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Heinz Welsch

Jan Kühling

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Department of Economics
University of Oldenburg, D-26111 Oldenburg

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Heinz Welsch
Jan Kühling
Department of Economics
University of Oldenburg
26111 Oldenburg, Germany

Abstract: Recent literature has found that individuals holding a greener self-image display higher levels of life satisfaction. We extend the single-country setting of that research to a transnational perspective and explore whether a relationship exists between green self-image (GSI) and life satisfaction (LS), both European-wide and at the national level. In order to explain differences in the GSI-LS relationship across nations and time, we study the role of pro-environmental values as a *shared social norm*. We find a significantly positive GSI-LS relationship in a pool of 35 European countries and in the majority of individual countries. In addition, we show that the well-being benefit of holding a green self-image is greater in societies that are less divided with respect to environmental attitudes, that is, where being green is a shared social norm.

Keywords: green self-image; subjective well-being; life satisfaction; social norm; social division

JEL codes: I31; Q50; Z13

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1. Introduction

Pro-environmental behaviors and attitudes have been a topic of inquiry for decades. One strand of this literature studied the utility consequences of being "green".[1] In these works, the hypothesis was explored that green lifestyles might be beneficial for individuals' subjective well-being (SWB) because they allow individuals to achieve meaning in their lives and behave in altruistic ways. Consistent with the "warm glow" theory of public good provision (Andreoni 1990), Videras and Owen (2006) and Welsch and Kühling (2010, 2011) found several types of pro-environmental behaviors to be correlated with greater SWB in both national and international data sets. More recently, Binder and Blankenberg (2017) found that, even controlling for green behavior, green self-image *per se* is associated with greater SWB in data for Great Britain.

The current paper ties in with this latter research and extends it in several ways. First, we extend the purely national setting to a transnational perspective. We explore whether a relationship exists between green self-image and SWB both European-wide and at the national level. Second, we investigate what explains differences in this relationship across countries and time. Specifically, we study the role of green attitudes as a *shared social norm* for the relationship between individuals' green attitude and their SWB.

Social norms, relationships, and comparisons have previously been studied as factors explaining pro-social and pro-environmental behaviors (Lindbeck 1997, Videras et al. 2012, Welsch and Kühling 2016), but not as factors influencing the well-being benefits of holding a green

[1] Other issues studied are the determinants of pro-environmental behaviors (Welsch and Kühling 2009, Tripathi and Singh 2016), the determinants of pro-environmental attitudes and concerns (Gelissen 2007, Welsch and Kühling 2017a), and the relationship between "green" attitudes, concerns and values on the one hand and "green" behaviors on the other. With respect to this relationship, green self-image was found to be a robust predictor of green behaviors (Tripathi and Singh 2016, Binder and Blankenberg 2017).

self-image. Well-being effects of congruence with social norms were, however, studied with respect to the "work norm": Building on the economic analysis of "social customs" (Akerlof 1980), Clark (2003) found that the negative effect on SWB of being unemployed is reduced by the prevalence of unemployment in the unemployed individuals' social environment.

We investigate a similar issue – the influence of a shared social norm – with respect to the relationship between green self-image and SWB. Specifically, building on the social customs (social norm) framework of Akerlof (1980), we test the hypothesis that the *societal* prevalence of a green self-image enhances *individuals'* well-being benefit from holding such a self-image. Moreover, while that framework suggests focusing on the *level* of societal greenness, we extend the analysis by focusing on the degree to which the green norm is *shared* (common) within society, rather than being contested. Specifically, we argue that if a positive relationship between green attitudes and SWB is driven by congruence with a green social norm, the attitude-SWB relationship should be weaker in societies that are more divided on these issues. Hence, we formulate and test the hypothesis that greater societal disparity in the degree of being green reduces individuals' utility of being green.[2]

In our empirical analysis we use about 228,000 observations on life satisfaction (LS) and green self-image (GSI) from 35 European countries, 2002-2015. Controlling for the usual individual-level and macro-level correlates of LS as well as country and year fixed effects, we find

[2] The hypothesis of green self-image as a social norm is to be distinguished from the rival hypothesis of green self-image as a manifestation of identity. The notion of self-image as identity entails that a certain self-image is beneficial for SWB because it allows individuals to differentiate themselves from others (Akerlof and Kranton 2000, 2010). The hypothesis of self-image as identity would imply that the SWB benefit from holding a given self-image is greater when societies are more divided on the relevant issue, rather than less divided. Invoking a social-identity framework, Welsch and Kühling (2017b) found social division with respect to immigration friendliness to enhance the well-being benefit from holding an immigration-friendly self-image (see section 2).

the following: (1) LS is significantly positively correlated with GSI in the overall sample. (2) LS is significantly positively correlated with GSI in 23 individual countries and non-significantly correlated with GSI in the rest of countries. (3) The positive association between LS and GSI is unaffected by the mean level of GSI (by country-year). (4) The positive association between LS and GSI is weaker when the degree of disagreement on environmental conservation (by country-year) is greater.

From a policy point of view, the finding that the well-being benefit of holding a green self-image rises with its societal salience suggests that the spread of green attitudes within society may be self-reinforcing. Considering that green self-image is a robust predictor of green behaviors (Tripathi and Singh 2016, Binder and Blankenberg 2017) and that environmental policy in democratic societies is bound to respect citizens' preferences, this may be an important contribution to environmental conservation.

The remainder of the paper is organized as follows. Section 2 discusses related literature and develops our hypotheses. Section 3 presents the data and methods. Section 4 reports and discusses the empirical results. Section 5 concludes.

2. Related Literature and Our Hypotheses

This paper ties in with two strands of literature which we discuss in the following subsections: green lifestyle and subjective well-being (2.1), and contextual factors of subjective well-being (2.2). Building on that literature, we formulate the hypotheses of this study (2.3).

2.1 *Green Lifestyle and Subjective Well-Being*

Several studies found a positive relationship between pro-environmental behaviors and subjective well-being. In single-country studies for the US (Brown and Kasser 2005) and Germany (Welsch

and Kühling 2011) as well as in multi-country studies (Videras and Owen 2006, Welsch and Kühling 2010) life satisfaction was found to be positively related to self-reported recycling, resource conservation, and environmental friendly consumption. Those findings are typically rationalized by reference to the "warm glow" (Andreoni 1990) arising from altruistic and pro-social behavior.

Using data from Britain, however, Binder and Blankenberg (2017) found in a fixed-effects framework that the behavior-SWB relationship becomes nonsignificant when measures of green self-image are included, whereas green self-image itself attracted a significant positive coefficient.

