

## Vienna 2019 Abstract Submission

### Title

Cognitive load and attribute information processing: the case of craft beer.

### I want to submit an abstract for:

Conference Presentation

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### Keywords

Cognitive load and attribute information processing: the case of craft beer.

### Research Question

To test whether cognitive depletion is source of information heuristics (ANA) in consumers' preference formation for craft beer products

### Methods

We conducted an online choice experiment on 650 consumers in Indiana using craft beer with different attributes. The Stroop task approach was used for inducing cognitive depletion

### Results

Cognitive depletion affects ANA behavior and WTP formation, but the nature of the attribute is an important factor to take into consideration

### Abstract

Choice Experiments (CEs) are frequently used in studies related to the food and beverage consumption in order to elicit consumers' preference and WTP for products and/or products attributes. In CEs respondents are presented with several hypothetical purchasing scenarios (choice tasks) containing product alternatives which differ in terms of attributes and attribute levels.

Authors have argued that individuals may employ processing heuristics in decision making (De Han & Van Veldhuizen; 2015). In the CE literature, "attribute non-attendance" (ANA) is referred as a salient heuristic in choice behavior where respondents ignore (non-attend) some attribute information when making choice decisions. Several studies show that ANA in CEs can significantly affect WTP and welfare estimates, suggesting that the conventional reliance on assumptions of a fully compensatory choice making might lead to potential bias formation (Hensher et

al., 2012, Scarpa et al., 2010). Indeed, Thiene et al. (2013), observed that ANA was a major caveat in the determination of consumers' preferences for certifications of origin on Prosecco wine. Accordingly, researchers have increased investigating the behavioral reasonings behind ANA behavior in choice experiments (Alemu et al., 2013).

The aim of the present study is to test for the first time in the literature whether cognitive depletion can influence individuals' choice behavior and in particular exacerbate attribute non-attendance behavior in preference formation for craft beer products. In cognitive psychology willpower is considered a relevant factor in explaining individuals' decision making and information processing (Vohs et al., 2014). Willpower is the capacity to exert self-control. A depletion of willpower capacity due to exertion induces a decrease in cognitive capacity, which is a limited resource. Pocheptsova et al. (2009), showed that individuals tend to switch to simpler, less effortful decision making processes when temporary depletion of mental resources is induced. We focused on craft beer given the increasing interest of consumers towards this product and towards the quality attributes that might characterize it (Malone and Lusk, 2018).

Between November 2016 and January 2017 we conducted an online choice experiment with 650 consumers in Indiana, USA. The craft beer was described by four attributes including brewing location (brewed in Indiana, Great Lakes region, or the U.S.), location of hops production (produced in Indiana, Great Lakes region, the U.S., or not labeled), organic/conventional production (organic or not labeled), and price (\$6.99, \$9.99, \$10.99, \$12.99, and \$16.99). Attributes and attribute levels were allocated across 16 choice tasks using a Bayesian efficient experimental design approach (Scarpa et al., 2007). The 16 choice tasks were then divided into two blocks of 8 and the respondents were randomly assigned among the two blocks. Each choice task consisted of two product alternatives and a no-buy option. In addition, we included a question eliciting ANA behavior at the choice task level so that for each choice task respondents were asked which attributes they ignored.

In order to capture the effect of willpower depletion on consumers' choice behavior, we implemented the Stroop task method (Stroop, 1935). Respondents were randomly assigned to one of three treatments differing in terms of the degree of induced cognitive depletion given by the use of different Stroop tasks. The first treatment was the control treatment, which did not include any form of Stroop task. The second treatment was the "Stroop test" treatment, where respondents prior to the choice experiment, were presented with a word that represented the name of a color (e.g. blue, red, orange, yellow, purple) which was displayed in a font of a mismatching color. For example, the word "red" was printed in the color yellow. The participants were instructed to select the color of the font the word was printed in, rather than its lexical meaning. This treatment was meant to simulate cognitive depletion. Finally, the third treatment was the "non-Stroop test" treatment. The "non-Stroop test" treatment differed from the "Stroop treatment" by instructing respondents to select the color corresponding to the lexical meaning of the word. This treatment acted as a control to the "Stroop test" treatment (Pocheptsova et al., 2009). When a color word is written in a different font color, the initial impulse is to read the lexical meaning of the word. Naming the font color instead is a form of self-regulation that induces willpower to be undertaken since it requires one to abrogate the tendency to read the color word. As a consequence, taking part in the "Stroop-test" treatment instead of the "non-Stroop test" treatment would implicate a decrease in the amount of remaining willpower that can be then used in the choice experiment questions. This would then allow us to observe how different degrees of cognitive effort would influence individuals' responses.

For each treatment, data have been analyzed using a Random Parameter Logit Model with Error Component (RPL-EC) (Caputo et al., 2013). Specifically, for each treatment we estimated RPL-EC models without accounting for (Model 1) and accounting (Model 2) for ANA behavior by parameterizing the ignored attributes to zero. Preference and WTP estimates from Models 1 and 2 were compared across the different treatments so that we were able to determine whether willpower depletion affected respondents' attribute information processing and evaluations for the different craft beer products.

Results show that cognitive capacity effects attributes processing on craft beer. Indeed our results show that individuals attended differently attribute information on craft beer products depending on whether they had or not a cognitive depletion task before answering the choice questions. However, our results do not support our hypothesis that cognitive depletion increases ANA behavior given that individuals who took part in the Stroop task treatment stated to have ignored the experimental attributes with lower frequency than respondents belonging to the other two treatments. Models estimates also support this. Our explanation of this result is that answering to stated ANA questions might have also been a source of cognitive effort to respondents, who might have then chosen the simpler and less effortful "I did not ignore any attribute" alternative when cognitive resources were

depleted. However, this is simply our assumption. In case coherence between choice behavior and ANA statements is observed, our assumption might not be confirmed. For this reason, we call for the need of the implementation of econometric analysis which can assess whether self-assessed ANA responses reflect individuals' choice behavior. Moreover, our results support that the nature of the attribute in question might be an important factor in explaining for ANA behavior. Indeed, we observed significant differences in ignoring nonprice attributes, such as brewing location or production hops location, across the different treatments. On the other hand, price was equally attended across the different treatments. This might be explained by the fact that price may be perceived as a more familiar or more valued attribute than the others and therefore its choice does not imply an extra cognitive effort (Campbell et al., 2008, DeShazo and Fermo 2004, Heidenreich et al., 2017).

In conclusion, we believe our results show that researchers should take into consideration cognitive load and ANA behavior in the investigation consumers' evaluation for products characteristics, such as in the case of craft beer.

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