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Do EPA administrators recommend environmental policies that citizens want?

Fredrik Carlsson,[a] Mitesh Kataria,[b] Elina Lampi[c]

Abstract

We investigate whether Swedish Environmental Protection Agency (EPA) administrator recommendations regarding improvements in environmental quality differ from citizen preferences. The scope and significance of the possible difference are assessed by conducting identical choice experiments on a random sample of Swedish citizens and a random sample of administrators working at the Swedish EPA. The experiment concerns two environmental quality objectives: a Balanced Marine Environment and Clean Air. The EPA administrators were asked to choose the alternatives they would recommend as a policy, while the citizens were asked to act as private persons. We find that the rankings of attributes differ between the two groups and that the willingness to pay (WTP) obtained from the choices made by the administrators is higher for five out of the seven attributes, and in some cases the difference between the WTPs is not only significant but also substantial. We also asked the administrators to motivate their choices in the experiment, and the main motive was ecological sustainability.

Keywords: Choice experiment, environmental policy, administrators, citizens, environmental objectives.

JEL Classification: D61, Q51, Q58.

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I. Introduction

Many people have an attitude of distrust toward politicians and administrators (bureaucrats) responsible for public policy. Part of this distrust could be related to uncertainty about whether administrators serve their own self-interest or act in the interest of the public. This viewpoint is a central element in public choice theory (Mueller, 2003); for example Niskanen (1971) where the bureaucrat is described as a budget-maximizer, and Brennan and Buchanan (1980) where politicians and bureaucrats collaborate and try to maximize the size of the public sector. Another explanation for the distrust is that politicians and administrators are considered to be distanced from people in general, creating policies and making decisions that are not in line with the desires of citizens. However, it can be argued that certain policies in fact should be paternalistic and to some extent ignore the preference of the general public (O'Donoghue and Rabin, 2003; Johansson-Stenman, 2008). For example, the fact that people working with environmental management have more information about environmental problems than the public may justify paternalistic behavior to some degree. According to studies in psychology, decision makers in the public sector have preferences that are similar to those of the general public when it comes to policies for the reduction of greenhouse gases, while decision makers in the private sector have preferences that are different (Nilsson et al., 2004; Nilsson and Biel, 2008). Moreover, there is evidence that the decisions of those who work in the public sector are based on their private norms regarding environmental values (Nilsson et al., 2004). von Borgstede et al. (2007) show that also individual professional roles in an organization, regardless of whether the organization is private or public, matter for the acceptance of climate policy measures. Environmental managers, planners, and economists all have different patterns of acceptance; environmental managers are significantly more willing to accept high-cost measures than both planners and economists.

However, very little attention is given in economics to how the policy recommendations of those who work with policy and management of the environment relate to citizen preferences.[1] There is also a lack of knowledge regarding similarities and differences between citizens' willingness to pay (WTP) for environmental improvements and how much money administrators think should be spent on them. Moreover, if administrators were to make different priorities, resources would be allocated differently than if they were based on the preferences of the citizens.

The main objective of this paper is therefore to investigate whether administrators at the Swedish EPA recommend environmental policies that are in line with citizen preferences. This is done by conducting two identical choice experiments (CE), one on a random sample of Swedish citizens and one on a random sample of EPA administrators. In Sweden, just as in many other countries, the Environmental Protection Agency (EPA) is one of the main responsible authorities in managing environmental resources, and hence plays a crucial role in determining environmental policy. The people working at the EPA are public servants and not politically appointed. The CE concerns two of the environmental objectives in Sweden: a Balanced Marine Environment and Clean Air (these are explained in the next section). The data for the citizens is part of a larger study on several environmental objectives (Carlsson et al., 2008; Kataria and Lampi, 2008).

The only studies in economics we are aware of that touch upon a similar issue are Alberini et al. (2006), McConnell and Strand (1997), and Colombo et al. (2007). Alberini et al. (2006) looked at how well the preferences of public officials and other stakeholders match those of the public. The preferences of the public were estimated using CE and rating tasks while the preferences of public officials and other stakeholders were obtained using rating and ranking

tasks. Both similarities and sharp dissimilarities in preferences between the groups were found. McConnell and Strand (1997) found in a Contingent Valuation study differences in WTP between scientists and the general public, but the major explanation of the difference was an overrepresentation of males among the scientists. Colombo et al. (2007) looked at possible differences between citizen and expert preferences. Using a CE to obtain citizen preferences, and the Analytic Hierarchy Process method[2] to obtain expert preferences, they found similar attribute rankings in the two groups. One advantage of our approach is that by using the same method (CE) and a very similar survey for both groups, we can make a clean test of whether the preferences differ. Moreover, since we are interested in preferences for a variety of aspects of these two environmental objectives, the CE method is most appropriate considering the objectives. For overviews of the CE method, see for example Louviere et al. (2000) and Alpizar et al. (2003). In our study, the citizens were asked to choose their preferred environmental policy, and the EPA administrators were asked to choose which policy they would recommend, i.e., not the policy they preferred as private citizens, although this of course may influence their responses.[3] The choices made can be used to estimate the WTP for various measures to improve environmental quality. By comparing the WTPs for the two groups, we can assess whether or not the choices of the administrators, i.e., what they would recommend as a policy, are in line with the preferences of the citizens.

