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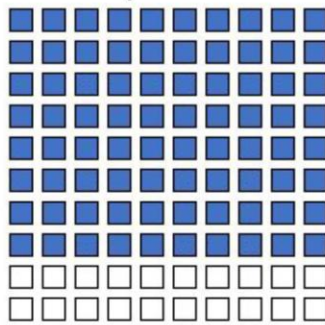
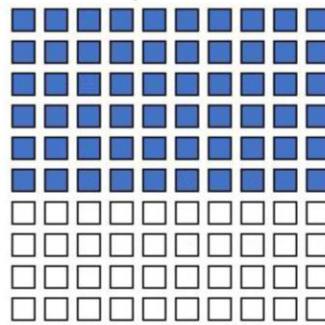
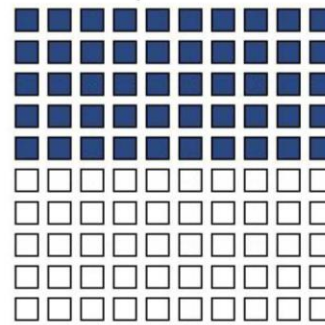









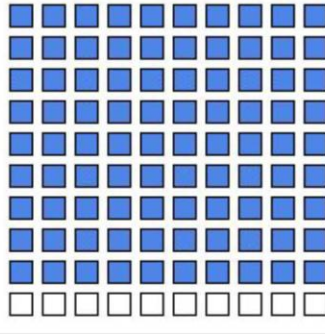
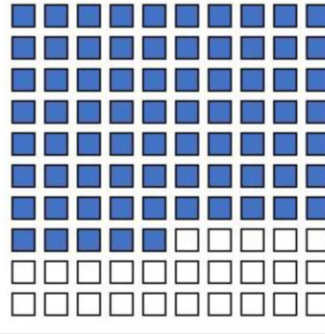
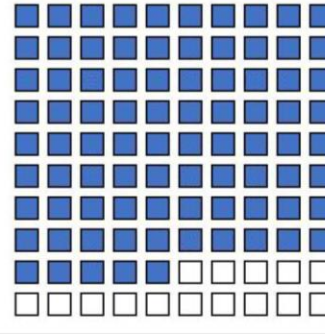
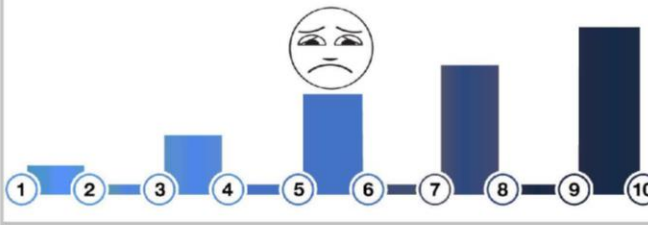
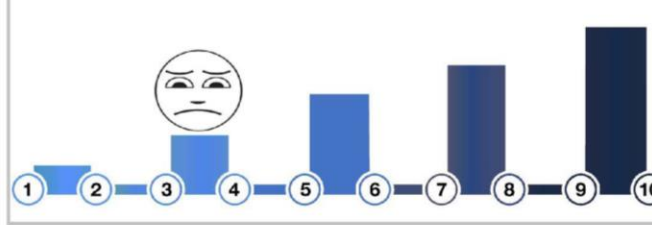

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- To investigate the relative importance of various features of a pulmonary arterial hypertension (PAH) treatment regimen using Best-Worst Scaling (BWS) Case 3.
- To assess variation of choice consistency (scale heterogeneity) by groups of interest.

