and is less clearly a life evaluation, and so we do not make use of it here. The Gallup World Poll uses the Cantril ladder question as its central life evaluation. This question asks respondents to evaluate their current lives on a 0 to 10 scale using the image of a ladder, with top rung (10) representing the best possible life for them, and the lowest (0) the worst possible life for them. There has been some uncertainty about how answers to this question could be compared to those from the life satisfaction question. Fortunately the GWP also included the life satisfaction question, on the same 0 to 10 scale used for the Cantril ladder, although only for a single year. This significant set of data showed that answers to the Cantril ladder had a slightly lower average value, and were more tightly grouped about the global median answer of 5.0, just as Cantril presumed when he described it as a 'self-anchoring' scale.[1] Looking across national averages for the 129 countries where both questions were asked, life satisfaction starts below the Cantril ladder and rises faster.[2] The two measures are of course positively correlated with each other at both the individual (r=0.63) and the national levels (r=0.91). For the purposes of our comparisons here, the most important finding is that the estimated structural determinants of the two measures are almost identical, so much so that tighter explanations for the individual-level data are provided by averaging the two answers. This suggests, by triangulation, that we would expect the effects of social trust to be the same on both measures. This cannot be directly tested, since the satisfaction

[1] For the 129 countries with both measures, the SWL national averages have a mean value of 5.91 (SD=1.41) compared to 5.45 (SD=1.11) for the Cantril ladder. At the individual level, the SWL average is 5.99 (SD=2.40) compared to 5.57 (SD=2.19) for the Cantril ladder.
[2] Using the 129 national averages, SWL= -0.41 + 1.16*ladder (SE=0.05), r2=0.83.

with life question was asked in 2007, and the trust question in 2009. Thus our equations reported here make use of the Cantril ladder answers on their own.

We turn now to consider measures of social trust. All three surveys ask the social trust question described above. In both the World Values Survey and the Gallup World Poll, the answers are binary, either 1 or 0. But the European Social Survey used a scale ranging from 0 to 10. The fuller range of available responses greatly increases the information provided, including the possibility of measuring international differences in the inequality of social trust, to match the measures of the inequality of well-being. But it does pose a difficulty of comparability of results across surveys. The answers to the binary question are all clustered at 0 or 1, while the answers to the eleven-point assessment are distributed among the eleven possible answers. When the 0 to 10 scale responses are used in a regression explaining life evaluations in the ESS, it attracts a coefficient of 0.11, implying an increase of that size for each one-point increase on the 10-point scale, or more than a full point in moving from the bottom to the top of the scale. To make the ESS data and results more comparable with the binary answers from other surveys, we divide the whole sample of social trust answers into two groups. A binary high-trust variable is created, with the value of 1.0 for each of those who have answered 7 or above on the ESS social trust question. Its average value of 0.3 is fairly close to the fraction of the population in these same countries who answer yes rather than no to the binary trust question often asked in other surveys. And it naturally produces a coefficient, 0.45, which is larger than 011, because of the ten-fold diminution of the range of the variable, but much less than ten times larger. This reflects the fact that the distribution of answers over the 0 to 10 scale is much more even than for the binary variables. We will use both the binary and full forms of the ESS social trust variable. We shall use the binary form results in this section, to help us to deliver comparability with the results from the other two surveys, in which only binary trust answers are available. We shall use the fuller information provided by the answers in the 0 to 10 scale for our more detailed analysis of the ESS trust data in subsequent sections.

There is also non-comparability among the surveys in their treatment of income. Ideally, we would like to be able to measure household income in logarithmic form, so as to be able to define the value of social trust in terms of a compensating differential measured as a proportionate change in income. This is possible in the case of the Gallup World Poll, where the household income data have been transformed into international dollars measured in terms of purchasing power parities. But in the ESS and WVS we only have income reported by decile of household income. Thus for our equations using these two surveys we include dummy variables for each decile, treating the fifth income decile as the omitted category. To get an income difference to compare with the estimated value of social trust we use the scaled-up coefficient on the ninth income decile, which shows the extra life evaluation from being in the ninth rather than the fifth income decile. For the ESS, the average income in the ninth decile is greater than that in the fifth decile by about 0.7 log units, not too far from the 1.0 log units implicit in the Gallup World Poll estimates. For a better comparison, we scale up the extra life evaluation from the ninth decile by a factor 1/0.7, and use that coefficient as the gain in life evaluation from a one-unit move in the logarithm in the household income, the same income move as that

implicitly in the GWP regressions. For the WVS, the average income in the ninth decile is greater than that in the fifth decile by about 1.07 log units. We scale the extra life evaluation from the ninth decile by a factor 1/1.07 to yield the gain in life evaluation from a one-unit move in the logarithm of household income.