In seeking psychological explanations of why green lifestyles (i.e. behaviors or self-images) may foster well-being, reference has been made to a differentiation between extrinsic/materialist motivations (striving for acquisition and possession) and intrinsic/moral motivations (altruism and empathy). Invoking such a framework, materialistic value orientations and (extrinsically motivated) consumerism were found to be associated with lower well-being (Kasser et al. 2004, O'Brien 2008, Delhey 2010, Dittmar et al. 2014; see Pandelaere 2016 for an overview). In addition to mere correlations, studies of causality (Richins 1997, Rucker and Petty 2004) found evidence that, though happier people consume less, the other causal direction also exists: more sustainable consumption leads to greater happiness.

Assuming a non-materialist value basis and intrinsic motivation underlying green lifestyles, the well-being benefits from being green appear to be a mirror image of the well-being repercussions from materialistic lifestyles. In contrast to the latter, a green lifestyle seems to allow individuals to view themselves as altruistic and socially responsible individuals.

2.2 Contextual Factors of Subjective Well-Being

Acting out of altruism and social responsibility yields utility through adherence to an internal (moral) norm. Moral norms are to be distinguished from social norms (Brekke et al. 2004). Social norms can be defined as shared agreements about what constitutes appropriate and inappropriate behavior (Schultz et al 2007). Adherence to shared social norms may be an independent source of utility, in addition to adherence to internal norms, and may explain a variety of "non-standard" types of behavior.

Akerlof (1980) was the first to analyze the significance of social norms (to which he referred as social customs) for understanding behaviors that standard economic models cannot explain. Behaviors that can be rationalized by social norms include, in particular, voluntary contributions to public goods (e.g. Lindbeck 1997). From a social-norm perspective, private provision of public goods yields utility by acting in accordance with what is socially considered as appropriate.

While those works are of a theoretical nature, focusing on the relationship between social norms and economic behavior, Clark (2003) conducted the first empirical study of the utility consequences of adherence to a social norm. He focused on what he calls the work norm, considered to be a general rule for appropriate behavior. In violation of that presumed norm, he found that being unemployed has less utility repercussions for the individual when family members are also unemployed or when the regional unemployment rate is high. Based on this evidence, he coined the term "unemployment as a social norm".

The findings of Clark (2003) highlight the role of contextual variables – average unemployment in this case – for the utility consequences of behaviors. A similar contextual perspective was taken by Welsch and Kühling (2017b). Similar to the utility consequences of an environment-friendly self-image (Binder and Blankenberg 2017), they studied the utility consequences of holding an immigration-friendly self–image and investigated how those utility consequences varied with measures of immigration friendliness at the societal level. Instead of

average immigration friendliness as the context variable, they focused on its dispersion within society and found positive well-being effects of immigration friendliness to be greater when society is more divided on the issue of immigration.

In interpreting this result, Welsch and Kühling (2017b) referred to the notion of social identity. Social identity can be defined as "the individual's knowledge that he belongs to a certain social group together with some emotional and value significance to him of this group membership" (Tajfel 1972, 292; see also Akerlof and Kranton 2000, 2010). From a social identity perspective, immigration friendliness yields utility because it allows individuals to differentiate themselves from others – which is more likely to be successful when the relevant attitudes are more dispersed in society, rather than being uniform.

2.3 Hypotheses of this Study

This study draws on both strands of literature discussed above. First, building on previous evidence on the relationship between green self-image (GSI) and SWB (Binder and Blankenerg 2017), and referring to the literature on the internal factors that may influence this relationship (norms of altruism and social responsibility), we formulate the following *GSI-as-moral-norm* hypothesis:

Hypothesis 1: Holding a greener self-image is associated with greater subjective well-being.

Second, referring to the literature on the external (contextual) factors through which self-image may affect subjective well-being, we conceptualize green self-image as a social norm or, alternatively, as a manifestation of social identity.

Within a social-norm framework, the validity of the norm can be measured in two ways, namely by the level (prevalence) of the respective attitude in society (Clark 2003) and by its

unanimity, or lack of dispersion (Welsch and Kühling 2017b). Accordingly, we formulate two (not mutually exclusive) versions of the *GSI-as-social-norm* hypothesis:

Hypothesis 2a: The well-being benefit of holding a green self-image is greater when the societal level of the respective attitude is higher.
Hypothesis 2b: The well-being benefit of holding a green self-image is greater when the unanimity (dispersion) of the respective attitude is higher (lower).

The counter hypotheses highlight the emotional and value significance the individual attaches to her membership to a distinct group. Accordingly, we formulate two versions of the *GSI-as-social-identity* hypothesis:

Hypothesis 3a: The well-being benefit of holding a green self-image is lower when the societal level of the respective attitude is higher.
Hypothesis 3b: The well-being benefit of holding a green self-image is lower when the unanimity (dispersion) of the respective attitude is higher (lower).

We note that the existing literature offers no clue as to which notion is more appropriate: GSI as a social norm or GSI as a manifestation of social identity.

3. Data and Methods

3.1 Data and Definition of Variables

We use survey data from the first seven waves of the European Social Survey (ESS); see www.europeansocialsurvey.org. The ESS is a repeated cross-sectional, multi-country survey

covering over 30 nations. Its first wave was fielded in 2002/2003, the seventh in 2014/2015. ESS data are obtained using random (probability) samples, where the sampling strategies are designed to ensure representativeness and comparability across European countries.

The seven-wave cumulative dataset of the ESS includes about 337.000 observations from 36 countries: Albania, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kosovo, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine and the UK. Due to a small number of non-responses in the ESS and a lack of data on macroeconomic control variables for Kosovo, the final sample for econometric analysis includes 228,390 data points for 35 countries.

The variable used to capture subjective well-being is life satisfaction (LS). It is based on the answers to the following question.

LS: *All things considered, how satisfied are you with your life as a whole nowadays?* (Respondents were shown a card.) *Using this card, where would you place yourself on this scale, where 0 means extremely dissatisfied and 10 means extremely satisfied?*

We shifted the scale to range from 1 to 11 and used the answers on the 11-point life satisfaction scale as our dependent variable.

Our main independent variables is an indicator of an individual's green self-image. The indicator is based on the following questions.

GSI: *Now I will briefly describe some people. Please listen to each description and tell me how much each person is or is not like you: She/he strongly believes that people should care for nature. Looking after the environment is important for her.*

The response options were: *very much like me (1), like me (2), somewhat like me (3), a little like me (4), not like me (5), not like me at all (6).* We reverted the coding such that "very much like me" = 6, …., "not like me at all" = 1.

