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Temporal Pessimism and Spatial Optimism in Environmental Assessments: An 18-Nation Study

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Abstract

The personal assessments of the current and expected future state of the environment by 3130 community respondents in 18 nations were investigated at the local, national, and global spatial levels. These assessments were compared to a ranking of each country's environmental quality by an expert panel. Temporal pessimism (“things will get worse”) was found in the assessments at all three spatial levels. Spatial optimism bias (“things are better here than there”) was found in the assessments of current environmental conditions in 15 of 18 countries, but not in the assessments of the future. All countries except one exhibited temporal pessimism, but significant differences between them were common. Evaluations of current environmental conditions also differed by country. Citizens’ assessments of current conditions, and the degree of comparative optimism, were strongly correlated with the expert panel’s assessments of national environmental quality. Aside from the value of understanding global trends in environmental assessments, the results have important implications for environmental policy and risk management strategies.

Temporal Pessimism and Spatial Optimism in Environmental Assessments: An 18-Nation Study

Environmental problems plague all countries and damage to interdependent ecosystems has multiplicative effects and international implications. The attitudes of individual citizens are importantly linked to these outcomes. For example, citizens' perceptions of risks can influence the acceptance of governments' environmental policies (Steg & Sievers, 2000) and whether or not people choose to act pro-environmentally (e.g., Weinstein, 1980). Fortunately, concern about environmental problems now is widespread. As Dunlap, Gallup, and Gallup (1993) observe, "environmental issues have penetrated the public agendas of all of the nations" (p. 10), and this certainly has accelerated with the recent pronouncements about the certainty of climate change. Nevertheless, environmental attitudes and concern are far from uniform across countries (Franzen, 2003; Schultz & Zelezny, 1999) and more research is needed to understand the ways in which environmental attitudes differ around the globe. This knowledge is valuable if policy-makers hope to understand these attitudes in order to successfully promote pro-environmental behavior. Therefore, international environmental attitude research is an important step towards achieving the goal of global sustainability.

For the most part, environmental attitudes and behaviors have been studied at the level of each person's immediate surroundings (Steg & Sievers, 2000) However, while the global environment encompasses much more than most individual can comprehend, the global ecology ultimately is a function of the everyday environment-relevant acts of all the billions of individuals on the planet. Although a few studies have shown that environmental attitudes vary, for example, with the distance from a person to a problem (Musson, 1974; Uzzell, 2000), more research is needed to better understand this phenomenon. The purpose of this study was to investigate the assessments of environmental conditions at different spatial and temporal levels by a large international sample.

Optimism Biases

Optimism is subject to self-favoring biases. For instance, comparative optimism refers to the belief that positive events are more likely, and negative events are less likely, to happen to oneself than to others. Unrealistic optimism is the erroneous expectation of a positive outcome and is associated with information-processing biases and maladaptive coping styles (Radcliffe & Klein, 2002). Most optimism bias research has been conducted on health issues, such as that on personal estimates of heart attack risk (Weinstein, 1980). Radcliffe and Klein (2002) suggest, however, that the types and levels of optimism might be different in other domains, and thus should be considered.

Environmental comparative optimism. In general, individuals seem to believe that, in environmental terms, they are safer than others. For example, residents who had not tested their homes for radon contamination believed that they were less at risk than their neighbors (Weinstein, Sandman, & Klotz, 1988). More recently, residents were found to believe that their local area was less likely to be affected by environmental hazards than the local area of their peers (Hatfield & Job, 2001). In another study, respondents believed they were less subject to danger from 22 environmental risks, as measured by the Environmental Appraisal Inventory (Schmidt & Gifford, 1989), than were comparable others (Pahl, Harris, Todd, & Rutter, 2005).

Comparative optimism is a useful construct for identifying biases because sub-mean risk assessments by the majority of a sample necessarily indicates bias: not everyone can be less at risk than most others (Radcliffe & Klein, 2002). An international study which includes countries that vary in objective environmental quality should usefully enhance understanding of biases in environmental optimism and pessimism. Comparative optimism may be accurate in the case of countries that have less degraded environments by objective measure or expert assessment, but inaccurate if it occurs in countries with objectively more-degraded environments. However, the occurrence of comparative optimism in most or all nations would support the idea that the optimism bias is universal, or nearly so.

In the health domain, the perceived risk of heart attack, when compared to the objective risk, is subject to unrealistic optimism (Kreuter & Strecher, 1995). However, similar comparisons in the environmental domain have not been studied as much, especially at the larger scale. Dunlap et al. (1993) speculated that lay assessments of national environmental quality might correspond to objective national environmental quality. The results from a study conducted in Britain are consistent with this notion: the objective number of beach pollutants was the strongest predictor of individuals' ratings of beach quality (Bonaiuto, Breakwell, & Cano, 1996). However, other studies have revealed important discrepancies between perceived and actual environmental quality (e.g., Kweon, Ellis, Lee, & Rogers, 2006). Clearly, more research on comparative optimism in the environmental domain is needed.

Spatial bias. For the most part, comparative optimism has focused on self-other (person-oriented) comparisons, and so studies of environmental risk perception have tended to focus on these differences (e.g., Hatfield & Job, 2001; Pahl et al., 2005). However, comparative optimism can also be examined in terms of geographic distance. In its spatial form, it is the tendency to view proximal conditions more favorably than distal conditions. In the first small demonstration of this, Musson (1974) examined assessments of overpopulation in the UK and found in a survey of 5 communities that although 74% of her respondents believed that Great Britain as a whole was overpopulated, only 48% viewed their own local area as overpopulated. More recent international studies report that assessed environmental quality decreased, or environmental problems increase, as the spatial level increase from the local, to the national, to the global level (Dunlap et al., 1993; Schultz et al., 2005; Uzzell, 2000).

