

Discussion of “Risk Preference Types, Limited Consideration, and Welfare” by Levon Barseghyan and Francesca Molinari

Elisabeth Honka*

It is a pleasure to discuss this article by Levon Barseghyan and Francesca Molinari. It represents the third article in a series of papers by the authors (with co-authors; Barseghyan, Molinari, and Thirkettle 2021, Barseghyan et al. 2021) in which they incorporate consumers’ limited consideration when making decisions under risk. In this paper, the authors allow for rich unobserved heterogeneity across consumers: (i) consumers can vary in their preference type, i.e., make decisions according to expected utility theory (EU) and Yaari (1987)’s dual theory (DT); (ii) consumers can vary within each type, i.e., have different coefficients of absolute risk aversion in EU or different coefficients for the parameter guiding the probability distortion function in DT; and (iii) consumers can have different considerations sets, i.e., the sets of alternatives consumers consider before making purchase decisions. Using this set-up, the authors lay out sufficient conditions for semi-parametric point identification in the EU and DT decision frameworks. From an empirical perspective, the most important requirements for the applicability of their findings is access to data on consumer choices in two distinct contexts, e.g., data on consumers’ choices of two different deductibles within the insurance context, and access to all prices for both contexts, i.e., data on prices of chosen and not chosen deductibles for both contexts.

My comments cover the importance of accounting for limited consideration in empirical work, discuss reasons for consideration in the context of this paper, examine empirical results, and make suggestions for future research.

*University of California Los Angeles, elisabeth.honka@anderson.ucla.edu.

1 Importance of Accounting for Limited Consideration

Limited consideration matters. Consideration sets matter because of their prevalence and their effects on market outcomes.¹

There is ample empirical evidence that consumers rarely make purchase decisions from the complete set of available products. Across a variety of products, markets, and industries, researchers have documented the existence of consumer consideration sets over the last decades.² Furthermore, consumers’ consideration sets are typically small: they usually contain two to four products.³

Not accounting for consumers’ consideration sets, i.e., incorrectly assuming that consumers take all available products into account when making purchase decisions, results in biased preference estimates. Since preference estimates are used to calculate elasticities and make predictions for other economic quantities of interests, such as competition or consumer welfare, biased preference estimates might result in the wrong conclusions. This point has been consistently made by prior research studying consumer consideration sets. For example, Honka (2014), Koulayev (2014), and Moraga-González, Sándor, and Wildenbeest (2022) show how not accounting for consumers’ limited information biases price elasticity estimates. Hortaçsu and Syverson (2004), Honka (2014), and Gaynor, Propper, and Seiler (2016) demonstrate how not taking consumers’ limited consideration into account changes welfare implications.

¹Throughout the economics and marketing literature, consideration sets have also been called “search sets,” “evoked sets,” or “(endogenous) choice sets.”

²For example, see Hauser and Wernerfelt (1990) for a variety of grocery store products, Roberts and Lattin (1991) for cereal, De los Santos, Hortaçsu, and Wildenbeest (2012) for books, Honka (2014) for auto insurance, Koulayev (2014) and Ursu (2018) for hotels, Bronnenberg, Kim, and Mela (2016) for digital cameras, Honka, Hortaçsu, and Vitorino (2017) for savings accounts, Ursu, Wang, and Chintagunta (2020) for restaurants, Kapor (2020) for colleges, Yavorsky, Honka, and Chen (2021), Gardete and Hunter (2020), and Moraga-González, Sándor, and Wildenbeest (2022) for cars, Morozov et al. (2021) for cosmetics, and Zhang et al. (2023) for shoes.

³For example, consumers’ average consideration set sizes are 2.4 for auto insurance (Honka 2014), 2.8 - 6.4 for digital cameras (Bronnenberg, Kim, and Mela 2016), 2.5 for savings accounts (Honka, Hortaçsu, and Vitorino 2017), 2.3 for online used cars (Gardete and Hunter 2020), 1.4 for cosmetics (Morozov et al. 2021), 1.1 for new car purchases (Yavorsky, Honka, and Chen 2021), 1.7 for home improvement products (Amano, Rhodes, and Seiler 2022), and 1.9 for shoes (Zhang et al. 2023).

