Consumers' Preferences for Eco-innovative Products: Elicitation of Willingness to Pay for Upgradeable Products with Calibrated Auction-Conjoint Method

V. Lobasenko[1], D. Llerena[2,1]

[1] INRA, GAEL, F-38000 Grenoble, France
valeriia.lobasenko@upmf-grenoble.fr
[2]. Univ. Grenoble Alpes, GAEL, F-38000 Grenoble, France
Daniel.llerena@upmf-grenoble.fr

Abstract

Understanding consumers' preferences is a key element of new product development and sustainable consumption. Current research emphasizes new products with an upgrade possibility. An introduction of upgradeable products on the market allows keeping in step with changed consumers' preferences while not buying a new product but upgrading a crucial part of the old product. Such marketing strategy may ease consumers' concerns about the obsolescence of their products as well as their concerns about sustainable consumption. Little is known about consumers' preferences for eco-innovative products with upgrade possibilities during their lifetime, and, precisely, the components of these preferences.

A fundamental research on upgradeable products (named flexible) by Alptekinoglu and Ramachandran (2014) consists of claiming that consumer may adjust some attributes of the product while using/consuming it. The authors suppose that if consumers' preferences change in time, a consumer may have a disutility from having a 'bad' product at time t+1, when he/she has bought this product at time t while it was 'good' yet. A consumer is interested in buying an upgradeable product when he has a high valuation of it, so he is ready to pay a premium. At the same time a consumer anticipates a significant costs reduction in future due to the economies realized by upgrading the product's obsolete parts only and not buying a new expensive product. The paper claims as well that "a flexible product may lead to more profits [to a producer] than a portfolio of standard products when consumer preferences are more stable" due to an elevated value of each upgrade. These notions are supported in the empirical work of Ülkü et al. (2012). The authors use a titration method and state that the valorization of an upgradeable product depends on the initial price and the price of upgrade, the periods between upgrades, the perceived quality of the upgrade and perceived efforts to install it. The results show that in general consumers are willing to pay premiums for upgradeable products, however, the more distant the upgrade is, the smaller are the premiums. Consumers tend to undervalue future savings when the product has a short upgrade period and to overvalue future savings in case of a long upgrade period. So, an upgradeable strategy is advantageous for long-life-cycle products with slow technology development processes. The authors also conclude that consumers are willing to pay less if the perceived quality of an upgrade is low and the perceived efforts are high.

By now there are many value elicitation methods had been developed: auctions, real and hypothetical choices analyses (contingent valuation, conjoint analysis, etc). In this paper we use calibrated auction-conjoint method (CACM) introduced by Lusk and Norwood (2011). CACM combines benefits of conjoint analysis with those of auctions, which gives a possibility to answer more thoughtfully placing the bids for a product (i.e. a vacuum cleaner or an upright vacuum cleaner in our research) and by this assessing the components of preferences and WTP for the product's upgrades. The method consists of three stages. First stage proposes a participant to rate the desirability of each attribute level of the product on the Likert scale (1 is the least desirable and 10 is the most desirable), assuming that all other characteristics are hold constant. On the second stage respondents are invited to indicate the relative importance of each attribute of the product on the Likert scale of 1 to 7 (1 is very unimportant and 7 is very important). Finally, on the third stage participants see the summary of their bids for several configurations of the product, which are calculated on the basis of the answers on previous stages. WTP is calculated as a premium for an upgradeable product versus a non-upgradeable. This method allows a participant to analyze a large number of attributes one by one and recalculate the bids (by changing the weight for an attribute in total product evaluation) if at the end of the session they do not agree with the calculation of their bids. To our knowledge this is the only research, which uses CACM for durable products with upgrade possibility.

The design of the experiment includes two types of upgrades: a) usage optimization and connectivity upgrade, b) upgrade of a functional part (a battery for an upright vacuum cleaner, a motor for a vacuum cleaner) and its' accessories. These two types of upgrades are relevant with the literature: previous research on upgradeable vacuum cleaners (Inoue et al., 2014) is focused on a vacuum cleaner with a performance upgrade by exchanging a motor part. Three different scenarios are proposed in Inoue et al. (2014) paper: an upgrade with an amelioration of suction power, an upgrade leading to a noise decrease and an upgrade leading to an energy consumption decrease. In our research an upgrade option is presented as an after-purchase service as well as the standard warranty option. Numerous attributes are also included in the design (price, weight, power, autonomy period, etc.)

To study people's preferences for eco-innovative products with upgrades, we have conducted an online survey in mid May 2014 with 323 participants in France.

If we look at the rates of desirability given by each participant for each level of attributes we can observe that participants had an expected behavior: the rates of desirability decreased for some attributes (i.e. price, time of recharge, noise) or increased for others (i.e. autonomy, number of accessories, number of speed modes). However, for the upgrade attribute the distribution is not that clear: 68% of participants indicate "standard warranty" as important level of upgrade attribute, only 31% state that for "usage optimization and connectivity" and 46% for "evolution of the battery/the motor". In other words, the standard warranty, i.e. the absence of the upgrade, is the most valued by the participants, when the upgrades themselves are much less desirable.

If we look at the weights distribution given by each participant for each attribute we can observe that most of the attributes have equal weight for consumers. The three less valued attributes are the brand, the accessories and the upgrade.

As shows our experiment, only about 65% of players have changed their weights for the price attribute (30,6% increased it and 34,7% decreased it). For the upgrade attribute as well about 64% have changed the weight, however for this attribute more than 45% has decreased the weight. There are no visible trends of how participants changed the weights - the number of each attribute changes is almost constant (exception is the accessories attribute for which more than half of the participants changed the weight negatively after the revision). These results support the idea that when people have a possibility to refine and change their preferences they do that in majority, what is not possible in other preference elicitation methods.

The advantage of the CACM method is in a possibility to have a clear image of how preferences are formed and allows to get WTP estimations of all variations of UVC from the attribute-based utility functions. However, there are some limits in using this method. As found in previous research using this method, it is valid and allows getting significant results for low-priced products. The calculation of utility function induces only small WTP variation in the presence of a large number of attributes, so in case of high prices, this variation is too small to be perceived by a consumer. For instance, the price for an upright vacuum cleaner varies only from 113,2€ to 120,4€ for 4 different configurations.

Key words: Sustainable consumption, preferences, willingness to pay, calibrated auction-conjoint method