Temporal bias. Discounting theory asserts that as social, spatial, or temporal units from the perceiver increase, the importance of the problem decreases (Gattig, 2002). Temporal biases seem particularly important because ecological problems characteristically occur slowly and have long-lasting consequences. Temporal discounting has been found to be less common (although still present) for some environmental risks (Böhm & Pfister, 2005). Unfortunately, few studies have investigated temporal biases for multiple risks or at the international level. One such investigation (Dunlap et al., 1993) examined the degree to which respondents believed that environmental problems affected their own health 10 years earlier, currently, and in 25 years. In all countries, most respondents believed that environmental problems would pose a serious threat to the health of their family over the following quarter century.

Cultural Differences and Optimism

Optimism may guide individuals and societies towards success, provided that chosen goals are attainable and real risks are not ignored. According to Peterson (2000), optimism is an inherent part of human nature that has made the growth of civilization possible, and so all contemporary cultures should possess a tendency to be generally optimistic. Nevertheless, Chang (2001) has shown that optimism and pessimism differ in Eastern and Western cultures. Peterson notes that desired outcomes are not universal; because cultures hold different primary goals and values, they are differentially optimistic about particular topics. For example, a culture that values material success may be more optimistic about the economy, whereas a culture that highly values the environment may display more environmental optimism.

Similarly, culture shapes individuals' environmental risk perception and preferences for risk management strategies (Douglas & Wildavsky, 1982). For instance, individuals' conceptualizations of environmental risk have been shown to arise from a "myth of nature" to which their culture commonly subscribes (Lima & Castro, 2005; Steg & Sievers, 2000). Variations in cultural values may result in differing assessments of environmental quality and optimism from nation to nation. As Chang (2001) asserts, "any model of optimism and pessimism that ignores the influence of culture is likely to be incomplete" (p. 276).

In light of the conflicting data about whether nations or cultures differ in their levels of environmental concern, this issue warrants further study. For instance, Inglehart (1995) claimed that richer countries have greater environmental concern. In support of this, Franzen (2003) found that environmental concern in 26 countries was “strongly” related to national wealth. However, Dunlap et al. (1993) compared industrialized and developing nations, and found different results. Not only were environmental issues mentioned among the top three most-important issues to respondents in 16 countries, but these issues were mentioned more frequently than expected in developing countries. In fact, respondents from developing countries actually expressed higher levels of concern about environmental problems than did respondents from industrialized nations.

The Present Study

This study expands knowledge about temporal, spatial, and national trends in assessments by citizens of numerous countries about current and future environmental conditions, and compares their assessments with experts’ quasi-objective assessments of environmental quality. Respondents in 18 countries were asked to judge 20 aspects of the environment at two temporal (current and future) and three spatial (local, national, and global) levels.

The literature, although informative, needs extension in several ways. For example, Dunlap et al.’s (1993) study did not include statistical tests. Furthermore, in the 14 years since it was conducted, attitudes may well have changed. Also, judgments about the future impact of environmental quality were specifically framed in terms of health and therefore are limited as assessments of current and future environmental conditions.

The present study extends Uzzell's (2000) and Schultz *et al*.'s (2005) work by including many more countries and by adding the temporal dimension. Finally, studies of environmental risk perception tend to focus on, and perhaps to encourage, negative assessments. To facilitate responses that do not unduly favor negative responses, Heath and Gifford (2006) recommend that scales be neutrally worded. Therefore, in this study, we asked respondents to assess environmental "quality" rather than "seriousness."

Hypotheses. Five hypotheses relate to assessments of current environmental conditions. First, we hypothesize that assessments of current environmental quality (pooled across countries) will worsen as geographic distance increases (i.e., the optimistic spatial bias, as found by Musson, 1974, and Uzzell, 2000). Second, based on the cultural considerations described above, we hypothesize that nations will significantly differ (when averaged across spatial level) in their assessments of current environmental conditions. Third, we expect to find significant interactions between country and the degree of spatial bias (i.e., some nations will be significantly more optimistic about local, as compared to global, conditions than other nations), although the literature is not sufficiently developed to offer directional predictions about these interactions. Fourth, based on the speculations of Dunlap et al. (1993), we hypothesize that ratings of national environmental quality will be positively associated with an objective (expert) ranking of that country's environmental performance. Fifth, we predict that the magnitude of the optimistic spatial bias in each country will also be positively associated with this objective ranking.

Two hypotheses relate to assessments of future environmental conditions. First, we hypothesize that assessments of future environmental change will worsen as the spatial level increases. Second, we hypothesize that countries will differ (averaged across spatial level) in their assessments of future environmental change. Finally, based on the lack of evidence in the literature, the study explores (a) whether a temporal bias exists at each spatial level and (b) interactions between nation and future assessments.

Method

The Environmental Futures Scale

The EFS was developed to measure spatial and temporal environmental comparative optimism or pessimism based on citizen assessments of the current and future state of 20 aspects of the environment (see Appendix A). Its items encompass the quality of both the natural and the built environments, as well as the society's ability to address environmental issues, including "the state of forests and wilderness," "visual pollution (e.g., billboards, ugly buildings, and litter)," and "the management of garbage." Each item was assessed at three spatial levels: "my area" (defined as 50 km around the respondent), "my country [replaced with name of each participating country]," and "globally." Response options for assessments were on 5-point scales in which the choices for the current state ranged from 1 (*very bad*) to 5 (*very good*) and those for the future state (i.e., 25 years from now, as compared to today) ranged from -2 (*much worse*) to 2 (*much better*). A pilot study indicated excellent internal consistency reliability for the full EFS scale (Cronbach's $\alpha = .97$). Demographic questions at the end of the scale were used to collect data on respondents' age, occupation, gender, years of education, and number of years spent in their local area.

Respondents and Data Collection

Research affiliates in 18 countries collected data from 3130 respondents (1738 females and 1368 males, mean age = 40.92, *SD* = 17.11; see Table 1 for sample size and demographic summaries for each participating country). Sample sizes ranged from 77 in France to 383 in Portugal, with an average national sample size of 174. Most respondents were recruited from urban areas, and the rest were from rural areas.