Despite ample empirical evidence of the importance of accounting for limited consideration, most applied research still maintains the assumption that consumers take all available products into account when making purchase decisions. This practice is partially driven by researchers not always having data on consumers’ consideration sets. Therefore, Barseghyan and Molinari (2023) (together with the prior articles in this series of papers) provides an important contribution on how to account for / estimate consideration sets when inferring demand for risky products in a setting in which data on consideration sets is unavailable.

2 Reason For Limited Consideration

The authors remain mute about the reason for consumers’ limited consideration in their article. Classic marketing literature has suggested that consideration sets are driven by firms’ marketing activities, such as advertising or promotions (see, e.g., Allenby and Ginter 1995, Andrews and Srinivasan 1995, Bronnenberg and Vanhonor 1996, Ching, Erdem, and Keane 2009, Van Nierop et al. 2010). This view was also picked by Goeree (2008) in which consideration sets are driven by advertising. Another (newer) stream of literature in both marketing and economics has viewed consideration sets as the outcome of a search process. Typically, consumers are assumed to have uncertainty about a product characteristic (e.g., price or match value) prior to searching. Because search is a costly activity (due to opportunity cost of time, psychological cost, etc.), consumers only search a subset of available products which form their consideration sets (see Honka, Hortascu, and Wildenbeest 2019 for a detailed overview).

Recall that the model is set up to allow researchers to estimate demand with data from one company. In the model, consumers know their type (EU or DT), their preferences, and the prices for all alternatives in both decision contexts, i.e., have full information about all product characteristics. Given consumers’ perfect knowledge of their utilities for all options, search to resolve uncertainty about a product characteristic cannot be the reason

for consumers' limited consideration.

As mentioned above, consideration sets have also been modeled as a function of firms' marketing activities, e.g., advertising. While the authors estimate constant consideration probabilities, these could, in principle, easily be made functions of marketing activities. However, the data come from one company and consumers make decisions in two distinct decision contexts, e.g., two deductible choices for auto insurance. Firms' marketing activities are unlikely to vary at that level: companies typically employ marketing activities at the brand or product level but not more granularly.

To sum up, the paper is more consistent with the consideration set than with the search literature. While it can describe consumers' limited consideration, it cannot explain *why* consumers only consider a subset of alternatives. The reasons for limited consideration matter because inform the need for policy interventions and provide guidance for the most effective policy intervention.

3 Empirical Results

The authors apply their model and identification results to the estimation of preferences and the type share for consumers choosing levels of two deductibles (for collision and comprehensive auto insurance). Subsequently, the authors make counterfactual predictions for consumer welfare for the case that both collision and comprehensive insurance were to be combined into one coverage. The authors find that such an intervention has weakly negative effects under EU and might increase consumer welfare under DT.

The authors are careful in viewing this as an empirical application for illustrative purposes and this is a point that I would also like to emphasize. The data are over 15 years old and the auto insurance market has gone through several important changes: the internet has fundamentally changed the insurance shopping process, auto insurance companies now have less oversight and more freedom in setting prices, user-based insurance (UBI) using telematics

data is widespread, and autonomously driving vehicles are entering the streets. Additionally, the data are from one company. Customers vary across firms: e.g., some firms attract more price-sensitive customers, while other firms might attract more service-sensitive customers. Using data from one firm allows to infer preferences for that firm’s customers and make counterfactual predictions for that firm’s customers. However, other firms’ customers likely have different preferences and therefore predictions for these customers might be different. To put it differently, the empirical results are not representative of today’s market and auto insurance buying population.

