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<Title>The role of psychographic factors in nature-based tourist expenditure

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<Abstract>Numerous studies have examined the relationship between tourist expenditure and observable characteristics of the individual and the trip. We add latent variables based on psychographic factors into a model of expenditure by nature-based tourists. This study models the log of per person trip expenditure by domestic and international visitors in a Norwegian alpine national park region as a function of psychographic factors as well as traditional measures of trip and demographic characteristics. In the regression models, factor scores were utilized from nature orientation, recreation experience preference (REP), a new ecological paradigm (NEP) and wilderness preference (WPS) scales. Higher scores on a NEP environmentalism factor were associated with higher expenditure, while higher scores on a REP risk seeking factor were associated with lower expenditure. Higher scores on a risk seeking, or challenge factor, from the nature orientation scale was associated with lower expenditure, while higher scores on an inspiration seeking factor were associated with higher expenditure. Structural equation models were then estimated for comparison. The implications for tourism management and marketing are discussed.

Rural communities in Scandinavia and elsewhere have embraced tourism development as an important source of income given declines in natural resource sectors (Lundmark, 2005). Tourism's contribution is a function of the amount of expenditure and local economic linkages. If other aspects of a market segment are similar, one would expect tourism destinations to prefer segments with higher expenditure. Research has found that expenditure varies across many variables, including destination type, trip purpose, transportation mode, activities engaged in at the destination, trip length, party size and demographic characteristics (Stynes and White, 2006; Fredman, 2008; Thrane and Farstad, 2011). These observable characteristics can answer questions about 'who, when, where and how', but not necessarily 'the question "why", the most interesting question of all tourist behavior' (Fodness, 1994, p 556). Within economics, the 'why' behind market choices – the underlying preferences, attitudes or beliefs – have frequently been discussed but until relatively recently have been remained in the 'black box' (McFadden, 1986; Ben-Akiva *et al*, 1999). In the tourism expenditure literature, Wang *et al* (2006) found that personality/motivation factors affected expenditure, specifically that excitement seekers spent more than those seeking stability.

Latent variables based on psychographic factors are of interest when modelling expenditure by nature-based tourists because they may complement observable characteristics, thus potentially enhancing our understanding of tourist behaviour and consumption (Mayo, 1975; Gladwell, 1990; Ryel and Grasse, 1991; Plog, 1994). Though visitor psychographic factors may overlap with, or be explained by, demographic or trip characteristics, there is a lack of analysis regarding these factors in particular. As Stynes and White (2006, p 10) note, segments can be defined in several ways, with one criterion being the creation of segments that are meaningful for marketing and management. Variation in psychographic factors may lead to variation in marketing and management approaches, so they represent a highly relevant foundation for segmentation, although implementation

remains a challenge (Steenkamp and Ter Hofstede, 2002). The present analysis included latent variables, based on psychographic factors, in the modelling of tourists' expenditure. Through structural models, one can test whether there is a direct association between psychographic factors and expenditure, or whether the association is indirect via demographic and trip characteristics. The structural analysis may indicate patterns that relate psychographic factors to observable and actionable characteristics of the visitors.

The remainder of this paper is arranged as follows. The next section presents a review of tourist expenditure theory and empirical findings, including association with observable individual characteristics, such as income and travel party size, and unobservable individual characteristics, such as beliefs and underlying preferences. The third section describes the data, based on an Internet survey of tourists recruited in the Northern Gudbrandsdal region in Norway. The fourth section presents the results of the regression and structural modelling of the log of per person trip expenditure (hereafter simplified to 'expenditure'). The results are discussed in the last section.

<A>Literature review

<B>Observable trip and demographic characteristics

Total tourist expenditure at a destination is a function of the number of travel parties and expenditure per party, with the latter being a function of expenditure per person per day, number of persons per travel party (party size) and number of days per visit (length of stay) (Kozak *et al*, 2008). Relationships may not be linear owing to economies of scale (Thrane and Farstad, 2011). As one would expect, results depend on the measure used, with a positive relationship between party size and party expenditure, but a negative relationship between party size and expenditure per person per day (Kozak *et al*, 2008). From a marketing and management perspective, the above measures represent intermediate steps, in the sense that the main focus is on the factors that (a) are correlated with party expenditure or its precursors

(expenditure per person per day, party size, and/or length of stay), and (b) can be affected by marketing and management decisions. Starting with socio-demographic variables, income has been a common and positive correlate of expenditure (Fredman 2008; Kozak *et al*, 2008; Thrane and Farstad, 2011). Age has been a common correlate, but the directionality has varied. Craggs and Schofield (2009) found higher expenditure for the 55 to 64 age group relative to younger groups. Thrane and Farstad (2011) used a combination of linear and squared terms and found that expenditure increased for ages up to 52 years old and then decreased. Craggs and Schofield (2009) found a modest effect from gender on expenditure, while other authors have found no effect (Jang *et al*, 2004). Thrane and Farstad (2012) found that nationality accounted for more than one-third of the explained variation in spending by foreign tourist in Norway. Also Barquet *et al* (2011) identified geographical origin as a main factor in explaining the size of tourists' expenditure.

Turning to past experience, trip purpose and trip characteristics, repeat visitors to a destination tend to have lower expenditure because of better familiarity with the destination (Lehto *et al*, 2004; Jang *et al* 2004). Suh and McAvoy (2005) found that business travellers spend more than pleasure travellers, but other studies have not found that business travellers spend more (Craggs and Schofield, 2009). Mok and Iverson (2000) found that trip purpose (honeymoon) was associated with higher spending. Expenditure may depend both on the type of activity (Fredman, 2008) and the number of activities engaged in (Spotts and Mahoney, 1991). It may depend on type of accommodation and the degree to which the trip is organized or all-inclusive (Fredman, 2008; Kozak *et al*, 2008; Laesser and Crouch, 2006). In addition, it may depend on transportation mode and destination type (Downward and Lumsdon, 2004; Laesser and Crouch, 2006; Fredman, 2008; Thrane and Farstad, 2011).

Latent psychographic characteristics

There is potentially a large set of beliefs and preferences that influence economic behaviour. McFadden (1986) described the 'black box' of economic decision making, depicting an expected influence from values (generalized attitudes) to preferences, as well as from beliefs (perceptions) to preferences, with preferences influencing behavioural intentions and subsequent behaviour. This resembles to some extent the value–belief–attitude relationship specified by Rokeach (1973), and also bears some similarity to the planned behaviour model, with causal relationship from beliefs (norms, attitudes, perceived control) to behavioural intention and behaviour (Ajzen, 1991). According to Rokeach (1973), values are single, stable beliefs transcending objects, whereas attitudes relate to particular objects.