Based on the preferences and available resources of research collaborators in each country, one of three main methods of data collection was chosen: direct interviews and convenience sampling, snowball sampling, and returned surveys from randomly selected postal routes. In five participating countries (Australia, Finland, Italy, Portugal, and the United States) data sets from two or more locations were collected, to obtain a broader geographical and demographical sample. To efficiently maximize the response rate and minimize costs, direct methods of data collection were utilized most frequently. In particular, intercept interviews, whereby individuals were approached in public areas and asked to complete the survey, were used in five countries (Russia, Australia, Spain, Germany, and the United States). Similarly, convenience samples were obtained from lectures and non-academic social gatherings in Finland and India. In Mexico and Brazil verbal interviews were conducted in randomly selected residences. Data were also gathered through more indirect means. Researchers in four countries (France, England, Germany, and Italy) employed a variation of snowball sampling, in which students or colleagues distributed the questionnaire to other (mainly non-university) acquaintances, but did not personally complete the survey. A third method of data collection was by mail. In three countries (Sweden, Canada, and the Netherlands), postal routes were randomly selected from neighborhoods of diverse socioeconomic status to improve the representativeness of the sample. Approximately 750 self-addressed, stamped surveys were distributed in each of these countries.

The Environmental Sustainability Index

The Environmental Sustainability Index (ESI) was created by the World Economic Forum, the Center for Environmental Law and Policy at Yale University, and the Center for International Earth Science Information Network at Columbia University (2005). The ESI measures the environmental performance and potential for sustainability in 146 countries based on their performance in five domains: the maintenance of environmental systems at healthy levels, the extent of human impact on the environment, the level of environmental impact on humans, the social and institutional capacities to address environmental problems, and the level of global stewardship demonstrated by each country. ESI scores served as the expert or objective measure of environmental quality for the countries in this study, and were compared with the citizen assessments on the EFS for the same countries.

Results

Missing Data

In total, 24 data sets were received and merged into one file. The data were scanned for missing or errant values. Responses were considered missing when respondents (1) apparently misunderstood the scales and consequentially, used incorrect values for their current or future evaluations (for example, some respondents gave numbers lower than "1" for "current" ratings, or higher than "2" for "future ratings), or (2) left some parts of the scale blank because they did not know enough about an aspect, or did not believe that it applied to their local and/or national areas (some respondents wrote "N/A" or "don't know" on the scale). A case summary for missing data showed that 971 (or 31%) respondents did not answer, or gave incorrect answers to, at least one of the items. 699 respondents were missing 10% or less of their data. Given the very high internal consistency of the EFS (see below), missing data for these respondents were substituted with their mean responses to that particular subscale. However, those missing more than 10% of their responses (n = 272, or approximately 9% of the total sample) were excluded from further analyses. Research affiliates in Germany elected to omit three items from the EFS (pesticides, fish, and natural disasters), which they deemed inapplicable to their country, and therefore all German respondents necessarily were missing more than 15% of their data. However, rather than excluding German respondents from the analyses, the missing values from these three variables were replaced with respondents' means on the corresponding subscales. Given the very high internal consistency of the entire scale and of each of the six subscales (as described below), the substituted responses probably very closely approximate these respondents' choices, had they answered the questions. After the substitutions, 79 respondents from Germany had no missing data. Of the remaining 32 German respondents, 30 had less than 10% of their data missing, and so mean substitution was used as for the other respondents, leaving two respondents from Germany who were excluded from the analyses. The number of valid cases on each subscale that remained for the analyses, after these substitutions, may be seen in Table 2.

EFS Internal Consistency and Descriptive Statistics

Cronbach's alphas for the six subscales on the EFS were as follows: current local conditions (α = .91), current national conditions (α = .92), current global conditions (α = .91), future local conditions (α = .91), future national conditions (α = .92), and future global conditions (α = .93). The reliability of the full EFS was extremely high (α = .97).

Table 2 presents the means, standard deviations, and ranges for the six subscale variables. These means are also displayed in Figure 1. Means for all current environmental conditions were slightly below the scale midpoint of 3 ("acceptable"), but declined for increasingly distant spatial levels. Mean ratings for expected future conditions were below the scale midpoint of zero ("no different"), and scores were increasingly pessimistic as spatial levels expanded. Specific country means for each subscale are listed in Table 3 and are displayed in Figure 2. Current local assessments were most positive in Finland (M = 3.59, SD = .45), and lowest in Mexico (M = 2.55, SD = .52). The future local means were somewhat surprising: For future local means, Romanians were the most optimistic (M = .10, SD = .60), and Australians were the most pessimistic (M = -.55, SD = .53).

Assessments of Current Environmental Conditions

To examine variations across spatial levels and countries among assessments of current environmental conditions, a two-way mixed design ANOVA was conducted, with spatial level as a within-subjects factor and country as a between-subjects factor. Demographic variables (i.e., age, gender, years of education, and years lived in the current area) were entered as covariates. Given the very high internal consistency of the scales, all ANOVAs were conducted on subscale values that were averaged across each respondent's 20 EFS scale items. The means are shown in Table 2. Because Mauchly's sphericity test of spatial level indicated a violation of the sphericity assumption, and given that the Greenhouse-Geisser correction was greater than .75, the corrected Huynh-Feldt values were used (Field, 2005).

A significant main effect of spatial level (across all countries) was found, $F(1.51, 4339.58) = 4703.60$, $p < .001$, indicating that respondents assessed the quality of proximal environments more favorably than that of more distant locales. Based on Cohen's (1988) guidelines, this is a medium effect size ($f^2 = 0.22$). Contrasts among the three spatial levels revealed that assessments of local environmental conditions were significantly more positive than those at the national level, $F(1, 2859) = 671.02$, $p < .001$, an effect size of $d = .31$, and at the global level, $F(1, 2859) = 3266.89$, $p < .001$, an effect size of $d = .94$. This supports the first hypothesis, that assessments of current environmental quality decrease as spatial level increases (see Table 2).