Control variables at the individual level include socio-demographic and socio-economic factors that have been found to be related to SWB (sex, age, health status, marital status, household size, employment status and household income), see, e.g., Dolan et al. (2008). In addition, our regressions include macroeconomic control variables (GDP per capita, annual GDP growth rate, unemployment rate, inflation rate) by country-year, taken from the OECD online database (www.oecd.org).

The summary statistics are displayed in Table A1 in the appendix. The mean life satisfaction score is 7.881 (on the 1-11 scale) and the standard deviation is 2.322. For green self-image the mean is 4.882 (on the 1-6 scale), with standard deviation 1.026. With respect to the individual categories of agreement with the green self-image, 30 percent, 40 percent and 19 percent of the respondents chose the options "very much like me" (6), "like me" (5) and "somewhat like me" (4), respectively, whereas about 10 percent report lower levels of greenness.

3.2 Measuring Attitude Disparity

The degree to which individuals are divided on the issue of environmental conservation can be measured either by a descriptive (ad hoc) measure, the standard deviation, or by axiomatic measures of disparity. The latter can be differentiated into indices of diversity and indices of polarization.

The concept of diversity (Shannon 1949) involves two elements: the number of categories (groups) to which individuals belong, and the size distribution of the groups. If all groups are of equal size, then the society with a larger number of groups possesses a higher index of diversity.

For a given number of categories, diversity is greater when the groups are more equally sized and reaches its maximum when all groups are of the same size.

In contrast to diversity, the notion of polarization (Esteban and Raj 1994) focuses on potential antagonism between two groups. Polarization is greatest when all individuals belong to two groups (out of n > 2).[3] The difference between polarization and diversity can be illustrated as follows. Consider two countries A and B. If A consists of two equally sized groups and B of three equally sized groups, then A is more polarized, but less diverse than B.

Given the basic notions of diversity and polarization, measures of disparity can be differentiated into those that involve the distance between categories and others that disregard distances (e.g. Desmet et al. 2009), possibly because distances are not meaningful in a given context. In our data, the degree of holding a green self-image is coded on an integer scale 1, …, 6. Hence distances between the categories are meaningful, and we use differences derived from this scale as the distance measure in the disparity indices that we consider.[4]

In our empirical investigation, we use three measures of disparity of green attitudes. The first is quadratic entropy (e.g., Rao 1982). It combines group sizes (s_i and s_j) with the distance between groups, d_{ij},, which are standardized to lie between 0 and 1. Since this measure would coincide with the Gini index if d_{ij} were the income differences between groups i and j, we refer to it as GI. It is defined as follows:

$$GI = \sum_{i=1}^{6}\sum_{j=1}^{6} s_i s_j d_{ij} \,. \qquad (1)$$

[3] For n = 2, diversity and polarization coincide.

[4] Since the number of categories is fixed in our GSI variable, what matters in our empirical analysis is the size distribution and the distances of categories.

GI computes the population-weighted total (standardized) distances between all groups and can be interpreted as the expected distance between two randomly selected individuals. Since it incorporates distances, it need not attain its maximum when all groups are of the same size, some authors refer to GI as a "weak diversity" index (e.g. Ricotta 2005).

Our second measure is the polarization index proposed by Esteban and Raj (1994). It is defined as follows:

$$ER = \sum_{i=1}^{6}\sum_{j=1}^{6} s_i s_j^2 d_{ij} \,. \qquad (2)$$

Similar to GI, this index controls for distances between groups. If all distances are the same, it attains its maximum when there are two groups of equal size.

Our third disparity measure is the index of peripheral heterogeneity proposed by Desmet et al. (2005). It focuses on distances to the largest (central) group, *c*, and is defined as follows:

$$PH = 2\sum_{i=1}^{6} s_i s_c d_{ic} \,. \qquad (3)$$

PH is a variant of GI, but focuses on the differences between the center (majority) and the peripheral groups, neglecting differences between the latter. It can be viewed as an intermediate index between diversity and polarization. Unless distances to the center are equal, PH attains a maximum when only the center and the peripheral group with the largest distance have strictly positive shares.

3.3 Empirical Strategy

We estimate micro-econometric SWB functions in which the self-reported life satisfaction (*LS*) of individual *i*, in country *c* and year *t* depends on the following sets of variables:

- Individual-level socio-demographic and socio-economic indicators ($\boldsymbol{micro}_{ict}$) and macroeconomic ($\boldsymbol{macro}_{ct}$).
- An indicator of individuals' green self-image (environment-friendly attitude) $GSI_{ict.}$
- Indicators of the level of green attitude, GSI_MEAN_{ct}, or disparity of green attitude, $Disparity_{ct}$, by country and year.
- Country and year dummies ($country_c$, $year_t$, respectively).

The general form of our estimating equations reads as follows:

$$LS_{ict} = cons + \boldsymbol{\alpha_1}'\boldsymbol{micro}_{ict} + \boldsymbol{\alpha_2}'\boldsymbol{macro}_{ct} + \beta \cdot GSI_{ict} + \gamma_1 \cdot GSI\_MEAN_{ct} + \delta_1 \cdot GSI_{ict} \cdot GSI\_MEAN_{ct} + country_c + year_t + \varepsilon_{ict}. \quad (4a)$$

$$LS_{ict} = cons + \boldsymbol{\alpha_1}'\boldsymbol{micro}_{ict} + \boldsymbol{\alpha_2}'\boldsymbol{macro}_{ct} + \beta \cdot GSI_{ict} + \gamma_2 \cdot Disparity_{ct} + \delta_2 \cdot GSI_{ict} \cdot Disparity_{ct} + country_c + year_t + \varepsilon_{ict}. \quad (4b)$$

where ε_{ict} denotes the error term. The *micro* controls are reported health status, sex, age, marital status, household size, employment status, household income and immigrant status. The *macro* controls are GDP per capita, the annual GDP growth rate, the inflation rate, and the unemployment rate. In addition to those controls, we account for unobserved country- and time-invariant factors with country and year fixed effects. The *country* fixed effects account for unobserved time-invariant country characteristics (like climate or culture) that may be correlated with both well-being and the independent variables whereas the *year* fixed effects account for unobserved time-specific confounding factors that are common to all countries (e.g. common global shocks).

The specifications (4a) and (4b) serve to test the hypotheses formulated in subsection 2.3. The *GSI-as-moral-norm* hypothesis corresponds to $\beta > 0$. The two versions of the *GSI-as social-norm* hypothesis correspond to $\delta_1 > 0$ and $\delta_2 < 0$, whereas the two versions of the *GSI-as-identity* hypothesis correspond to $\delta_1 < 0$ and $\delta_2 > 0$.

