THESES OF DOCTORAL DISSERTATION

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The relationship between proenvironmental behavior and health behavior

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Research goals

Many health problems are related with individual behavior, such as lack of exercise, improper dieting, smoking and drinking habits. Necessarily there is an exploding number of people with cardiovascular complaints, obesity, cancer and alcohol-related illnesses, a part of which could be prevented if people led more healthy lives. At the same time, environment pollution and resource depletion puts the Earth and human existence at risk as well. Again it is individual behavior that can contribute to environment protection. Evidently there are people who tend to care more for the environment than others, and in the same way there are people who care more for their own health than others. Often those who lead a healthy lifestyle are also expected to lead more environment-friendly lives.

There has been much research on health behavior and on proenvironmental behavior to date. But the relationships between these two types of behavior, and their common motivational roots, at least to my knowledge, have not been investigated thoroughly. I expect them to be connected because of three reasons: (1) Some of the behaviors can be seen as health behaviors and proenvironmental behaviors concurrently, because they seem to be beneficial for one's health and for the environment. For example eating organic food, or commuting to work by bike instead of car. (2) There are similarities in the motivational background. Health concerns affect not only health behavior but proenvironmental behavior as well. Besides both behaviors have very similar explaining models in health and environmental psychology respectively. (3) Both behaviors require certain personal capabilities before a person becomes motivated to engage in them. Both behavior types involve foresight and that the person is motivated by goals that are distant in time and where there is no immediate feedback on actions taken to reach the goal. This type of foresight and motivation may depend on the person's personality (e.g., self-control), and resources (e.g., education, income) and value structure. I chose to use conscientiousness as a personality predictor because it expresses carefulness, responsibility, being organized, thorough, being active in reaching one's goals. Those who cannot be described by conscientiousness are irresponsible, cannot hold impulsive behavior under control (Goldberg, 1999). I find this trait a possible link to the relationship between the two behaviors.

Hypotheses

The purpose of this paper is to investigate (a) whether propensities to perform health preserving behaviors and environmentally friendly behaviors are correlated and (b) to which degree correlations between the two types of behavior can be attributed to common roots such as personality, values, and/or demographic variables. The target variables are proenvironmental behavior and health behavior, while the background variables are conscientiousness and values.

My major hypothesis is that proenvironmental behavior and health behavior are related. Further I expect that this relationship can be attributed to common background factors.

The more detailed hypotheses are:

- I expect that proenvironmental behavior and health behavior are in correlation.
- I expect conscientiousness to have an affect on both behaviors.
- I expect that there are values that affect both behaviors. Most probably these are self-transcendent values.
- I expect the common predictors to be partly responsible for the connection between the two behaviors.

Methods

Procedure and participants

The survey was administered in 2005. I asked a convenience sample of 300 Hungarian residents age 18+ to fill out a 12-page questionnaire. 279 participants returned the questionnaire, 10 of which were excluded because of signs of low motivation, leaving 269 participants in the sample. 48% of the participants were post-graduate university students of different majors (mental hygiene, psychology, theology), most of whom worked at the same time, 20% were graduate full-time students, and the remaining 32% were other adults employed at various fields of occupation. 59% of the participants were men and 41% were women. The participants` mean age was 29.89 (range between 21 and 70). The average size of the households were 3.15, the average number of children were 0.66. 50% of the participants were single and 50% were married or cohabited with a partner. 11.6% lived in the capital of Hungary, Budapest, 26.5% in a main town of a county, 40.7% in other towns, 20.5% in villages and 0.7% in farms. 23% of the participants were students, 70% were

employees and 7% had other types of occupation. 50% had a university degree, 38% a high-school diploma and the remaining 12% had lower education.