Ben-Akiva *et al* (1999, p 188) point to the traditional divergence between the psychological and the traditional neo-classical economics approach to decision making, whereby the former has focused on understanding 'the nature of the decision elements' while the latter has focused on 'the mapping from information inputs to choice'. Yet, modern behavioural economics has incorporated more elements from psychology into economic analysis, and has also tilted the focus, acknowledging the necessity 'to unravel the black box and incorporate the sources of process variations to better predict the outcomes' (Ben-Akiva *et al*, 1999, p 191).

Fodness (1994) evaluated the tourist motivation behind travel activity and destination choice, where motivations were understood as primarily driven by need satisfaction (Maslow, 1943; Tinsley *et al*, 1977). There is now an extensive literature on the identification of motivations influencing vacation travel, both 'push factors' (socio-psychological motives that push individuals to leave behind daily surroundings) and 'pull factors' (destination attributes) (Dann, 1981; Yoon and Uysal, 2005). Elements of pull factors, characteristics of activities or of the destination, have been evaluated relative to expenditure (Spotts and Mahoney, 1991;

Laesser and Crouch, 2006; Fredman, 2008). However, evaluation of the influence on expenditure from fundamental push factors (for example, escaping from daily life) is lacking. These fundamental motivations might help explain visitor preferences for types of experiences and destinations. As a result, they can be relevant for decisions on destination development, management and marketing.

The new ecological paradigm (NEP), developed by Dunlap and Van Liere (1978) and revised by Dunlap *et al* (2000), measures the endorsement of an eco-centrist or pro-ecological beliefs, the extent to which the individual adheres to principles about, primarily, humans threatening ecosystems. It is perhaps the most widely used measure of environmental/ecological beliefs (Dunlap, 2008), and it is periodically used in tourism analysis (Jurowski *et al*, 1997; Zografos and Allcroft, 2007). Zografos and Allcroft (2007) found a significant relationship between ecological beliefs, based on the NEP scale, and tourist behaviour. Dolnicar and Leisch (2008) also found a relationship between environmental values, using scales other than NEP and tourist behaviour.

The recreation experience preference (REP) scale is a large set of indicator questions on push and pull motivations for nature-based leisure/tourism, including escape, introspection or seeking scenic beauty or risk (Driver 1983; Manfredo *et al*, 1996). Saayman and Saayman (2009), applying questions similar to those from REP, found that higher tourist expenditure was associated with the escape motive (relaxing and getting away from the normal routine). Oh and Schuett (2010), although not testing the direct relationship between REP motivations and expenditure, found that trip type was related both to expenditure and to some of the REP motivations. Dolnicar and Leisch (2008, p 678) did not model expenditure, but found that 'looking for luxury and wanting to be spoilt, looking for a variety of fun and entertainment, not paying attention to prices and money, and looking for cosiness and a familiar atmosphere' corresponded to low levels of pro-environmental behaviour.

A scale that corresponds to subsets of REP, focusing on nature orientation, has been developed in the Scandinavian context and utilized by Haukeland *et al* (2010, 2013). Building on Uddenberg's (1995) investigation of modern Swedes' nature orientations, Haukeland *et al* (2010, p 258) identified four dimensions of nature orientation: inspiration, recreation, challenge, and sightseeing (or comfort). Inspiration comprises items such as obtaining a feeling of freedom or finding inspiration in natural surroundings. Recreation items include focusing on physical relaxation and pursuing good health. Challenge includes searching for challenging physical activities involving risk. Sightseeing includes the enjoyment of touring in comfort and seeing sights of interest. Haukeland *et al* (2010) found an expected connection between national park tourists' comfort/sightseeing orientation and their preference for food and accommodation facilities. Furthermore, higher importance ratings for challenge and sightseeing were associated with higher importance ratings for service and infrastructure. Conversely, a recreation-in-nature orientation was, respectively, unrelated and negatively related to these two types of more costly facility preferences.

The wilderness preference scale (WPS) was developed to measure preferences for wilderness-type experiences (Hendee *et al*, 1968), and it has been assessed as an appropriate scale for measuring the affect (emotional) component of attitudes towards wilderness (Heberlein, 1973). Preference for minimal facilities and the avoidance of other people represents an end-scale which has been termed *purism*, and WPS also has been described as the wilderness purism scale (Vistad and Vorkinn, 2012). An expressed interest in basic trail facilities might be expected to associate with higher expenditure, relative to wilderness purists. Fredman and Emmelin (2001) found that 'wilderness purists' stated lower willingness to pay for trips to an alpine national park area at the Swedish–Norwegian border compared to non-purists.

Taken together, the REP, NEP, WPS and nature orientation scales represent a variety of potential push factors for nature-based tourism. Thus, the factors, or latent variables, related to these scales, may constitute relevant psychological elements for economic analysis of nature-based tourist behaviour and spending.

<A>Data and methodology

<B>Internet-based survey of visitors recruited in situ

This study utilized a visitor survey conducted in the Northern Gudbrandsdal region of Norway. This region contains several national parks and is known for both its natural and cultural heritage. During the summer period from the end of June until the end of September 2009, e-mail addresses were recruited from domestic and international tourists using stratified sampling along the six main roads out of the Northern Gudbrandsdal region. On 18 rotating weekdays, drivers of all motor vehicles leaving the area on the six main roads were stopped by a representative of the Norwegian Public Roads Administration and asked by a project assistant to fill in a recruiting form with email addresses. Local residents and commercial drivers were not included. Only 2% refused to be recruited at this stage. Despite the comprehensive sampling procedure, the actual tourist population in the area remains unknown; thus representativeness cannot be claimed. During the same period, 42 accommodation firms in the region sourced e-mail addresses from their guests (out of 84 firms approached for this purpose). The receptionists placed recruiting forms at the reception and collected the forms filled in by their guests. This latter group of tourists can be characterized as a self-selected sub-sample. Although the inclusion of the tourists recruited at accommodation firms would potentially impair the representativeness of the tourist sample, with respect to the overall tourist population passing through the area, we found that the sub-population staying at hotels, pensions and mountain inns represented a particularly interesting share of the tourists in the area. The complications with respect to sampling of tourists at

accommodation firms also have been noted in other Scandinavian projects (Vistad, 2009; Ankre and Reinius, 2010).