In an attempt to explain the potential difference in WTP between administrators and citizens' we will discuss several explanations for this difference. We also investigate on what grounds administrators make their policy recommendations and whether they think that some people should have more say when deciding on environmental policies. Finally, we also asked them to rate their perceived trustworthiness of the results of stated preference studies. As Lipsky (1980) argues, "Policy implementation in the end comes down to the people who actually

implement it." Thus, the opinions of administrators about different environmental issues might affect environmental policy decisions.

II. The choice experiment

The Swedish Parliament adopted 16 so-called environmental quality objectives in 1999 and 2005. The main purpose of these objectives is to provide a framework for obtaining a sustainable environment. Another purpose is to define the quality of the environment, natural resources, and cultural resources in Sweden, and to be able to measure the change in environmental quality over time. The objectives are designed to, among other things, promote human health, safeguard biodiversity and the natural environment, and preserve the cultural heritage. The objectives should be reached within one generation, i.e., by the year 2020 (SEPA, 2006). The Environmental Objectives Council has the overall responsibility for coordinating the goals of and monitoring the actions taken by different governmental bodies in different sectors. The council publishes a yearly progress report.

In this paper we look at two of the environmental quality objectives: a Balanced Marine Environment and Clean Air. The Swedish EPA is the public agency that has the main responsibility for these two objectives. The overall goal of the Balanced Marine Environment objective reads: "The North Sea and the Baltic Sea must have a sustainable productive capacity, and biological diversity must be preserved. Coasts and archipelagos must be characterized by a high degree of biological diversity and a wealth of recreational, natural, and cultural assets. Industry, recreation, and other utilization of the seas, coasts, and archipelagos must be compatible with the promotion of sustainable development. Particularly valuable areas must be protected against encroachment and other disturbance" (SEPA, 2006).

The overall goal of the Clean Air objective reads: "The air must be clean enough not to represent a risk to human health or to animals, plants, or cultural assets" (SEPA, 2006).

The survey was developed in collaboration with selected EPA administrators, who were of course not included in the sample. In addition, our sample did not include the department where environmental economists work. Focus groups and a small pilot study were conducted before implementing the final survey. The questionnaire sent to the general public consisted of three parts: The first asked questions about the respondent's engagement in environmental issues, and the second contained the CE about one of the environmental quality objectives. Each respondent answered a CE on either a Balanced Marine Environment or Clean Air; the random sample of 2,000 individuals was split into two groups of equal size. The third part of the questionnaire consisted of questions regarding the respondents' socio-economic status.

The CE included six choice sets, each with three different alternatives. The first alternative was always an opt-out alternative describing the current environmental quality. Each alternative had four or five different attributes depending on the environmental objective under consideration. All 16 environmental objectives adopted by the Swedish Parliament are described with different interim targets that are intended to make them more tangible and to be of help in the progress toward reaching them. We decided to use these interim targets when defining the attributes, and the opt-out levels in the CE, in order to concretize the objectives and make them easier to understand. Table 1 presents the attributes and levels of the CE in the survey. The cost attribute was expressed as a tax to be collected over the next five years.

>> Table 1 here

The survey sent to the EPA administrators was almost identical to the one sent to the citizens, with the exception that the administrators were asked to make choices for both a Balanced Marine Environment and Clean Air, and that they should choose the alternative they would recommend to govern environmental policy.[4] In addition, the administrator survey contained a fourth part, which included questions about attitudes toward stated preference surveys, cost-benefit analysis, and environmental decision making.

The choice sets were created using a cyclical design, a so-called fold-over (Carlsson and Martinsson, 2003). First, an orthogonal main effects design was generated, consisting of 12 attribute level combinations. Each combination in the main effects design is one alternative in one of the 12 choice sets. The levels of the attributes of the second alternative in a choice set are obtained by adding two levels to each attribute level of the first alternative, and when the highest level is reached, it starts over from the lowest level.[5] To these two alternatives, an opt-out alternative was added. The 12 sets were then randomly blocked into two survey versions. All respondents were asked to choose one of the three alternatives. Figure 1 shows an example of a choice situation given to the citizens.

