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Analysis

Multi-Product Category Choices Labeled for Ecological Footprints: Exploring Psychographics and Evolved Psychological Biases for Characterizing Latent Consumer Classes

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ABSTRACT

This paper explores psychographics and evolved psychological biases to characterize consumer segments regarding pro-environmental choices. Based on survey-evidence from Germany, we analyze consumer preferences for two product categories, a food-staple and a non-food staple, labeled for carbon and water footprints. Latent class analysis is employed to identify and characterize distinct consumer segments as a function of consumers' 'ecological worldview', consumer involvement, motivation to attend to product label information, personal values, as well as consumers' environmental group membership and donation behavior. Results suggest that latent segments of ecologically-oriented consumers can be differentiated from price-sensitive segments, with the former appearing less prone to certain evolved psychological biases compared to the latter segments. In contrast to previous work on self-reported ecologically conscious behavior, our results highlight the role of personal values, in particular that of personal health. This is found to be valued less by ecologically-oriented consumers, indicating that such individuals may have a strong communal focus in their value orientation. In terms of policy implications, our findings suggest that sustainability labels can provide valuable and interpretable information to consumers, yet more effective intervention efforts may require a stronger focus on targeted information provision with regard to carbon rather than water footprints.

> "Interventions designed to promote sustainable behaviors have not always been successful, because they tend to ignore important facets of human evolved psychology."
>
> [(van Vugt et al., 2014: 15)]

1. Introduction

A growing body of literature suggests that a large portion of climate-related emissions are caused by current diets and individual consumption decisions (Scherer and Pfister, 2016; Armel et al., 2011; UBA, 2007). This highlights the importance to improve our understanding of sustainable consumption behavior, and to identify why consumers engage in unsustainable behaviors (McDonagh and Prothero, 2014).

In order to further our understanding regarding peoples' incentives to act in a sustainable manner, and to shed light on pro-environmental behavior, a large body of previous work has profiled "green" consumers. To investigate this type of consumer with respect to environmentally responsible consumption behavior, some analyses focused on the role of sustainability labeling as it relates to purchase intention and quality perception of products (e.g., Grebitus et al., 2015; de Andrade et al., 2017). Studies have identified significant market potential for sustainable products (e.g.,Vigani et al., 2015; Zhou et al., 2016), but research regarding attitudinal and behavioral issues underlying particular consumer segments remains relatively sparse. While recent work suggests that consumers committed to environmentally sustainable products believe that their actions will be effective in contributing to sustainable development (e.g., von Meyer-Höfer et al., 2015), there remains a need to investigate to what extent involvement, ecological orientation and other psychographics, and underlying evolved psychological biases of human behavior (van Vugt et al., 2014; Griskevicius et

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al., 2012), contribute to identifying and explaining consumer segments that are likely to select environmentally sustainable products.[1] The objective of this paper is to address this gap in the literature with regard to two different product categories, aiming for broader generalizability of our findings.

Our approach builds on earlier explanations of consumer decision making, by incorporating latent psychometric constructs and socio-demographic characteristics in consumer choice models to identify distinct consumer segments (McFadden, 1986; Swait, 1994). However, despite a large body of literature that has applied latent class analysis (e.g., Nilsson et al., 2006; Koistinen et al., 2013) or hierarchical cluster analysis (e.g., Schnettler et al., 2015) to explore consumer heterogeneity in the context of sustainable production and consumption, there is still a lack of latent class studies on sustainable consumption capturing psychographics and exploring psychological aspects, as they relate to product or label design strategies (e.g., De Angelis et al., 2017). Further, previous work has suggested that most consumer models accounting for sustainability are narrow with regard to the attributes in focus, and that models with a broader perspective focusing on the general population would be valuable (e.g., Pedersen and Neergaard, 2006). This paper contributes to the literature, using a widely-encompassing assessment of individual differences to define consumer segments based on data from a survey conducted in Germany ($n = 1579$). Our research analyzes differences in individuals' environmental attitudes with a particular focus on an 'ecological worldview' (Dunlap et al., 2000), personal values (Rokeach, 1973), and other characteristics as a means to provide novel insights into factors that could facilitate interventions toward more sustainable consumption patterns.

The following evolutionary psychology perspective put forward, and its focus on evolutionary biases, is motivated by several factors. First, the evolutionary psychology literature emphasizes the benefits of market segmentation, as it highlights individuals' varying sensitivity to different environmental interventions, suggesting that a "diversified, market-segmented approach might work best" when designing interventions to promote sustainable behavior (van Vugt et al., 2014: 26). Second, an evolutionary perspective enriches and improves our understanding of human behavior, resulting in an improved effectiveness to respond through product labeling and public (information) policy provision. In the words of van Vugt et al. (2014: 3), the aim of an evolutionary bias perspective is "to show how we can better respond to environmental problems through an improved understanding of evolved human nature", thereby complementing insights from other theory frameworks (e.g. Ajzen, 1991; Thaler and Sunstein, 2008). A focus on psychological biases through an evolutionary framework provides, thus, the benefit of an integrative theory for understanding the ultimate reasons why we do the things we do, and is therefore not in competition with these models (Griskevicius et al., 2012; van Vugt et al., 2014).

