Sustainable Behavior and Time Perspective: Present, Past, and Future Orientations and Their Relationship with Water Conservation Behavior

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Abstract
Three hundred individuals at a Mexican city responded to Zimbardo’s Time Perspective Inventory (ZTPI), and self-reported how frequently they engaged in water conservation practices. The ZTPI assesses individual differences in terms of attitudes believed to identify orientations towards a positive or negative past, hedonistic or fatalistic present, and future orientations. Results were processed within two structural equation models, which showed that present orientation negatively affected water conservation. Water conservation did not correlate with past orientation. Yet, that pro-environmental behavior significantly and positively was influenced by Future Orientation. Women reported a higher involvement in water conservation practices, whereas adult individuals (> 18 years old) and those with higher schooling levels presented a higher Future Orientation. Proposals considering these results are discussed aimed at developing sustainable attitudes and behaviors.

Keywords: Time perspective; conservation (ecological behavior); Hermosillo (Mexico).

This paper explores the relationship between people’s time perspective and their tendency towards a responsible and sustainable use of natural resources. One of the most important aspects characterizing sustainable behavior is its extended temporal component since it includes - on the one hand - a concern for upcoming times and for future generations (Joreiman, Van Lange, & Van Vugt, 2004). This concern considers the possibility that already unborn individuals could take advantage of natural resources, as much as present generations do (Pinheiro, 2002a, 2002b). On the other hand, some studies suggest that present-oriented individuals sometimes tend to engage in both antisocial and anti-environmental actions. Since anti-environmental actions could be instances of antisocial behavior (Corral-Verdugo, Frías, & González, 2003) and antisocial people seem to exhibit a tendency to living the present without a concern for the future (Harvey & Micceli, 1999), such a present orientation could constitute an indicator of behaviors opposing sustainability. If – as those studies suggest – future orientation is linked to sustainability and present orientation is one indicator of anti-environmental tendencies, thus, investigating time orientation could be a fruitful strategy in the search for predictors of sustainable behavior.

Zimbardo and Boyd (1999) proposal is one of the few conceptions of a psychological dimension of time to be considered as a profile of sustainable behavior. According to this conception, time perspective is one fundamental dimension in the construction of psychological time, which includes those cognitive processes classifying human experience in past, present and future “compartments.” These authors consider that time perspective is learned and modified by personal, social and institutional factors. Their perspective tackles a strong – yet little studied – influence on diverse facets of human behavior (Keough, Zimbardo, &...
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and proneness to risk taking) are expected to predominate in term thinking and its associated traits (tendency to antisociality, Biaggio et al., 1998; Guagnano, 1995). On the contrary, a short-exhibit these personal characteristics (Allen & Ferrand, 1999; and, coincidently, environmentally concerned persons also control, morality, and altruism are correlates of future orientation, behaviors (Pinheiro, 2002a). Responsibility, internal locus of current actions have consequences not only on the individual, concerning with the status of the environment. Realizing that and a long-term thinking are characteristic of individuals with a marked future orientation are good in establishing and achieving goals and in planning strategies for meeting long-term obligations. Also, these future-oriented people tend to avoid engaging in risk behaviors, given their ability to prevent negative consequences in the future. Moreover, future-oriented individuals visualize and formulate future objectives, which will influence present decisions and judgments (Keough, et al. 1999). The question is whether or not the time perspective of people could influence their propensity to behave in an environmentally responsible way.

A sustainable way of life requires, in theory, a propensity for the future. Anticipating the consequences of own behavior, and a long-term thinking are characteristic of individuals concerned with the status of the environment. Realizing that current actions have consequences not only on the individual, but on others as well, should be conducive to sustainable behaviors (Pinheiro, 2002a). Responsibility, internal locus of control, morality, and altruism are correlates of future orientation, and, coincidently, environmentally concerned persons also exhibit these personal characteristics (Allen & Ferrand, 1999; Biaggio et al., 1998; Guagnano, 1995). On the contrary, a short-term thinking and its associated traits (tendency to antisociality, and proneness to risk taking) are expected to predominate in present-oriented individuals (Rushton, 1985) and in anti-environmental persons (Corral-Verdugo, Frías, et al. 2003). Past orientation would not be particularly related to either pro-environmentally or anti-environmentally tendencies - unless such a past include salient memories and experiences from contacts with the environment (see Chipeniuk, 1995, for instance). The “positive” features of future-propensity (anticipation, planning, and responsibility) and the “negative” aspects of present orientation (proneness to risk taking, impulsiveness) are not components of this (past) time perspective.

