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Modeling for sustainability

Individual reflection/ analysis of group assignment results

**Analysing the outcomes of parameter combinations 2 and 1**

*Combo 2 analysis:*

Fare = 0; Buying Price = 5; Threshold = 0

These parameters describe a situation where public transport is free, car prices are very high, yet the perceived utility of using public transport is 0, or in other words there is no perceived utility for using public transport. Considering all theories explored in the theoretical framework as well as the MOA model, we can assume that a lower income group of people will use public transport because of the utility-maximisation, as it is free, yet they will not perceive this to be the most efficient option. On the other hand, you will have a group of people that will buy cars because they are seen as much more luxurious than public transport, because this social status of owning a car is perceived as one of the utilities of buying the car. Therefore, since there is little perceived utility of public transport and high prestige for buying cars, using theories we can predict that the model will show a higher number of public transport use than car use, as it can be assumed that price is a bigger factor in consumer decision making than social status for most people.

After analysing the output for this combination, the theoretical predictions can be confirmed. The result of a situation where public transport is free with low perceived utility and where cars are very expensive is 1147 people using cars and 2569 people using public transport. This output is significant as it tells us that people do in fact prioritize price over social status, and that humans act as rational actors that seek to maximize their utility. Additionally, as expected, the car profile is over double the public profile, confirming that the more expensive a good, the higher prestige it is assigned.

Graphical user interface, application

Description automatically generated

*Comparing combo 2 with combo 1*

Combination 1: Fare = 0; Buying Price = 5; Threshold = 1

When comparing the outcomes of combination 2 and 1, where the only parameter difference is changing the threshold from 0 to 1, the result of combination 2 is amplified. There are still more people using public transport than cars, but at a much higher rate. Increasing the threshold to 1 changed the number of people taking public transport from 2569 to 3337. What is interesting is that when the public transport threshold increases, the car profile almost doubles. This could be understood as it is more luxurious and prestigious to spend money on something that is far less practical. In other words, buying a car when it is very expensive instead of using free public transport which is very efficient and has a lot of utility is an even more luxurious act than buying a car when it is more useful or equally useful as public transport.

Graphical user interface, chart

Description automatically generated

These outcomes tell us that 0 fare policies in general are very effective in decreasing motorization rates, but it must be noted that in order to use this model to predict the outcome in a specific country or city, the model by itself would be insufficient. More case-specific parameters would have to be added, taking into account for example:

* the socio-economic state of the area,
* the culture and overall attitudes towards luxurious goods (some cultures are more favourable than others to be perceived as wealthy)
* the efficiency of the current public transport system
* the size of the area studied
* other relevant means of public transport used (for example bikes in Amsterdam)
* population size