Finally, a word about the preferred estimation form. In all three cases we include country and year fixed effects. Country fixed effects are necessary to absorb the net effects from the range of national level variables not included. In all cases we include a number of individual-level controls, including age and age squared, health status, and other variables available only in specific surveys, especially the ESS. Full details are shown in the Statistical Appendix.

Table 1
Estimates of the value of social trust
Income-equivalent values of social trust
Based on individual-level data from three international surveys

	Survey		
	ESS	WVS	GWP
Effect of binary trust	0.45	0.30	0.25
Standard error	(0.03)	(0.03)	(0.03)
Effect of household income	0.50	0.43	0.31
Standard error	(0.05)	(0.06)	(0.02)
Ratio: trust effect/income effect	0.90	0.70	0.81
Standard error	(0.07)	(0.10)	(0.10)
Adjusted R^2	0.32	0.22	0.29
Number of observations	278k	356k	144k
Number of countries	32	110	112

Notes:
Results are based on regressions using data from individual survey respondents – after controlling for country and year fixed effects, and a number of individual-level variables. In ESS, the effect of household income is estimated as that associated with a move from the 5th decile to the 9th decile of the income distribution - or an increase of log household income by 0.7 unit - divided by the factor 0.7. The underlying regression for the ESS estimates is reported in column 3 of Appendix Table 6. In WVS, the effect of household income is estimated as that associated with a move from the 5th decile to the 9th decile of the income distribution - or an increase of log household income by 1.07 unit - divided by the factor 1.07. The underlying regression for the WVS estimates is reported in column 1 of Appendix Table 12. In GWP household income is already in log form. Thus in all cases the income effect is in terms of a 1-unit increase in log income. The underlying regression for the GWP estimate is reported in column 1 of Appendix Table 7.

Table 1 shows the key results from each of the three surveys. The well-being advantages of social trust, as seen by the individual, and measured by a binary or binary-equivalent variable, range from 0.25 to 0.45 across the three surveys, in each case at a high level of statistical significance. Thus to be a generally trusting member of the global sample is associated with a life evaluation that is a quarter to a half a point higher on the 10-point scale. These effects can then be compared to those of income. The effects of household

income are estimated to be 0.31 on log income in the case of the GWP. In the two other surveys, the effects are 0.50 for the ESS and 0.43 for the WVS.

The third set of numbers brings the social trust and income effects together to show the income-equivalent value of social trust. These ratios range from 0.7 to 0.9, and in all cases these ratios are very significant in statistical terms, reflecting the large sample sizes and the generally powerful individual-level linkages between life satisfaction and both income and social capital. The range of estimates from one survey to another provides an appropriate note of caution about treating any one estimate as a precise measure. Indeed, one of the motives behind our decision to use all three major surveys in a consistent way was to produce a number of intentionally comparable estimates from all the available sources of data, expecting to find, as we did, a range of resulting estimates.

The results in Table 1 are entirely based on individual-level responses. Other possibilities include either national or two-level analysis. In both these latter cases, explicit allowance is being made for the possibility of contextual effects, where individual well-being depends not only on their own circumstances but on those of others in their countries. The individual-level analysis recognizes the possibility of such contextual effects, but combines them within country fixed effects. Two-level analysis, which we used in some earlier analysis with the SWL and GWP data,[3] is bedeviled by the relatively small number of national-level observations in relation to the possible number of relevant national-level variables. This has tended to lead to estimates of contextual effects that are highly unstable.

The use of national level data in principle permits the estimation of the combined impact of direct and contextual effects. It is, however, limited by the relatively small number of countries and the short and often uneven country coverage from year to year. The best of the three surveys for this analysis is the ESS, with six complete survey rounds at two-year intervals. This permits us to use panel analysis with country fixed effects and year fixed effects, providing at least a tentative estimate of the within-country national level linkages between social trust and life evaluations. For the Gallup World Poll, there is generally only a single year of observations on social trust, making a pure cross-section the preferred form of analysis. The WVS has such a changing and uneven pattern of country surveys that stable national-level estimates for the effects of social trust cannot be pinned down without relying mainly on cross-sectional variation, which we achieve by using fixed effects for years but not for countries. Thus, looking across the three surveys, we lack the same comparability of results that we were able to achieve for the individual results with their much larger samples.

However, we nonetheless present in Table 2 our current estimates at the national level for all three surveys. The estimation method is a pure cross-section for the GWP, a panel estimation with year and country fixed effects in the case of the ESS, and a tattered panel without fixed effects for the WVS. In all three cases the estimated effects of social trust are higher than shown in Table 1, suggestive of positive contextual effects. Income

[3] See Helliwell (2003) for two level analysis using the WVS, and Helliwell, Barrington-Leigh, Harris, and Huang (2010, Table 10.1) for the GWP data.

effects are higher in the case of the ESS and roughly the same in the case of the GWP. The higher effect in the ESS probably reflects the well-established short-term dynamics between national income and subjective well-being. This dynamic aspect naturally does not appear in the GWP cross-section. In both surveys the estimated national-level compensating differentials for the value of social trust are higher than in Table 1. Because of the smaller samples sizes, and the resulting lower precision, we prefer not to rely too heavily on these larger national-level estimates, beyond taking comfort in the fact that they are if anything higher than we found at the individual level.