Both recruiting approaches included an introduction to the project in six languages (Norwegian, English, German, Dutch, Swedish and Danish). In total, 2,719 e-mail addresses were collected, with 62% being collected along the roads and the remainder in accommodation. Adjusting for illegible and undeliverable addresses, 2,510 participants were reached for the follow-up Internet survey. The survey was conducted in Norwegian, German and English, from December 2009 until February 2010, with two reminders. The 1,318 completed surveys represent a response rate of 53%. Of these 1,318 respondents, 63% were Norwegian, 10% German, 8% Dutch, and the remainder from a range of countries in Europe and around the world. Of these, 1,038 respondents answered the questions related to psychographic factors (while the remaining 280 ended the survey before reaching these questions).

The survey comprised questions about the trip in Northern Gudbrandsdal, the travel party, length of stay and expenditure, whether this region was the main destination for the trip, facility and service preferences, and motivations, as well as demographic characteristics. A split sample approach was used. Group A respondents ($n = 760$) were asked their (a) facility and service preferences and (b) nature orientations. In both cases, ratings ranged from 1 = no importance to 5 = highest importance. Group B respondents ($n = 248$) were asked their REP, on a scale of 1 = no importance to 5 = decisive importance. The 13 items from the REP scale represent a small extract from the total scale (Driver, 1983).

Respondents also completed the NEP scale, which ranged from 1 = strongly agree to 5 = strongly disagree. We used a reduced seven-indicator NEP version previously applied by, *inter alia*, Kaltenborn *et al* (2008). The WPS ranged from 1 = very negative to 7 = very positive. We used a shortened WPS version of eight items, previously applied in

Scandinavian studies (Vistad and Vorkinn, 2012). Items for the nature orientation, REP, NEP and WPS scales used in this analysis are presented in the Appendix.

The split sample approach resulted from an interest in assessing existing psychographic scales (REP, NEP, WPS) against the newly developed nature orientation scale, plus a set of questions on facility preference (Haukeland *et al*, 2010). The randomized allocation to sub-samples was not independent of all respondent characteristics because of a coding error related to questionnaire language; that is, no German (speaking) respondent was assigned to group B, while those answering in English were overrepresented in group B.

<B>Methodology

Psychographic factors may be associated with tourist expenditure either (a) directly or (b) indirectly via observable individual characteristics that affect expenditure of tourists in the alpine national park area. The direct relationship is tested in regression models, similar to the methodological approaches by Zografos and Allcroft (2007), Dolnicar and Leisch (2008), Saayman and Saayman (2009) and Oh and Schuett (2010). The dependent variable is log of per person trip expenditure (Thrane and Farstad, 2011). For both groups of respondents (A and B), expenditure is analysed with and without psychographic dimensions in the regression models. We also apply structural equation modelling to perform simultaneous tests of direct and indirect associations between psychographic factors and expenditure. A primary objective of structural modelling is to assess causal relationships, or path diagrams, by simultaneously estimating a regression and a (confirmatory) factor model. First, the psychographic factors were identified by exploratory factor analysis of the REP, NEP, WPS and nature orientation scales (Haukeland *et al*, 2013). Then, the statistical package AMOS was used for an initial graphical structural modelling (Byrne, 2001), and the final models were estimated in the statistical package Mplus (Muthén and Muthén, 2007). The indicator variables were specified as ordinal in the Mplus analysis.

Exploratory factor analysis with varimax rotation was used to identify measures for the nature orientation, REP, NEP and WPS scales; items with loadings above 0.60 were retained for each factor (see Appendix, Tables A1–A4).

Four factors were identified for nature orientations (NO): *recreation*, *inspiration*, *challenge* and *comfort*. The recreation factor had high loadings on items reflecting enjoyment of serenity and undisturbed nature, as well as health, relaxation and recharging. The inspiration factor included items reflecting the appreciation of nature and landscape as personal stimulation, while the challenge factor included items reflecting the search for risky challenges and demanding physical activities (Haukeland *et al*, 2010, 2013). The comfort factor was comprised of only one item: enjoying comfort in natural surroundings.

Five dimensions for REP were identified: *escape*, with high loadings on items reflecting the need for getaway and relaxation; *learning*, including items reflecting knowledge seeking; *socializing*, with high loadings on all socializing items (family, friends and others with similar values); *enjoyment*, comprised of only one item: viewing scenic beauty; and *risk-taking*, including items reflecting seeking of excitement and danger.

Two distinct dimensions were identified for the NEP scale. The first dimension is termed *environmentalism*, with high loadings on pro-ecological items. The second is *optimism*, with high loadings on items reflecting nature's resilience and the ability of humans to find solutions. There was a two-factor solution for the WPS scale. The first dimension was termed *basic facilities*, reflecting an appreciation of poles/stones for dry shoed trail crossings, huts/lodges and food services, maintained tracks and information about trail routes. The second dimension was *solitude* and reflected solitude and avoidance of crowding.

Table 1 provides descriptive statistics for the relevant variables utilized in the expenditure analysis. As indicated, the rationale behind the splitting of the sample into two groups was the comparison of the established psychographic scales (REP, NEP, WPS) against the newly developed nature orientation scale. Beyond that, the same variables were applied to both groups. Stepwise regression analysis of expenditure was carried out, with inclusion criteria of $p < 0.15$ and exclusion criteria of $p > 0.2$. The variance inflation factor of all explanatory variables was below 2. Table 2 shows models for the full sample, group A and group B; the last two have models that exclude the psychographic dimensions (type I) and models that include these dimensions (type II). Factor scores were used to represent each psychographic dimension. Log-transformed specifications showed better fit than the linear specifications, so the former are presented here ('Ln' refers to the natural logarithm).

Regarding the basic variables in travel expenditure modelling, high income and log of length of stay were positively associated with expenditure, while log of party size was negatively associated. In the models for group A and for the full sample, holiday or business travel purpose was positively associated with expenditure. Low income and age were only significantly associated with expenditure in the model based on the full sample, and the positive sign for age combined with negative sign for age squared indicate an inverse U-shape (highest expenditure among middle aged).

For both groups, the inclusion of psychographic dimensions (the II models) added explanatory power. *F* tests indicated that the increased explanatory power is statistically significant at the 5% level for group A and at the 1% level in group B (Chow, 1960; the test statistic is distributed $F(K_{Full}-K_{Reduced}, N-K_{Full}-1)$, and is 3.1 in group A and 4.2 in group B).