There are a limited number of studies investigating the relationship between time perspective and sustainability. Lindsay and Strafman (1997) reported that consideration of future consequences (CFC) (i.e., the weight attached to immediate vs. delayed consequences of one’s actions) made people more likely to engage in consumer behavior that benefits the environment. Also, Joireman, et al. (2001) found that individuals scoring high in CFC reported more willingness to fund improvement in public transit. According to these studies, the consideration of future consequences made people more convinced of and affected by the long-term benefits of their sustainable behavior. A more recent study by Joireman, et al. (2004) indicated that higher scores in CFC correlated with preference for commuting to work by public transportation (instead of by car). These authors concluded, “A future orientation may be more important than a pro-social orientation in shaping commuting preferences” (p. 188). No study considering the relationship of present and past perspectives with sustainable behavior is detected in the literature. As formerly indicated, few studies have been conducted considering the link between future orientation and pro-environmental actions. Thus, the purpose of this study was to investigate how water conservation is related to past, present and future orientations.

Water conservation is one significant instance of sustainable behavior. Previous studies have shown that factors such as motivational variables are instigators of water conservation. The more motives a person has for saving this resource, the more he or she conserves water (López, Balboa, Igarzúa, & Claramunt, 1994). Perceptual factors are also important in explaining either waste or conservation of this liquid. The individuals’ perception regarding the value of their gardens was a positive predictor of water consumption, according to Syme, Thomas and Salerian (1983). In turn, De Oliver (1999) found that the perception of others engaging in an obligatory campaign of water conservation led people to cooperate with the required conservation effort. Conservation skills are also predictors of this sustainable behavior (Corral-Verdugo, 2002; Middelstad et al., 2001), and ecological beliefs also seem to predispose people to a rational use of this natural resource (Corral-Verdugo, Bechtel, & Fraijo, 2003). Our task was to
identify whether or not time perspective has a role in modifying or directing water conservation effort. The research hypotheses were: 1) Present orientation will negatively affect water conservation. The more a person has a propensity for the present the less her/his proenvironmental effort. 2) Future orientation will positively affect water conservation. The more the propensity for the future, the more the sustainable behavior exhibited by the individual. 3) Past orientation will have no effect on water conservation. This proenvironmental behavior will be practiced regardless of the past-orientation level of the persons. 4) Although sociodemographic variables, such as gender, education, and age will have an impact on water conservation, their influence will not attenuate the effect of time perspectives on that sustainable behavior.

**Method**

**Participants**

Three hundred individuals (160 females, 140 males) from the city of Hermosillo, Mexico participated in this study. They were selected from zones of that city that, according to the Mexican Census Office (INEGI, 2000) were representative of high, middle, and low socio-economic classes. Households were randomly selected from each zone. The zones were selected and maps of these neighborhoods were obtained from local authorities. The selection of households involved the use of these maps in which every premise was represented. All premises were assigned a number, and a list of random numbers was used to select 100 households. 50% of them were low-class homes, while 40% constituted middle-class homes and the additional 10% were high-class households. The individuals investigated in each home were the housewives, a male adult, and a young man/woman aged 12-18 years old. The age mean for the total sample was 31.8 (SD = 13.3) years. 46% of them reported a family monthly income between 0 and 600 U.S. dollars, 26% had an income between 600 and 2000 dollars and only 15% reported earnings between 2000 and more than 3000 dollars per month. The mean of educational level for this sample was 11.9 (SD = 4.9) completed grades at school. Since a third part of the sample was constituted by adolescents, the distributions of age and schooling are presented separately, for adults and younger respondents, on Table 1, showing a clearer picture of these distributions.