A significant country effect was apparent, $F(17, 2859) = 36.74$, $p < .001$, which is a medium effect size ($f^2 = .26$). This supports the second hypothesis, that when averaged across spatial levels, country membership is related to respondents' assessments of current environmental conditions. The results of Games-Howell multiple comparisons (adjusted $\alpha = .002$) revealed that residents of Finland, Sweden, and Germany made significantly more positive assessments of current environmental conditions than 15, 15, and 14 other countries, respectively. In contrast, residents of Mexico and Spain made significantly more negative assessments than all the countries from which they differed (12 and 14 other countries, respectively). The other 13 countries differed significantly from between three to eight other nations, but these differences were neither as pronounced nor as unidirectional as those for the five countries mentioned above. The complete matrix of national differences in current environmental assessments is displayed in Table 4.

Does the Spatial Bias Exist Everywhere?

To examine whether a spatial bias existed in each country, current comparative optimism scores were first computed by subtracting average global from average local EFS scores. Values above zero indicate that local conditions were viewed as superior to global conditions; those below zero indicate that global conditions were viewed as better. Next, one-sample *t*-tests (Bonferroni adjusted $\alpha = .002$) were conducted for each country to examine whether these scores significantly differed from zero. Fifteen countries manifested significant optimistic spatial biases (i.e., that local conditions are better than global conditions). Interestingly, respondents in Russia and Romania demonstrated significant pessimistic spatial biases: global assessments were significantly more positive than local assessments. Among the 18 nations, only assessments in India exhibited no significant change with spatial level. These trends are illustrated in Figure 2.

Assessments of Future Change in Environmental Conditions

Temporal trends. Next, we examined whether assessments changed from present to future. One-sample *t*-tests were conducted on each of the future change subscales (at the local, national, and global levels) to evaluate whether or not their means differed significantly from zero, which would suggest the existence of a temporal trend. The means are shown in Table 2. Scores below zero indicate pessimism and those above zero signify optimism. Using a Bonferroni correction, the Type I error rate for each comparison was reduced to $\alpha = .02$. The subscale means reveal significant temporal pessimism at all three spatial levels: the local, $t(2882) = -25.63$, $p < .001$, $d = -0.48$, national, $t(2883) = -29.59$, $p < .001$, $d = -.55$, and global, $t(2881) = -36.31$, $p < .001$, $d = -.68$. All three effect sizes are medium-to-large. Thus, respondents were, on average, pessimistic at all spatial levels in their projections of future environmental conditions.

Temporal trends across countries. To test the hypothesis that environmental optimism differs across countries, a one-way ANOVA was conducted on assessments of future environmental change. A significant main effect of country on future ratings supported this hypothesis, $F(17, 2838) = 56.50$. This effect size ($f^2 = .28$), once again, is medium in size. Pairwise comparisons (all *p*s < .002) reveal that, although assessments from every country differed significantly from at least one other country, some countries were more (or less) optimistic than many others (see Table 5 for the full matrix of national differences). For example, respondents from Finland, Germany, and Canada were significantly more temporally pessimistic than respondents from five other countries and, notably, temporal pessimism in Australia exceeded that in 12 other countries. Assessments of the future from Russia and Portugal were less temporally pessimistic than those in seven other countries. Finally, Romania was the only country for which assessments of the future were at all temporally optimistic, and Romanian assessments were significantly more temporally optimistic than those of all other nations.

Environmental Assessments by Citizens and Experts

How do these lay assessments relate to those by experts? Mean ratings of current national environmental conditions by citizens was correlated with expert rankings on the ESI, and a strong positive relation was found, $r = .78$, $p(\text{one-tailed}) < .001$. In a second correlation, mean spatial optimism scores (average local minus average global) were analyzed in relation to the ESI rankings. Again, a large association was observed, $r = .68$, $p(\text{one-tailed}) = .001$. This suggests that, in general, countries with more spatial optimism are also those with better environmental conditions, and supports the final hypothesis, that assessments of environmental conditions by citizens strongly agree with expert assessments of environmental quality.

Discussion

This is the first study to investigate the environmental assessments and comparative optimism of community residents in many countries at different spatial and temporal levels. The predicted optimistic spatial bias was found for assessments of current environmental conditions, but not for assessments of future change. Almost all (17 of 18) countries also manifested temporal pessimism, as predicted. These trends provide insight into the general environmental cognitions of individuals in many countries. The findings should be useful in the development of local and global environmental policies, and in the promotion of improved environmental behavior. Many national differences exist, however, and should be useful guidelines for national policy.

Spatial Bias

The results support the first hypothesis: assessments of current environmental conditions decreased significantly as geographical distance from the person increased. This is consistent with previous research, and attests to the robustness of the optimistic spatial bias (Dunlap et al., 1993; Musson, 1974; Uzzell, 2000). This global trend may occur because citizens are motivated to maintain a positive self image, which is partly constructed from one's place identity (Bonaiuto et al., 1996). Alternatively, optimistic spatial biases may be a consequence of media reports that have increased awareness of, and corresponding concern about, *global* environmental problems. And yet, this would presume that coverage of global problems exceeds that of local problems, which is not necessarily the case.

However, not every country's residents manifested the optimistic spatial bias; respondents from India did not assess their local environment as significantly better than the global environment, and those from Russia and Romania actually showed the opposite trend. These results raise some potentially interesting questions. Why do the citizens of India not exhibit this bias? Why do the citizens of Russia and Romania exhibit a reverse bias? Certainly, a plausible reason the for the trend in the latter two countries lies in the emergence from mass industrialization policies that may not have considered the environment, which may make the future seem brighter than the past.

These results help resolve a discrepancy in the literature. Uzzell's (2000) findings suggested that the spatial bias was relatively constant across the three countries studied, seemingly unaffected by differences in objective environmental quality. Through use of a larger cross-cultural sample, the present findings suggest that spatial bias, although common, is not universal. This is consistent with Dunlap et al.'s (1993) results that pointed towards variations in spatial bias among the 24 nations studied. Differences in national identity may be at least partly responsible for the observed discrepancies. For example, in Bonaiuto et al.'s (1996) study of beach pollution, individuals with stronger national identities perceived fewer pollutants than did those with a weaker sense of nationalism. This appears to reflect a kind of denial that serves to maintain a positive national identity. Therefore, cultural variations in nationalism or national pride may contribute to differences in the spatial optimism bias across countries.