>> Figure 1

In the version sent to the EPA administrators, we added an instruction before the choice sets that read: "Suppose that you as an EPA administrator are asked to recommend one of the following three alternatives to govern Swedish environmental policy for the environmental objective a Balanced Marine Environment / Clean Air." Thus, we are not interested in their private preferences, although this could of course influence their responses. We asked the EPA respondents to recommend one alternative in each choice set.

III. A behavioral and econometric model

Respondent behavior in a stated preference survey can have many underlying reasons, and can be modeled in different ways. First, respondents might have different altruistic motivations for their behavior. In terms of modeling behavior in a choice experiment, it might not be important to distinguish between self-interest and altruistic motivations, but from a cost-benefit point of view it could be, in particular since the WTP estimates themselves depend on the motivations (e.g., McConnell, 1997; Flores, 2002). Second, respondents have multiple preference orderings and might not apply private preferences, or interests, when responding, but instead apply some sort of social preferences, where social preferences are not necessarily altruism but instead a different set of preference orderings (Sagoff, 1998; Nyborg, 2000). [6] It is of course difficult to know the underlying reasons, and clearly, there is a large heterogeneity among the respondents. In the analysis we will make the conventional assumption that citizens are maximizing their utility when making their choices in the experiment, i.e., they act as private persons. However, we of course allow for self-interest or altruistic motivations. More importantly, from a public policy perspective it is important to note that the basic Samuelson rule in terms of aggregate marginal willingness to pay still holds for various forms of altruism (Johansson-Stenman, 2006). The magnitude of the willingness to pay, of course, depends on for example altruism, but applying the Samuleson rule implies that the decision should be based on the estimated willingness to pay irrespective of the underlying motivations.

How should we model the decisions of the administrators? Remember that we asked them to choose the alternative they as EPA administrators would recommend to govern Swedish environmental policy for the environmental objective in question. We also know that the Swedish EPA should consider the perspective of the general public in the decision-making

process (SEPA, 2004). On the other hand, the EPA has a mandate from the Swedish Parliament to try to reach these environmental quality objectives. A fact that probably increases the administrators' willingness to recommend more costly policies. What we will do in the analysis is assume that the administrators use their information about the environmental goals, while they at the same time also consider the perspective of the general public. Therefore, we simply assume that the administrators want to maximize social welfare, and we represent this as they maximizing the utility of "a representative citizen." Assuming this is of course not the same as them actually doing it. After all, administrators might for various reasons not choose the alternative they believe is in the best interest of the public. For example; i) they could choose what they believe is an alternative citizens want, but be uninformed about their true preferences, ii) or they could be paternalistic and choose an alternative they know the citizens do not want but that they believe is still the best alternative for the citizens, iii) they might also choose to recommend what they think is best for the environment regardless of the citizens' preferences, or iv) what they believe is in the best interest for future generations, or, v) they could just try to reach the environmental goals they have an obligation to fulfill and care therefore less about the citizens' preferences. Moreover, although the administrators had to choose between the costs stated in the CE, it is possible that administrators have more knowledge about the real costs of reaching the environmental objectives and that might affect their choices. It is of course difficult to know the underlying reasons, and clearly, there could be heterogeneity among the administrators. Our assumption that an administrator maximizes the utility of a representative citizen should thus only be seen as a way of representing how the choices are made. A difference in preferences between administrators and citizens can be due to any of the reasons given above. More importantly, no matter what we assume here, the results of the econometric model will be the same. Thus,

this assumption does not affect the econometric analysis or the results. We will come back to the assumption about the behavior of the EPA administrators when we discuss the results.

In the econometric analysis we apply a random utility model. For the citizens, the underlying utility function represents their preferences. For EPA administrators, the utility function is assumed to represent how the administrators perceive the utility of a representative citizen. The utility consists of a systematic (V_{njt}) and a random component (ε_{njt}):

$$U_{njt} = V_{njt} + \varepsilon_{njt},$$

where U_{njt} is citizen/representative citizen $n's$ utility of choosing alternative j (j=1,2,3) in choice situation t (t=1,...,6). The systematic part of the utility can be expressed as $\beta_n' x_{njt}$, where x_{njt} is a vector of observed variables. Alternative i is chosen over alternative j if $U_{nit} > U_{njt}$. We estimate the models with a random parameter logit model. We include an alternative specific constant for the opt-out alternative and assume that all attribute parameters other than the cost parameter are normally distributed. Since we have repeated observations, we assume that the parameters are constant across choice sets for a given respondent. The models are estimated with Nlogit 4.0 using simulated maximum likelihood with Halton draws with 500 replications. See Train (2003) for details on simulated maximum likelihood.

From the estimated model we can obtain marginal WTP for each of the attributes. These are simply the ratio between the attribute parameter and the cost parameter. Since the cost parameter is held fixed, the WTPs are normally distributed. The WTPs obtained from the administrators is not their private WTPs; instead it should be interpreted as their perceived

WTP of the representative individual (henceforth we will simply call it the "representative citizen WTP").