Table 2
National-level estimates of the value of social trust
Income-equivalent values of social trust

	Survey		
	ESS	WVS	GWP
Effect of binary trust	2.37	0.81	1.08
Standard error	(0.78)	(0.28)	(0.45)
Effect of GDP per capita	1.73	0.59	0.33
Standard error	(0.41)	(0.09)	(0.08)
Ratio	1.37	1.37	3.21
Standard error	(0.54)	(0.56)	(1.38)
Adjusted R^2	0.36(within)	0.37	0.76
Number of observations	152	328	126
Number of countries	32	106	126

Notes:
Results are based on regressions using national average data, and using GDP per capita (in PPP) rather than the national averages of household incomes. The ESS results are from a panel regression containing social trust, log GDP per capita, healthy life expectancy and both country and year fixed effects (column 6 of Appendix Table 9). The WVS results have the same variables, but without controlling for fixed effects (column 1 of Appendix Table 13). The GWP regression is a pure cross-section (column 8 of Appendix Table 10) that also includes the six key variables used to explain international happiness differences in Table 2.1 of the World Happiness Report.

Taken together our individual-level and national-level results confirm a strong positive relation between social trust and life evaluations, while the ESS panel results with country fixed effects also suggest that these linkages are strong over time within countries as well as between countries. This in turn suggests that social trust, sometimes thought to culturally fixed, can in fact change within policy-relevant time horizons, and that these changes in social trust are linked to significant changes in national levels of subjective well-being. An example may help to illustrate this point. Social trust in Poland averaged 3.82 (SE=0.03) in the three rounds of the ESS 2002 to 2006, and 4.27 (SE=0.04) in the two latest rounds (2010 and 2012). To evaluate this increase in social trust on the 10-point scale, we use the corresponding social trust and income coefficients from national panel estimation with country fixed effects (equation 5 in Table 9 of the Statistical Appendix). Using these estimates, the social trust increase from 2002-07 to 2010-12 is calculated to have increased life evaluations by almost 0.18 points (0.45*0.458=0.206), about one-third of the total increase in Poland's life evaluations over

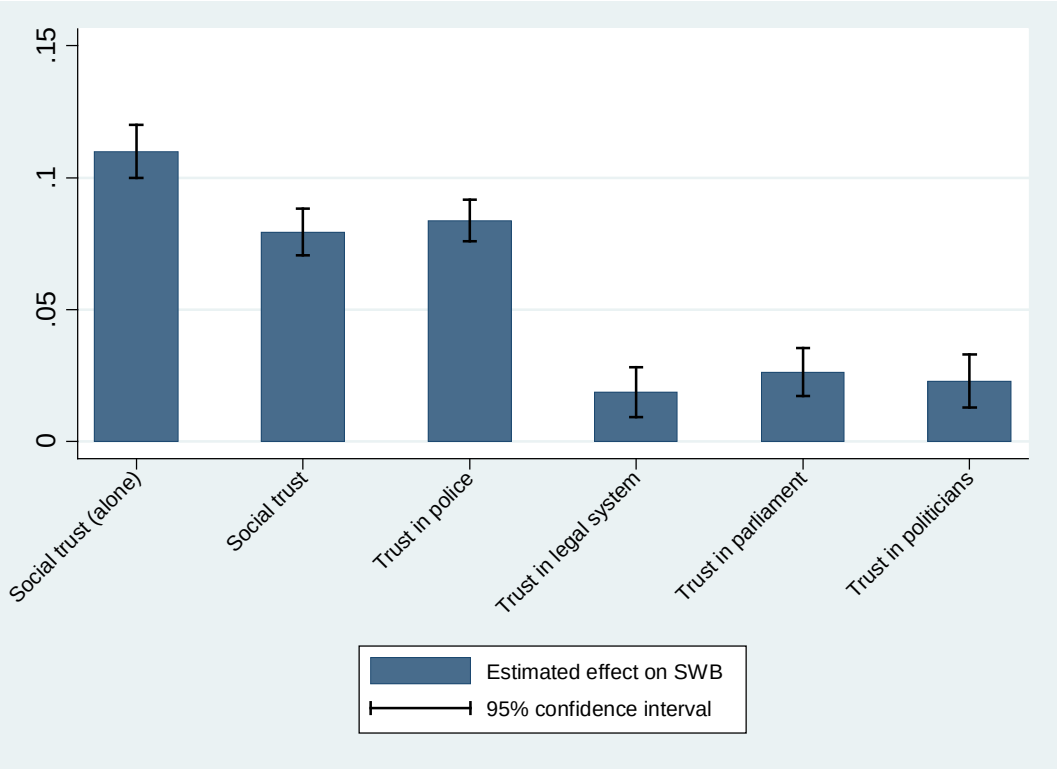
that same period. For comparison purposes, it would take an increase in GDP per capita of 12% to produce an equivalent increase in life satisfaction.