**Instruments**

The Zimbardo’s Time Perspective Inventory (ZTPI, Zimbardo & Boyd, 1999) was utilized for this study. The ZTPI purportedly assesses individual differences in terms of attitudes believed to identify persons of past, present or future orientation. According to Zimbardo, this inventory identifies tendencies towards a Hedonistic Present (living present life in enjoyment), a Fatalistic Present (perceiving own life under the control of external events), a Positive Past (an orientation towards pleasant past memories), a Negative Past (living a past of unpleasant and painful events), and Future Orientation (the tendency to planning and anticipating events). We administered a Spanish version of the entire set of (56) items constituting the ZTPI. Items of this inventory are assessed on a 5-point Likert scale; according to how characteristic each statement is of the respondent. In turn, water conservation was self-reported as the frequency with which the respondent engaged in actions such as conserving water while washing dishes, brushing teeth, or washing their car(s) during the last week. Finally, participants were asked to provide demographic information, including age, family monthly income, and schooling.

**Procedure**

Participants were approached and their informed consent to participate in this study was obtained. Everyone accepted to respond to the instruments. Both the ZPTI and the water conservation items were administered in the households’ living room. It took about 20 minutes to respond to these instruments.

**Data Analysis**

Cronbach’s alphas, as well as univariate statistic for each scale and their items were obtained. These alphas were considered to indicate internal consistency (reliability) of every scale. The structural equations model (SEM) was specified in order
to test both the factor structure of the ZTPI and the effect of time perspectives on water conservation. Items of the ZTPI were parcelled into three indicators per tested construct (hedonistic present, fatalistic present, negative past, positive past and future orientation). A parcel is the mean of two or more randomly chosen items of a construct. Since both types of present orientation (hedonistic, fatalistic) were highly and significantly correlated (r = .75, p < .0001) as well as positive past and negative past were (r = .72, p < .0001), we decided to collapse these items into parcels. This was done to achieve indicators required to produce a latent variable.

In this first model, the three time-perspective factors were specified as predictors of water conservation. A second SEM was specified and tested in order to control for the sociodemographic covariates (age, gender, income, and schooling) effect, and to see whether or not the addition of these covariates affected the goodness of fit of the previous model. In this second model, age and gender were included as manifest predictors of water conservation along with the three time-orientation factors and an additional latent variable representing Socio-Economic Status (SES), which was specified as resulting from the correlation between income and schooling. A constraint was imposed in specifying this SES factor, due to our using the minimum number of indicators (two) required to produce a latent variable.

In order to correlate results of the four scales with the participants’ demographic information, indices representing those scales were computed. Every index was computed from averaging the responses to items of every scale. Then, Pearson’s correlation coefficients were obtained to indicate the relationships between those indices and the demographic variables. In addition, differences between demographic groups (gender, age) in terms of time perspectives were assessed, as well as regarding to water conservation practices.

Results

Table 2 shows univariate statistics and reliability indicators of scales used in this study. Cronbach’s alphas of .80, .77, .75,
Table 2
Means and Reliabilities of the Scales (continuation)