IV. Results

For the general public, we use survey responses from a mail questionnaire sent out in June 2007 to a random sample of 2,000 men and women aged 18-75, selected from the Swedish census registry. One thousand questionnaires were sent out for each objective, and the respondents received a single reminder three weeks later. In total 648 individuals returned the questionnaire, of which 306 (a Balanced Marine Environment) and 310 (Clean Air) were available for analysis due to non-responses to various questions.[7] For the administrators, we use survey responses from a mail questionnaire sent out in September 2007 to a random sample of 100 EPA administrators. A single reminder was sent out two weeks later. In total 59 administrators returned the questionnaire, of which 58 were available for analysis.[8] Comparing the descriptive statistics of the citizens with the national statistics, we find that the mean age of the citizens (48.8 years) in our sample does not significantly differ from the mean age at the national level. However, the shares of women and of those who have at least three years of university education are significantly higher in our citizen sample than in the population as a whole (Statistics Sweden, 2007).[9] In the econometric analysis we therefore have to test whether this overrepresentation affects the results.

Results of the choice experiment

As explained, the EPA administrators answered CEs on both environmental objectives, while the citizen respondents answered only one CE for one environmental objective. Four separate models were estimated, one for each objective and respondent group. Table 2 reports the

results of the random parameter models, all of which are estimated with simulated maximum likelihood.

>> Table 2

In terms of sign and significance, the models for the two groups of respondents do not differ in any substantial way. The estimated standard deviations of the random parameters are highly significant in all models, indicating that we capture unobserved heterogeneity. However, the differences in heterogeneity between the administrators and the citizens do not show any systematic pattern; for example, the heterogeneity is not systematically larger for one of the groups. Considering that administrators' have better knowledge about the environment compared to the citizens, one might have expected their preferences to be less heterogeneous, but this is not the case.

In order to test whether the observed overrepresentations of women and highly educated people affect the results, we estimated the two models for citizens with interaction variables between the attributes and the two socio-economic variables. In all cases except one, the interaction variables are insignificant.[10] McConnell and Strand (1997) found that that female and male scientist had different preferences for protection of marine mammals. Therefore, we also tested for the EPA administrator sample, whether male and female administrators have different preferences by estimating a model with interaction terms. However, we do not find any significant differences in WTP between female (49% of the sample) and male administrators. We therefore proceed with the reduced model without interaction variables.

To begin with, we test the hypothesis of equal parameters between the two groups of respondents, i.e., if we can pool the data from the two CEs. This is done with a likelihood ratio test where we adjust for a possible difference in scale parameters.[11] For both environmental objectives we can reject the hypothesis of equal parameters; there are therefore some differences between the citizen preferences and the recommendations of the administrators. However, this is an overall comparison and we allow for differences in the heterogeneity of the mean coefficients as well. Furthermore, based on Table 2 we cannot say that an attribute from a Balanced Marine Environment is more or less important than one from Clean Air, since the scale parameters might be different. It is therefore important to also estimate and compare the WTPs for the various attributes. We could use the marginal WTPs, but the problem is that the attributes are measured in different units for the different environmental objectives. Therefore, we report the WTP for an improvement of the attribute from the current level (opt-out) to the best possible level (the highest level of the attribute) in the experiment in Table 3. This is simply the marginal WTP (i.e., the ratio between the attribute parameter and the cost parameter) times the change in the attribute level from the status quo level to the best possible level. For example, the WTP for Animals and plants for the Balanced Marine Environment objective is the marginal WTP times the reduction of the number of endangered species from today's level of 35 to 5.

>> Table 3

The WTP estimates of both the citizens and the EPA administrators are significant for all attributes except Cultural assets for the Clean Air objective. For the given improvements of the attributes, we can also compare the ranking of the attributes. The rankings (in terms of the WTP estimates) are actually a little bit different. For the Balanced Marine Environment objective, citizens rank Fish stock highest, and then Animals and plants, while the

administrators have the opposite ranking of these two attributes. However, the levels of the WTPs do not statistically differ among the attributes for the citizens, while the administrators have a clearer ranking and priority of the attributes in the Balanced Marine Environment objective than what the citizens have.[12] This might indicate that citizens prefer environmental improvements in general, but have difficulties distinguishing between the different parts of the marine environment objective. For the Clean Air objective, the rankings are also different. Citizens have the highest WTP for the Animals and plants attribute, while for administrators the WTP is highest for the Health and recreation. Both groups rank the Cultural assets attribute as the least important for both objectives.[13]