4. New Evidence on Well-being Effects of Different Types of Trust

The results in the previous section were focused on social trust. Here we try to estimate, relying mainly on the European Social Survey, the relative importance of several types of interpersonal and institutional trust. We concentrate on five different measures, all reported on a scale ranging from 0 to10: social trust, trust in police, trust in three aspects of governance- the legal system, parliament, and politicians. The simple correlations in the appendix show significant positive correlations among all pairs, with the tightest pairs being parliament and politicians (r=0.73), police and the legal system (r=0.67) and parliament and the legal system (r=0.65). Social trust has the lowest correlations with the other variables, about r=0.3 in each case. Given the close logical and statistical relations among the trust measures, we might expect it to be difficult to assess their separate and combined influence. However, when they are all entered in the same equation to explain life evaluations (as measured by the average answer to life satisfaction and happy with life) on an individual basis for roughly 260,000 respondents in 32 European countries, 2002-2012, they are all individually significant, permitting us to rank their individual importance and estimate their combined contributions to well-being.

Figure 2 shows the levels, and 95% significance bounds, for six different coefficients. Two are for social trust, the first from an equation in which social trust is included without any other trust measures, and the second from an equation in which the other four trust measures are all included. Columns 1 and 2 of Appendix Table 6 report the underlying estimates. When social trust is on its own, the coefficient is 0.11, and this falls to 0.08 when all of the other trust measures are included. This drop reflects the positive correlations reported above. Bearing in mind that the ESS trust variables are measured on a scale running from 0 to 10, the social trust effects are very large in either specification. Moving up just one standard deviation (2.5 points on the 0 to 10 scale) in social trust would thereby increase life evaluations by 0.28 points with the larger social trust effect, or by 0.20 points with the other trust variables included. Moving from the bottom to the top of the social trust scale would raise life evaluations by 1.1 points or 0.80 points in the two cases.

Figure 2: Estimated trust effects from ESS



What about the ranking of the different trust variables? Social trust and trust in police have the largest effects on well-being, about 0.08 in both cases, for a one-point change in the ten-step trust assessment. Each of these variables reflects each person's experience in their own lives, coupled with what they hear from friends and hear and see in the media. Social trust averages 4.91 across the ESS countries, compared to 5.77 for trust in police.

The other three variables reflect trust in institutions less closely connected to daily life – the legal system, parliament, and politicians. In each case, those who have more trust in the institutions in question report higher life evaluations. The estimated well-being effects of moving up one point in the ten-point trust evaluation scale are significant in each case, ranging from +0.019 for the legal system to +0.026 for parliament and +0.023 for politicians. What is the scope for more institutional trust to make people happier with their lives? In all three cases the current levels of trust are at or below the mid-point on the 10-point scale, being highest at 4.99 for the legal system, 4.32 for parliament, and lowest for politicians (3.46). If trust in the three linked institutions were to be higher by one point on the 10-point scale, the estimated combined effect on well-being would be 0.068 points, a substantial boost, although less than for either trust in police or social trust.

Putting all these results together, any estimate of the effects of social trust alone shows it to provide very much a lower bound on the likely effects of the overall environment of

trust. For example, using social trust on its own to represent all the other forms of trust provides a well-being impact of 0.11 for moving up one point on the 10-point trust scale. Moving up one standard deviation, 2.5 points, on the trust scale would thus translate into an increase of 0.28 points in life evaluations. This is a very substantial estimate, to be sure. But if we instead use the results from the equation with all five trust measures, and add up the increases in well-being that would be estimated to follow, we get a total well-being increase of 0.23 points from a one-point increase on the ten-point scale. Moving up all five types of trust by one-standard deviation, about 2.5 points in each case, would thus be estimated to increase subjective well-being by 0.58 points.

Thus we can conclude, based on the ESS evidence, with its larger range of trust measures and large samples of respondents, that the benefits of a high trust environment are likely to be more than twice as high if a broader range of trust measures is taken into account. The overall well-being increase from higher trust would be even higher if workplace trust, which is not measured in the ESS, and has been shown to be at least as important as any of the other trust domains, were taken into account.