Following the common practice in life satisfaction research, we estimate equations (4a and (4b) and versions thereof using least squares. We report robust standard errors adjusted for clustering at the county-year level.[5]

With respect to identification, we note that we minimize the risk of omitted variable bias by controlling for the individual-level and macro-level variables that have been found to influence life satisfaction. We acknowledge, however, the correlational character of our empirical analysis, that is, we cannot technically rule out that an individual's life satisfaction influences her greenness. However, as discussed in the literature review, psychological research has shown that pro-social and altruistic traits influence life satisfaction through plausible channels. To the degree that a green self-image is a manifestation of such traits, a green self-image should in fact influence life satisfaction.

4. Results and Discussion

4.1 Green Self-Image and Life Satisfaction

Table 1 reports the main results of LS regressions that include the degree to which individuals consider themselves as someone for whom it is important to care for the environment (green self-

[5] Because each wave of the ESS represents a new random sample, it is unlikely that a respondent appears repeatedly over the years covered, which might induce equicorrelation in the disturbances. Our database does not permit to check whether a person appears repeatedly.

image). The regressions control for the usual individual-level correlates of LS (Table A2 in the appendix), the rates of growth, unemployment and inflation, GDP per capita, as well as country and year fixed effects.

With respect to the individual-level (Table A2) and macro-level control variables, we note that the results are qualitatively in agreement with common findings (Frey and Stutzer 2002, Dolan et al. 2008). Life satisfaction is positively related to health, income, being female and being married, negatively related to being unemployed, and U-shaped in age. As is usually found, being involuntarily unemployed is the strongest adverse factor for life satisfaction. It reduces LS by about 0.95 points on the 11-point scale. With respect to the macro level, the growth rate attracts a significant positive coefficient, whereas the unemployment rate and GDP per capita attract significant negative coefficients. Since we control for income at the individual level, the negative coefficient on GDP per capita suggests that it acts as comparison income in a relative-income framework (Clark et al. 2008). The inflation rate is nonsignificant.

Regressions 1 and 2 in Table 1 include green self-image in different ways. Regression 1 includes GSI as a set of dummy variables for the different categories and finds life satisfaction to be significantly greater for individuals from categories 2 to 6 than for individuals from the base category. Moreover, the coefficients are monotonically increasing as agreement with the green self-image increases. The "greenest" individuals (category 6) are about 0.47 points more satisfied (on the 11-point scale) than individuals from the lowest category. This is rather sizeable, as it amounts to about one half of the effect of being in employment instead of unemployed (Table A2).

We take the monotonic and almost linear relationship between LS and increasing categories of GSI as a justification for treating GSI as a continuous variable. As regression 2 reveals, GSI specified this way is significantly positively correlated with greater LS. The coefficient (0.071) implies that LS at GSI category 6 is about 0.43 times greater than at category 1, in broad agreement

with regression 1. The results from regressions 1 and 2 are consistent with hypothesis 1: a greener self-image is associated with greater life satisfaction.

Regressions 3 to 6 introduce the level (mean) of GSI and several measures of the disparity of GSI (SD, GI, ER, PH) as additional independent variables. This leaves the coefficient of GSI from regression 2 almost unaffected. Mean GSI attracts a significant positive and sizeable coefficient (0.292), presumably because environmental quality is better in societies whose citizens have greener preferences (regression 3). The various disparity measures all attract significant negative coefficients (regressions 4 to 7), presumably because they indicate social tension and antagonism with respect to environmental issues.

Table 2 presents results of running regressions similar to regression 2 in Table 1 for individual countries, rather than the pool of countries. The Table reports the estimates of the coefficient on GSI and their significance. The coefficient on GSI is significantly positive for 23 out of the 35 countries, the level of significance being 1 percent for most of those. For the other countries, it is nonsignificant; no significantly negative coefficients arise. The significant coefficient values range from 0.026 (Italy) to 0.173 (Romania).

4.2 Contextual Effects: Green Self-Image as a Social Norm

We now turn to possible explanations for differences in the LS-GSI relationship. Referring to the idea of GSI as a social norm (or, alternatively, as social identity), hypotheses to be tested are that the LS-GSI relationship is stronger (weaker) when GSI is (i) higher on average and (ii) less unequally distributed in society.[6]

[6] We tested the alternative hypotheses that the LS benefit from GSI depends on national affluence (per capita GDP) or environmental pressure and found these factors to be nonsignificant.

Table 3 reverts to the overall (cross-national) sample and extends the regressions from Table 1 by including mean GSI (by country-year) and its interaction with individual-level GSI. Regression 1 in Table 3 shows that GSI, mean GSI, and their interaction all attract nonsignificant coefficients. We attribute this to collinearity of the independent variables, as the interaction term correlates with GSI at r = 0.98 and with GSI_MEAN at r =0.37. To accommodate this technical problem, regressions 2 and 3 split the sample into subsamples with mean GSI below and above its median value instead of the interaction model.[7] As regressions 2 and 3 show, GSI attracts significantly positive coefficients no matter whether mean GSI is low or high. The coefficient is larger in the "high" subsample (0.0741) than in the "low" subsample (0.0654), but the difference is not statistically significant. We thus conclude that the Hypotheses 2a and 3a must be rejected: the well-being benefit from holding a greener self-image neither rises nor falls in the societal level of the green attitude.

Regressions 1 to 4 in Table 4 focus on the Hypotheses 2b and3b. The regressions include individual-level GSI, measures of the disparity of GSI (by country-year) and interactions of the two variables. In all four regressions, un-interacted GSI attracts significantly positive coefficients, which are considerably larger than in the counterpart regressions (4 to 7) in Table 1. In regression 1 in Table 4, the coefficient on the standard deviation of GSI (GSI_SD) is insignificantly negative, whereas the interaction of GSI with GSI_SD is significantly negative. Regressions 2 to 4 yield the same qualitative result: while the un-interacted disparity measures are nonsignificant, the interactions of GSI with the disparity measures GI, ER and PH all attract significantly negative coefficients. The latter is consistent with Hypothesis 2b and refuses Hypothesis 3b: the LS benefit

[7] The two subsamples are only approximately of equal size because mean GSI is a clustered (country-year) variable.

from holding a green self-image is smaller (greater) when society is more (less) divided on the issue of environmental conservation.

