

A Study to Develop a Simple Questionnaire on Driving Characteristics of Elderly Drivers

- Study on Driver Characteristics for Delaying Driving Cessation (34)-

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Studies often use multiple questionnaires. This is especially burdensome for the elderly because of the lengthy time required to complete the questionnaires. An efficient survey would be possible if a questionnaire with valid items could adequately represent the differences among older drivers.

In the previous report, we focused on the Workload Sensitivity Questionnaire (WSQ38) and conducted a Latent Rank Theory (LRT) analysis to identify valid items when targeting elderly drivers. As a result, we created a shortened version that can measure the degree of burden of driving for elderly drivers with 9 or 10 items (Item 9 is WSQ9, item 10 is WSQ10), regardless of the type of burden. Therefore, in this report, we attempted to develop an exhaustive, simplified version of the questionnaire that incorporates multiple measures of driving, using the same procedure for analysis.

Latent Rank Theory clusters subjects stepwise by latent rank (LR : Latent Rank), which is estimated for similar subjects based on their response patterns to items. By focusing on Item Discriminancy, which is the ability to measure responses to individual items calculated, and Item Difficulty, which is used to understand the difficulty of responses, it is possible to appropriately express differences among subjects using valid items.

Of the 300 registered subjects in Dahlia (Data Repository for Human Life-Driving Anatomy), 232 (including 126 females) were included in the analysis. The mean age was 72.06 years (54-86 years, $SD = 6.11$). The existing questionnaires for analysis were: awareness of cognitive and physical function decline when driving, early detection checks for cognitive impairment when driving, driving style, compensation strategies for safe driving, and personality traits. The figure shows an example of the results of one of the questionnaires.

We modified the text of the adopted items, standardized the method of answering the questions (five-point scale), and proposed a comprehensive but simple questionnaire.

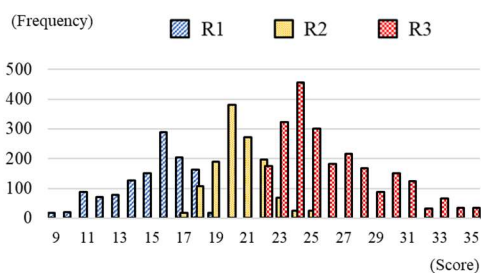


Fig.2 Histogram of sum scores for each rank of Personality Traits (8 items)

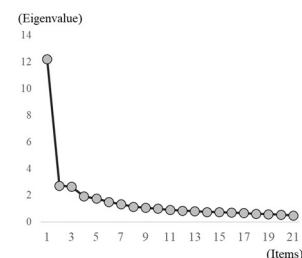


Fig.1 Scree plot from polychoric correlation matrix

Table IRP of Personality Traits Items

personality trait	Item Reference Profile (IRP)			IRP index	
	R1	R2	R3	Discriminancy	Difficulty
item 04	1.945	2.654	3.130	0.709	3.130
item 05	1.888	2.291	2.911	0.620	2.911
item 20	2.288	2.884	3.290	0.595	3.290
item 17	1.878	2.397	2.981	0.584	2.981
item 03	1.799	2.382	2.925	0.583	2.925
item 02	1.985	2.539	3.106	0.567	3.106
item 10	1.779	2.308	2.860	0.553	2.860
item 28	2.514	3.061	3.377	0.547	3.377
item 19	2.431	2.970	3.133	0.539	3.133
item 01	2.623	3.151	3.508	0.528	3.508
item 09	2.219	2.673	3.192	0.518	3.192
item 23	2.423	2.650	3.161	0.511	3.161
item 12	1.973	2.483	2.979	0.510	2.979
item 22	2.093	2.601	3.000	0.508	3.000
item 07	2.340	2.711	3.210	0.498	3.210
item 15	2.700	3.055	3.553	0.498	3.553
item 06	2.231	2.606	3.094	0.489	3.094
item 32	1.777	2.184	2.656	0.471	2.656
item 33	2.167	2.562	3.021	0.459	3.021
item 11	2.509	2.942	3.134	0.432	3.134
item 39	2.406	2.807	3.177	0.402	3.177
item 35	1.919	2.302	2.691	0.390	2.691
item 36	2.714	3.097	3.395	0.383	3.395
item 25	2.164	2.540	2.886	0.377	2.886
item 26	2.409	2.694	3.070	0.376	3.070
item 21	2.009	2.368	2.643	0.359	2.643
item 38	2.467	2.787	3.120	0.334	3.120
item 14	2.520	2.834	3.128	0.314	3.128
item 40	1.736	2.043	2.343	0.308	2.343
item 16	2.384	2.665	2.966	0.302	2.966
item 30	2.847	3.139	3.140	0.292	3.140
item 37	2.768	3.042	3.252	0.274	3.252
item 31	2.646	2.871	3.137	0.267	3.137
item 24	1.516	1.776	2.030	0.260	1.516
item 29	2.756	2.952	3.156	0.205	3.156
item 18	2.859	2.740	2.934	0.194	2.934
item 34	2.677	2.811	3.005	0.194	3.005
item 08	1.926	1.826	2.018	0.192	1.926
item 13	2.912	2.841	2.946	0.105	2.946
item 27	2.852	2.887	2.938	0.051	2.938