5. Trust and Resilience at the Individual Level

Here we estimate the extent to which the positive linkage between social trust and well-being at the individual level can be traced to the help it provides individuals to deal with difficult circumstances. Our evidence is drawn from the European Social Survey, because it provides the largest international survey with continuing measures of social trust. The basic idea is fairly simple – that living in a high-trust environment increases both the psychological and external resources available to individuals to weather storms of one sort or another. We thus see a parallel between what this evidence might show and what has already been studied at the community and national level - that on average communities or groups with higher levels of social capital are better able to deal with storms and other natural disasters.

Difficult circumstances reduce subjective well-being both because of unpleasant immediate consequences and fears about the chances of future adversity. Why might higher levels of social trust or connectedness reduce the physical or psychological costs of adversity? Consider, for a particular example, the subjective well-being of people who perceive themselves as belonging to a group that is discriminated against in their country. Looking across the ESS sample, this is true for about 7% of respondents, or 20,000 among the quarter-million who provided subjective life evaluations in the six waves of the ESS spanning the years 2002-2012. As shown in the ESS results discussed in section 3 and reported in detail in the statistical appendix, to feel oneself a member of a group likely to be discriminated against is associated with a decline of 0.68 in a life assessment on a 0 to 10 scale. This is a drop as large as would accompany moving more than half-way down the income distribution. This group of respondents includes those who have been subject to discrimination, those who fear they might be so subjected in the future, and those have neither felt past not expect to see future discrimination against themselves personally, but perceive actual or potential discrimination against others. Those who have

high social trust are less likely to interpret past or present actions as discriminatory, and less likely to anticipate future discrimination. And they are also more likely, given their high social trust, to think that others will lend a hand to stop discriminatory actions by others. Thus we would hypothesize that those with higher social trust would face a significantly smaller well-being cost from being a member of a group that they think to be subject to discrimination.

Similar theoretical arguments can be made to support the idea that either ill-health or unemployment would cause less damage to well-being to those individuals who see themselves as living in a high-trust environment. Presumably that is the sort of environment where others would be more likely to lend a helping hand if needed, and to maintain a watchful eye just in case.

Just as high social trust may lessen the subjective well-being damage from unfortunate events or circumstances, so it might lessen the need for, and advantages from, additional social connections of types that generally increase social trust and well-being. Thus we might expect to find that while people with low social trust actually meet less frequently with friends (by 0.35 on the 7-point scale, $p<0.001$) they may have more to gain from doing so. Conversely, those who already see themselves as living in a high-trust environment may have less to gain, either through higher trust or other well-being benefits of spending more time with friends.

All of these considerations lead us to hypothesize that the well-being effects of a discriminatory environment, ill-health, unemployment and time spent with friends may all be significantly less for those who generally think that other people can be trusted. To test these hypotheses, we use the binary social trust variable described earlier, dividing the whole sample of social trust answers into two groups. Those who answer 7 and above on the 10-point scale are taken to being belong to the high-trust group, comprising just over 30% of the sample. A high-trust variable is created, with the value of 1.0 for each of those who have answered 7 or above on the ESS social trust question. Its average value of 0.3 fairly close to the fraction of the population in these same countries who answer yes rather than no to the binary trust question often asked in other surveys. We multiply the high-trust variable by the each of the hypothesized variables: member of a group discriminated against, unemployed, in ill-health and frequency of meeting with friends. These four variables are entered into the original equation (see last column of Table 6 in the Statistical Appendix). All are expected to show attenuation in the effects of the four variables. Thus we expect a positive coefficient in the case of the three negative events, and a negative coefficient reducing the positive effects from the frequency of meeting with friends.