Measures

I used questionnaires that were developed by others or by me. In the case of the behavior scales unidimensionality had to be checked. Kaiser and Wilson (2004) suggest using the goal-directed behavior approach. The inconsistency between the behaviors can be explained by the attribute of factor analysis that it does not account for the differences in difficulty of the behaviors. The goal-directed behavior approach is based on item-response theory. In this model, each behavior can be characterized by the personal effort (i.e. one's commitment) and the behavioral costs involved in its realization. These two contribute to the probability of behavior. It results in the behaviors being on one dimension and can be differentiated on the basis of difficulty. This is why we can use item-response theory, which is originally used for measuring skills, to measure behavior. In this model we can measure commitment to environment protection by how much effort someone is willing to sacrifice for this goal. If the tiniest obstacle is enough to distract someone from conducting the behavior it is probable that he is not committed. An vice versa: the more environment protection is important for someone the more he is willing to sacrifice. Hence measuring behavor is similar to measuring achievement.

For measuring proenvironmental behavior I used the General Ecological Behavior (GEB) scale (Kaiser, 1998) which is a composite of 50 performances. Since all of them passed several reliability and validity checks, I see this assembly as a parsimonious and valid selection of behaviors. These behaviors can be grouped into six domains; energy conservation, mobility & transportation, waste avoidance, consumerism, recycling, and vicarious social behaviors toward conservation. I constructed a new measurement for health behavior based on goal-directed approach. In both cases, the data were compatible with the predicted model and a unidimensionality prediction was confirmed.

I measured values by PVQ IV (Portrait Values Questionnaire) (Schwartz et al, 2001), which is a 40-item questionnaire. The response format is a 6-point scale ranging from "The person described here is not at all similar to me." to "very similar to me". I checked by SSA (smallest space analysis) if the structure of relations among the motivational types of values is such as suggested by Schwartz (1992). I detected two outlying items, which were excluded from the scale construction. The

structure of relations is almost identical to the Schwartz value circumplex with the exception that the location of universalism and benevolence is reverse. But this deviation is not an important one since these two motivational types are highly related, and next to each other in the multidimensional space. At the structural equation modeling I used the individual items as the indicator variables of the latent trait of a given value. The items were centered around the mean of all 40 items in order to correct for personal response styles.

I used one of the big-five factors as a background trait variable, namely conscientiousness. I used Goldberg`s (1999) International Personality Item Pool (2001), which is available on the internet. I chose the 60-item version scale which consists of six facets: self-efficacy, dutifulness, achievement-striving, self-discipline, cautiousness, orderliness, each of which consists of 10 items. The response scale is a five-point scale; higher scores indicate higher agreement with the statement. Negative items were reverse coded. I constructed the scores of the facets by taking the means of the 10 items. At the structural equation modeling I used the six facets as the indicator variables of the latent trait conscientiousness. The standardized regression weights are between 0.636 and 0.782.

Results

Conscientiousness and values are related. Since there are contradictory results about the direction of cause and because it is not relevant in my research I handled them as variables on the same level. Results show that conscientiousness is in a positive relation with self-direction, achievement, security and conformity and in a negative relation with hedonism, power and tradition.

The demographic variables are in a relationship with both behaviors, conscientiousness and values. I had to keep in consideration that the demographic variables are correlated, partly due to sampling. Because of the systematic relations the results cannot be generalized over the sample.

Values are related to both proenvironmental behavior and health behavior. The score of the General Ecological Behavior scale positively correlates with benevolence and universalism (self-transcendence), negatively correlates with stimulation (openness to change), hedonism (self-enhancement and openness to change) and power (self-enhancement). The strongest correlation is with universalism. Health behavior is correlated with benevolence, universalism (self-transcendence) and self-direction (self-enhancement) to the same degree, and to a smaller degree

with security (conservation). There is a negative correlation with stimulation (openness to change), hedonism (self-enhancement and openness to change) and power (self-enhancement). There is a great overlap between the two patterns of correlations and I demonstrated it on a sinusoid curve graph. The pattern of proenvironmental behavior differs from that of health behavior in that the positive correlations with self-direction and security are not significant, but they produce the same shape in the curve. The same pattern confirms the hypothesis of connection between the two behaviors.

Conscientiousness affects both behaviors. Those who are more conscientious tend to behave in an environment-friendly and healthy way. Of the two behaviors health behavior has a stronger connection to the personality trait. But the direction of connection is the same and of the components dutifulness has the strongest contribution to the effect.

