講演番号 238

文献番号 20226238

Validation of a Simplified Questionnaire Comprehensively Captures Driving Characteristics

- Study on Driver Characteristics for Delaying Driving Cessation (36)-

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KEY WORDS: **Human engineering, Elderly person, Questionnaire, Latent Rank Theory (LRT) [C2]**

Studies often use multiple questionnaires. This is especially burdensome for the elderly because of the lengthy time required to complete the questionnaires. In the previous report, based on the latent rank theory (LRT), we extracted valid questions from multiple questionnaires and created a simplified questionnaire targeting senior drivers. This simplified questionnaire consistes of 45 items instead of 121 items for six different questionnaire scales. This leads to shorter response times and reduced burden. Furthermore, we believe that this has a positive impact on the quality of the data.

To confirm the usefulness of the questionnaire, we report the results of a Web-based survey conducted on approximately 3,000 people (aged 30 to 80) in Japan.

In the analysis, the 60s, 70s and 80s were grouped together as the older group (n = 1650). This was used as the criterion group. The analysis was conducted using LRT for each subscale according to the number of latent ranks determined in the previous report. In other words, a model was created for the older age group (IRPs were estimated), the IRPs obtained there were fixed, and the goodness of fit was calculated by applying them to the other age data. The goodness of fit was relatively good and within the acceptable range for all subscales and for all ages. For each age for each subscale, the α coefficient ranged from .744 to .945 (M = .836) and the ω coefficient from .762 to .946 (M = .843), which were adequate. Sufficient internal consistency was also confirmed.

Table Goodness-of-fit indices and reliability coefficients for other age groups based on 60 over

Scale & Age	Safe driving attitude				Anxiety about causing traffic accidents				Coping with adverse conditions				Coping with passengers			
	60over (criterion group)	30s	40s	50s	60over (criterion group)	30s	40s	50s	60over (criterion group)	30s	40s	50s	60over (criterion group)	30s	40s	50s
N	1650	300	300	900	1650	300	300	900	1650	300	300	900	1650	300	300	900
N of Items	7	7	7	7	2	2	2	2	3	3	3	3	3	3	3	3
N of Ranks	3	3	3	3	2	2	2	2	3	3	3	3	3	3	3	3
df	117.747	117.747	117.747	117.747	0.842	0.410	0.410	0.410	1.215	2.463	2.463	2.463	2.463	2.463	2.463	2.463
Chi-sq	208.996	174.798	249.361	865.983	482.554	169.087	124.648	353.920	79.990	307.104	185.107	549.919	321.878	120.699	281.948	368.542
NFI	.965	.830	.782	.749	.772	.622	.702	.731	.982	.670	.766	.777	.926	.845	.706	.851
IFI	.985	.937	.872	.776	.773	.622	.702	.731	.982	.671	.768	.778	.927	.848	.707	.852
CFI	.984	.934	.865	.772	.772	.616	.697	.730	.982	.664	.761	.776	.927	.844	.701	.850
RMSEA	**0.022**	**0.040**	0.061	0.084	0.589	1.173	1.006	0.979	0.198	0.643	0.498	0.497	0.280	0.401	0.616	0.407
AIC	-26.499	-60.697	13.866	630.488	480.870	168.266	123.827	353.099	77.559	302.178	180.181	544.993	316.952	115.773	277.022	363.616
CAIC	-781.087	-614.555	-539.992	-52.728	475.473	166.336	121.898	350.719	69.770	290.592	168.595	530.700	301.167	104.187	265.436	349.324
BIC	-663.339	-496.808	-422.245	65.019	476.315	166.747	122.308	351.129	70.986	293.055	171.058	533.164	303.630	106.650	267.899	351.787
Alpha	.780	.744	.785	.753	.783	.845	.811	.826	.818	.810	.761	.802	.832	.820	.830	.821
Omega	.788	.762	.801	.769	.783	.845	.811	.826	.821	.816	.783	.808	.839	.825	.837	.828

Scale & Age	Cognitive Decline				Self-awareness of Functional Declines				Perception of workload				Personality Traits			
	60over (criterion group)	30s	40s	50s	60over (criterion group)	30s	40s	50s	60over (criterion group)	30s	40s	50s	60over (criterion group)	30s	40s	50s
N	1650	300	300	900	1650	300	300	900	1650	300	300	900	1650	300	300	900
N of Items	5	5	5	5	8	8	8	8	9	9	9	9	8	8	8	8
N of Ranks	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
df	44.105	44.105	44.105	44.105	166.568	166.568	166.568	166.568	223.389	223.389	223.389	223.389	166.568	166.568	166.568	166.568
Chi-sq	2417.449	352.934	572.447	1489.543	2279.815	876.276	532.650	592.311	3404.112	1400.129	1216.768	3022.132	829.625	746.379	444.013	1181.303
NFI	.686	.734	.623	.679	.785	.625	.732	.878	.767	.576	.639	.664	.898	.549	.718	.749
IFI	.690	.759	.642	.685	.797	.673	.799	.909	.779	.617	.684	.681	.917	.610	.803	.776
CFI	.689	.752	.633	.683	.796	.664	.792	.908	.778	.609	.678	.678	.917	.595	.794	.773
RMSEA	0.181	0.153	0.200	0.191	0.088	0.119	0.086	0.053	0.093	0.133	0.122	0.118	**0.049**	0.108	0.075	0.082
AIC	2329.238	264.724	484.237	1401.333	1946.678	543.139	199.513	259.174	2957.333	953.350	769.989	2575.353	496.489	413.242	110.877	848.166
CAIC	2046.588	57.262	276.775	1145.417	879.219	-240.362	-583.988	-707.322	1525.735	-97.426	-280.787	1279.159	-570.970	-370.259	-672.625	-118.330
BIC	2090.694	101.367	320.880	1189.522	1045.787	-73.794	-417.420	-540.753	1749.124	125.964	-57.397	1502.548	-404.402	-203.691	-506.057	48.238
Alpha	.783	.831	.817	.825	.892	.915	.897	.893	.926	.945	.938	.931	.837	.846	.830	.829
Omega	.804	.839	.829	.834	.893	.916	.897	.893	.927	.946	.938	.932	.846	.855	.840	.841