To summarize, I agree with the authors that the change-in-welfare predictions should be viewed as illustrating the importance of a model that allows for different risk types and limited consideration, but not as providing substantial guidance on whether it would be beneficial for consumers if lines of coverage were to be combined.

4 Conclusion

Developing models and methods to account for consumers’ limited consideration in demand estimation when only data on choices is available is an important and growing area of research (see also, e.g., Choi, Dai, and Kim 2018, Abaluck and Adams 2021). It represents a valuable complement to the research that utilizes data on consumers’ consideration sets.

Based on my reading of the paper, I would like to make two suggestions for future work. First, the authors currently assume that, within a single context, the households’ ranking of alternatives is monotone in ν_i for $t_i = 1$ and in ω_i for $t_i = 2$ resulting in vertical differentiation of alternatives within each preference type. In empirical work, researchers often also worry about horizontal differentiation. Therefore, they usually include a vector of observable product or firm characteristics in consumers’ utility function and estimate heterogenous consumer preferences for these characteristics. Doing so would be especially important if the data under study contained insurance purchases from multiple firms instead

of one. However, the authors' identification results do not hold in such specification. I encourage the authors to explore whether an extension in this direction is possible.

And second, Assumption 2.5 states that consideration sets are independently drawn conditional on x_i and ν_i for $t_i = 1$ and ω_i for $t_i = 2$. From an applied perspective, this represents a strong assumption. For example, within the current model, I would expect that more risky consumers have smaller consideration sets. Within a more general model specification, such as the one discussed in the previous paragraph, I would expect consideration sets to be correlated with consumer preferences. I urge the authors to explore this avenue for future work.

Conflict of Interest Statement

I state that there are no competing interests to declare.

References

- Abaluck, Jason and Abi Adams (2021), “What Do Consumers Consider Before They Choose? Identification from Asymmetric Demand Responses,” *The Quarterly Journal of Economics*, 136 (3), 1611–1663.
- Allenby, Greg and James Ginter (1995), “The Effects of In-Store Displays and Feature Advertising on Consideration Sets,” *International Journal of Research in Marketing*, 12 (1), 67–80.
- Amano, Tomomichi, Andrew Rhodes, and Stephan Seiler (2022), “Flexible Demand Estimation with Search Data,” Working Paper, Imperial College London.
- Andrews, Rick and T. Srinivasan (1995), “Studying Consideration Effects in Empirical Choice Models Using Scanner Panel Data,” *Journal of Marketing Research*, 32 (1), 30–41.
- Barseghyan, Levon, Maura Coughlin, Francesca Molinari, and Joshua Teitelbaum (2021), “Heterogeneous Choice Sets and Preferences,” *Econometrica*, 89 (5), 2015–2048.
- Barseghyan, Levon and Francesca Molinari (2023), “Risk Preference Types, Limited Consideration, and Welfare,” *Journal of Business and Economic Statistics*, forthcoming.
- Barseghyan, Levon, Francesca Molinari, and Matthew Thirkettle (2021), “Discrete Choice under Risk with limited Consideration,” *American Economic Review*, 111 (6), 1972–2006.
- Bronnenberg, Bart, Jun Kim, and Carl Mela (2016), “Zooming in on Choice: How Do Consumers Search for Cameras Online?” *Marketing Science*, 35 (5), 693–712.
- Bronnenberg, Bart and Wilfried Vanhonacker (1996), “Limited Choice Sets, Local Price Response, and Implied Measures of Price Competition,” *Journal of Marketing Research*, 33 (2), 163–173.
- Ching, Andrew, Tulin Erdem, and Michael Keane (2009), “The Price Consideration Model of Brand Choice,” *Journal of Applied Econometrics*, 24 (3), 393–420.
- Choi, Michael, Anovia Yifan Dai, and Kyungmin Kim (2018), “Consumer Search and Price Competition,” *Econometrica*, 86 (4), 1257–1281.
- De los Santos, Babur, Ali Hortag su, and Matthijs R. Wildenbeest (2012), “Testing Models of Consumer Search Using Data on Web Browsing and Purchasing Behavior,” *American Economic Review*, 102 (6), 2955–80.
- Gardete, Pedro and Megan Hunter (2020), “Guiding Consumers through Lemons and Peaches: A Dynamic Model of Search over Multiple Attributes,” Working Paper, Boston College.
- Gaynor, Martin, Carol Propper, and Stephan Seiler (2016), “Free to Choose? Reform, Choice, and Consideration Sets in the English National Health Service,” *American Economic Review*, 106 (11), 3521–3557.
- Goeree, Michelle Sovinsky (2008), “Limited Information and Advertising in the US Personal Computer Industry,” *Econometrica*, 76 (5), 1017–1074.