However, simply comparing the ordering of the attributes with respect to the magnitude of WTP does not give much information. Table 3 therefore also reports the results of a two-sided t-test of equal mean WTP between the citizens and the representative citizen (EPA administrators). Using a two-sided t-test for the Balanced Marine Environment objective, the difference in WTP between the citizens and the representative citizen is significant at the 10% level for Animals and plants and Fish stock. The WTP of the representative citizen is higher than the citizen WTP for decreasing the number of endangered animal and plant species and for increasing the fish stock. For Clean Air, the difference in WTP is significant at the 5% level for one of the attributes: Health and recreation. Hence, when the difference in WTP is significant, the WTP obtained from the administrator choices is always larger than the citizen WTP. There is also a large difference for Cultural assets in the Clean Air objective; however, the difference is not statistically significant, which is explained by the large standard errors for this attribute. Table 3 also reports the difference in percent between citizen WTP and representative citizen WTP; a positive difference means that the WTP of the representative citizen is larger than the citizen WTP. The difference varies between -27% and +261%.

The WTP of the representative citizen is larger than the citizen WTP for five out of the seven attributes, and in some cases the difference is not only significant but also substantial. Although both groups have a high WTP for endangered animals and plants living in the marine environment, the WTP of the representative citizen is twice as high as the citizen WTP. Similarly, the WTP of the representative citizen for better air quality, in terms of improved health, is over three times the citizen WTP. One reason why the results differ between the groups could be that the socio-economic characteristics are different. EPA administrators live in Stockholm and are all highly educated. Although this should not be seen as a sample selection problem per se, it could explain part of the difference. At the same time, among the citizens, neither education nor household location significantly explains the variation in WTP.[14] Therefore, we cannot say that the administrators are simply reflecting the preferences of citizens with similar characteristics as themselves.[15]

There are many problems with conducing hypothetical experiments. The most obvious is hypothetical bias. In this particular case, there is a risk that both citizens and administrators overstate their willingness to improve the environment at a given cost in order to improve their self-image/identity and/or as a way of obtaining a warm glow. In order to reduce the risk of hypothetical bias we included a short cheap-talk script in each survey version. Although the results are somewhat mixed, cheap-talk scripts have been successfully used to reduce hypothetical bias in choice experiments (Carlsson et al., 2005; List et al., 2006). However, we do not claim that we managed to eliminate hypothetical bias. For example, the results of List (2001) imply that experienced people are not affected by the script, while inexperienced citizens are.[16] This in turn implies that the differences in marginal WTP between the groups are smaller than what we estimate them to be. At the same time, the differences in marginal

WTP are so large that we do not believe that this can explain the whole difference. Furthermore, we have no reason to believe that hypothetical bias would affect the relative magnitude of the WTP estimates for a given group, which means that there is in any case a difference in terms of the ranking of the attributes. It is also possible that the citizens who answered the questionnaire are more interested in environmental issues than those who did not participate. If this is the case, the differences in the sizes of WTPs should be even larger than found here.

That administrators working with environmental issues make choices that imply a higher WTP of a representative citizen than the actual WTP of the citizens is in line with the results of von Borgstede et al. (2007). Thus, if we were to use the administrator recommendations for policy management, resources would be allocated differently than if we had used citizen preferences.[17] It is of course not straightforward to say whether this is good or bad for social welfare. For example, the administrators are much more informed about environmental problem and the quality objectives, and citizens might have made different choices if they had the same information. Although these arguments are contrary to the conventional assumption about consumer sovereignty, it is an argument worth mentioning.

The motives and opinions of the EPA administrators

In the econometric model the choices of EPA administrators were assumed to reflect a social welfare maximizing agent. Needless to say, this might not be true. The personal views of EPA administrators on how decisions regarding environmental projects should be made are likely to affect the extent to which economic information is incorporated into the environmental decision-making process.

In the survey, we asked the EPA administrators to motivate their CE choices. The results make it possible to explain, at least partly, the differences found between administrators and citizens. A majority (55%) chose the alternatives they perceived as necessary for ecological sustainability, while about one-third chose the alternatives they believed would be appreciated the most by future generations. Only 16% answered that they chose alternatives they believed to be preferred by people living today. In other words, administrators put a heavy weight on the long-run development of environmental quality but not on ordinary people's views when making choices in the experiment. Clearly, this is not in line with a social welfare-maximizing agent. On the other hand, it might be naïve to even expect non-economist to give (economic) factors such as "current populations willingness to pay" a high priority in real decision-making. First of all, we have to be aware of that a majority of administrators at the EPA have natural science backgrounds, often ecology and biology. They have knowledge about how nature works and ideas about how to preserve it. It does not seem too misleading to assume that they want to use this knowledge in favor of the environment. It seems also plausible that administrators have a higher regard to the environment than citizens do in general. Taking this into account it is not surprising that a majority of the EPA-administrators makes policy decision based on what they perceive as necessary for ecological sustainability. Going back to econometric results in table 2, we also know that the EPA-administrators do after all consider the cost aspect when making policy recommendations. However, while cost clearly is important, "current populations' willingness to pay" is less important.

