Ecological Economics 138 (2017) 223–237

Contents lists available at ScienceDirect

Ecological Economics

journal homepage: www.elsevier.com/locate/ecolecon

Analysis

Can Personality Traits Explain Where and With Whom You Recreate? A Latent-Class Site-Choice Model Informed by Estimates From Mixed-Mode LC Cluster Models With Latent-Personality Traits

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ARTICLE INFO

Article history:
Received 10 October 2015
Received in revised form 17 February 2017
Accepted 3 March 2017
Available online 26 April 2017

Keywords:
Latent traits
Personality
Sensation seeking
Extroversion
Competitiveness
Mixed-mode latent-class cluster model
Ordinal
Nominal, and cardinal indicators
Latent-class choice model

ABSTRACT

We test and find that personality traits interact with site characteristics and the ability of a potential companion to determine where, and with whom you recreate. 4605 mountain bikers chose between multiple pairs of hypothetical mountain-bike rides, and, in addition, answered Likert-scale questions on sensation-seeking, competitiveness and extroversion. For each personality trait, a mixed-mode latent-class cluster model was estimated, accounting for that fact that the indicators can have ordinal, cardinal or nominal meaning. Most LC models ignore these distinctions. Our model also allows the scores on questions to be correlated, even after conditioning on class (typically assumed away). Then, a latent-class choice model of trail attributes and companion's ability was estimated using the choice-pair data, with the estimated latent personality-traits as covariates. Three choice classes are identified and the odds of being in each varies by personality: estimated choice probabilities and WTP estimates vary significantly and substantially by class and personality type.

1. Introduction

Preference heterogeneity for a site-specific recreational activity may be over the physical attributes of the site, but also over whether you have a companion and their relative ability. Our hypothesis is people vary in terms of how, and how much they want to be challenged. Site characteristics can make an activity more or less challenging/difficult. If alone you can choose the pace (relaxed to challenging), but if you have a companion you lose control over how the activity will play out, particularly if the companion is of a different ability level, but you can socialize.

This paper simultaneously tackles three research issues. The first one addresses whether personality traits can explain preference heterogeneity for recreational activities. The second and the third research issues deal with econometric features of latent-class (LC) models, which are often used to explore preference heterogeneity. Specifically, the second issue is many estimated latent-class models restrictively assume—often wrongly—that once you condition on class, the different answers used to estimate the model (the scores on the indicator questions—most often answers to Likert-scale questions) are statistically independent. If you assume conditional independence when it does not exist, you get biased parameter estimates (each answer appears more important than it is). The third research issue is scores on indicators vary in terms of their informational content (nominal, ordinal, or cardinal) but many estimated LC models do not take this into account—they restrictively assume all scores have the same informational content, often the wrong one. So, most LC models either ignore information in some of the scores (e.g. assume the scores are simply nominal when they, in fact, have ordinal meaning), or assume information that is not there (e.g. assume the scores have cardinal significance when they do not). We specify and estimate a LC model (specifically a mixed-mode LC cluster model, see Sections 1.2 and 3.1) that allows for dependencies amongst indicators, and, in addition, correctly specifies the scale (nominal, ordinal, cardinal) of the different indicators. Next we discuss how personality traits influence behavior and then present some methodological implications of LC models.

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http://dx.doi.org/10.1016/j.ecolecon.2017.03.038
0921-8009/

1.1. The Influence of Personality Traits on Behavior and Choice

Personality traits tend to be stable over time, situations, and tasks (Fleeson and Noftle, 2008; Funder, 2009). They are also measurable and have a long history of being measured. These two things make them prospective candidates for explaining why I might choose differently from you and why for many individuals their choices show similarities across time, situations, and tasks.

Personality traits, in fact, predict behavior and choice in many situations: choice of drugs (e.g. heroin vs. cocaine), relationship choices, choice of mate, what you study in school and eating habits (Bereczkei et al., 1997; Corulla and Coghill, 1991; Hopwood et al., 2008; Jonason et al., 2012; Mascie-Taylor, 1988; MacNicol et al., 2003), as well as income, job performance, educational achievement and criminal behavior (Almlund et al., 2011). In the *Handbook of the Economics of Education*, Almlund et. al. survey how personality affects choices. While many studies–mostly in other fields have demonstrated that personality traits can explain choices, most economists ignore personality as an explanatory variable.

In our application, we are interested in whether personality traits influence where you recreate and with whom you recreate, or not. Recreational activities involve exertion, the performance of sports-specific skills, risks, thrills, socializing and competition and these aspects of the experience vary by sport, site and companion. It is our hypothesis that variation in preferences over these aspects of recreation vary with personality traits. We test and confirm this hypothesis by modeling and estimating how mountain bikers choose between different rides as a function of site characteristics and companion's ability. Our results cause us to further hypothesize that personality traits can explain choice of sport (running versus golf versus technical climbing), choice of venue and companion(s) given the sport (where to golf, or climb, and with whom) and how often to participate in a specific recreational activity (whether to ski, snowboard, snowmobile, or stay home).

