

SP survey in the Audience, WS 2023/24 (red: bad weather, $W = 1$)

Data: Times T_i , Costs C_i , weather $W = 0/1$: nice/bad:

Alt. 1: Pedestrian	Alt. 2: Bike	Alt. 3: Public transport	Alt. 4: Car	#1	#2	#3	#4
30 min	30 min	30 min+0€	30 min+0€	4	5	19	9
15 min	15 min	30 min+0€	30 min+0€	8	11	10	8
20 min	20 min	20 min+0€	20 min+2€	4	8	23	5
60 min	60 min	60 min+0€	60 min+2€	0	2	26	8
20 min	15 min	20 min+2€	20 min+0€	2	8	2	19
30 min	10 min	10 min+2€	10 min+2€	0	27	2	9

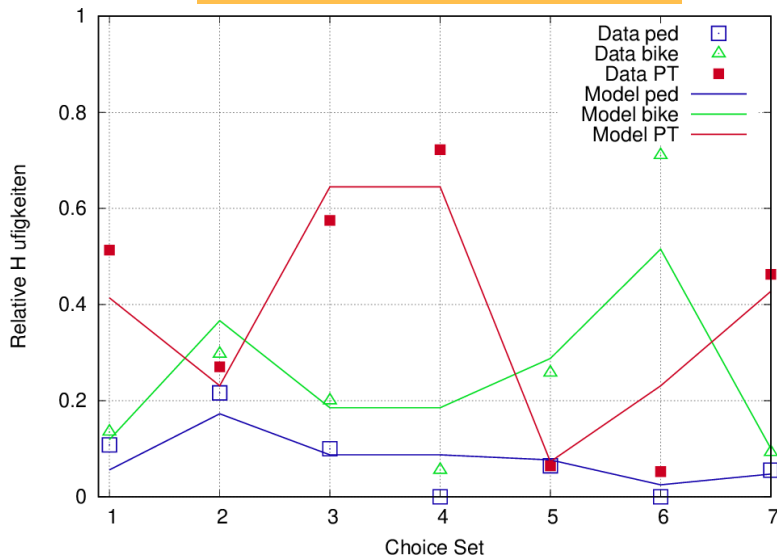
Note: For reasons of efficiency, the survey was performed simultaneously for each choice set. In reality, everybody gets individual questionnaires.

Model specification and calibration

$$V_i = \beta_0 \delta_{i1} + \beta_1 \delta_{i2} + \beta_2 \delta_{i3} + \beta_3 T_i + \beta_4 C_i + \beta_5 W(\delta_{i3} + \delta_{i4})$$

or

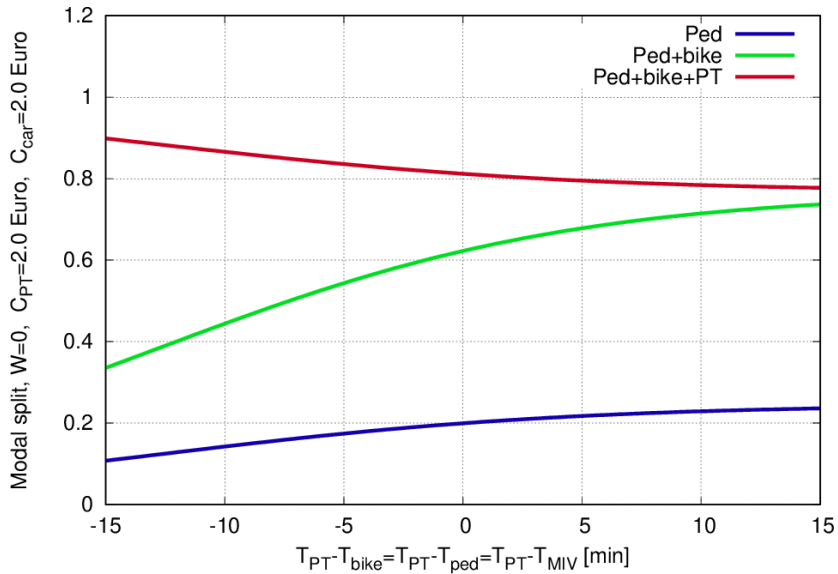
$$\begin{aligned} V_1 &= \beta_0 + \beta_3 T_1 + \beta_4 C_1 + \beta_5 W, \\ V_2 &= \beta_1 + \beta_3 T_2 + \beta_4 C_2 + \beta_5 W, \\ V_3 &= \beta_2 + \beta_3 T_3 + \beta_4 C_3 + \beta_5 W, \\ V_4 &= \beta_3 T_4 + \beta_4 C_4 + \beta_5 W \end{aligned}$$