Although an evolutionary perspective does not assume that people will always be consciously aware of the ultimate reasons for their decisions (van Vugt et al., 2014: 5), we need to distinguish between *proximate* behavioral causes (e.g., put forward by the theory of planned behavior, Ajzen (1991): the consumer is impulsive) and *ultimate* behavioral causes which refer to relatively immediate psychological triggers for behavior (e.g., Kenrick et al., 2010: what leads the consumer to make impulsive choices?) that influence environmental outcomes (van Vugt et al., 2014), and are thus relevant for effective private and public interventions. Therefore, understanding the ultimate reasons for choices helps us with regard to the search for suitable private labeling initiatives and public intervention strategies, whereas neglecting ultimate reasons limits the search for intervention strategies (van Vugt et al., 2014: 5). More specifically, and as further discussed below, a key benefit of accounting for evolved psychological biases lies in the insight that strategies aimed to change consumer behavior might fail if those strategies are mismatched with evolved psychological tendencies (van Vugt et al., 2014).

For the purpose of our empirical study, we concentrate on those biases which we deem most relevant in the context of the issues at hand, including self-interest, social imitation, individuals' tendency to disregard concerns they cannot see or feel, and future discounting. We are therefore drawing a sub-set from a broader set of psychological biases discussed by van Vugt et al. (2014) and in related work (Griskevicius et al., 2012). In Appendix I, we provide a summary of these and other key biases, and arising opportunities for intervention.

Section 2 provides a discussion of relevant literature, followed by an introduction to the theory (Section 3), the presentation of methods (Section 4), and the discussion of empirical results (Section 5) and conclusions (Section 6).

2. Literature

Faced with a vast and growing literature (e.g., Akehurst et al., 2012; Diamantopoulos et al., 2003; do Paço et al., 2009; Jansson et al., 2009; Pedersen and Neergaard, 2006; Straughan and Roberts, 1999; Thomsen and McAloone, 2015), McDonagh and Prothero (2014) have identified five streams of sustainability discourse with a focus on consumer behavior and marketing. Our work falls into their first research stream, which relates to consumer attitudes, behavior and preferences, and investigates various characteristics of the individual. This literature stream has studied pro-environmental behavior (e.g., Turaga et al., 2010; De Angelis et al., 2017; Kumar et al., 2017) and consumers' underlying motivations (e.g., de Medeiros and Ribeiro, 2017). The literature has put forward evolutionary psychology explanations, including self-interest, social imitation (copying the behaviors of others), future discounting (valuing the present more than the future) and individuals' tendency to disregard concerns they cannot see or feel and thus experience (Griskevicius et al., 2012; van Vugt et al., 2014). As for the latter, the evolutionary basis relates to how the brain developed in an ancestral world, in which a physical and instinctual link between behavior (e.g., I pollute my cave) and the environment (the cave becomes uninhabitable) existed. The evolutionary consequence was that since early humans did not face distant, slow-moving environmental problems, the brain did not evolve to be alarmed when confronted with dangers that we cannot experience with our senses (van Vugt et al., 2014: 22). This early environment contrasts today's world of consumption with its frequent disconnect between behavior (e.g., I buy a manufactured product in the store) and its environmental consequences (the factory is poisoning the river downstream) (Griskevicius et al., 2012). Thus, in a world of packaged and manufactured goods, it is more difficult to appeal to our evolved sensory mechanisms to motivate environmental action (van Vugt et al., 2014). As a consequence, in the modern world of consumption, where tangible links and visceral cues are difficult to implement at the point of sale of a typical retail environment, the challenge is to employ proxy stimuli that appeal to pro-environmental behavior and peoples' innate love for nature (biophilia). One strategy for using such stimuli is to have consumers focus on distant environmental problems by presenting them with statistics (Griskevicius et al., 2012) and, possibly, by linking such statistical and facts-based information with other visual measures at the retail level (e.g., a pro-environmental product label with carbon or water footprint numbers). Therefore, it is of interest to consider insights gained from research on product labeling as it relates to sustainable consumption in general, and footprint labeling in particular.

The footprint labeling literature is based on the concept of ecological footprints espoused by Rees (1992). Following this concept, carbon footprints refer to the amount of CO_2 created, and water footprints

[1] We follow Demby's (1994) definition of psychographics, in terms of "The use of psychological, sociological, and anthropological factors, such as benefits desired (from the behavior being studied), self-concept, and lifestyle (or serving style) to determine how the market is segmented by the propensity of groups within the market–and their reasons–to make a particular decision about a product, person, ideology, or otherwise hold an attitude or use a medium."