Regarding nature orientation, for group A, only one of the four dimensions shows significant co-variation with expenditure; the factor NO-*inspiration* was positively associated

with expenditure. For group B, only three of the nine psychographic factors were entered into the model in the stepwise procedure, and only two had significant coefficient signs. With respect to the REP, there was significant negative association between preference for REP-*risk-taking* and expenditure. Within the NEP scale, there was a significant and positive association between NEP-*environmentalism* and expenditure, but not between the NEP-*optimism* dimension and expenditure. None of the WPS factors were entered into the regression model in the stepwise procedure.

<B>*Structural analysis*

To assess the extent to which psychographic factors are directly or indirectly associated with tourist expenditure, we applied structural equation modelling. A point of departure for the structural models was the combined factor and regression analyses (Tables A1–A4 and Table 2), plus separate regression tests of psychographic factors as dependent variables and the remaining variables as independent. For all psychographic factors, in both groups, we tested the combined indirect (via other variables) and direct relationship with expenditure. Several structural model solutions were possible, and we present two alternative solutions for each group. Alternative 1 is a 'fuller model' with latent variables directly affecting expenditure. For alternative 2, non-significant (at $p = 0.10$) latent variables are removed, and remaining latent variables are freed to associate with expenditure based on best model fit.

For group A, alternative 1, NO-*inspiration* had a positive relationship with expenditure, while NO-*recreation* had a negative relationship. The NO-*recreation*-expenditure path was not significant at the 10% level, but its paths of co-variation with NO-*inspiration*, Holiday, and Length of stay were significant. The coefficients for the other variables have the expected signs, similar to what was observed in the regression model. Structural equation modelling allows variables to be intermediaries, and Length of stay is an intermediary between International and Expenditure. Length of stay affects expenditure and

is affected by whether one is an international visitor. International showed a relationship with a nature orientation indicator, 'NO18 – feel connectedness with nature' (Figure 1).

For alternative 2, No-recreation was allowed to be affected by explanatory variables, and there were significant paths to it from Length of stay, International, High income, and Holiday. (Knut – in Figure 2, we have arrows going in both directions – to and from Recreation to the explanatory variables. They should only be going to Recreation.) Thus, for example, High income visitors were likely to spend more and were likely to have stronger recreation motives. In the process of 'freeing' the model from alternative 1 to 2, Inspiration became non-significant as a predictor of Expenditure, and it was dropped from the model. The international visitor dummy variable showed an additional relationship with the nature orientation indicator, 'NO5 – fresh air, unpolluted environment' (Figure 2). International visitors had weaker Recreation motivations than did domestic visitors, but they had relatively strong motivations for 'feel connectedness with nature' and 'fresh air, unpolluted environment''

For group B, alternate 1, NEP-*environmentalism* and NEP-*optimism*, were retained in the structural model, together with WPS-*basic facilities* and REP-*escape* (instead of REP-*risk taking*, which was included in the regression model). However, only the NEP-*environmentalism*-Expenditure path, with a negative sign, was significant at the 10% level. Surprisingly, NEP-*environmentalism* switched sign from the regression model to the structural model. There was a negative covariance between NEP-*environmentalism* and NEP-*optimism*, as expected. The positive covariance between NEP-*optimism* and REP-*escape*, and negative between NEP-*environmentalism* and REP-*escape*, suggests that those who are motivated by escape (a self-oriented motivation) are less likely to be concerned about the environment, as measured by the NEP factors. Likewise, the factor WPS-*basic facilities* covaries positively with REP-*escape* and negatively with NEP-*environmentalism*. As the

covariance between WPS-*basic facilities* and NEP-*optimism* was non-significant, it was constrained to be zero. In terms of the demographic/trip variables, they are as expected in terms of signs on the expenditure paths. The international visitor dummy variable showed a negative relationship with two NEP indicators, 'NEP2 – humans are severely abusing the environment' and 'NEP6 – if things continue on their present course, we will soon experience a major ecological catastrophe' (Figure 3).

For group B, alternative 2, the non-significant WPS-*basic facilities* and REP-*escape* variables were dropped from the model. Unlike in group A, the remaining latent variables retained their direct relationship with Expenditure as model fit was maximized. Both increased in significance (Figure 4).

Table 3 shows the goodness-of-fit of the four structural models. All had acceptable values with respect to thresholds: the comparative fit index (CFI) and the Tucker-Lewis index (TLI) above 0.9, the root mean square error of approximation (RMSEA) below 0.8, and the chi-square ratio below 2 (Byrne, 2001). However, the alternate 1 models for both groups have p values below 0.05. The p values for both alternate 2 models are above 0.05, indicating good model fit.

<A>*Discussion and conclusion*

This analysis, using a sample of domestic and international visitors to an alpine national park region in Norway, explored the inclusion of individuals' psychographic factors into models of tourism expenditure. The four-factor solution for nature orientations was consistent with findings presented by Haukeland *et al* (2010). The five REP factors were largely consistent with the classification presented by Driver (1983), though the items used here were a sub-set of the full REP. Four of the five REP factors (*escape*, *learning*, *socializing* and *risk-taking*) resemble to some extent the stimulus avoidance, intellectual, social and competence-mastery factors identified by Beard and Ragheb (1983). The two NEP factors reflected the rotation of

signs in the NEP statements, with an *environmentalism* factor that is related to the basic eco-centrist (pro-ecological) one-dimensional sum-score, and an *optimism* factor (resembling the *human exemptionalism* factor identified by Kaltenborn *et al* (1998, 2008)). The two WPS factors differentiated between the basic trail facility aspects and the social aspects.

Regression models were presented with and without psychographic factors. With respect to observable individual characteristics, these showed the expected relationship with the log of per person trip expenditure: positive signs for high income and length of stay, and negative sign for party size (Kozak *et al*, 2008; Thrane and Farstad, 2011). Some of the psychographic dimensions added explanatory power to the regression models, when demographic and trip characteristics were controlled for. By using structural models we have shed some light on whether the direct association between psychographic factors and expenditure reflected in the regression models is maintained when we allow for indirect association via demographic and trip characteristics. The present analysis indicates some indirect association, and we recommend further evaluation with new data and additional psychographic factors.