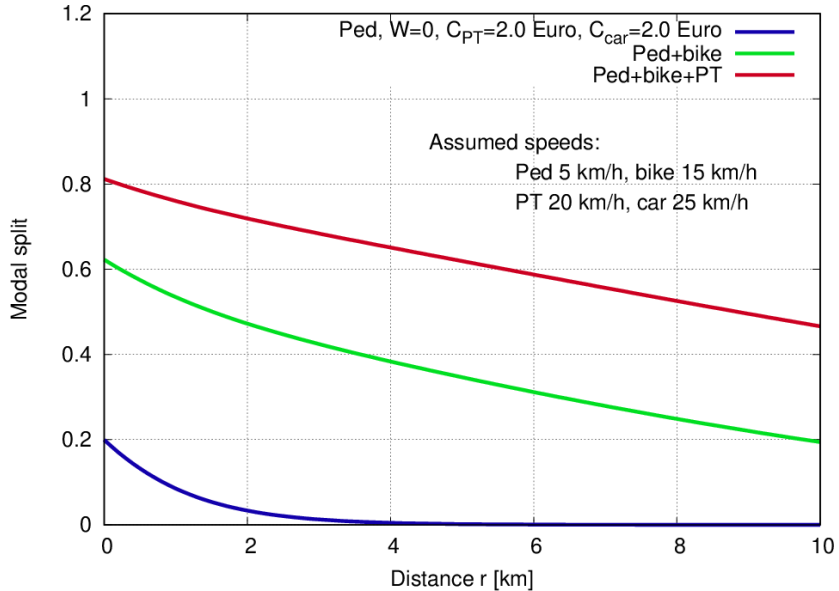
$$\begin{aligned} \ln L_{\text{init}} &= -378.5, \\ \ln L &= -304, \\ \hat{\beta}_0 &= -1.99 \pm 0.28, \\ \hat{\beta}_1 &= -1.24 \pm 0.24, \\ \hat{\beta}_2 &= -0.01 \pm 0.17, \\ \hat{\beta}_3 &= -0.114 \pm 0.023, \\ \hat{\beta}_4 &= -1.02 \pm 0.14, \\ \hat{\beta}_5 &= 1.90 \pm 0.49 \end{aligned}$$

$$\begin{aligned} \hat{\beta}_0 / (-\hat{\beta}_3) &= -17.5 \text{ min}, \\ \hat{\beta}_1 / (-\hat{\beta}_3) &= -10.9 \text{ min}, \\ \hat{\beta}_2 / (-\hat{\beta}_3) &= -0.1 \text{ min}, \\ \text{VoT} &= 60 \hat{\beta}_3 / \hat{\beta}_4 = 6.67 \text{ €/h}, \\ \text{shelter cost} &= \hat{\beta}_5 / (-\hat{\beta}_4) = 1.86 \text{ €} \end{aligned}$$

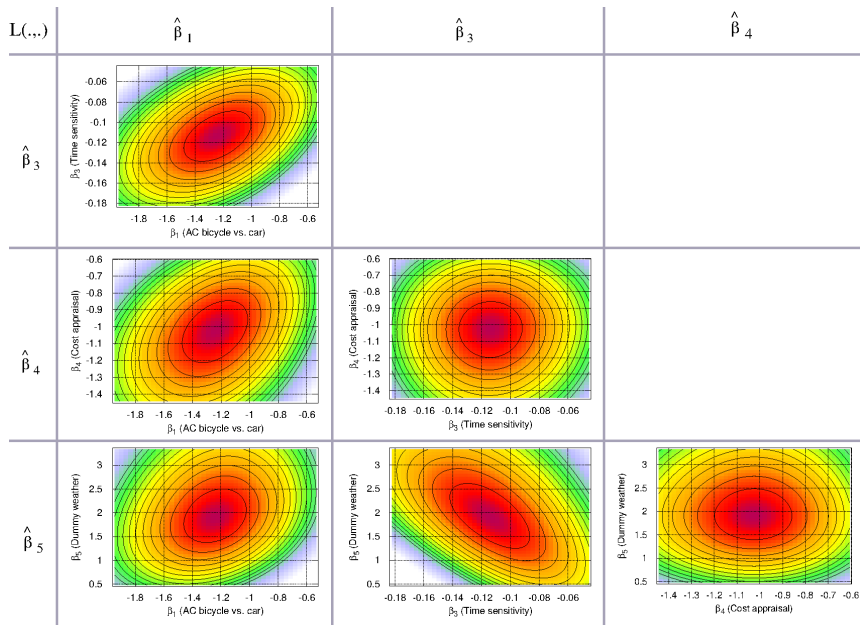
Dependence of the modal split on the PT attributes



Dependence on the distance



Log-likelihood function in parameter space



$$\begin{aligned}
 V_i = & \beta_0 \delta_{i1} \\
 & + \beta_1 \delta_{i2} \\
 & + \beta_2 \delta_{i3} \\
 & + \beta_3 T_i + \beta_4 C_i \\
 & + \beta_5 W (\delta_{i3} + \delta_{i4})
 \end{aligned}$$