Another prediction, that assessments of future environmental change would vary with spatial level, was not confirmed. The optimistic spatial bias did not appear in assessments of the future. This was the first attempt to study spatial bias in assessments of the environmental future, and so further research is necessary to confirm or disconfirm this finding.

Temporal Trends

Respondents generally were pessimistic about the future of the environment, which supports the existence of a general tendency to temporal pessimism. This is consistent with the results of Dunlap et al. (1993), who showed that environmental problems were rated as more threatening to one's health over time. When optimism is so often a general default heuristic (cf. Metcalfe, 1998), why did this pessimistic trend emerge in the case of environmental assessments? One possibility is that individuals are acutely aware of environmental deterioration, and conclude that these trends will continue if something is not done to rectify them. Given, for example, that CO_2 emissions worldwide are increasing, the conclusion that climate change will continue is now beyond plausibility. In other words, awareness of environmental deterioration seems to be so strong that it overrides the default bias toward optimism. Another possibility is that temporal pessimism is caused by discounting. Because the problem is increasingly distant, and thus a less immediate and personal threat (Gattig, 2002), individuals may feel free to express opinions contrary to the typically pervasive optimism bias. That is, the self-protective mechanism of optimism may be de-emphasized when the issue is less immediate. Interestingly, respondents were not differentially pessimistic about local, national, or global environmental conditions. This is also consistent with discounting theory. Possibly because individuals have already discounted at the current spatial level, as well as temporally, they feel no need to further discount at future spatial levels. This is consistent with the affect regulation hypothesis of optimism (Taylor, Wayment, & Collins, 1993). Although individuals may believe that current environmental conditions may worsen over time, the belief that local environmental conditions will nevertheless be better than more distant environmental conditions may help to counter negative feelings about a dismal future.

The differences between countries in environmental assessments raise questions about the influence of experience on assessments. The least temporally pessimistic citizens were those from Romania and Russia, countries that have recently faced quite serious environmental problems. However, many residents of the most pessimistic country, Australia, believe their country is facing considerable environmental challenges, despite the country's high ESI score. Australians seem to believe that although they are reasonably well off right now, the future is bleak: widespread perceptions are that the country's river systems are drying up, the major cities are running out of fresh water, bush fires are increasing, and most electricity is generated by highly-polluting coal. In contrast, Romania's current environmental conditions are worse at present, but it has recently joined the European Union, which has been quite proactive in terms of its commitment to curb global warming, and therefore its residents expect a brighter future.

Perhaps these differences in pessimism stem from cultural or political, rather than physical differences. This notion is congruent with the findings of Heine and Lehman (1995) who, among others, have demonstrated cultural differences in optimism. The best resolution of these ambiguous findings may lie in a possible interaction among cultural, political, and physical characteristics of a country. Future research might usefully compare environmental optimism among collectivistic and individualistic cultures who live in countries of similar environmental quality. This would help to clarify why assessments varied by country. That is, were respondents in India less comparatively optimistic because of their environmental surroundings, or were their assessments the result of a cultural characteristic, such as modesty?

National Differences in Assessments of Current Environmental Conditions

As predicted, country membership influenced assessments of current environmental conditions, when averaged across spatial levels. This is consistent with Dunlap et al.'s (1993) finding that respondents from industrialized and developing countries rated environments differently. In addition, variations in environmental assessments across countries were strongly associated with expert (ESI) rankings of environmental quality. This supports our hypothesis, and is consistent with the observations of Dunlap et al. (1993), who surmised that ratings of environmental concern were linked with the environmental reputation of that country. Furthermore, the magnitude of spatial optimism exhibited by citizens of a country was also strongly related to ESI rankings. These results suggest that lay-expert opinions are not always as discrepant as they are sometimes portrayed; lay evaluations of national environmental condition can be very accurate, especially in aggregate populations. The cognitive biases that operate at an individual level are less-evident when the responses of many individuals are pooled, such that resulting averages are fairly accurate assessments of present national environmental quality.

Considering the Potential Role of Accuracy as an Explanation for Findings

The utility of accuracy as an explanation for some obtained findings is supported by the strong association between assessments of current national environmental conditions and expert rankings of environmental quality. But can our other results also be explained by mere accuracy? Considering all findings, there seems to be little support for accuracy as a general explanation. The finding that ratings of current environmental conditions decrease as spatial distance increases from local, to national, to global provides half support for the accuracy explanation. Although potential sample biases (described below) may have resulted in national conditions accurately being more negatively assessed than local conditions, it seems unlikely that sample biases would result in such near-universal findings. As well, the further decrease in ratings as spatial level increases from the national to the global level is unlikely to be generally accurate. One possibility is that the objective environment sets the bounds for evaluations and limits the range within which the cognitive biases occur. For instance, Mexican ratings of national environmental quality were lower than ratings in countries of objectively better environmental quality. Nevertheless, spatial and temporal biases were still present in Mexico. The likelihood that each of 19 countries is truly of better environmental quality than the global average is slim. Rather, it is more probable that the trend of decreasing ratings of environmental quality from proximate to more distant spatial levels suggests the existence of the spatial optimism bias.

In addition, we cannot conclude that temporal pessimism results from participant accuracy; although current environmental trends suggest that this pessimism is founded, it cannot be said that this forecast will ultimately prove true. Longitudinal studies would be required to assess the veracity of participants' projections. Future studies could also attempt to disentangle the unique, and combined, influences of accuracy and the spatial optimism bias on environmental assessments. Such studies could assess ratings of local and national environmental conditions sampling from participants in separate cities, known to vary in environmental quality, from within the same country.

In short, although accuracy likely accounts for some of our findings, it is not a solely sufficient explanation to account for all results. This adds credence to the influence of strong psychological biases on environmental cognitions and assessments.

Limitations

One issue in any international study with numerous research affiliates is the standardization of data collection procedures. Although a specific data collection method was suggested, so as to obtain a broad demographic sample from each country, research associates who often lacked resources administered the Environmental Futures Scale in the most efficient, yet rigorous, way they deemed possible. Thus, the findings of this study cannot be said to be perfectly representative of participating countries. On the positive side, many of these findings have strong effect sizes, and thus may well be robust to the differences in the ways that the data were collected. Indeed, the fact that we obtained common results using multiple methods attests to the robustness of our findings of the near-universality of temporal pessimism and the spatial optimism bias for evaluations of current environmental conditions.