About one-third of the EPA-administrators made policy recommendations (in the survey) they believed would be appreciated the most by future generations. Administrators that take a "future-generation perspective" are presumably stating that they take decisions that are more regarding to future generations than they would expect from an average citizen. This is in line

with the arguments by Sagoff (1988); decisions based on economic analysis consider already existing values in society, while political decisions have more forward-looking perspective. Notably, the motives of the EPA administrators suggest that we actually should expect a difference in WTP between administrators and citizens'.

We also asked the administrators to state whether, and if so who, they perceived should have more say than others when deciding on Swedish environmental policy. They were allowed to choose among various interest and professional groups such as biologists/ecologists, environmental economists, experts in political science, sociologists, politicians, and people who are especially affected by the environmental problem in question. Forty-one percent of the EPA administrators thought that biologists/ecologists should have more say than others, while about 18% stated that environmental economists should. This indicates that a majority of the administrators believe that persons with environmental education know what the best environmental management is. However, about 12% of the EPA administrators answered that people who are especially affected by the problem should have the most say, while 15% believed that no group should have more say than others. Thus, although the EPA should consider the perspective of the citizens in the decision-making process (SEPA, 2004), our results suggest that making decisions in line with citizen preferences is not generally of high priority. Thus, based on the administrators' motives we conclude that the administrators seem to be paternalistic and choose the alternative they believe is the best for citizens regardless of the citizens' preferences. Alternatively, they choose to recommend what they think is best for the environment or for future generations.

Finally, the administrators were asked to rate how trustworthy they perceived results of stated preference studies to be on a 1-5 scale (1 meaning *Not trustworthy at all* and 5 meaning *Very*

trustworthy). While about 90% of the EPA administrators had heard about stated preference studies, many responded that they do not believe in them: About 47% stated that these methods are not trustworthy (a rating of 1 or 2), and no one felt that they are very trustworthy. This could affect their willingness to incorporate economic information into the final policy decision. These results are partly conflicting with Günter and König (2006), who surveyed decision makers in the German healthcare system and scientists working in the field of health economics and found that around 47% of the decision makers and 65% of the scientists believed that choice experiments are an appropriate method for supporting decisions about the allocation of collective resources in health care. However, our results are better in line with the results by Bromley (1990) who argues that the past 40 years of observations of public decisions indicate that the public sector is not especially convinced of the efficiency advice offered by economists.

Interestingly, in our survey a large majority (79%) of the administrators expressed a positive view of using cost-benefit analyses as a basis for decision making in environmental issues, which is partly in conflict with the fact that they do not trust stated preference studies. After all, stated preference studies constitute the most commonly used method to capture the benefit side, in the context of environmental impacts, in cost-benefit analysis.[18]

V. Conclusions

In Sweden, just as in many other countries, the EPA is one of the main responsible authorities for managing environmental resources. Consequently, it plays an important role in determining environmental policies. The main interest of this paper was to investigate whether citizen preferences regarding environmental quality differ from the policy recommendations of those engaged in environmental management. This was done by

conducting the same choice experiment on a random sample of Swedish households and on a random sample of administrators working at the Swedish EPA. For the environmental objective in question, the EPA administrators were told to choose the alternative they would recommend to govern Swedish environmental policy. We found that the rankings of attributes by citizens and EPA administrators are not the same. These results are not in line with Nilsson et al. (2004), who found that the preferences of the general public and decision makers working in the public sector do not differ with respect to support for programs aimed to improve environmental quality. Colombo et al. (2007) also found that citizens and decision makers rank environmental attributes in a similar fashion. The results here are instead more in line with Alberini et al. (2006), who found both similarities and dissimilarities between general public and official/stakeholder preferences. McConnell and Strand (1997) found, in line with our results, different WTPs between scientists and ordinary citizens, but that this difference was only due to overrepresentation of males among scientists. Clearly, the results are contextual, but our advantages are that we use the same elicitation method for both groups and that the EPA is the public agency that is responsible for the two environmental objectives investigated in this study. We also found significant differences in the levels of WTP for particular attributes. For example, for the attribute Animals and plants in the Balanced Marine Environment objective, the WTP obtained from the administrators' choices is more than twice as large as the citizen WTP. For the Clean Air objective, the administrator WTP for better health is more than three times the citizen WTP. However, for the marine environmental objective, the levels of the WTPs do not statistically differ among the attributes for the citizens, indicating that citizens might have a preference for environmental improvements in general, but have difficulties distinguishing between the different parts of environment objective.

