Reliable willingness-to-pay estimates for specialty eggs using an online hypothetical survey

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Understanding market demand and premiums paid for food products with social and environmental attributes (locally produced, animal welfare, sustainable production systems) is increasingly important to ensure agricultural policies satisfy consumer demands and that the productivity constraints are economically sustainable. Non-hypothetical experimental auctions (NHEA) are the preferred elicitation method since they are believed to be more reliable then hypothetical elicitation methods, however NHEA are expensive to conduct and not applicable to all types of goods. Ideally, measuring market demand for specialty products could be done quickly and cheaply using online surveys. In this study we examine methodological approaches to produce reliable estimates from internet surveys.

Methodology

The data for this study was obtained by an internet survey on the willingness to pay for dozen regular eggs and a dozen cage free eggs. The sample is composed mostly of residents from Montréal. Potential participants were informed that they would receive $20 by mail. Participants were randomly allocated to either a hypothetical stated preference (SP) or a NHEA treatment. In both cases, a neutral explanation presented the production methods used for each type of eggs. The bidding page included the standard prices found in grocery stores in the Montreal area for a dozen regular eggs ($3.10), a dozen organically produced eggs ($6.45) and dozen omega-3 enriched eggs ($4.39). The SP treatment used the following open ended question: 'Please enter the maximum you would be willing to pay for a dozen regular eggs'. Once the amount was entered and submitted it could no longer be changed. The next page of the survey was identical to the previous except that it asked the maximum price for a dozen cage free eggs. The NHEA treatment used a Becker-DeGroot-Marschak (BDM) auction to elicit values. An explanation of the auction was followed by a practice round to illustrate the BDM mechanism. Once recruited an additional 8$ was added to the payout (for a total of 28$) to compensate for potential economic transaction of the binding auction. If their bid value was above the randomly selected draw for that treatment, then the bid would be deducted from their payment in exchange for a coupon to be exchange at a local grocery store for a dozen eggs of the appropriate type.

-Additional questions where used to determine purchase intentions, strategic behaviours and standard socio-economic information.

Sample

Table 1 reports the descriptive statistics for the socio demographic characteristics. The data is presented for the both SP and NHEA. Both treatments share comparable samples characteristics. For instance, less than 40% of respondents are male, the average age is between 34 and 40 and the majority of respondents hold a university degree.

Table 1 : Descriptive statistics for the hypothetical and non-hypothetical treatments

Variable Name	Stated Preference % or mean(SD)*	NHEA % or mean(SD)*
Socio demographic		
Gender (Male = 1)	37,5	37,7
Age (in years)	34,5 (14)	39,8(15.4)
University degree (bachelors, masters or PhD)	52,3	63,1
Household with more than 2	27,4	27,9
Buy's organic always or often	14,3	11,5
Number of Participants	**128**	**122**

Results

Table 2 reports the average bids per treatment for a dozen regular eggs and cage free eggs. Results clearly indicate the presence of a hypothetical bias[1]. For instance, people declared being willing to pay $3.33 and $4.59 for regular and cage free eggs, respectively. However, when confronted to real transaction, their willingness-to-pay is reduced to $2.21 and $3.19 for regular and cage free eggs, respectively.

The third column shows the averages of the price premiums paid by individuals. Note that the price premium represents the difference between individual bids for regular egg and bids for cage free egg. Interestingly, statistical tests indicate that there is no difference between the SP and NHEA treatments when we consider the price premium calculated for each individual. This means that the price premium does not

[1] The hypothetical bias is when people declare willingness-to-pay that are different in hypothetical situation relative to willingness-to pay in the context of real transaction.

seem to be subject to the hypothetical bias.

Table 2: Mean Bids (CDN$) for a dozen regular eggs, a dozen cage free eggs, and the difference for each respondent. The Mann-Whitney U test statistic for the null hypothesis that both bid samples are the same.

Treatements	Regular Eggs ($CDN)	Cage Free Eggs ($CDN)	Premiums (Cage Free - Regular) ($CDN)
SP	3,33	4,59	1,26
NHEA	2,21	3.19	1,03
Mann–Whitney U test	p-value > 0,001	p-value < 0,001	p-value > 0,1

Examining the distribution of bids provides further insight into differences in bidding behaviour between treatments. Figure 1 shows the bid distribution for cage free eggs of the stated preference treatment, in red, against the bids of the NHEA, in blue. It is clear from this figure that the behaviour in hypothetical setting is much more erratic compared to the auction. The diverse bidding behaviour in stated preference can be explained by strategic behaviour, measured in our model, and by other unmeasured variables previously discussed in the literature, such as social desirability. This heterogeneity in behaviors makes it difficult to obtain a reliable willingness to pay estimate from the stated preference data.

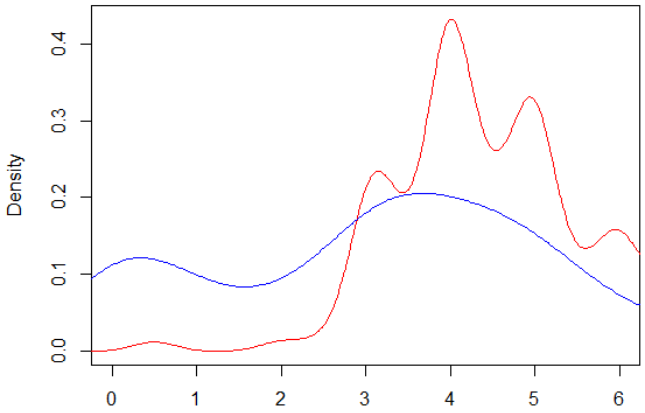

Figure 1: Density of the bids for cage free eggs. NHEA treatment (blue line) Stated preference (red line)

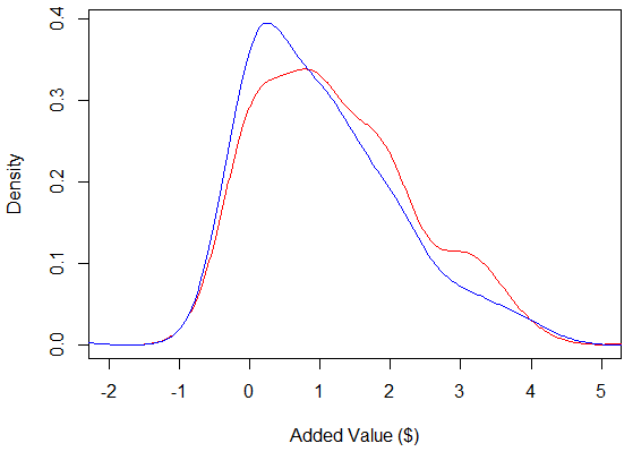

Figure 2: Density of the price premiums calculated at individual level. NHEA treatment (blue line) Stated preference (red line)

Interestingly, when we examine the bidding distribution for the price premium (Figure 2) we find that both

treatments are relatively similar. This would suggest that the observed diversity of behaviour is consistent for individuals over several bids. Taking the difference, cage free eggs bid minus regular eggs bid, would seem to eliminate the diversity of behavior observed in stated preference setting.

Therefore, price premium estimates from stated preference surveys would match those of auctions, as observed with the averages (Table 2), and would be reliable.

Conclusion

From the current study results it would seem that stated preferences can yield reliable estimates of price premiums if these are calculated from bids on the regular and a value added products. Consequently, low cost internet surveys can quickly provide reliable information on market willingness-to-pay for specialty eggs or other value added products.

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