While more disparity with respect to environmental attitudes unambiguously reduces the well-being benefits from holding an environment-friendly self-image, it is not immediately clear how much the different types of disparity matter for the GSI-LS relationship. To approach this question, we evaluate the GSI-LS relationships from regressions 1 to 4 in Table 4 at the minimum and maximum values of the respective disparity measures (Table A1). Considering the standard deviation (SD) as a measure of attitude disparity (regression 1), a 1-point increase in GSI (on the 6-point scale) enhances LS by 0.033 points at maximum disparity and 0.124 points at minimum disparity. The corresponding values for diversity, measured by GI (regression 2), are 0.029 and 0.120. For polarization, measured by ER (regression 3), the values are 0.001 and 0.189; for peripheral heterogeneity, measured by PH (regression 4), they are 0.003 and 0.111. This suggests that the well-being benefit from GSI is close to zero at high levels of polarization (ER) and peripheral heterogeneity (PH), whereas a high level of diversity (GI) is less detrimental to the GSI-LS relationship. Conversely, a high degree of unanimity in the sense of low polarization implies large well-being benefits from holding a green self-image.

4.3 Discussion

We found robust evidence that holding a greener self-image is significantly associated with higher levels of life satisfaction. This holds in the pool of 35 European countries as well as in 23 individual countries, though the relationship varies in strength. We found no evidence that a negative GSI-LS relationship may exist in any of the remaining countries. The finding of a positive GSI-LS relationship in several countries corroborates the finding of such a relationship in Great Britain by Binder and Blankenberg (2017). While our analysis relies on repeated cross-sections, the latter

paper used a panel-data fixed-effects framework. Taken together, the multi-country framework of our analysis and the fixed-effects approach of Binder and Blankenberg (2017) suggest considerable robustness of a positive GSI-LS relationship.

The finding that a significant positive relationship between green self-image and well-being exists in most countries – to varying degrees – but not in all countries begs the question as to what explains these differences. With respect to this question, we explored the hypothesis that GSI is more beneficial for well-being when holding a green self-image is a shared social norm in the respective societies. We formulated two versions of the GSI-as-social-norm hypothesis, one involving the average level and the other the disparity (lack of unanimity) of the green attitude. While Clark (2003) found a higher level of unemployment to reduce the well-being repercussions of being unemployed, we were unable to detect a significant influence of the average GSI level on the GSI-LS relationship. By contrast, the social-norm character of being green works through the distribution, not the level of greenness: more unanimity (more disparity) in green attitudes enhances (reduces) the well-being benefit of being green. Out of the various disparity measures, strong polarization of attitudes undermines the GSI-LS relationship more strongly than does the diversity of attitudes. At the highest level of within-sample polarization, the GSI-LS relationship is close to zero. This may explain the lack of a significant relationship found in some countries.

The finding that the well-being benefit of being green is greater when society is less divided on environmental issues (GSI-as-a social-norm) implies a refutation of the rival hypothesis of GSI-as-social-identity. Holding a green self-image thus differs radically from holding an immigration-friendly self-image, for which it was found that the well-being benefit is greater when society is more divided on the issue (Welsch and Kühling 2017b).

5. Conclusions

Some recent literature has found that individuals holding a greener self-image display higher levels of life satisfaction. While that work was confined to a single country, we showed that a positive GSI-LS relationship exists in a pool of 35 European countries and in the majority of individual countries. In addition, we contributed to the literature by showing that the well-being benefit of holding a green self-image is greater in societies that are less divided with respect to environmental attitudes, that is, where being green is a shared social norm.

Our findings are policy relevant because in democratic societies environmental and sustainability policies depend on the preferences and attitudes of the people. If being "green" yields utility *per se*, it is more likely that people behave more environment-friendly and support green policies. Moreover, if the well-being benefit from being green rises with the degree of unanimity of green attitudes, holding such attitudes may be a self-reinforcing process, provided that the "skeptics" can be nudged into a more environment-friendly direction. Conversely, however, increasing societal division on environmental issues (e.g. climate change) may undermine the green well-being benefits, frustrate people holding a green self-image, and ultimately be detrimental to environmental conservation.

The main limitation of this research consists of its correlational character. Similar to previous research, we cannot rigorously rule out reverse causation, that is, greater life satisfaction yields greener attitudes. Yet, some related research in psychology was able to show that higher levels of materialism causes lower levels of personal well-being, whereas higher levels of pro-social attitudes cause well-being to be higher. This suggests that a similar path of influence may exist in the GSI-LS relationship.

The latter issue – causation – is an obvious direction for future research. Well-being regressions on longitudinal data with *lagged* GSI as the independent variable may be helpful in this

regard. In addition, future research may study whether the relationships that we found in European data also exist in other world regions.

References

Akerlof, G.A. (1980), A Theory of Social Custom, of Which Unemployment May Be One Consequence, *Quarterly Journal of Economics* 94, 749-775.

Akerlof, G.A., Kranton, R.E. (2000), Economics and Identity, *Quarterly Journal of Economics* 115, 715-755.

Akerlof, G.A., Kranton, R.E. (2010), *Identity Economics: How Our Identities Shape Our Work, Wages, and Well-Being*, Princeton University Press, Princeton/NJ.

Andreoni, J. (1990), Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving, *Economic Journal* 100, 464 -477.

Binder, M., Blankenberg, A.-K. (2017), Green Lifestyles and Subjective Well-Being: More about Lifestyles than Actual Behavior?, *Journal of Economic Behavior and Organization* 137, 304-323.

Brekke, K.A., Kverndock, S., Nyborg, K. (2003), An Economic Model of Moral Motivation, *Journal of Public Economics* 87, 1967-1983.

Brown, K.W., Kasser, T. (2005), Are Psychological and Ecological Well-Being Compatible? The Role of Values, Mindfulness, and Lifestyle, *Social Indicators Research* 74, 349-386.

Clark, A.E. (2003), *Unemployment* as a Social Norm: Psychological Evidence from Panel Data, *Journal of Labor Economics* 21, 323-352.

Clark, A.E., Frijters, P., Shields, M. (2008), Relative Income, Happiness and Utility: An Explanation for the Easterlin Paradox and other Puzzles, *Journal of Economic Literature* 46, 95-144.

Delhey, J. (2010), From Materialist to Post-Materialist Happiness? National Affluence and Determinants of Life Satisfaction in Cross-National Perspective, *Social Indicators Research* 97, 65-84.

Desmet, K., Ortuno-Ortin, I., Weber, S. (2005), Peripheral Diversity and Redistribution, CEPR Discussion Paper No. 5112.

Desmet, K., Ortuno-Ortin, I., Weber, S. (2009), Linguistic Diversity and Redistribution, *Journal of the European Economic Association* 7, 1291-1318.

Dittmar, H., Bond, R., Hurst, M., Kasser, T. (2014), The Relationship between Materialism and Personal Well-Being: A Meta-Analysis, *Journal of Personality and Social Psychology* 107, 879-924.

Dolan, P., Peasgood, T., White, M. (2008), Do We Really Know What Makes Us Happy? A Review of the Economic Literature On the Factors Associated with Subjective Well-Being, *Journal of Economic Psychology* 29, 94-122.