The regression analysis indicated that tourists with strong orientations towards NO-*inspiration* had significantly higher expenditure, but this variable became non-significant in the more flexible group 1, alternative 2 structural model. Conversely, the NO-*recreation* factor, which was omitted from the stepwise regression, was significant when allowed an indirect positive relationship via various trip/demographic characteristics. We might conclude that NO-*inspiration* and NO-*recreation* as motivations do not affect expenditure directly; rather, for NO-*recreation* at least, the motivation is correlated with some of the demographic/trip characteristic factors. The NO-*challenge* (group A) and REP-*risk-taking* (group B) factors showed negative association with the expenditure in the regression models.

However, the coefficients on the risk dimensions were modest in magnitude and statistical significance, and they fell out of the structural model.

Those with higher scores on the NEP-*environmentalism* dimension had significantly higher spending in the regression model, but the reverse was true in the structural model. The pattern in the regression model might be considered as contrary to the expected relationship, based on Dolnicar and Leisch (2008). Although the magnitude of expenditure does not correlate perfectly with the associated size of the ecological footprint of travel behaviour, our result might be due to the fact that the 'balance of nature' items were mixed between our factors and that the respondents seemingly handled positive and negative statements differently. NEP-*environmentalism* and NEP-*optimism* both had negative signs for the path to Expenditure in the structural models. This result might partially be explained by a measurement effect (for example, response set bias), in which some people tended to agree (or disagree) with all the items, regardless of wording. The negative covariance may reflect those who completed the survey as expected (agree on items worded in same direction, disagree on others), while the dual-negative paths to expenditure reflect response set bias. In any case, this result deserves further research. The WPS factors did not show association with expenditure in the regression model or the structural model.

This study was conducted in a rural area known for its natural and cultural heritage. Results may not easily transfer to urban or coastal tourism destinations. In addition, some of the psychographic dimensions were based on only one or two items, which limits the ability of the scale to fully capture the dimensions' richness. Owing to the delay between in-situ recruiting and the Internet-based survey, the quality of reported expenditure figures might have been attenuated.

Despite these limitations, this study illustrates the potential of including psychographic factors in models of tourist expenditure, thereby helping to answer 'why'

tourists behave as they do (Fodness, 1994). As a preliminary and partial unravelling of the black box of economic behaviour (McFadden, 1986; Ben-Akiva *et al*, 1999), our study adds to the literature on psychographic factors explaining tourist expenditure (Wang *et al*, 2006; Dolnicar and Leisch, 2008). Another indication from our study regarding use of latent variables based on psychographic factors is the value of structural modelling in assessing relationships between expenditure and other individual characteristics, demographic or trip-related, that also relate to expenditure.

Targeted marketing efforts are not always clear cut from studies of psychographic factors (Steenkamp and Ter Hofstede, 2002), but results from studies such as this one can guide decisions about investment of limited financial, human and 'attraction' resources. For example, a positive association between environmental values and expenditure might affect marketing images and wording, as well as use of advertising in environmentally oriented information sources.

Jacobsen (2007, p 117) found 'that those visitors who characterized their own concern about environmental issues as above average stayed longer in Norway than the other international motorists, indicating that they might be more profitable customers for the regional tourism-related industries'. A considerable part of the nature-based tourism in Northern Gudbrandsdal is motivated by the serenity and undisturbed quality of nature, which also serves as a setting for 'health restorative' activities (Haukeland *et al*, 2010, 2013). We also have found that those with various types of nature-related motivations associate (directly) with higher trip expenditure or (indirectly) with individual characteristics that associate with higher expenditure. Future research using additional destination types and psychographic measures might indicate clearer patterns of connections between psychographics on the one hand and demographics and trip behaviour on the other.

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Table 1. Descriptive statistics for main study variables (*N* = 1,038).

	Group A (*n* = 760)			Group B (*n* = 278)		
	Mean	**SD**	**Range**	**Mean**	**SD**	**Range**
Expenditure per person per trip (euros)	609	674	6–7,500	732	978	2–8,425
Length of stay (LS, days)	10.49	9.82	0–100	10.83	9.17	1–70
Party size (PS)	2.30	1.17	1–11	2.38	1.35	1–10
Purpose of trip:						
Visiting friends and relatives	0.17	0.376	0–1	0.11	0.315	0–1
Holiday	0.76	0.430	0–1	0. 82	0.385	0–1
Business/work + other	0.08	0.264	0–1	0. 07	0.253	0–1
Main transportation mode:						
Inland transport (primarily by car)	0.93	0.255	0–1	0. 89	0.311	0–1
Airplane	0.07	0.255	0–1	0. 11	0.311	0–1
Northern Gudbrandsdal main destination	0.58	0.494	0–1	0. 54	0.500	0–1
Income level (self-assessed)[a]						
Relatively high	0.30	0.459	0–1	0.38	0.485	0–1
Medium	0.58	0.494	0–1	0. 51	0.501	0–1

Relatively low	0.12	0.326	0–1	0. 12	0.321	0–1
Age (years)	47.58	13.35	16–78	49.35	14.06	18–84
Residence/nationality						
Domestic (Norwegian) tourist	0. 68	0.467	0–1	0.53	0.500	0–1
International tourist[b]	0. 01	0.108	0–1	0. 05	0.219	0–1
Psychographic dimensions						
NO-*Recreation*	4.288	0.561	1–5			
NO-*Inspiration*	4.002	0.652	1–5			
NO-*Challenge*	2.911	0.960	1–5			
NO-*Comfort*	3.526	0.738	1–5			
REP-*Escaping*				3.749	0.750	1.80– 5.00
REP-*Learning*				3.972	0.749	1.33– 5.00
REP-*Gathering*				3.603	0.901	1.00– 5.00
REP-*Enjoyment*				4.246	0.605	1.75– 5.00

REP-*Risk-taking*	3.068	0.854	1.00– 5.00
NEP-*Environmentalism*	3.895	0.741	1.00– 5.00
NEP-*Optimism*	3.369	0.833	1.00– 5.00
WPS-*Basic facilities*	2.721	1.061	1.00– 7.00
WPS-*Solitude*	3.504	1.103	1.00– 6.00

Notes: [a]All respondents were asked if they considered their income as 'high', 'medium' or 'low'. Norwegian visitors were in addition asked about household income (monthly gross income); thus for Norwegians we can estimate average stated income for the three relative levels. Those domestic visitors reporting 'relatively high income' stated an average monthly gross household income of €7,859; those reporting 'average income' stated an average income of €5,301; and those reporting 'relatively low income' stated an average income of €3,112. The 2009 average exchange rate between Norwegian kroner (NOK) and euro was applied: 8.7285 (the NOK/USD exchange rate was 6.2816). [b]Different nationalities were slightly unevenly distributed between the two groups, primarily due to a coding error in the online survey; no German (-speaking) respondent was assigned to group B. Moreover, there were larger shares of Swedes, Danes and non-European tourists in group B.

