Green, P.E. and A.M. Krieger (1985), Models and Heuristics for Product Line Selection," Marketing Science, 4 (1), 1 - 19.

**Objective:** to extend single product optimization toward product line research/decisions

**Main Contribution:**

1) formulate Buyer’s Problem and Seller’s Problem;

2) demonstrate

(i) the greedy and interchange heuristic and

(ii) Lagrangian relaxation methods for Buyer’s Problem;

3) show some empirical and pragmatic solutions for Seller’s Problem.

**Strength:** Clear Structure; Detailed Literature Review; Strong Marketing Implications

**Weaknesses:**

1) to solve Seller’s Problem, the authors relax the conditions for V\_ij (while not identical, do not differ greatly). These descriptions are rather subjective without rigorous math definitions;

2) the authors modify the U matrix of buyer utilities by equating consumer’s utility to the seller’s utility if U\_ij = U\_i0. This is a very strong assumption in that consumers and firms have different objectives so that they are quite hard to share information on utilities.

3) the authors do not identify the methods to identify the best levels for each attribute;

4) due to infeasible data, the authors cannot have the appropriate probability cutoff value at which the respondent is assumed to select the test product over the status quo.

5) no data were available on the seller’s V\_ij so that the authors make very strong assumption that a set of V’s are proportionate to each product’s price.

6) No theoretical foundations for Methods B1, B2, B3 as different bounds.

**Future Directions:**

1. When the buyers and the sellers have conflicting interests, many assumptions for this method may not hold.
2. Future works should take the interrelationships between products for buyers as complementarities or substitutability.
3. Future works should take the interdependencies in manufacture and distribution between products for sellers.

Bertsimas., D. and V.V. Misic (2016), “Robust Product Line Design,” Operations Research, 65 (1), 19-37.

**Objective:** to optimize product line design under uncertainty

**Main Contribution:**

1) incorporate Parameter Uncertainty and Structural Uncertainty into robust optimization;

2) propose types of uncertainty sets for Parameter Uncertainty and Structural Uncertainty;

3) demonstrate how to trade-off nominal and worst-case revenue;

4) showcase the excellent performance with two real-world examples.

**Strength:**

1. From the perspective of overall contribution, incorporating uncertainty into product line design is original and fundamentally innovative;
2. This paper covers a wide range of topic and modifies every type of extant models with uncertainty, which increase its potential impact for future researchers. Combining 1) and 2), it is safe to say that this paper does not intend to solve specific problems rather than bring new ideas as to consider product line design.
3. Deriving Pareto efficient frontiers of solutions possesses great managerial implications for company decisions as to trade-off between average and worst-case revenues.

**Weaknesses:**

1. The dark side of wide coverage is that this paper has hardly proposed new methods as to address Parameter Uncertainty and Structural Uncertainty.
2. The trade-off between Parameter Uncertainty and Structural Uncertainty increases computational complexity and limits its managerial impacts.

**Future Directions:**

1. Incorporate cost information as a source of uncertainty;
2. This model does not consider the market structure and the behavior of the competitors;
3. This model pays limited attentions to no-purchase options.

Yee, M., E. Dahan, J. R. Hauser, and J. Orlin (2007), “Greedoid-Based Non-Compensatory Consideration-Then-Choice Inference," Marketing Science, 26(4), 532-549.

**Objective:** to provide a basis to infer best-fitting non-compensatory decision rules from full-rank or partial-rank data

**Main Contribution:**

1) Identify Lexicographic processes with Greediod Languages;

2) Greediod significantly increases the computational efficiency;

3) Showcase the excellent performance with two real-world examples;

**Strengths:**

1. High flexibility with full-rank, consider-then-rank, and degraded ratings tasks;
2. Demonstrate potentials as a method for identify market segments;
3. Provide the structure and theory for Greediod Language in company with empirical evidences in the domain of LBA.

**Weaknesses:**

*The exact dynamic program is still exponential in the number of aspects, which limits the contributions in terms of computational efficiency;*

This paper mainly rephrases the problem with Greediod Language without giving sound explanations for its relative efficiency.

**Future Directions:**

In order to deal with exponential computational complexity with respects to the number of attributes, there is a need to develop partial-order methods.

Kohli, R. and K. Jedidi (2015), “Error Theory for Elimination by Aspects," Operations Research, 63 (3), 512-526.

**Objective:** to derive error theory for Elimination by Aspects

**Main Contribution:**

The authors assume that aspects have random utilities with independent, extreme value distributions. The authors make important academic contributions by filling the blank for error theory for EBA. This paper establishes the linkage between EBA, MNL and rank-order logit model.

**Strength:**

EBA is consistent with probabilistic utility maximization and available for generating MNL and rank-order logit model;

EBA can be extended to incorporate functions of covariates and capture consumer heterogeneity using latent-class or random-effects approaches.

**Weakness:**

McFadden proposed that aspect choices are independent across stages and this paper disagrees with this assumption. However, time inconsistency has been documented in the literature, which tends to show that preferences differ significantly at different stages of elimination. So how to address time inconsistency by EBA?

Page 516 mentions that EBA allows violation of order preference while Page 523 claims that EBA assumes that aspect selection is independent of irrelevant alternatives. Is there any inconsistency between these two statements?

**Future Directions:**

Build the connection between nested logit models and preference trees;

Model time inconsistency into Elimination by Aspects.