These differences between administrators and citizens can have several effects. Most notably, administrators are likely to make different priorities than citizens for a given amount of resources. Administrators might also argue for a larger share of the resources to be spent on environmental quality than citizens would. Hence, the main motive for administrators' choices in the CE is ecological sustainability, which is more important than ordinary people's preferences regarding changes in environmental quality. This suggests that the assumption that administrators tries to maximize social welfare (maximizing the utility of "a representative citizen") is not an accurate representation. Many economist engaged in environmental management might agree and witness the difficulties in using the "economic efficiency" arguments outside the economic profession. However, there exists significant preference heterogeneity even among EPA administrators. This means that policy recommendation is likely to differ across different administrators.

A majority of the administrators have a paternalistic approach; they think that individuals with environmental education should have more say in shaping environmental policy in Sweden than other groups in society. Although EPA administrators have more information about the environmental quality objectives than what citizens have, a paternalistic point of view is in strong contrast to how economic theory and many economists advocate that environmental resources should be managed. It might also increase potential distrust among citizens toward those who are responsible for environmental policies and management. This is to our knowledge the first study that compares decision maker and citizen preferences regarding environmental quality using the CE methodology for both groups. Clearly, more studies of this kind are needed.

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Table 1. Attributes and levels in the choice experiment.

Attribute	Description	Levels	
Balanced Marine Environment		Opt out	Improvement
Animals and plants	Number of endangered species	35	5, 15, 30
Discharge of oil and chemicals	Increase in surveillance of oil and chemical discharges	0 %	10, 40 %
Catch and growth of fish stock	Increase in fish (cod) stock	0	10, 40, 70 %
Cultural assets	Number of small-scale fishermen at risk of losing their jobs	800	200, 600
Clean Air			
Animals and plants	Number of acidified lakes (due to bad air quality)	17000	3000, 8000, 14000
Human health and recreation	Number of premature deaths per year (due to bad air quality)	5000	1000, 2500, 4000
Cultural assets	Reduction, in percent, in number of damaged cultural buildings (due to bad air quality)	0 %	10, 40, 60 %
Cost	Cost in SEK per year and household	0	100, 300, 600, 800, 1000

Table 2. Estimated random parameter logit models, p-values in parentheses.

	Balanced Marine Environment		**Clean Air**	
Parameters	Citizens	Representative citizen (administrators)	Citizens	Representative citizen (administrators)
Opt-out	-4.9097	-4.1363	-3.5098	-1.2404
	(0.000)	(0.051)	(0.000)	(0.143
Animals and plants	-0.0247	-0.1091	-0.0002	-0.0002
	(0.000)	(0.000)	(0.000)	(0.000)
Health and recreation			-0.0004	-0.0009
			(0.000)	(0.000)
Cultural assets	-0.0011	-0.0013	0.0026	0.0054
	(0.000)	(0.095)	(0.332)	(0.299)
Oil and chemical spills	0.0179	0.0276		
	(0.000)	(0.005)		
Fish stock	0.0109	0.0368		
	(0.000)	(0.000)		
Cost	-0.0015	-0.0031	-0.0024	-0.0014
	(0.000)	(0.000)	(0.000)	(0.001)
Standard dev.				
Opt-out	6.6813	2.3415	3.5613	1.4755
	(0.000)	(0.094)	(0.000)	(0.027)
Animals and plants	0.0403	0.0809	0.0002	0.00006
	(0.000)	(0.004)	(0.000)	(0.258)
Health and recreation			0.0012	0.0007
			(0.000)	(0.000)
Cultural assets	0.0008	0.0031	0.0081	0.0150
	(0.046)	(0.007)	(0.364)	(0.140)
Oil and chemical spills	0.0075	0.0286		
	(0.448)	(0.042)		
Fish stock	0.0118	0.0210		
	(0.000)	(0.027)		
No. of individuals	306	58	310	57
No. of observations	1814	344	1843	338
R-square (constants only)	0.28	0.34	0.33	0.27

Table 3. Mean WTP in SEK for attributes, standard errors in parentheses. Results of t-tests of equal mean WTP between citizens and representative citizen (administrators), p-values in parentheses.

	Balanced Marine Environment				**Clean Air**			
	Citizens	Representative citizen (administrators)	Diff. (%)	t-test (p-value)	Citizens	Representative citizen (administrators)	Diff. (%)	t-test (p-value)
Animals and plants*	510 (99)	1068 (202)	109 %	2.481 (0.013)	961 (115)	1771 (521)	84%	1.52 (0.129)
Health and recreation*					710 (142)	2560 (794)	261%	2.295 (0.022)
Cultural assets*	437 (70)	240 (131)	- 45%	1.323 (0.186)	66 (67)	229 (225)	247%	0.692 (0.489)
Oil and chemical spills	492 (67)	361 (108)	- 27%	1.038 (0.299)				
Fish stock	525 (83)	840 (148)	60%	1.856 (0.063)				

*** In order to express the values in WTP terms we simply change the sign of the parameters with a negative sign in Table 2 (Animals and plants and Health and recreation, and Cultural assets for the Balanced Marine Environment objective).**

Figure 1. Example of a choice situation for the environmental quality objective Clean Air.