A related methodological limitation may be that cities were not randomly selected by the principal investigators. They were chosen based on the presence of suitable and willing research collaborators. This could result in several potential sample biases, which may, in turn, partly account for some of the observed findings. For instance, participating collaborators may elect to live in less-polluted areas of their country and this could render some truth to the observed spatial optimism bias for current ratings (i.e., participant may, in general, live in cities of better environmental condition than other cities in their country). Additionally, our sample populations may not accurately represent those of the general population in countries studied because of the possibility that more educated people may be more aware about environmental issues, and consequentially more pessimistic. Thus, our sample could overestimate temporal pessimism.

Another issue surrounds the nature of optimism and pessimism as constructs. Some have suggested that these constructs are not a bipolar continuum, but rather exist as two orthogonal dimensions (e.g., Chang, 2000). That is, a person might be both high on pessimism and low on optimism, or vice versa. Respondents who are more likely to endorse both positive and negative outcomes would give the impression that they have neutral views when, in fact, they see both negative and positive aspects of the environment. Nevertheless, several studies that have measured optimism and pessimism using bidimensional scales have shown support for the unidimensional nature of optimism and pessimism (Chang, Maydeu-Olivares, & D'Zurilla, 1997; Lee & Seligman, 1997). Therefore, results from the unidimensional EFS employed in the present study may well be a good approximation of those that might be obtained from a similar bidimensional scale.

Conclusions and Future Directions

In conclusion, the results of this study contribute to the body of knowledge about spatial biases and temporal trends in international assessments of current and future environmental conditions by community residents. Apparently, environment-related biases are like environmental problems: they are generally unaffected by national borders. This does not bode well for environmental solutions, given that international problems are often accompanied by corresponding international biases which, according to some (Hatfield & Job, 2001), inhibit much-needed pro-environmental action. The optimistic spatial bias would seem to dampen enthusiasm for helping to solve local environmental problems, because they are discounted, at least in relation to environmental problems at larger scales. Certainly, these results provoke several important questions: Can individuals be taught to temper their optimistic spatial biases, and if so, will this encourage pro-environmental behavior on their part? Are environmentally optimistic or pessimistic individuals more likely to act? Given the dire news about climate change and sustainability, it is important to continue investigating the psychological bases of environmental problems.

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Table 1

Demographic Information by Country

Country	N	Age		Sex		Education pre-18		Education post-18		Years lived here	
		Mean	SD	Male	Female	Mean	SD	Mean	SD	Mean	SD
Australia	110	43.06	14.61	43	66	12.21	1.34	3.75	2.36	16.97	11.67
Brazil	94	36.11	14.39	45	49	9.12	2.58	9.67	1.72	22.03	14.82
Canada	125	46.68	19.56	45	77	12.18	1.33	4.16	2.47	22.81	18.79
England	117	45.63	13.12	34	78	12.98	1.89	4.50	2.06	20.96	14.86
Finland	118	28.61	11.44	14	102	10.86	1.67	4.40	2.77	12.85	12.84
France	77	36.89	12.85	43	33	13.80	2.56	2.99	2.87	27.68	17.65
Germany	111	42.60	15.20	67	44	*	*	*	*	26.35	16.37
India	139	24.55	4.96	90	49	12.81	1.23	4.54	1.31	19.68	7.77
Italy	377	37.53	14.79	156	219	11.40	2.46	3.23	2.92	29.29	17.93
Japan	298	44.80	16.30	98	200	11.89	.57	2.88	2.33	25.58	17.96
Mexico	150	37.33	12.05	53	96	10.58	3.21	2.89	2.98	26.99	16.01

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Table 1

Demographic Information by Country (continued).

Country	N	Age		Sex		Education pre-18		Education post-18		Years lived here	
		Mean	SD	Male	Female	Mean	SD	Mean	SD	Mean	SD
Netherlands	108	51.32	16.41	77	29	9.98	3.89	4.92	2.97	33.09	19.51
Portugal	383	50.11	18.76	182	199	6.98	3.98	1.07	2.11	40.71	19.28
Romania	150	39.23	16.07	72	77	11.25	1.97	3.22	2.72	26.32	14.96
Russia	228	31.62	16.52	106	122	10.42	1.03	4.14	2.11	22.92	17.37
Spain	200	41.51	17.24	91	109	11.92	3.63	2.22	2.45	25.20	17.66
Sweden	130	45.71	13.85	70	59	10.76	1.45	3.33	2.41	28.58	16.68
United States	215	43.40	18.59	82	130	12.13	1.41	4.08	2.27	16.87	15.31
Total	3130	40.92	17.11	1368	1738	10.91	3.04	3.35	2.82	26.28	18.14
		Range = 13-90				Range = 0 - 18		Range = 0 - 12		Range = 0 - 89	

* Information not collected

Table 2

Descriptive Statistics for the EFS Subscales

Assessments of:	N	Mean	SD
Current Environmental Conditions			
At the local level	2904	2.93	.61
At the national level	2905	2.75	.57
At the global level	2880	2.39	.54
Expected Future Environmental Change			
At the local level	2883	-.27	.57
At the national level	2884	-.34	.61
At the global level	2882	-.47	.70