Esteban, J.M., Raj, D. (1994), On the Measurement of Polarization, *Econometrica* 62, 819-851.

Frey, B.S., Stutzer, A. (2002), What Can Economists Learn From Happiness Research?, *Journal of Economic Literature* 40, 402-435.

Gelissen, J. (2007), Explaining Popular Support for Environmental Protection: A Multilevel Analysis, *Environment and Behavior* 39, 392-415.

Kasser, T., Ryan, R.M., Couchman, C.E., Sheldon, K.M. (2004), Materialistic Values: Their Causes and Consequences, in T. Kasser, A.D. Kanner (eds.): *Psychology and Consumer Culture: The Struggle for a Good Life in a Materialistic World*, Washington: American Psychological Association.

Lindbeck, A. (1997) Incentives and Social Norms in Household Behavior, *American Economic Review* 87, 370-377.

O'Brien, C. (2008), Sustainable Happiness: How Happiness Studies Can Contribute to a More Sustainable Future, *Canadian Psychology/Psychologie Canadienne* 49, 289-295.

Pandelaere, M. (2016), Materialism and Well-Being: The Role of Consumption, *Current Opinion in Psychology* 10, 33-38.

Rao, C.R. (1982), Diversity and Dissimilarity Coefficients: A Unified Approach, *Theoretical Population Biology* 21, 24-43.

Richin, M.L. (1997); Measuring Emotions in the Consumption Experience, *Journal of Consumer Research* 24, 127-146.

Ricotta, C. (2005), Through the Jungle of Biodiversity, *Acta Biotheoretica* 53, 29-38.

Rucker, D.D., Petty, R.E. (2004), Emotion Specificity and Consumer Behavior: Anger, Sadness, and Preference for Activity, *Motivation and Emotion* 28, 3-21.

Schultz P.W., Nolan J.M., Cialdini, R.B., Goldstein, N.J., Griskevicius, V. (2007), The Constructive, Destructive, and Reconstructive Power of Social Norms, *Psychological Science* 18, 429-434.

Shannon, C. (1949), *The Mathematical Theory of Communication*, University of Illinois Press.

Tajfel, H. (1972), Experiments in a Vacuum, in J. Israel and H. Tajfel (eds.): *The Context of Social Psychology: A Critical Assessment*, 69-119, Academic Press, London.

Tripathi, A., Singh, M.P. (2016), Determinants of Sustainable/Green: A Review, International *Journal of Environmental Technology and Management* 19, 316-358.

Videras, J., Owen, A.L., Conover, E., Wu, S. (2012), The Influence of Social Relationships on Pro-Environment Behavior, *Journal of Environmental Economics and Management* 65, 35-50.

Videras, J.R., Owen, A.L. (2006), Public Goods Provision and Well-Being: Empirical Evidence Consistent with the Warm Glow Theory, *BE Journals of Economic Analysis and Policy* 5(1).

Welsch, H., Kühling, J. (2009), Determinants of Pro-Environmental Consumption: The Roles of Reference Groups and Routine Behavior, *Ecological Economics* 69, 166-176.

Welsch, H. Kühling (2010), Pro-Environmental Behavior and Rational Consumer Choice: Evidence from Surveys of Life Satisfaction, *Journal of Economic Psychology* 31, 405-420.

Welsch, H. Kühling (2011), Are Pro-Environmental Consumption Choices Utility-Maximizing? Evidence from Subjective Well-Being Data, *Ecological Economics* 72, 75-87.

Welsch, H., Kühling, J. (2016), Green Status Seeking and Endogenous Reference Standards, *Environmental Economics and Policy Studies* 18, 625-645,

Welsch, H. Kühling, J. (2017a), Pan-European Patterns of Environmental Concern: The Role of Proximity and International Integration, *Journal of Environmental Studies and Sciences*, forthcoming.

Welsch, H., Kühling, J. (2017b), Divided We Stand: Immigration Attitudes, Identity, and Subjective Well-Being, Discussion Paper, Department of Economics, University of Oldenburg, Germany.

Table 1. Life Satisfaction and Green Self-Image in a Pool of Countries: Main Results

	(1) Dummies_Set	(2) Continuous	(3) MEAN	(4) SD	(5) GI	(6) ER	(7) PH
GSI_2	0.239***						
	(3.12)						
GSI_3	0.256***						
	(3.54)						
GSI_4	0.319***						
	(4.47)						
GSI_5	0.410***						
	(5.76)						
GSI_6	0.467***						
	(6.54)						
GSI		0.0711***	0.0692***	0.0696***	0.0694***	0.0712***	0.0712***
		(16.59)	(16.08)	(16.23)	(16.16)	(16.63)	(16.61)
GSI_MEAN			0.292***				
			(5.71)				
GSI_SD				-0.621***			
				(-6.60)			
GSI_GI					-2.747***		
					(-7.00)		
GSI_ER						-19.82***	
						(-4.72)	
GSI_PH							-3.590***
							(-8.39)
Growth	0.0267***	0.0268***	0.0281***	0.0274***	0.0274***	0.0259***	0.0251***
	(11.70)	(11.71)	(12.17)	(11.96)	(11.97)	(11.27)	(10.96)
GDPPC	-0.0000380***	-0.0000381***	-0.0000427***	-0.0000424***	-0.0000424***	-0.0000370***	-0.0000374***
	(-8.42)	(-8.44)	(-9.31)	(-9.30)	(-9.32)	(-8.18)	(-8.29)
Unemp	-0.0476***	-0.0476***	-0.0491***	-0.0491***	-0.0490***	-0.0474***	-0.0470***
	(-18.95)	(-18.97)	(-19.46)	(-19.48)	(-19.49)	(-18.85)	(-18.71)
Inflat	0.00148	0.00152	0.000638	0.00240	0.00186	0.00325	0.00211
	(0.43)	(0.45)	(0.19)	(0.70)	(0.55)	(0.95)	(0.62)
_cons	7.222***	7.271***	6.064***	8.101***	8.064***	8.317***	7.649***
	(35.26)	(37.71)	(21.14)	(35.44)	(36.30)	(28.36)	(38.39)
N	228390	228390	228390	228390	228390	228390	228390
R-sq	0.289	0.289	0.289	0.289	0.289	0.289	0.289

t statistics in parentheses
* p<.1, ** p<.05, *** p<.01

Regressions include socio-demographic controls (see Table A2) and country and year dummies. Standard errors are corrected for country-year clustering.