	Alternative 1 (Situation today)	**Alternative 2**	**Alternative 3**
Animals and plants	17,000 lakes are severely acidified because of air pollution	14,000 acidified lakes	3,000 acidified lakes
Human health and recreation	5,000 premature deaths per year because of air pollution	1,000 premature deaths per year	2,500 premature deaths per year
Cultural assets	Air pollution damages buildings	60 % fewer cultural buildings are damaged	40 % fewer cultural buildings are damaged
Increased tax per year and household, during next 5 years	0 SEK	+ 300 SEK	+ 800 SEK

If you could only choose between these three alternatives, which one would you choose?

□ Alternative 1 (current situation)
□ Alternative 2
□ Alternative 3

[1] In political science, there has been an increased interest in the behavior of administrators ever since Lipsky (1980). In economics, citizen juries and participatory tools have been used as environmental valuation methods or complements to stated preference methods (Davis and Whittington, 1998; Kenyon et al., 2001). However, these are methods where citizens discuss and make decisions in groups, and not a comparison between decision makers and citizens.

[2] This is a method designed for using expert judgments to represent citizen preferences. Experts are asked to compare attributes on a scale; see Colombo et al. (2007) and Saaty (1980).

[3] The limited sample size of administrators was the main reason why we did not conduct another survey where some administrators were asked to respond as private persons. This would have been interesting since we could have compared their choices as private persons with their choices as administrators, and the administrator choices as private persons with the rest of the population's choices.

[4] Since we could only send out surveys to 100 administrators, we asked all administrators to make choices for both environmental objectives, i.e., we preferred to obtain more information at the expense of a possible fatigue or order effect.

[5] So if an attribute has four levels (0, 1, 2, 3) and the level in the first alternative is 1, the level in the second alternative is 3.

[6] This might especially be the case if the good to be valued is ethically complex, such as endangered species. On the other hand, people in general are also reluctant to tax increases (Gemmell et al., 2004; Hammar et al., 2006), which might affect their willingness to pay for a public good like environmental quality.

[7] The response rate is 33%, corrected for those who had moved or for other reasons had not received the questionnaire.

[8] The response rate is 62%, corrected for those who had changed jobs or were on parental or sick leave.

[9] One thousand samples were bootstrapped by randomly drawing observations, with replacement, as many times as there are observations in the original sample. By using the percentile method and a 95% confidence interval, it can be shown whether the means significantly differ from each other at the 5% significance level.

[10] The exception was Animals and plants for the Clean Air objective, where respondents with a university education have a higher WTP for reducing the number of threatened species.

[11] When performing this test we need to account for the fact that the estimated parameters are confounded with the respective scale parameters. One way of dealing with this problem is to first test for a difference in scale between the data sets. We do this using the grid search procedure proposed by Swait and Louivere (1993). Given the estimated scale parameter one can then test the hypothesis of equal parameters. When estimating the random parameter model with the grid search procedure, 25 replications are used instead of 500.

[12] Using two-sided t-tests we cannot reject the hypothesis of equality for any of the WTP comparisons for citizens. For administrators, the WTPs for Animals and plants and Fish stock are significantly different from the WTPs for the other two attributes.

[13] For citizens, the WTP for Cultural assets is significantly lower than the WTP for the two other attributes. For administrators, the WTPs for the three attributes are all statistically different from each other.

[14] Interacting the attributes with whether or not the respondent has a university education and whether or not the respondent lives in a big city, we end up with a model with eight additional parameters for a Balanced Marine Environment and six additional parameters for Clean Air. Only one of these parameters was statistically significant: the interaction between education and the Animals and plants attribute for the Clean air objective. Respondents with a university education have a slightly higher WTP for this attribute. The full results are available upon request.

[15] Ågren et al. (2007) found that politicians have significantly different preferences and want to spend more money on local public services than citizens and that these differences remain even after controlling for the socio-economic characteristics of the both groups. For example, female politicians have significantly different preferences for spending compared to female citizens. Although Ågren et al. (2007) investigate politicians' preferences while we study administrators, the similarities between these results are notable.

[16] It is possible that the effect of a cheap talk script on experienced people is context dependent. The experienced people in List's (2001) paper were sports card dealers while the experienced people in our study are administrators working with environmental issues.

[17] Note that these are the conditional WTPs, i.e., we do not use the alternative specific constant for the opt-out alternative.

[18] Samakovlis and Vredin Johansson (2005) conclude that the quality of cost-benefit analysis done by several Swedish public authorities is not good enough, and that authorities should use cost-benefit analysis more often.