Figure 3. Estimated interactive effects from ESS

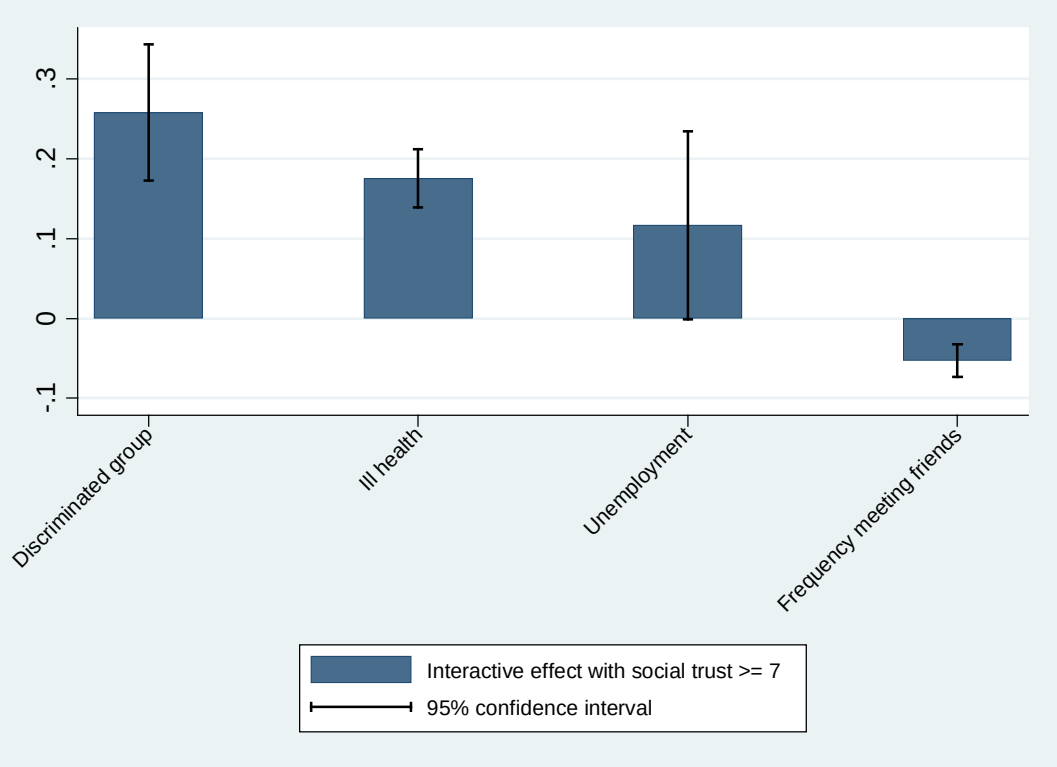


Figure 3 shows the results, which in all cases support the hypotheses, with coefficients that are large in size and statistical significance. In the first example case we discussed, of being in a group subject to discrimination, the well-being damage is 0.26 points, or 38%, ($p<0.001$) less for high trusters than for the rest of the population, holding all else constant. This is consistent with other research using community belonging as a buffer against the individual well-being costs of discrimination (Branscombe, Daley, & Phipps, 2016). Their research finds an almost complete offset, perhaps because their evidence is taken from those who have actually faced discrimination, or because community belonging provides a better measure of the relevant social support.

Moving up one point on the ill-health scale (with 1 for the best of health and 5 for the worst) is correlated with 0.64 reduction in the life evaluations for the low-trust group compared to 0.46 for the high-trust group, a reduction of 28% ($p<.001$).

For unemployment, those in the low-trust group face a 0.84-point lower life evaluation. This effect is reduced by 0.12 points, or 14% ($p<0.05$) for those in the high-trust group.

Finally, there is also attenuation of the gains from more time spent with family and friends. Increasing the frequency of meeting with friends by 1.0 (on a scale ranging from 1 to 7) raises life evaluations by 0.16 points for those in the low-trust group, compared to 0.11 for those in the high trust group. Frequency of meeting with friends matters

significantly for both groups ($p<0.001$), but is nonetheless one third smaller ($p<0.003$) for those in the high-trust group.

Taken together, these resilience-providing channels between social trust and well-being offset more than one-quarter (26%) of the combined damage from the three unfavourable events, reducing it from 2.2 points to 1.6 points on the 0 to 10 scale of life evaluation. The gains from social meeting with friends also are reduced by roughly one-quarter. These four channels together account for almost one-third of the total benefits of high trust for subjective well-being, as shown by the coefficient on the binary trust variable falling from 0.45 in the equation without the interaction terms to 0.33 where the interaction terms are included. We of course expect to find that social trust will continue to have most of its total positive effects on well-being arising from the large majority of the population who are employed, in good health, and are not members of groups felt thought likely to be subject to discrimination. Nonetheless, our tests show that social trust has much greater proportionate advantages for those who are subject to ill-health, unemployment and discrimination. Thus the well-being gap between the advantaged and disadvantaged, in terms of employment, health and discrimination would be significantly narrower if trust levels were generally higher, Thus increases in social trust would not only raise average levels of well-being for all, but would reduce its inequality, by raising well-being more for the disadvantaged than for the rest of the population.

6. Summary and Policy Applications

There are several conclusions that flow from our new results. First, we have used the largest available sets of international data to demonstrate large income-equivalent values for social trust, with a likely lower bound equivalent to moving two or three income deciles, or alternatively a doubling of household income. A companion paper (Hamilton, Helliwell, & Woolcock, 2016) estimates that social trust alone represents, on these valuations, a significant part of total national and global wealth, on the order of 20% of total wealth as measured by the World Bank. This in itself has implications for policy, emphasizing the importance of paying earlier and deeper attention to maintaining and improving the social fabric.

Second, the more detailed and precisely measured trust data in the European Social Survey was used to show that social trust, while of central importance to well-being, is only a part of the overall climate of trust. We found significant additional well-being links from several different measures of trust. Social trust and trust in police are estimated to be the most important, but we found also significant additional benefits from trust in three key aspects of the institutional environment: the legal system, parliament and politicians. Other surveys including workplace trust have found it to be of great value to individual well-being as well, above and beyond its effects on workplace efficiency. Thus any estimates of the total well-being value of a trustworthy environment will be larger than those based solely on social trust.