Values and conscientiousness were applied in the same regression analysis to test their relative effects on each behavior. Conscientiousness and the self-transcendence value orientation (composed of universalism and benevolence) predict the two behaviors. Both background factors (trait, value) are relevant predictors. The similarity of the two models serve as another evidence for the connection between the two behaviors.

The structural model

I regard the structural modeling as the most important part of my research. In the first step I analyzed the bivariate correlation among the two behavior categories by means of confirmatory factor analysis. In the second step partial correlation analysis by means of structural equation modeling was conducted, controlling for a number of background characteristics that might function either as common antecedents (reflecting personal resources) or suppressors (reflecting basic differences in opportunities for performing the two types of behavior between groups defined by the suppressor). In the third step the same procedure was conducted as in Step 2, but now controlling for both relevant background characteristics and the included personality trait. In the fourth step again the same procedure was conducted, but now also controlling for the individual's value priorities.

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To test whether proenvironmental and health behaviors are correlated I performed a confirmatory factor analysis (CFA) on the six indicator variables applying the usual assumption of a simple factor structure and uncorrelated error variances. The correlation between the two latent variables is 0.493. Hence, I can conclude, as it was hypothesized, that the two behaviors are positively – and quite strongly – correlated. People in this sample who are more prone to behave in an environmentally friendly way also lead more healthy lifestyles.

To detect possible suppressors or inflators of the theoretically interesting correlation, I examined whether descriptive background characteristics account for the correlation between health and proenvironmental behaviors in the second step. Of these, only one – size of settlement – fulfils the basic criterion for being able to account for co-variation, namely being significantly correlated with both behaviors. This background characteristic is therefore retained in the following analyses. However descriptive background characteristics in themselves are only able to account for a small and non-significant part of the correlation between the two behaviors.

In the third step I examined the influence of the personality trait conscientiousness on the correlation between the two behaviors to check whether the significant correlation between the behaviors could be caused by both being rooted in a common personality trait. At the same time, I controlled for the effects of the demographic variables in order to make sure that the influence of personality antecedents is not confounded with the influence of demographic background variables. Conscientiousness is positively and significantly related to health behavior and to pro-environmental behavior. This implies that someone with a higher conscientiousness level is more prone to behave both in an environmentally friendly and in a healthy way at the same time. Hence, conscientiousness seems to be a common antecedent of the two behaviors. I must add, though, that the paths are not strong, indicating that there are other – and stronger – antecedents of the two behaviors not included in my model. The covariance between the two behaviors has decreased but not significantly. Hence, although conscientiousness seems to be a common antecedent of the two behaviors it cannot account for the significant covariance of the behaviors.

In the fourth step I examined the influence of the individual's value priorities on the correlation between the two behaviors. At the same time, I controlled for the effects of demographic variables and personality. Only universalism and benevolence had a significant path to at least one behavior after controlling for the others. Hence, universalism and benevolence were retained for the final analysis. Further, it showed up that neither of these two construct were unidimensional in the analyzed data set. Hence, they were both refined in order to produce unidimensional constructs with

acceptable reliabilities. The two remaining value constructs reflected biospheric values, which are a sub-set of universalism values, and being helpful (a subset of benevolence values). Biospheric values are positively and significantly related to health behavior and to pro-environmental behavior. Helpfulness values are positively and significantly related to health behavior, but not to pro-environmental behavior when biospheric values are controlled. This implies that someone giving a higher priority to biospheric and helpfulness values is more prone to behave both in an environmentally friendly and in a healthy way at the same time. Hence, the two behaviors seem to be rooted in the same value priorities.

When including these values in the model, the covariance between health and proenvironmental behavior decreased only marginally compared to the previous step. But when I compared the covariance of the initial factor analysis solution with the final model including both background characteristics, the personality trait, and value priorities the nested model comparison showed a highly significant change. This means that there is a significant attenuation on the correlation between health and proenvironmental behavior when background characteristics, conscientiousness and value priorities together are present as common antecedents. This indicates that all these factors contribute to explaining the relationship between the two behaviors. Still, important common antecedents are obviously left out of this analysis, since I am not able to account for all for the covariance as I did not intend to. These results show that there is a connection between proenvironmental and health behavior and I could cover some part of the background variables of socio-demographics, personality and values.

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