Table 2. Ln expenditure per person per trip by independent variables, OLS regression, stepwise.

	Total sample (*N* = 950)	Group A (*n* = 702)		Group B (*n* = 247)	
	I	I	II	I	II
Ln length of stay	0.503	0.491	0.483	0.488	0.459
(Ln LS)	(0.048)**	(0.049)**	(0.049)**	(0.122)**	(0.120)*
Ln travel party size	–0.258	–0.347	–0.364	–0.383	–0.370
(Ln PS)	(0.158)	(0.168)*	(0.168)*	(0.134)**	(0.132)**
Ln PS squared	–0.189	–0.162	–0.154		
	(0.097)	(0.105)	(0.105)		
Purpose of trip:[a]					
Holiday	0.407	0.460	0.449		
	(0.085)**	(0.085)**	(0.085)**		
Business/work	0.513	0.583	0.579		
	(0.131)**	(0.134)**	(0.134)**		
Transportation mode airplane[b]	0.187				
	(0.114)				
Main destination Nord-Gudbrandsdalen				0.271 (.144)	0.281 (.142)
High income[c]	0.197	0.157	0.162	0.447	0.442
	(0.064)**	(0.067)*	(0.067)*	(0.147)**	(0.144)**

Low income^c	–0.156 (0.095)	–0.225 (0.097)*	–0.227 (0.096)*		
Age	0.041 (0.014)**				
Age-squared / 100	–0.042 (0.015)*				
International tourist^d	0.596 (0.080)**	0.672 (0.080)**	0.691 (0.080)**	0.691 (0.173)**	0.601 (0.176)**
Psychographic dimensions					
NO-*Inspiration*			0.105 (0.048)*		
NO-*Challenge*			–0.060 (0.033)		
REP-*Risk-taking*					–0.186 (0.084)*
NEP-*Environmentalism*					0.344 (0.114)**
NEP-*Optimism*					–0.147 (0.095)
Constant	3.579 (0.345)**	4.601 (0.135)**	4.380 (0.222)**	4.446 (0.028)**	4.256 (0.531)**
R-squared-adj	0.380	0.430	0.434	0.276	0.303

Notes: Standard errors are in parentheses. In the stepwise procedure we applied inclusion

criteria of *p* < 0.15 and exclusion criteria of *p* < 0.2. The effects of type of travel route, time

elapsed since the trip, household type, education (university degree), and gender were also assessed, but these variables were non-significant and therefore omitted from the models. [a]Visiting friends and relatives is the base category. [b]All other transport modes (primarily car) is the base category. [c]The 'medium' income level is the base category. An alternative model specification with log of income, setting the income of international tourists to average levels of, respectively, 'high', 'medium' and 'low' (for national tourists) yielded significantly positive signs in sub-sample A and the total sample. [d]Domestic (Norwegian) is the base category. [*] $p < 0.05$; [**] $p < 0.01$.

Table 3. Fit indices of structural models.

	Group A – structural model		Group B – structural model	
	Alternative 1	**Alternative 2**	**Alternative 1**	**Alternative 2**
χ^2/df ratio	197/118 = 1.67	93/76 = 1.22	227/187 = 1.21	60/50 = 1.20
p-value	0.0000	0.0846	0.0247	0.1485
Root mean square error of approximation (RMSEA)	0.031	0.018	0.029	0.029
Comparative fit index (CFI)	0.994	0.998	0.983	0.986
Tucker–Lewis index (TLI)	0.992	0.997	0.980	0.980
R-squared for Expenditure	0.438	0.435	0.351	0.347

Figure 1. Structural model of expenditure including psychographic factors, standardized regression weights (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$), group A, alternative 1.

Note: Error terms and coefficients for indicators are omitted.

Figure 2. Structural model of expenditure including psychographic factors, standardized regression weights (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$), group A, alternative 2.

Note: Error terms and coefficients for indicators are omitted.

Figure 3. Structural model of expenditure including psychographic factors, standardized regression weights (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$), group B, alternative 1.

Note: Error terms and coefficients for indicators are omitted.

Figure 4. Structural model of expenditure including psychographic factors, standardized regression weights (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$), group B, alternative 2.

Note: Error terms and coefficients for indicators are omitted.