- Adult PAH patients recruited through a German patient organization (March – June 2022)
- Online survey, Best-worst scaling case 3 choice tasks (**Figure 1**)
  - Six attributes, 12 tasks in random order (120 tasks, 10 blocks) plus a dominance task
- Modeling
  - Conditional logit model (CL) was applied to examine main effects
  - Heteroscedastic conditional logit (HCL) was used to assess scale heterogeneity
  - Goodness of fit was evaluated using the Akaike information criterion (AIC) and Bayesian information criterion (BIC)

- Eighty-three patients completed the survey (76% female) (**Table 1**)
- Physical activity limitations after 3 years & 3-year survival rate were most important attributes, with remaining attributes being relatively less important (**Table 2**)
- HCL models showed evidence of scale heterogeneity and outperformed CL models on AIC and BIC.
- Low scale parameters suggest that participants exhibited high variance and made less consistent choices.
- Error variance increased with response time <12 minutes, marked limitation of physical activity, the need for daily assistance due to PAH, and older age (>45 years)

- When establishing personalised treatment plans for PAH, it is crucial to consider patient preferences regarding physical activity limitations after 3 years and 3-year survival.
- Differences in scale/choice consistency suggest that some groups have more difficulty in making treatment decisions. Therefore, these groups may benefit from more comprehensive discussion with their treating physician.

	Treatment A	Treatment B	Treatment C
Unplanned PAH-related hospitalization within 3 years	80% are never unplanned hospitalized 	60% are never unplanned hospitalized 	50% are never unplanned hospitalized 
Headache in first 6 months	Severe 	Moderate 	Mild 
Physical activity limitations after 3 years	Substantial limitation 	No limitation 	Slight limitation 
Digestive symptoms in first 6 months	None 	Moderate 	Severe 
Survival rate at 3 years	90% live at least 3 years 	75% live at least 3 years 	85% live at least 3 years 
Pain in first 6 months	Moderate 	Mild 	None 
	Best Worst	Best Worst	Best Worst

	Overall n=83
<b>Patient characteristics</b>	%
<b>Age in years (median, range)</b>	59 (27, 91)
<b>Gender (female)</b>	76
<b>WHO Functional Class (FC)<sup>a</sup></b>	
Slight limitation (FC II)	72
Marked limitation (FC III)	28
<b>Highest level of education</b>	
High school or less	18
Some college but no degree	8
Technical school or associates degree	26
4-year college degree or higher	47
<b>Current employment status</b>	
Employed	31
Retired or pensioner	52
Other	16
<b>General health</b>	
Excellent/Very good	2
Good	38
Fair	48
Poor	12
<b>Normal physical activities (multiple responses allowed)</b>	
Lifting or carrying groceries	72
Climbing several flights of stairs	30
Climbing one flight of stairs	66
Doing the dishes	81
Bathing or dressing yourself	87
Cooking	82
Walking	70
Walking more than one kilometer	48
Walking one block	54
Walking several blocks	40
<b>Current level of physical activity<sup>b</sup></b>	
Slight limitation	48
Marked limitation	52
<b>Need help in daily life due to PAH</b>	61