<table>
<thead>
<tr>
<th>Scales / items</th>
<th>N</th>
<th>Means (SD)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. I often follow my heart more than my head.</td>
<td>291</td>
<td>2.69 (1.18)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>20. I find myself getting swept up in the excitement of the moment.</td>
<td>291</td>
<td>2.80 (1.22)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>21. If things don’t get done on time, I don’t worry about it.</td>
<td>293</td>
<td>2.93 (1.30)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>22. I prefer friends who are spontaneous rather than predictable.</td>
<td>293</td>
<td>2.54 (1.23)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>23. Spending what I earn on pleasures today is better than saving for tomorrow’s security</td>
<td>293</td>
<td>2.62 (1.24)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>24. Often luck pays off better than hard work.</td>
<td>293</td>
<td>2.32 (1.21)</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>25. I like my close relationships to be passionate.</td>
<td>293</td>
<td>2.39 (1.26)</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Scales / items
Past Orientation (Alpha=.77)
1. Familiar childhood sights, sounds, smells often bring back a flood of wonderful memories. | 293 | 3.38 (1.23) | 1   | 5   |
2. I often think of what I should have done differently in my life. | 293 | 3.10 (1.22) | 1   | 5   |
3. My decisions are mostly influenced by people and things around me. | 293 | 3.49 (1.19) | 1   | 5   |
4. It gives me pleasure to think about my past. | 292 | 3.67 (1.20) | 1   | 5   |
5. On balance, there is much more good to recall than bad in my past. | 293 | 3.90 (0.97) | 1   | 5   |
6. I enjoy stories about how things used to be in the “good old times.” | 293 | 2.46 (1.26) | 1   | 5   |
7. Past events keep being replayed in my mind. | 292 | 2.82 (1.28) | 1   | 5   |
8. Happy memories of good times spring readily to mind. | 293 | 2.82 (1.36) | 1   | 5   |
9. I’ve taken my share of abuse and rejection in the past. | 293 | 3.58 (1.22) | 1   | 5   |
10. The past has too many unpleasant memories that I prefer not to think about. | 293 | 2.99 (1.23) | 1   | 5   |
11. I’ve made mistakes in the past that I wish I could undo. | 293 | 2.89 (1.31) | 1   | 5   |
12. I get nostalgic about my childhood. | 293 | 2.57 (1.25) | 1   | 5   |
13. Things rarely work out as I expected. | 292 | 2.56 (1.30) | 1   | 5   |
14. It’s hard for me to forget unpleasant images of my youth. | 292 | 3.15 (1.30) | 1   | 5   |
15. Even when I am enjoying the present, I am drawn back to comparisons with similar past experiences. | 293 | 2.73 (1.09) | 1   | 5   |
16. I find myself tuning out when family members talk about the way things used to be. | 293 | 2.60 (1.26) | 1   | 5   |
17. I like family rituals and traditions that are regularly repeated. | 292 | 2.88 (1.19) | 1   | 5   |
18. I think about the bad things that have happened to me in the past. | 293 | 2.58 (1.26) | 1   | 5   |
19. I think about the good things that I have missed out on in my life. | 293 | 2.93 (1.27) | 1   | 5   |
20. Life today is too complicated; I would prefer the simpler life of the past. | 293 | 2.62 (1.24) | 1   | 5   |

Scales / items
Future Orientation (Alpha=.75)
1. I believe that a person’s day should be planned ahead each morning. | 293 | 3.35 (1.22) | 1   | 5   |
2. When I want to achieve something, I set goals and consider specific means for reaching those goals. | 293 | 3.52 (1.18) | 1   | 5   |
3. Meeting tomorrow’s deadlines and doing other necessary work comes before tonight’s play. | 293 | 3.70 (1.15) | 1   | 5   |
4. It upsets me to be late for appointments. | 298 | 3.81 (1.08) | 1   | 5   |
5. I meet my obligations to friends and authorities on time. | 293 | 3.64 (1.05) | 1   | 5   |
6. Before making a decision, I weigh the costs against the benefits. | 293 | 2.59 (1.16) | 1   | 5   |
7. I complete projects on time by making steady progress. | 291 | 2.40 (1.04) | 1   | 5   |
8. I make lists of things to do. | 292 | 2.81 (1.34) | 1   | 5   |
9. I am able to resist temptations when I know that there is work to be done. | 293 | 3.29 (1.19) | 1   | 5   |
10. I think about the bad things that have happened to me in the past. | 291 | 3.12 (1.19) | 1   | 5   |
11. There will always be time to catch up on my work. | 293 | 3.12 (1.31) | 1   | 5   |

Scales / items
Water Conservation (Alpha=.62)
1. Conserved water while washing dishes | 293 | 4.66 (6.68) | 0   | 25  |
2. Conserved water while brushing teeth | 293 | 8.42 (8.04) | 0   | 30  |
3. Conserved water while washing hands | 293 | 9.02 (9.55) | 0   | 70  |
4. Conserved water while washing dishes | 293 | 7.14 (9.38) | 0   | 56  |
and .62 were computed from the present, past, future and water conservation scales. Means of these scales reveal that the highest levels of adherence to time perspective items were for future orientation (mean=3.42) and past propensity (mean=3.16), followed by present orientation (mean=3.01). The “water conservation” scale produced a mean of 7.27 times participants engaged in water saving actions in the last week.