Figure 1
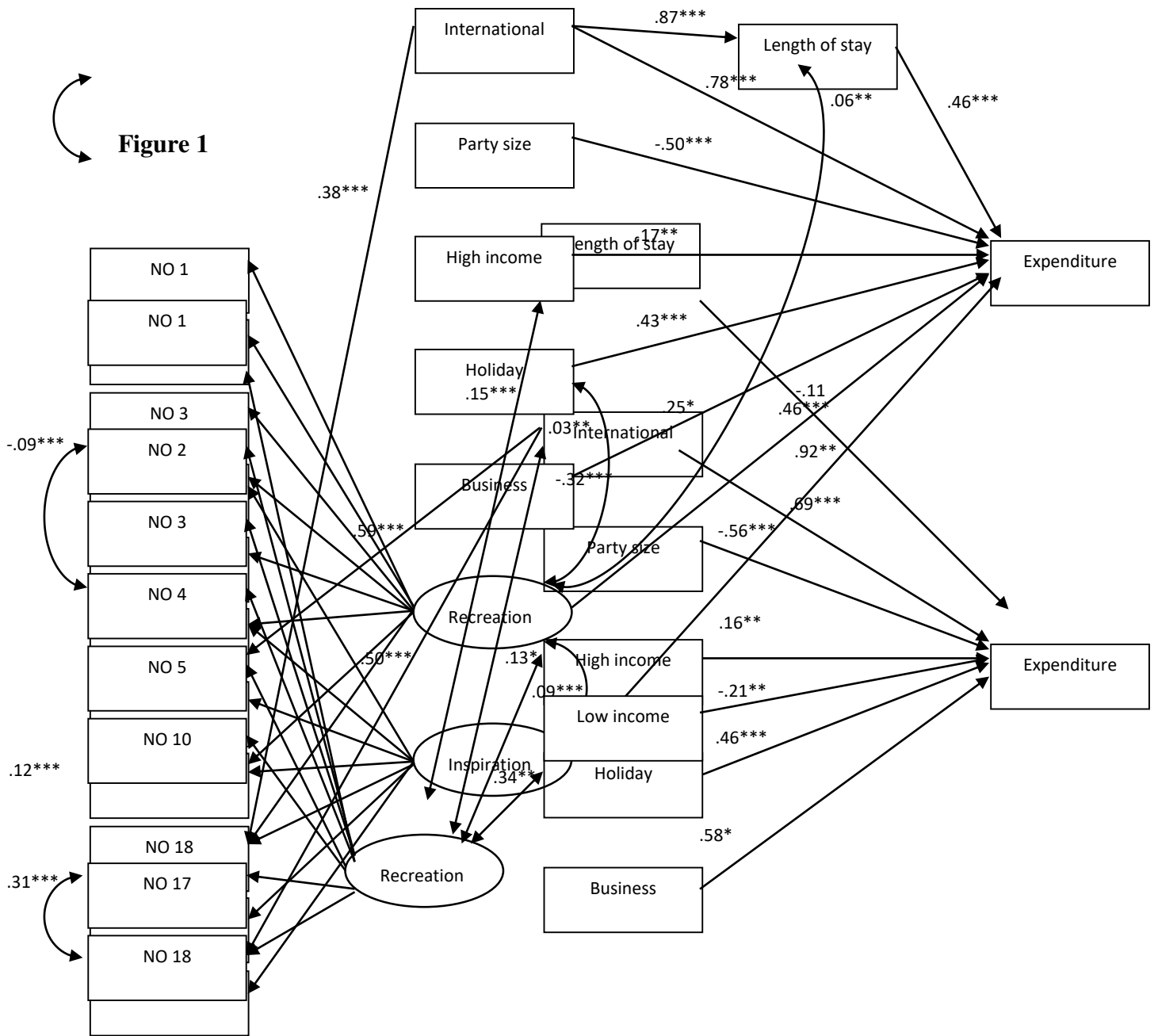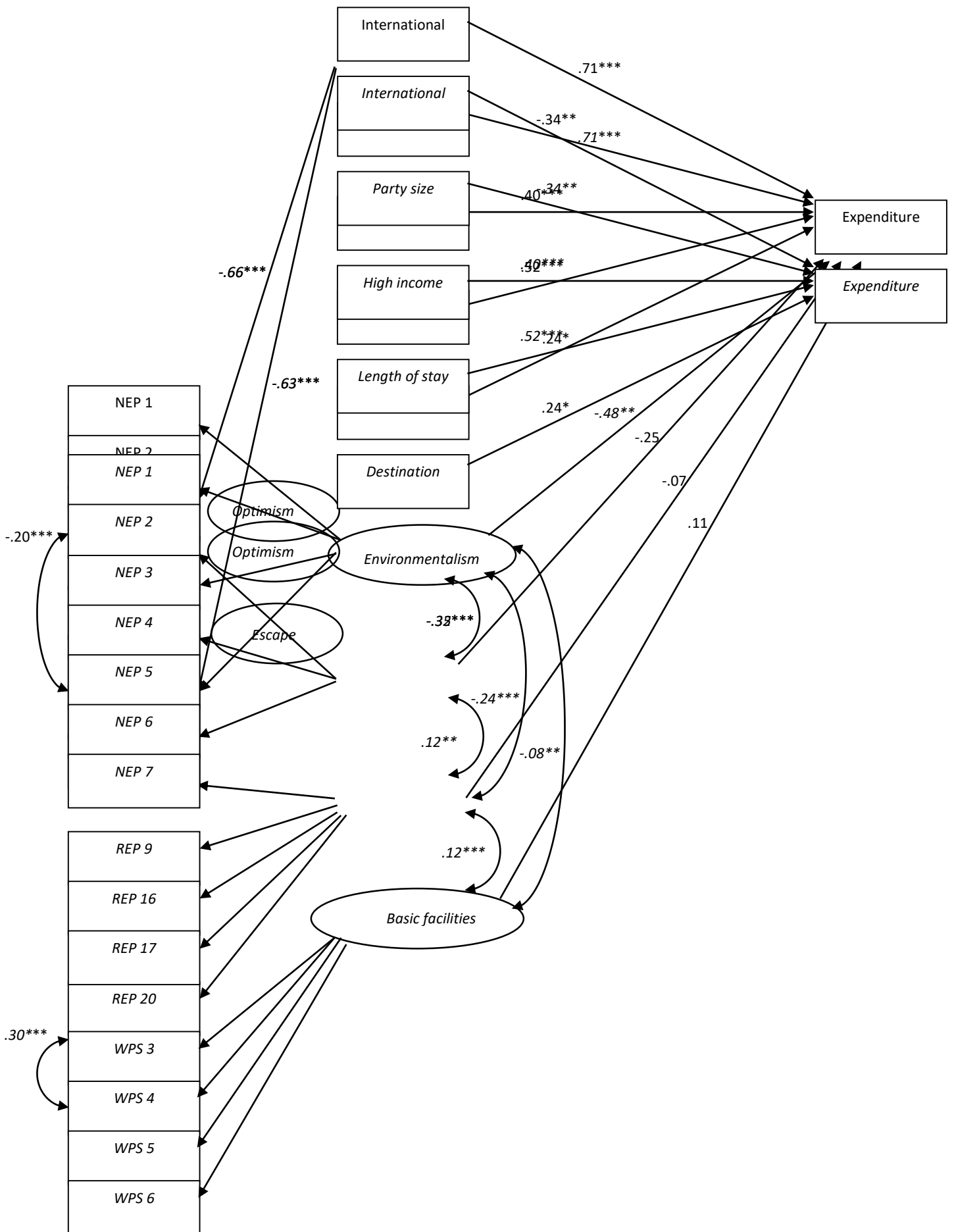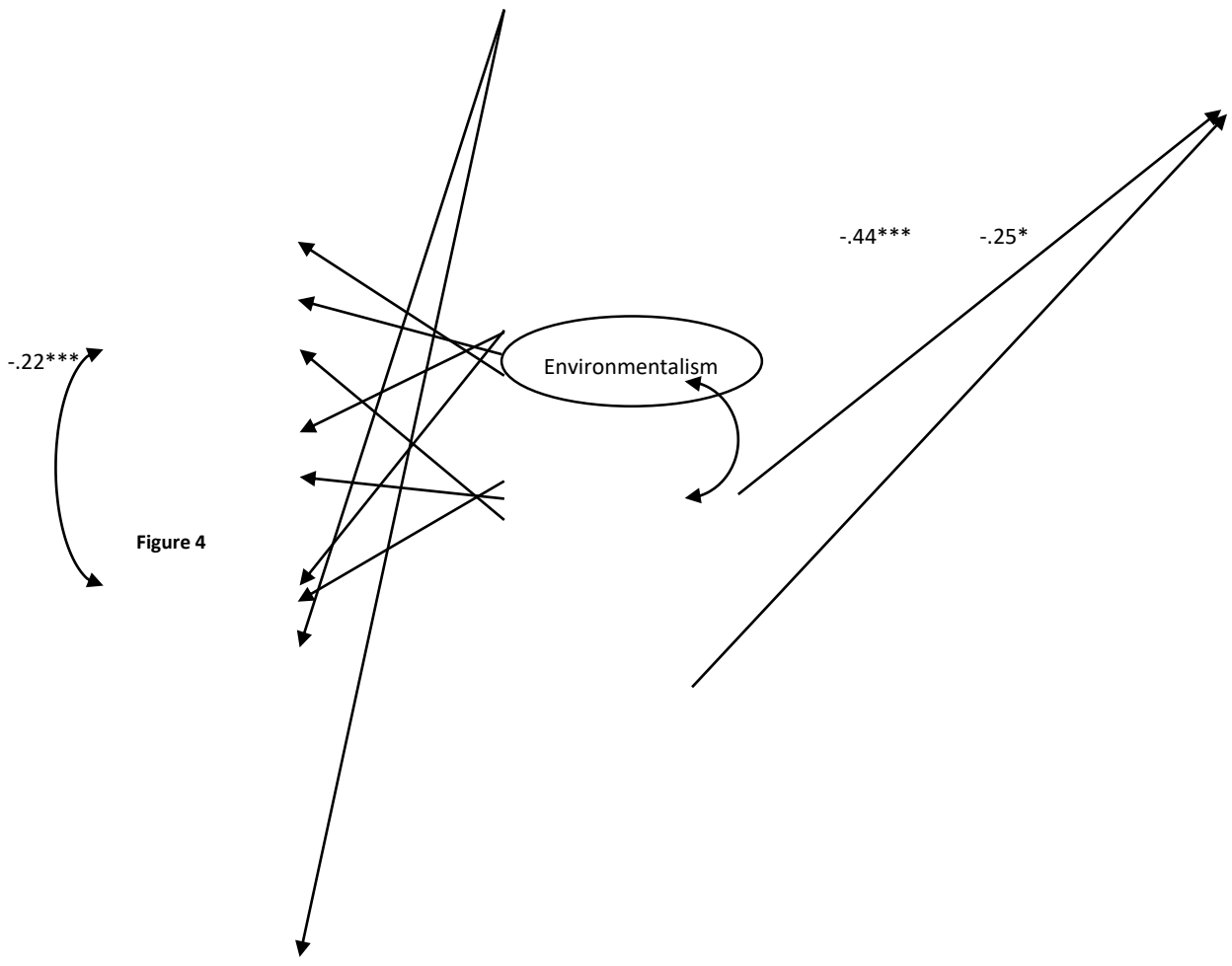
Figure 3