- Hauser, John and Birger Wernerfelt (1990), “An Evaluation Cost Model of Consideration Sets,” *Journal of Consumer Research*, 16 (4), 393–408.
- Honka, E., A. Hortascu, and M. Wildenbeest (2019), “Empirical Search and Consideration Sets,” in JP Dube and P Rossi (Editors), “Handbook on the Economics of Marketing,” North Holland.
- Honka, Elisabeth (2014), “Quantifying Search and Switching Costs in the U.S. Auto Insurance Industry,” *RAND Journal of Economics*, 45 (4), 847–884.
- Honka, Elisabeth, Ali Hortaçsu, and Maria Ana Vitorino (2017), “Advertising, Consumer Awareness, and Choice: Evidence from the U.S. Banking Industry,” *RAND Journal of Economics*, 48 (3), 611–646.
- Hortaçsu, Ali and Chad Syverson (2004), “Product Differentiation, Search Costs, and Competition in the Mutual Fund Industry: A Case Study of S&P 500 Index Funds,” *The Quarterly Journal of Economics*, 119 (2), 403–456.
- Kapor, Adam (2020), “Distributional Effects of Race-Blind Affirmative Action,” Working Paper, Princeton University.
- Koulayev, Sergei (2014), “Search for Differentiated Products: Identification and Estimation,” *RAND Journal of Economics*, 45 (3), 553–575.
- Moraga-González, José Luis, Zsolt Sándor, and Matthijs Wildenbeest (2022), “Consumer Search and Prices in the Automobile Market,” *Review of Economic Studies*, forthcoming.
- Morozov, Ilya, Stephan Seiler, Xiaojing Dong, and Liwen Hou (2021), “Estimation of Preference Heterogeneity in Markets with Costly Search,” *Marketing Science*, 40 (5), 871–899.
- Roberts, John and James Lattin (1991), “Development and Testing of a Model of Consideration Set Composition,” *Journal of Marketing Research*, 28 (4), 429–440.
- Ursu, Raluca (2018), “The Power of Rankings: Quantifying the Effect of Rankings on Online Consumer Search and Purchase Decisions,” *Marketing Science*, 37 (4), 530–552.
- Ursu, Raluca, Q. Wang, and Pradeep Chintagunta (2020), “Search Duration,” *Marketing Science*, 39 (5), 849–871.
- Van Nierop, Erjen, Bart Bronnenberg, Richard Paap, Michel Wedel, and Philip Hans Franses (2010), “Retrieving Unobserved Consideration Sets from Household Panel Data,” *Journal of Marketing Research*, 47 (1), 63–74.
- Yaari, Menahem (1987), “The Dual Theory of Choice under Risk,” *Econometrica*, 55 (1), 95–115.
- Yavorsky, Dan, Elisabeth Honka, and Keith Chen (2021), “Consumer Search in the U.S. Auto Industry: The Role of Dealership Visits,” *Quantitative Marketing and Economics*, 19 (1), 1–52.
- Zhang, Luna, Raluca Ursu, Elisabeth Honka, and Oliver Yao (2023), “Product Discovery and Consumer Search Routes: Evidence from a Mobile App,” Working Paper, University of Washington Tacoma.