Table 2. Life Satisfaction and Green Self-Image by Country

Number	Country	N (Observations)	Coefficient GSI
1	Austria	5,453	0.071***
2	Belgium	10,584	0.018
3	Bulgaria	4,859	0.050
4	Switzerland	9,728	0.023
5	Cyprus	2,389	0.140***
6	Czech Republic	8,206	0.113***
7	Germany	16,337	0.097***
8	Denmark	9,046	0.044***
9	Estonia	1,940	0.162***
10	Spain	9,208	0.101***
11	Finland	10,419	0.046***
12	France	8,733	-0.027
13	Great Britain	12,345	0.036**
14	Greece	6,460	0.156***
15	Croatia	2,173	0.024
16	Hungary	5,904	0.075**
17	Ireland	8,931	0.148***
18	Israel	8,004	0.051**
19	Iceland	1,042	0.037
20	Italy	516	0.026*
21	Luxembourg	969	0.125*
22	Latvia	1,569	0.166***
23	Netherlands	11,326	0.059***
24	Norway	10,486	0.003
25	Poland	9,695	0.089***
26	Portugal	6,390	0.112***
27	Romania	1,648	0.173***
28	Russia	7,967	0.052**
29	Sweden	10,765	0.011
30	Slovenia	7,079	0.074**
31	Slovakia	4,262	0.015
32	Turkey	3,559	0.055
33	Ukraine	4,595	0.029
34	Albania	1,068	-0.024
35	Lithuania	4,735	0.117***
Total	All Countries	228,390	0.071***

Regressions include socio-demographic and macroeconomic controls and country and year dummies. Standard errors are corrected for country-year clustering.

Table 3: Life Satisfaction, Green Self-Image, and Mean GSI

	(1) MEAN	(2) LOW_MEAN	(3) HIGH_MEAN
GSI	-0.0653	0.0654***	0.0741***
	(-0.65)	(11.60)	(11.21)
GSI_MEAN	0.155		
	(1.36)		
I_GSI_MEAN	0.0278		
	(1.33)		
Growth	0.0281***	0.0167***	0.0220***
	(12.20)	(3.98)	(6.15)
GDPPC	-0.0000429***	-0.0000385***	-0.0000190***
	(-9.35)	(-3.67)	(-2.93)
Unemp	-0.0491***	-0.0372***	-0.0336***
	(-19.48)	(-6.43)	(-9.97)
Inflat	0.000708	-0.0171***	0.0389***
	(0.21)	(-2.66)	(5.86)
_cons	6.731***	7.193***	6.532***
	(11.76)	(16.45)	(23.07)
N	228390	113895	114495
R-sq	0.289	0.279	0.303

t statistics in parentheses
* p<.1, ** p<.05, *** p<.01

Dependent variable: 11-point life satisfaction. Regressions include socio-demographic controls and country and year dummies. Standard errors are corrected for country-year clustering.

Table 4: Life Satisfaction, Green Self-Image, and GSI Disparity

	(1) SD	(2) GI	(3) ER	(4) PH
GSI	0.189***	0.162***	0.423***	0.190***
	(4.35)	(4.48)	(3.97)	(5.15)
GSI_SD	-0.0530			
	(-0.23)			
I_GSI_SD	-0.115***			
	(-2.75)			
GSI_GI		-0.661		
		(-0.74)		
I_GSI_GI		-0.424**		
		(-2.57)		
GSI_ER			11.24	
			(1.10)	
I_GSI_ER			-6.330***	
			(-3.29)	
GSI_PH				1.142
				(0.75)
I_GSI_PH				-0.955***
				(-3.22)
Growth	0.0275***	0.0275***	0.0259***	0.0250***
	(12.02)	(12.03)	(11.28)	(10.88)
GDPPC	-0.0000426***	-0.0000427***	-0.0000370***	-0.0000372***
	(-9.35)	(-9.38)	(-8.18)	(-8.23)
Unemp	-0.0491***	-0.0491***	-0.0473***	-0.0468***
	(-19.50)	(-19.51)	(-18.83)	(-18.63)
Inflat	0.00256	0.00202	0.00334	0.00188
	(0.75)	(0.59)	(0.98)	(0.55)
_cons	7.524***	7.621***	6.591***	7.049***
	(24.30)	(27.12)	(11.08)	(26.03)
N	228390	228390	228390	228390
R-sq	0.289	0.289	0.289	0.289

t statistics in parentheses
* p<.1, ** p<.05, *** p<.01

Dependent variable: 11-point life satisfaction. Regressions include socio-demographic controls and country and year dummies. Standard errors are corrected for country-year clustering.

Table A1: Summary Statistics

	Mean	SD	Min	Max
GSI_1	0.005	0.072	0.000	1.000
GSI_2	0.021	0.145	0.000	1.000
GSI_3	0.074	0.261	0.000	1.000
GSI_4	0.190	0.393	0.000	1.000
GSI_5	0.404	0.491	0.000	1.000
GSI_6	0.305	0.461	0.000	1.000
GSI	4.882	1.026	1.000	6.000
GSI_MEAN	4.866	0.200	4.215	5.611
GSI_SD	1.012	0.104	0.562	1.421
GSI_GI	0.212	0.026	0.099	0.313
GSI_ER	0.055	0.002	0.037	0.067
GSI_PH	0.124	0.015	0.083	0.196
LS11	7.881	2.322	1.000	11.000
Growth	1.232	3.604	-14.421	25.555
GDPPC	35289.895	12601.364	7479.342	88247.928
Unemp	8.431	4.140	2.547	26.094
Inflat	2.510	2.533	-4.480	15.895
HealthStatus	3.767	0.930	1.000	5.000
Sex_Female	0.533	0.499	0.000	1.000
age_total	48.522	17.961	14.000	114.000
age_squared	2676.994	1815.427	196.000	12996.000
size_household	2.695	1.429	1.000	18.000
Marital_Married	0.532	0.499	0.000	1.000
Marital_Divorced	0.090	0.286	0.000	1.000
Marital_Seperated	0.012	0.109	0.000	1.000
Marital_Widowed	0.098	0.297	0.000	1.000
OCC_Education	0.065	0.247	0.000	1.000
OCC_Unemp_Invol	0.041	0.197	0.000	1.000
OCC_Unemp_Vol	0.017	0.128	0.000	1.000
OCC_Sick	0.025	0.156	0.000	1.000
OCC_Retired	0.243	0.429	0.000	1.000
OCC_Civil_Military	0.001	0.037	0.000	1.000
OCC_Household	0.092	0.289	0.000	1.000
OCC_Other	0.010	0.099	0.000	1.000
net_income	5.528	2.770	1.000	12.000