-.22***

Figure 4

Environmentalism

-.44***   -.25*

Table A1. Rotated factor matrix, nature orientation scale ($n = 704$).

	Recreation	Inspiration	Challenge	Comfort
NO2 – Tranquillity and peacefulness	0.830			
NO5 – Fresh air, unpolluted environment	0.802			
NO1 – Physical relaxation in nature	0.754			
NO3 – Sense impressions (sights, sounds, and so on)	0.746			
NO4 – Good health	0.645			
NO10 – Recharge batteries/regain strength	0.640			
NO14 – Obtain a deeper connection in life		0.809		
NO20 – Experience nature's magic/mystery		0.749		
NO21 – Find inspiration in natural surroundings		0.727		
NO18 – Feel connectedness with nature		0.719		

NO17 – Obtain a feeling of freedom	0.620			
NO2 – Search for challenges involving risk		0.836		
NO9 – Demanding physical activities in nature		0.795		
NO11 – Enjoy comfort in natural surroundings				0.856
Percentage of variance explained	40.0	8.2	6.6	5.5

Table A2. Rotated factor matrix, recreational experience preference (REP) scale (*n* = 248).

	Escape	Learning	Socializing	Enjoyment	Risk-taking
REP8 – Have your mind move at a slower pace	0.836				
REP9 – Have a change from your daily routine	0.794				
REP16 – Think about who you are	0.675				
REP20 – Get away from the noise back home	0.629				
REP17 – Relax physically	0.615				
REP14 – Learn more about nature		0.882			
REP13 – Develop your knowledge of things there		0.817			
REP3 – Be with people having similar values			0.742		
REP2 – Do something with your family			0.693		

REP12 – Be with friends		0.650			
REP5 – View the scenic beauty				0.810	
REP1 – Experience excitement					0.879
REP11 – Risk dangerous situations					0.665
Percentage of variance explained	32.6	10.3	8.2	6.3	5.4

Table A3. Rotated factor matrix, new ecological paradigm (NEP) (*n* = 248).

	Environmentalism	Optimism
NEP2 – Humans are severely abusing the environment	0.756	
NEP1 – The balance of nature is very delicate and easily upset	0.722	
NEP4 – Plants and animals have as much rights as humans to exist	0.714	
NEP6 – If things continue on their present course, we will soon experience a major ecological catastrophe	0.633	
NEP5 – The balance of nature is strong enough to cope with modern industrial nations		0.786
NEP7 – Human ingenuity will ensure that we do NOT make the earth unlivable		0.740
NEP3 – The so-called 'ecological crisis' facing humankind has been greatly exaggerated		0.716
Percentage of variance explained	39.0	18.0

Table A4. Rotated factor matrix, wilderness preference scale (WPS) (*n* = 248).

	Tracking	Solitude
WPS3 – There are maintained and signed tracks	0.839	
WPS4 – You may find information of paths/tracks at start site and crossing of other paths/tracks/roads	0.856	
WPS5 – There are poles and stones for dry shod crossing of marshes and wetlands	0.796	
WPS6 – There are maintained huts/lodges with beds made and food available	0.624	
WPS7 – You may experience solitude (that you can walk for miles without seeing other people)		0.818
WPS8 – You are meeting a lot of other people on the trip		–0.764
Percentage of variance explained	40.4	19.3