Third, we were found strongly suggestive evidence that living in a high-trust environment makes people more resilient in the face of several types of adversity. In particular, being subject to discrimination, ill-health or unemployment, while always damaging to subjective well-being, is much less damaging to those living in more trustworthy environments. This evidence provides a natural individual-level counterpart to the more aggregate evidence that community-level and national-level responses to natural disasters are much more favorable to well-being in a high-trust environment. These individual-level effects reveal also a fresh set of links between trust and inequality. Those who are subject to discrimination, ill-health or unemployment are typically concentrated towards the lower end of the national distribution of happiness. Thus the resilience-increasing feature of social trust, which channels its benefits especially to those subject to adversity, thereby reduces the inequality of well-being as well as raising its average value. And has been shown elsewhere (Goff et al., 2016), reductions in the inequality of well-being are themselves likely to feed back to improve the climate of social trust, since the links between wellbeing inequality and social trust are even closer than those running from income inequality to social trust.

Finally, the ESS country-level results with country fixed effects show that within-country changes in social trust can have significant effects on subjective well-being within policy-relevant time horizons.

References

Aldrich, D. P. (2011). The externalities of strong social capital: Post-tsunami recovery in Southeast India. *Journal of Civil Society*, *7*(1), 81-99.

Aldrich, D. P. (2012). Social, not physical, infrastructure: the critical role of civil society after the 1923 Tokyo earthquake. *Disasters*, *36*(3), 398-419.

Algan, Y., & Cahuc, P. (2014). Trust, growth and well-being: New evidence and policy implications. In P. Aghion & S. Durlauf (Eds.), *Handbook of economic growth Vol. 2* (pp. 49-120). Elsevier.

Almond, G., & Verba, S. (1963). The civic culture: political attitudes and democracy in five countries. *Princeton: Princeton University*.

Bjørnskov, C. (2003). The happy few: Cross-country evidence on social capital and life satisfaction. *Kyklos*, *56*(1), 3-16.

Bjørnskov, C. (2006). The multiple facets of social capital. *European Journal of Political Economy*, *22*(1), 22-40.

Bjørnskov, C. (2007). Determinants of generalized trust: A cross-country comparison. *Public choice*, *130*(1-2), 1-21.

Bjørnskov, C. (2008). Social capital and happiness in the United States. *Applied Research in Quality of Life*, *3*(1), 43-62.

Branscombe, N., Daley, A., & Phipps, S. (2016). Perceived discrimination, belonging and the life satisfaction of Canadian adolescents with disabilities. Halifax: Dalhousie Department of Economics Working Paper, forthcoming.

Cassar, A., Healy, A., & Von Kessler, C. (2011). Trust, risk, and time preferences after a natural disaster: Experimental evidence from Thailand. *University of San Francisco Working Paper*.

Castillo, M., & Carter, M. (2011). Behavioral responses to natural disasters. *Unpublished Manuscript*.

Delhey, J., Newton, K., & Welzel, C. (2011). How general is trust in "most people"? Solving the radius of trust problem. *American Sociological Review*, *76*(5), 786-807.

Dinesen, P. T., & Sonderskov, K. M. (2016). Trust: Inheritance or adaptation? In R. Uslaner (Eds.), *Handbook on Social and Political Trust*. Oxford University Press, forthcoming.

Dussaillant, F., & Guzmán, E. (2014). Trust via disasters: The case of Chile's 2010 earthquake. *Disasters*, *38*(4), 808-832.

Dussaillant, F., & Guzmán, E. (2015). Disasters as an opportunity to build social capital. *International Journal of Emergency Mental Health and Human Resilience*, *2015*.

Fischer, D. H. (1991). *Albion's seed: Four British Folkways in America*. Oxford University Press.

Fleming, D. A., Chong, A., & Bejarano, H. D. (2014). Trust and reciprocity in the aftermath of natural disasters. *The Journal of Development Studies*, *50*(11), 1482-1493.

Fleming, C. M., Manning, M., & Ambrey, C. L. (2016). Crime, greenspace and life satisfaction: An evaluation of the New Zealand experience. *Landscape and Urban Planning*, *149*, 1-10.

Frank, K., Hou, F., & Schellenberg, G. (2015). Life satisfaction among recent immigrants in Canada: Comparisons to source-country and host-country populations. *Journal of Happiness Studies*, 1-22.

Fukuyama, F. (2001). Social capital, civil society and development. *Third World Quarterly*, *22*(1), 7-20.

Goff, L., Helliwell, J. F., & Mayraz, G. (2016). *The welfare costs of well-being inequality*. National Bureau of Economic Research working paper no. w21900.