Figure 1 exhibits the results of the first SEM, presenting the tested factorial structure for the three time dimensions and the water conservation factor. All lambdas are significant ($p<.05$), revealing convergent construct validity for the specified factors. Since the values of the covariances between factors are lower than the values of those lambdas, this indicates divergent (discriminant) convergent validity. Present and past orientation produced a .19 covariance; past and future orientations had a .59 correlation; while the present and future dimensions did not correlate. Present orientation negatively and significantly affected water conservation (structural coefficient= -.20; $p<.05$), the past dimension did not influence this sustainable behavior, and future orientation affected it with a significant, and positive structural coefficient (.36; $p<.05$). Goodness of fit indicators for this first SEM are presented in the bottom of Figure 1.

Figure 2 exhibits the patterns of interrelation among the time-orientation factors, the sociodemographic variables and water conservation, within the second SEM. The measurement model repeats the findings of the factor structure of model 1 for the past, present, and future orientation constructs, and for the water-conservation latent variable. In addition, it produces the SES factor, indicated by high and significant lambdas from the income and schooling variables to their latent factor. The only significant covariances ($p<.05$) produced from the time perspective dimensions and the socio-demographic indicators resulted from future orientation and age (.26), future orientation and SES (.28) and age and past orientation (.17). The structural model shows, again, that present orientation negatively affects water conservation, the future perspective influences this sustainable behavior in a positive way, and past orientation has no significant effect. SES did not affect water conservation, but significant and positive structural coefficients from age (.22, $p<.05$) and from gender (.14, $p<.05$) to that proenvironmental behavior resulted, indicating that adults and women were more conservationist than younger and male respondents. The statistical and practical indicators reveal a slight decrease in goodness of fit in this second model, as compared with the first one (see Figure 2). Adding the socio-demographic indicators did not notoriously affect the influence of the time perspective factors on water conservation.

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**Figure 1.** Structural model of water conservation predicted by present, past and future orientations. Rectangles indicate manifest variables, while ovals are latent factors. Dotted lines represent non-significant relations. Goodness of fit: $X^2= 125.5$ (56 df), $p<.001$; NNFI=.92, CFI=.94, RMSEA=.06, $R^2=.14$.
Additional analyses revealed significant differences between demographic groups in terms of some time perspectives, as well as regarding to water conservation practices. Women reported a higher involvement in water conservation practices than men did. Adult individuals (>18 years old) presented a higher future orientation; they tended to be also more past oriented and reported being more engaged in water conservation behaviors than the younger did (See Table 3). A significant correlation resulted between schooling and future orientation ($r = .37, p < .001$).

**Discussion**

Results of this study seem to show that people’s time perspectives affect their commitment to act in a pro-environmental way. As our first structural model showed,
future-oriented individuals reported a higher engagement in pro-environmental actions than they actually do. Therefore, alternative ways of measuring this kind of behaviors should be used in future studies, combined with self-reports, to guarantee the expected validity. A larger sample of participants would also be recommendable.

What are the possible applications of these findings? Two possibilities are appealing: First, since future orientation and sustainable behavior appears to be significantly related, a recommended strategy to promote the conservation of natural resources is the induction of a more future-oriented perspective among citizens. Future orientation is a function of socialization, maturation and aging. Children develop the capacity to anticipate events as they approach adulthood (Coleman, 1990; Nurmi et al., 1992), which does not mean that they are not able to exhibit future-oriented traits. Therefore, educational programs that include the acquisition of time-administration skills, the training in planning tasks, and the development of social norms and values could be a fruitful strategy in developing a pro-environmental perspective and, subsequently, a pro-environmental commitment. Second, since education is positively correlated with future orientation, making accessible educational opportunities to people will result in an increased future orientation and pro-environmental effort. Known fact in Conservation Psychology is that education promotes sustainable actions (Dietz et al. 1998; Scott & Wüsten, 1994). Unfortunately, in Latin America countries, poverty constitutes a formidable barrier to overcome in attempting to provide educational opportunities (especially in high school and above) to everybody. Of course, more research is needed in order to confirm the findings of this study and its possible contributions to the understanding of sustainable behavior.

References


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