Table 3

EFS Subscale Means and ESI Scores for each Country

Country	Mean Ratings						ESI Scores
	Local		National		Global		
	Current	Future	Current	Future	Current	Future	
Australia	3.27	-.55	2.91	-.70	2.11	-1.00	61.00
Brazil	2.93	-.43	2.63	-.52	2.37	-.64	62.20
Canada	3.42	-.42	3.13	-.49	2.07	-.82	64.40
England	3.15	-.32	2.87	-.35	2.21	-.58	50.20
Finland	3.59	-.24	3.62	-.27	2.43	-.53	75.10
France	2.95	-.29	2.65	-.36	2.03	-.71	55.20
Germany	3.38	-.27	3.27	-.32	2.59	-.73	56.90
India	2.78	-.19	2.72	-.21	2.75	-.14	45.20
Italy	2.92	-.25	2.65	-.35	2.33	-.49	50.10
Japan	2.81	-.26	2.61	-.35	2.34	-.64	57.30
Mexico	2.55	-.50	2.26	-.69	2.30	-.65	46.20
Netherlands	3.10	-.30	3.01	-.35	2.34	-.62	53.70
Portugal	2.82	-.18	2.68	-.23	2.50	-.28	54.20
Romania	2.66	.10	2.62	.12	2.96	.32	46.20

Russia	2.51	-.23	2.56	-.25	2.63	-.22	56.10
Spain	2.68	-.43	2.43	-.51	2.04	-.64	48.80
Sweden	3.58	-.12	3.45	-.15	2.38	-.34	71.70
United States	2.91	-.38	2.69	-.46	2.26	-.61	52.90

Table 4

Significant Mean Differences[1] of Current National Ratings Between Countries

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Australia					-		-		+	+	+			+	+	+	-	
2. Brazil			-		-		-				+	-				+	-	
3. Canada		+			-	+		+	+	+	+	+	+	+	+	+	-	+
4. England					-		-		+	+	+		+	+	+	+	-	
5. Finland	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+		+
6. France			-		-		-			+		-				+	-	
7. Germany	+	+		+	-	+		+	+	+	+	+	+	+	+	+		+
8. India			-		-	-					+	-				+	-	
9. Italy	-		-	-	-		-				+	-				+	-	
10. Japan	-		-	-	-		-				+	-				+	-	
11. Mexico	-	-	-	-	-	-	-	-	-	-		-	-	-	-		-	-
12. Netherlands		+			-	+	-	+	+	+	+		+	+	+	+	-	+
13. Portugal			-	-	-		-				+	-				+	-	
14.Romania	-		-	-	-		-				+	-				+	-	
15. Russia	-		-	-	-		-				+	-					-	
16. Spain	-	-	-	-	-	-	-	-	-	-		-	-	-		-	-	-
17. Sweden	+	+	+	+		+		+	+	+	+	+	+	+	+	+		+
18. United States			-		-						+	-				+	-	

1 Comparisons are in reference to the country in the left-hand column.

Table 5

Significant Mean Differences[1] of Future National Ratings Between Countries

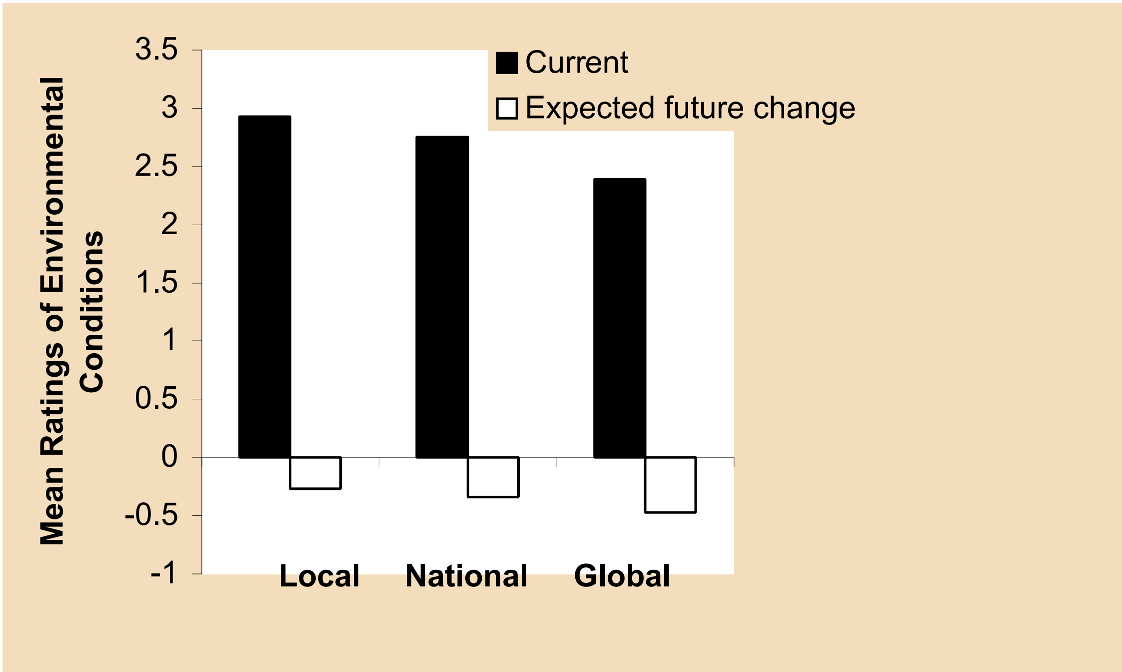
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Australia				-	-	-	-	-	-	-		-	-	-	-		-	
2. Brazil					-			-					-	-	-		-	
3. Canada								-					-	-			-	
4. England	+										+			-				
5. Finland	+	+									+			-		+		
6. France	+										+			-				
7. Germany	+										+			-				
8. India	+	+	+								+			-		+		
9. Italy	+										+			-			-	
10. Japan	+										+			-			-	
11. Mexico				-	-	-	-	-	-	-		-	-	-	-		-	
12. Netherlands	+										+			-				
13. Portugal	+	+	+								+			-		+		
14.Romania	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+
15. Russia	+	+									+			-		+		
16. Spain					-			-					-	-	-		-	
17. Sweden	+	+	+						+	+	+			-		+		+
18. United States														-			-	

