The Journal of Choice Modelling 11 (2014) 16–29

Contents lists available at ScienceDirect

The Journal of Choice Modelling

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

Does attribute cut-off elicitation affect choice consistency? Contrasting hypothetical and real-money choice experiments

Riccarda Moser [a], Roberta Raffaelli [b,*]

[a] Research and Innovation Centre, Edmund Mach Foundation, Via Mach 1, 38010, San Michele all'Adige, Italy
[b] Department of Economics and Management, University of Trento, Via Inama 5, 30122 Trento, Italy

ARTICLE INFO

Article history:
Received 23 August 2013
Received in revised form
6 December 2013
Accepted 5 February 2014
Available online 14 June 2014

Keywords:
Choice experiment
Non-compensatory behaviour
Heuristics
Cut-offs
Scale parameter

ABSTRACT

The use of threshold values (cut-offs) is a well-recognized simplifying strategy in real life decision-making processes. Recent stated preference studies show that strategies used by respondents in hypothetical settings are consistent with how they normally process information in real markets. Of the different discrete choice models using cut-offs, the Swait (2001) model allows different heuristics to be captured. The few applications of this soft cut-off approach mainly focus on the effects of cut-offs on attribute estimates and willingness to pay, but scant attention has been paid to the consequences of cut-off elicitation. We focussed our investigation on the effects of self-reported cut-offs on choice consistency. In line with studies on context and complexity effects in choice modelling, we parameterize the scale parameter on the basis of two alternative measures related to the stated cut-offs: (1) the number of potential violations included in the choice cards, and (2) the number of cut-offs stated at the most severe level. Moreover, we investigated whether different treatments (hypothetical vs. real-money) affect cut-off elicitations, violations and choice consistency.

We tested our models using an empirical dataset generated by a field choice experiment on consumers' preferences for apples. The data show that most respondents stated they had cut-off values in mind when buying apples, but, as expected, in most cases they violated them in their actual choices. Estimation of heteroskedastic logit models shows that the proposed measures related to stated cut-offs have a systematic effect on the variance of the error term, but only in the hypothetical treatment. That is, respondents were found to be less consistent as the number of potential violations or the number of cut-offs stated at the most severe level increased. In the real-money treatment, neither of the coefficients of the two measures was statistically significant. This may indicate that when choices are binding, consumers put necessary effort into each choice card, regardless of the number of potential violations, and they are more consistent.

1. Introduction

Research in consumer behaviour has long confirmed that consumers often simplify decisions by adopting non-compensatory behaviour in the marketplace (Ford et al., 1989; Huber and Klein, 1991; Simonson and Tversky, 1992; Scheibehenne et al., 2008; Adamowicz and Swait, 2013). Of the various heuristics followed in decision making, those that

* Corresponding author. Tel.: +39 0461 282274.
E-mail addresses: riccarda.moser@fmach.it (R. Moser), roberta.raffaelli@unitn.it (R. Raffaelli).

http://dx.doi.org/10.1016/j.jocm.2014.02.003
1755-5345/

are threshold-based are described as "pervasive" by Huber and Klein (1991: pp. 346), who state: "*One common simplification process is the use of a non-compensatory cut-off, that is, establishing a minimum acceptable level on an attribute that an alternative must possess to be considered further*". Interestingly, cut-offs are not associated with a single heuristic, rather several heuristics are based on cut-offs (see Leong and Hensher, 2012).

Understanding the processes underlying consumers' decision-making is of growing interest in stated preference research. In choice modelling, it has often been assumed that respondents consider all the attributes presented to them, as if all of these somehow influence their choices (Kaye-Blake et al., 2009). Recent studies on attribute processing strategies show that in hypothetical settings individuals appear to adopt a range of "coping" strategies that are consistent with how they normally process information in real markets (Hensher, 2010).

The use of cut-off based heuristics raises two related issues: how to identify the heuristics adopted by respondents and how to model their choices. Heuristic identification can be approached in at least two ways: by inferring them from the choices made or by asking the respondent directly. In the latter case, this can be done either through process tracing methods (Ford et al., 1989; Denstadli et al., 2012), that is, by asking respondents to state what they were thinking during the decision-making task, or by asking supplementary questions in the survey.