**Table 2: Coefficients and p-values of the conditional logit and heteroscedastic logit models**

		Conditional logit model		Heteroscedastic conditional logit model									
		Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Attributes	Levels	coef	p	coef	p	coef	p	coef	p	coef	p	coef	p
Survival rate at 3 years	90% live at least 3 years	1.044	0.000	1.354	0.000	1.180	0.000	1.256	0.000	1.361	0.000	2.105	0.000
	85% live at least 3 years	0.433	0.000	0.567	0.000	0.497	0.000	0.540	0.000	0.558	0.000	0.893	0.000
	75% live at least 3 years	-0.420	0.000	-0.540	0.000	-0.463	0.000	-0.492	0.000	-0.535	0.000	-0.795	0.000
	70% live at least 3 years	-1.057	0.000	-1.380	0.000	-1.214	0.000	-1.305	0.000	-1.384	0.000	-2.203	0.000
Unplanned PAH-related hospitalisation within 3 years	90% are never hospitalised	0.405	0.000	0.566	0.000	0.479	0.000	0.494	0.000	0.520	0.000	0.897	0.000
	80% are never hospitalised	0.024	0.676	0.049	0.499	0.021	0.741	0.035	0.618	0.046	0.529	0.084	0.459
	60% are never hospitalised	-0.163	0.002	-0.232	0.001	-0.181	0.003	-0.214	0.001	-0.224	0.002	-0.399	0.001
	50% are never hospitalised	-0.265	0.000	-0.383	0.000	-0.319	0.000	-0.314	0.000	-0.343	0.000	-0.582	0.000
Physical activity limitations after 3 years	No limitation	0.983	0.000	1.313	0.000	1.152	0.000	1.229	0.000	1.289	0.000	2.118	0.000
	Slight limitation	0.886	0.000	1.163	0.000	1.018	0.000	1.104	0.000	1.177	0.000	1.880	0.000
	Marked limitation	-0.473	0.000	-0.617	0.000	-0.548	0.000	-0.594	0.000	-0.638	0.000	-1.019	0.000
	Substantial limitation	-1.396	0.000	-1.859	0.000	-1.622	0.000	-1.739	0.000	-1.827	0.000	-2.980	0.000
Digestive symptoms in first 6 months	None	0.404	0.000	0.504	0.000	0.449	0.000	0.515	0.000	0.531	0.000	0.818	0.000
	Mild	0.309	0.000	0.390	0.000	0.356	0.000	0.375	0.000	0.385	0.000	0.574	0.000
	Moderate	-0.088	0.100	-0.099	0.148	-0.085	0.168	-0.108	0.101	-0.116	0.098	-0.138	0.193
	Severe	-0.624	0.000	-0.795	0.000	-0.721	0.000	-0.782	0.000	-0.800	0.000	-1.253	0.000
Pain in first 6 months	None	0.138	0.012	0.199	0.005	0.159	0.012	0.176	0.010	0.181	0.013	0.327	0.005
	Mild	0.167	0.003	0.205	0.004	0.175	0.006	0.183	0.007	0.198	0.006	0.251	0.023
	Moderate	-0.010	0.859	-0.018	0.805	-0.016	0.812	0.004	0.954	0.004	0.960	-0.003	0.982
	Severe	-0.295	0.000	-0.385	0.000	-0.318	0.000	-0.362	0.000	-0.383	0.000	-0.575	0.000
Headache in first 6 months	None	0.364	0.000	0.461	0.000	0.418	0.000	0.460	0.000	0.482	0.000	0.762	0.000
	Mild	0.032	0.565	0.033	0.643	0.032	0.613	0.048	0.473	0.045	0.533	0.065	0.558
	Moderate	0.057	0.292	0.059	0.390	0.051	0.403	0.059	0.367	0.061	0.378	0.049	0.645
	Severe	-0.452	0.000	-0.553	0.000	-0.502	0.000	-0.567	0.000	-0.588	0.000	-0.875	0.000
Scale parameter													
	Response time < 12 min			-0.430	0.000							-0.472	0.000
	Marked limitations					-0.260	0.000					-0.108	0.210
	Requires assistance							-0.330	0.000			-0.285	0.001
	Age 46 to 65									-0.264	0.012	-0.166	0.124
	Age 65 plus									-0.382	0.001	-0.319	0.006
Akaike's information criterion and Bayesian information criterion													
	LL(model)	-1398.60		-1381.43		-1392.06		-1388.48		-1393.04		-1363.99	
	AIC	2833.20		2800.86		2822.11		2814.96		2826.07		2773.99	
	BIC	2953.72		2928.07		2949.32		2942.17		2959.98		2927.98	
	df	18		19		19		19		20		23	
	LM test for heteroscedasticity			chi2(1) = 36.09 p < 0.001		chi2(1) = 13.26 p < 0.001		chi2(1) = 21.16 p < 0.000		chi2(2) = 11.90 p < 0.005		chi2(5) = 72.76 p < 0.000	

LL = Log Likelihood; AIC = Akaike information criterion; BIC = Bayesian information criterion; df = degrees of freedom; LM = Lagrange multiplier test for heteroskedasticity

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