1.1.1. Sports and Personality Traits

Sit and Lindner (2005) find *paratelic* individuals (playful, unconcerned, fun seeking) prefer risky sports while *telic* individuals (serious, goal-directed, achieving) prefer safe sports and endurance activities. More sport-competitive individuals tend to be more telic (Kerr, 1987; Kerr and van Lienden, 1987). More extraverted individuals formally compete more (Kirkcaldy and Furnham, 1991); endurance athletes are more extraverted than non-exercisers and those that exercise more are more extroverted (Egloff and Gruhn, 1996).[1] Extroversion and a tendency to be anxious are both positively correlated with the propensity to exercise, for the latter group to improve mood (Davis et al., 1995). Tolea et al. (2012) finds extroversion positively correlated with muscle strength. Looking ahead, our results contradict some of these findings.

Sensation-seeking involves the desire to seek out new and thrilling sensations and has been associated with high-risk social activities including promiscuous sex, illicit drugs and crime, as well as high-risk sports (Thomson et al., 2013). Thomson et al. identifies a link between a D3 dopamine receptor gene variant and sensation seeking in skiers and snowboarders. Sensation-seeking is positively correlated with physical activity (De Moor et al., 2006; Jack and Ronan, 1998).

1.1.2. Socializing, Competing and Personality Traits

Social psychology asserts a native desire to seek the company of others; the field offers numerous reasons for wanting a companion. First, and foremost, people get utility from friendship and human contact. This category includes the feelings of security provided by a companion and also the joy of interacting with others, including games and competitive situations. Second, having company during an activity allows you to gauge your own abilities: we use other people to gather information about ourselves—*social comparison* (Festinger, 1954). This innate tendency to compare ourselves to another increases the more similar the other person is in terms of opinions and ability. Comparison is part of our quest to make ourselves feel better.[2] Competing with those who are better and holding your own allows you to identify with them, and competing with lessors and beating them confirms you are not one of them—you have drawn a contrast/distinction between them and you. Both processes can be self-enhancing. Ignoring the costs, when comparing with another person we prefer, on average, to compare ourselves to those who are slightly better; it is a way to improve, but there are potential costs; competing with those slightly better can be threatening (Blanton et al., 1999; Buunk and Gibbons, 2007). This threat is eliminated by recreating alone or by choosing a companion out-of-your-league–termed *self-handicapping*. Some individuals, to protect their egos, purposively handicap their ability (Jones and Berglas, 1978; Shepperd and Taylor, 1999). With biking you can self-handicap by riding hard the day before. Other individuals compare downward—*downward social comparison theory* (Wills, 1981), a way to improve self-esteem is to demonstrate you are better than your companion. The drive to compare is not limited to humans (Gilbert et al., 1995). In mountain biking you only need a technical section to assess relative skill, and only one short, steep climb to assess strength, but a long hard ride to assess endurance. We hypothesize that preference for a companion as a function of their ability (or no companion) will vary with personality traits.

According to *Achievement Goal Theory* you are motivated to demonstrate your competence and achievements, but you have two ways of doing this: by comparing what you do with what others are doing you assess your ability in terms of others and by comparing with your past self in terms of personal improvement (Sit and Lindner, 2005). Whether you prefer to compete with others or with your former self likely depends on your personality.

1.1.3. Personality Traits and Environmental Values

We are not the first to consider the relationship between personality traits and environmental values, but the studies cited below consider the influence of personality on value (use plus non-use) for broad environmental goals and programs, most with a large non-use component, not recreational choice and use values, the topic of this paper.

Psychologists ask whether personality traits affect the probability that you are an environmentalist in preference and advocacy, but they are not much interested in estimating your dollar values for specific policies and programs. Much of this research in psychology has appeared in the *Journal of Environmental Psychology* (e.g., Hirsh, 2010; Milfont and Sibley, 2012). Hirsh (2010) and Hirsh and Dolderman (2007) found that pro-environmental views are associated with *openness* ("One's level of imagination, creativity and openness to ideas") and *agreeableness* ("compassion, empathy and concern for others"), while *consumerism* (the accumulation of market goods) was negatively associated with agreeableness, but (as are pro-environmental views), positively associated with openness. Milfont and Sibley investigate the issue on both an individual level and aggregate country-wide levels. They find, consistent with

[1] Extroverts predominately get their gratification from outside sources, introverts from internal sources (their mental life).

[2] Motives for the drive include self-enhancement, perceptions of relative standing, maintaining a positive self-image and closure (Brickman and Bulman, 1977; Suls et al., 2002). See also Buunk and Gibbons (2007).