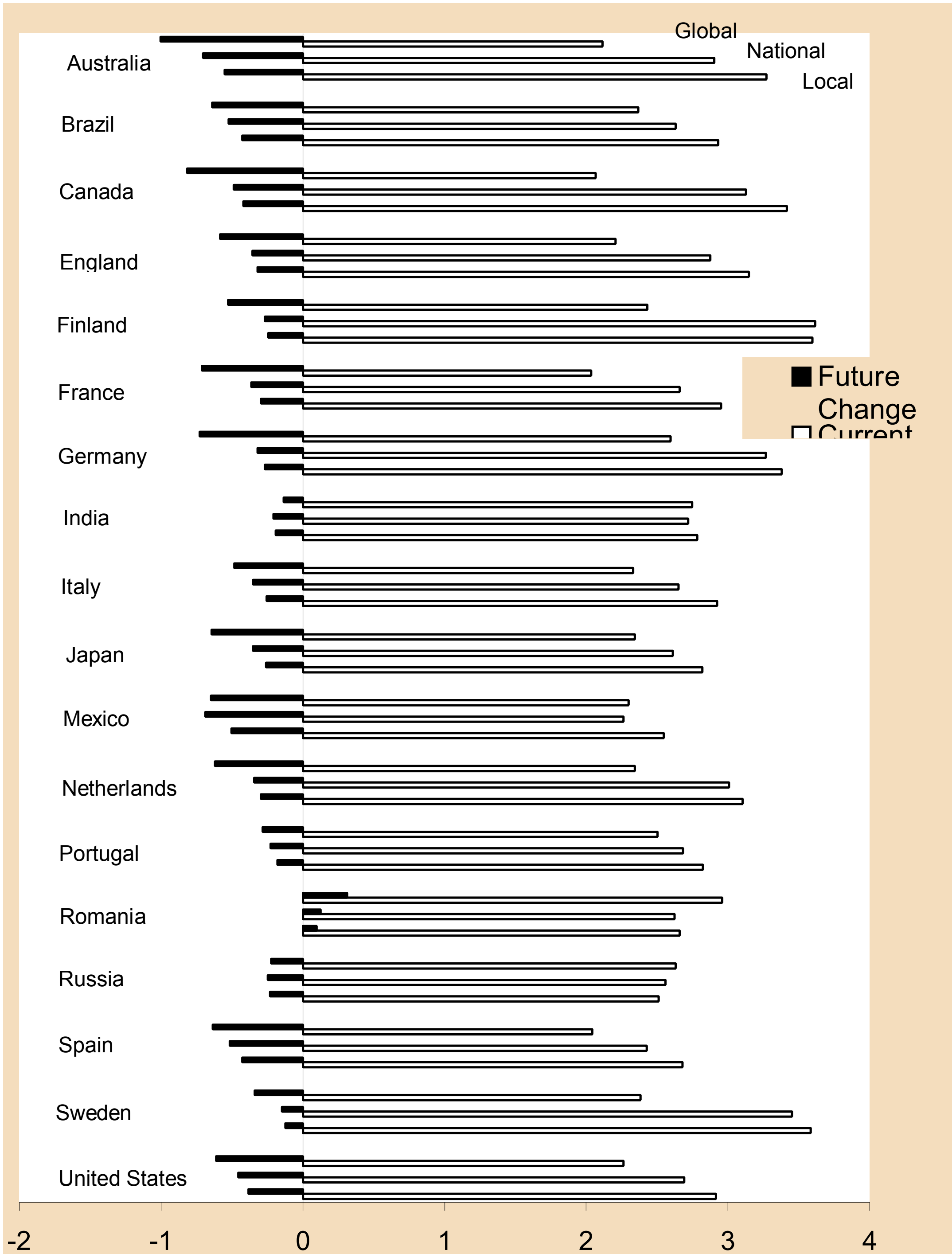
1 Comparisons are in reference to the country in the left-hand column.

Figure Captions

Figure 1. Mean ratings of current environmental conditions and expected future change (in 25 years) at the local, national, and global spatial levels summed across countries.

Figure 2. Mean ratings of current environmental conditions and expected future change at the local, national, and global spatial levels for each country.


Mean Ratings of Environmental Conditions
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
Current
Expected future change
Local
National
Global


Global
National
Local
Australia
Brazil
Canada
England
Finland
France
Germany
India
Italy
Japan
Mexico
Netherlands
Portugal
Romania
Russia
Spain
Sweden
United States
Future Change
Current
-2
-1
0
1
2
3
4

Appendix: The Environmental Futures Scale

Environmental Futures

This survey asks for your opinion about several aspects of the environment. In the "Now" column below, please indicate what you think the state, or condition of each part of the environment is *now,* using this scale:

very bad,	bad,	acceptable,	good, or	very good, in this area (50 km around it), your country, and globally.
(1)	(2)	(3)	(4)	(5)

In the "The Future" column, please give your best, actual, honest opinion as to what you think the state, or condition, will be *in 25 years*, compared to now. Of course, no one really knows what will happen, but in each case, report what you *expect* conditions will be, using this scale:

much worse,	worse,	no different,	better, or	much better, in this area (50 km around it), [country], and globally.
(-2)	(-1)	(0)	(1)	(2)

			Now	**The Future** (in 25 years)
1.	The availability of fresh drinking water:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
2.	The state of rivers and lakes:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
3.	The degree of biodiversity (diversity of organisms):	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
4.	The quality of air:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
5.	The state of urban parks and green space:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
6.	The state of forests and wilderness:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
7.	The environmental impact of vehicle traffic:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____

8.	The effects of human population on the environment:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
9.	The effects of greenhouse gases:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
10.	The state of fisheries:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
11.	The aesthetic quality of the built environment:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
12.	The management of garbage:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
13.	The management of fibres or fumes from synthetic materials (e.g., asbestos, carpets, and plastics).	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
14.	The management of radiation and nuclear waste:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
15.	The quality of soil for agricultural purposes:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
16.	The management of natural disasters:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
17.	Visual pollution (e.g., billboards, ugly buildings, and litter	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____

18.	The effect of pesticides and herbicides:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
19.	The management of acid rain:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____
20.	The management of noise:	a. my area	_____	_____
		b. [country]	_____	_____
		c. globally	_____	_____

Sex: ________

Year of Birth: _______

Occupation: ___________________________

Number of years of education until 17-18 years old: ____
Number of years of education after 17-18 years old:____
Length of time you have lived in your area (50 km):_____________