Various choice models use cut-off heuristics (Rotondo, 1986; Manrai and Sinha, 1989; Swait, 2001; Elrod et al., 2004; Gilbride and Allenby, 2004; Cantillo et al., 2006; Cantillo and Ortúzar, 2006; Martinez et al., 2009; Kaplan et al., 2011). Swait (2001) plays a central role in this field with the incorporation of the concept of soft cut-offs into the discrete choice setting. This concept attempts to model both the use of cut-offs and their violation, since there is ample evidence that respondents often violate their stated cut-offs (Green et al., 1988; Huber and Klein, 1991). According to Swait (2001) a respondent may violate stated or self-reported cut-offs for single attributes having evaluated the benefits associated with the bundle of attributes represented in that particular alternative. His model accommodates cut-off violations as though the respondent prefers to tolerate the associated potential cost (penalty) rather than give up that particular alternative; he clearly states that his model is a paramorphic representation and does not imply that people actually act or think according to it. Penalties for cut-off violations represent discontinuities in peoples' preferences and therefore soft cut-offs can also be used to represent nonlinearities and discontinuities in the deterministic portion of the utility function (Bush et al., 2008).

Applications of Swait's soft cut-off approach are still scarce in the literature. They are found in transport economics (Danielis and Marcucci, 2007; Marcucci and Gatta, 2011; Hensher and Rose, 2012), health economics (Amaya-Amaya and Ryan, 2006; Mentzakis et al., 2011) and environmental and resource economics (Bush et al., 2008, 2009). To the best of our knowledge, there have been only two applications in food economics. Aizaki et al. (2012) examined Japanese consumers' preferences for beef characterized by different countries of origin and Bovine Spongiform Encephalopathy (BSE) test status, and included stated cut-offs concerning BSE test status. Ding et al. (2012) investigated the influence of attribute cut-offs in Canadian consumers' choices of a functional food: canola oil characterized by country of origin, omega-3 content and GM/non-GM derivation.

Previous applications mainly focussed on the effects of cut-offs on attribute estimates and willingness to pay. In particular, it has been demonstrated that ignoring thresholds in datasets containing them leads to significant errors in WTP estimation (Cantillo et al., 2006; Kaye-Blake et al., 2009). The most recent research focusses on other issues: Hensher and Rose (2012) show how attribute cut-offs condition the perceived acceptability of an alternative, while Ding et al. (2012) address issues of heterogeneity in individual's responses to cut-offs and cut-off endogeneity. Little attention has been paid to the potential consequences on choices of letting respondents specify their cut-offs before the choice task. The question we address in this paper is the following: does cut-off elicitation affect the consistency of subsequent choices? In order to answer this question, we used an empirical dataset generated by a choice experiment (CE) on consumers' preferences for apples. As this CE included purely hypothetical and real-money treatments, we were also able to investigate whether different treatments affected cut-off elicitation, violations and choice consistency.

To the best of our knowledge, this is the first application focussing on the effects of cut-off elicitation on choice consistency in hypothetical and real-money treatments. Information about cut-offs elicited in the CE was not only introduced into the deterministic part of the utility function in accordance with the Swait's model, it was also used to set the scale parameter in line with studies on complexity effects and consistency in choice modelling (Dellaert et al., 1999; Swait and Adamowicz, 2001a, 2001b; DeShazo and Fermo, 2002; Caussade et al., 2005; Hensher, 2004, 2006).

Our contribution is of interest to food choice modellers as food choice is highly routinized and is a good example of a context where decision makers may adopt simplified rules for choosing between goods (Adamowicz and Swait, 2011, 2013). More generally, given the recent interest in thresholds and cut-off elicitation in stated preference research (Chou et al., 2008; Mørkbak et al.,. 2010; Campbell et al., 2012; Hensher and Rose, 2012) it adds to the scant literature on whether and how to elicit respondent cut-offs.

The paper is structured as follows: Section 2 briefly deals with cut-off identification and discusses the potential effects on the choice task; Section 3 describes the survey design and administration; Section 4 describes the model specification; Section 5 presents the results; and Section 6 presents our conclusions.

2. Cut-off identification and potential effects on the choice task

The use of threshold values is a well-recognized simplifying strategy in the decision-making process (Payne, 1976; Klein and Bither, 1987; Huber and Klein, 1991; Svenson, 1996). In stated preference studies, the main approach used to identify