Hamilton, K., Helliwell, J. F., & Woolcock, M. (2016). Social capital, trust and well-being in the evaluation of wealth. In K. Hamilton & C. Hepburn (Eds.), *Wealth: Economics and Policy*. Oxford University Press, forthcoming.

Helliwell, J. F. (2003). How's life? Combining individual and national variables to explain subjective well-being. *Economic Modelling*, *20*(2), 331-360.

Helliwell, J. F. (2006). Well-being, social capital and public policy: What's new? *Economic Journal*, *116*(510), C34-C45.

Helliwell, J. F. (2007). Well-being and social capital: Does suicide pose a puzzle? *Social Indicators Research*, *81*(3), 455-496.

Helliwell, J. F., Barrington-Leigh, C. P., Harris, A., & Huang, H. (2010). International evidence on the social context of well-being. In E. Diener, J. F., Helliwell, & D. Kahneman (Eds.), *International differences in well-being* (pp. 291–327), Oxford University Press.

Helliwell, J. F., Bonikowska, A., & Shiplett, H. (2016). Migration as a test of the happiness set-point hypothesis: Evidence from immigration to Canada. National Bureau of Economic Research working paper, forthcoming.

Helliwell, J. F., Huang, H., & Wang, S. (2014). Social capital and well-being in times of crisis. *Journal of Happiness Studies*, *15*(1), 145-162.

Helliwell, J. F., & Putnam, R. D. (2004). The social context of well-being. *Philosophical Transactions-Royal Society of London Series B Biological Sciences*, *359*(1449), 1435-1446.

Helliwell, J. F., & Wang, S. (2011). Trust and well-being, *International Journal of Wellbeing*, *1*(1), 42-78.

Helliwell, J. F., Wang, S., & Xu, J. (2015). How durable are social norms? Immigrant trust and generosity in 132 countries. *Social Indicators Research*, 1-19.

Kawachi, I. (2016). Trust and public health. In R. Uslaner (Eds.), *Handbook on social and political trust*. Oxford University Press, forthcoming.

Knack, S. (2001). Trust, associational life and economic performance. In J. F. Helliwell & A. Bonikowska (Eds.), *The contribution of human and social capital to sustained economic growth and well-being* (pp. 172-202), Ottawa: Government of Canada.

Hommerich, C. (2012). Trust and subjective well-being after the Great East Japan Earthquake, Tsunami and Nuclear Meltdown: Preliminary results. *International Journal of Japanese Sociology*, *21*(1), 46-64.

Kahn, M. E. (2005). The death toll from natural disasters: the role of income, geography, and institutions. *Review of Economics and Statistics*, *87*(2), 271-284.

Lau, M., & Li, W. (2011). The extent of family and school social capital promoting positive subjective well-being among primary school children in Shenzhen, China. *Children and Youth Services Review*, *33*(9), 1573-1582.

Lucchini, M., Bella, S. D., & Crivelli, L. (2015). Social capital and life satisfaction in Switzerland. *International Journal of Happiness and Development*, *2*(3), 250-268.

Nagler, M. G. (2013). Does social capital promote safety on the roads? *Economic Inquiry*, *51*(2), 1218-1231.

Nagler, M. G., & Ward, N. J. (2016). Lonely highways: The role of social capital in rural traffic safety. *Eastern Economic Journal*, *42*(1), 135-156.

Portes, A. (2014). Downsides of social capital. *Proceedings of the National Academy of Sciences*, *111*(52), 18407-18408.

Rice, T. W., & Feldman, J. L. (1997). Civic culture and democracy from Europe to America. *The Journal of Politics, 59*(04), 1143-1172.

Rothstein, B., & Uslaner, E. M. (2005). All for all: Equality, corruption, and social trust. *World Politics, 58*(01), 41-72.

Toya, H., & Skidmore, M. (2014). Do natural disasters enhance societal trust? *Kyklos, 67*(2), 255-279.

Uchida, Y., Takahashi, Y., & Kawahara, K. (2014). Changes in hedonic and eudaimonic well-being after a severe nationwide disaster: The case of the Great East Japan Earthquake. *Journal of Happiness Studies, 15*(1), 207-221.

Uslaner, E. M. (2008). Where you stand depends upon where your grandparents sat: The inheritability of generalized trust. *Public Opinion Quarterly, 72*(4), 725-740.

Yamamura, E., Tsutsui, Y., Yamane, C., Yamane, S., & Powdthavee, N. (2015). Trust and happiness: Comparative study before and after the Great East Japan Earthquake. *Social Indicators Research, 123*(3), 919-935.

Yip, W., Subramanian, S. V., Mitchell, A. D., Lee, D. T., Wang, J., & Kawachi, I. (2007). Does social capital enhance health and well-being? Evidence from rural China. *Social Science & Medicine, 64*(1), 35-49.