Table A2. Life Satisfaction and Green Self-Image: Detailed Result

	(1) Dummies_Set	(2) Continuous	(3) MEAN	(4) SD	(5) GI	(6) ER	(7) PH
GSI_2	0.239***						
	(3.12)						
GSI_3	0.256***						
	(3.54)						
GSI_4	0.319***						
	(4.47)						
GSI_5	0.410***						
	(5.76)						
GSI_6	0.467***						
	(6.54)						
GSI		0.0711***	0.0692***	0.0696***	0.0694***	0.0712***	0.0712***
		(16.59)	(16.08)	(16.23)	(16.16)	(16.63)	(16.61)
GSI_MEAN			0.292***				
			(5.71)				
GSI_SD				-0.621***			
				(-6.60)			
GSI_GI					-2.747***		
					(-7.00)		
GSI_ER						-19.82***	
						(-4.72)	
GSI_PH							-3.590***
							(-8.39)
Growth	0.0267***	0.0268***	0.0281***	0.0274***	0.0274***	0.0259***	0.0251***
	(11.70)	(11.71)	(12.17)	(11.96)	(11.97)	(11.27)	(10.96)
GDPPC	-0.0000380***	-0.0000381***	-0.0000427***	-0.0000424***	-0.0000424***	-0.0000370***	-0.0000374***
	(-8.42)	(-8.44)	(-9.31)	(-9.30)	(-9.32)	(-8.18)	(-8.29)
Unemp	-0.0476***	-0.0476***	-0.0491***	-0.0491***	-0.0490***	-0.0474***	-0.0470***
	(-18.95)	(-18.97)	(-19.46)	(-19.48)	(-19.49)	(-18.85)	(-18.71)
Inflat	0.00148	0.00152	0.000638	0.00240	0.00186	0.00325	0.00211
	(0.43)	(0.45)	(0.19)	(0.70)	(0.55)	(0.95)	(0.62)
HealthStatus	0.663***	0.663***	0.663***	0.663***	0.663***	0.663***	0.663***
	(113.57)	(113.55)	(113.58)	(113.55)	(113.55)	(113.53)	(113.58)
Sex_Female	0.136***	0.136***	0.136***	0.137***	0.137***	0.136***	0.136***
	(15.83)	(15.81)	(15.84)	(15.87)	(15.88)	(15.84)	(15.80)
age_total	-0.0580***	-0.0580***	-0.0580***	-0.0580***	-0.0580***	-0.0581***	-0.0580***
	(-34.44)	(-34.44)	(-34.43)	(-34.45)	(-34.45)	(-34.46)	(-34.42)
age_squared	0.000637***	0.000637***	0.000637***	0.000637***	0.000637***	0.000637***	0.000637***
	(37.92)	(37.92)	(37.90)	(37.92)	(37.92)	(37.93)	(37.91)
size_household	-0.0217***	-0.0217***	-0.0219***	-0.0220***	-0.0221***	-0.0219***	-0.0215***
	(-5.65)	(-5.65)	(-5.71)	(-5.72)	(-5.76)	(-5.69)	(-5.59)
Marital_Married	0.337***	0.337***	0.337***	0.337***	0.337***	0.337***	0.337***
	(25.76)	(25.78)	(25.77)	(25.76)	(25.76)	(25.77)	(25.76)
Marital_Divorced	-0.137***	-0.137***	-0.137***	-0.137***	-0.137***	-0.137***	-0.138***
	(-7.39)	(-7.39)	(-7.38)	(-7.40)	(-7.39)	(-7.40)	(-7.42)
Marital_Seperated	-0.446***	-0.445***	-0.445***	-0.445***	-0.445***	-0.444***	-0.445***
	(-10.04)	(-10.03)	(-10.03)	(-10.02)	(-10.02)	(-10.01)	(-10.01)
Marital_Widowed	-0.0882***	-0.0880***	-0.0880***	-0.0879***	-0.0879***	-0.0878***	-0.0878***
	(-4.22)	(-4.21)	(-4.21)	(-4.21)	(-4.21)	(-4.20)	(-4.21)

Table A2 continued

	(1) Dummies_Set	(2) Continuous	(3) MEAN	(4) SD	(5) GI	(6) ER	(7) PH
OCC_Education	0.206***	0.206***	0.207***	0.207***	0.207***	0.207***	0.207***
	(10.53)	(10.54)	(10.58)	(10.59)	(10.59)	(10.57)	(10.55)
OCC_Unemp_Invol	-0.953***	-0.953***	-0.952***	-0.952***	-0.951***	-0.952***	-0.953***
	(-35.82)	(-35.83)	(-35.79)	(-35.78)	(-35.77)	(-35.79)	(-35.85)
OCC_Unemp_Vol	-0.610***	-0.610***	-0.609***	-0.610***	-0.609***	-0.610***	-0.610***
	(-15.65)	(-15.66)	(-15.64)	(-15.65)	(-15.64)	(-15.65)	(-15.67)
OCC_Sick	-0.275***	-0.275***	-0.275***	-0.274***	-0.274***	-0.274***	-0.274***
	(-8.20)	(-8.21)	(-8.22)	(-8.19)	(-8.18)	(-8.17)	(-8.19)
OCC_Retired	0.143***	0.143***	0.143***	0.143***	0.143***	0.143***	0.142***
	(8.74)	(8.73)	(8.73)	(8.75)	(8.76)	(8.76)	(8.69)
OCC_Civil_Military	-0.0164	-0.0165	-0.0148	-0.0129	-0.0130	-0.0152	-0.0177
	(-0.14)	(-0.14)	(-0.13)	(-0.11)	(-0.11)	(-0.13)	(-0.15)
OCC_Household	0.0296*	0.0297*	0.0294*	0.0294*	0.0294*	0.0298*	0.0301*
	(1.75)	(1.76)	(1.74)	(1.74)	(1.74)	(1.77)	(1.78)
OCC_Other	-0.0697	-0.0698	-0.0686	-0.0687	-0.0688	-0.0689	-0.0668
	(-1.56)	(-1.56)	(-1.53)	(-1.54)	(-1.54)	(-1.54)	(-1.49)
net_income	0.118***	0.118***	0.118***	0.118***	0.118***	0.118***	0.118***
	(62.98)	(62.98)	(63.11)	(63.19)	(63.24)	(63.17)	(62.99)
_cons	7.222***	7.271***	6.064***	8.101***	8.064***	8.317***	7.649***
	(35.26)	(37.71)	(21.14)	(35.44)	(36.30)	(28.36)	(38.39)
N	228390	228390	228390	228390	228390	228390	228390
R-sq	0.289	0.289	0.289	0.289	0.289	0.289	0.289

t statistics in parentheses
* p<.1, ** p<.05, *** p<.01

Dependent variable: 11-point life satisfaction. Regressions country and year dummies. Standard errors are corrected for country-year clustering.

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