8.5 Training Effects in Dual-Task Costs

The training effects in dual-task costs under the instruction "Equal Emphasis" were analyzed with an age group (2) as a between-subjects factor and training (2), domain (2), and difficulty (2) as within-subjects factors repeated measures ANOVA[51]. The analysis revealed three significant within-subjects effects: training, $F(1, 34) = 6.99$, $MSE = 84.72$, $p < .05$, $\eta^2 = .17$, domain, $F(1, 34) = 8.30$, $MSE = 316.82$, $p < .01$, $\eta^2 = .20$, and difficulty, $F(1, 34) = 34.06$, $MSE = 117.52$, $p < .0001$, $\eta^2 = .50$. The main effects were not qualified by any interactions: Training x Domain, ($F = 1.19$, $1 - \beta = .19$), Training x Difficulty, ($F = 1.05$, $1 - \beta = .17$), Domain x Difficulty, ($F < 1.0$, $1 - \beta = .14$), Training x Domain x Difficulty, ($F < 1.0$, $1 - \beta = .12$). As can be seen in Table 1 and 2 (Appendix E), there was reduction in dual-task costs from Assessment 1 to Assessment 2. The DTCs were higher in the cognitive than in the balance domain, and in the easy than in the difficult condition.

A significant between-subjects effect of age group, $F(1, 34) = 11.81$, $MSE = 212.87$, $p < .01$, $\eta^2 = .26$, was not qualified by any interaction involving age-group factor: Age Group x Training, ($F < 1.0$, $1 - \beta = .15$), Age Group x Domain, ($F < 1.0$, $1 - \beta = .13$), Age Group x Difficulty, ($F = 1.66$, $1 - \beta = .24$), Age Group x Training x Domain, ($F < 1.0$, $1 - \beta = .05$), Age Group x Training x Difficulty, ($F < 1.0$, $1 - \beta = .05$), Age Group x Domain x Difficulty, ($F < 1.0$, $1 - \beta = .05$), and Age Group x Training x Domain x Difficulty, ($F < 1.0$, $1 - \beta = .08$). With respect to the age group differences, the analysis revealed that, in general, older adults had higher DTCs than their younger counterparts. However, older and younger participants improved their dual-task performance to the same degree in both domains and under both difficulty conditions. The analysis without outliers revealed a similar pattern of results.

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[51] Detailed descriptions of the dependent variables relevant to this analysis are presented in Appendix E; Table E1 and E2. There were two univariate but no multivariate outliers. I analyzed the data with and without outliers. Evaluation of assumptions of normality, homogeneity of variance-covariance matrices, and sphericity was satisfactory. Thus, I reported the results according to Wilks' Lambda.

Table E1.

Dual Task in RT (Assessment 1 and 2): Variable Descriptions of DTCs (in %) in Easy and Difficult Conditions

Assessment	Difficulty	Sample	Outlier	M	SD	Min.-Max.	Skew (SE)	Kurt (SE)	Shapiro-Wilk (p)
1	Easy	Total		14.88	8.83	-10.43 – 35.41	-0.17 (0.39)	1.31 (0.77)	.97 (.50)
		Young		14.53	6.89	3.47 – 31.25	0.84 (0.54)	0.85 (1.04)	.95 (.47)
		Old		15.24	10.62	-10.43 – 35.41	-0.51 (0.54)	1.12 (1.04)	.96 (.58)
	Difficult	Total		6.01	8.58	-7.86 – 28.02	0.72 (0.39)	0.34 (0.77)	.95 (.15)
		Young		3.37	6.20	-5.04 – 13.30	0.46 (0.54)	-1.04 (1.04)	.90 (.07)
		Old		8.65	9.93	-7.86 – 28.02	0.36 (0.54)	-0.16 (1.04)	.96 (.62)
2	Easy	Total		13.31	10.38	-8.63 – 50.97	1.59 (0.39)	4.53 (0.77)	.86 (.01)
		Young		11.13	5.67	4.00 – 27.14	1.22 (0.54)	2.38 (1.04)	.89 (.04)
		Old	1	15.49	13.40	-8.63 – 50.97	1.07 (0.54)	2.06 (1.04)	.91 (.09)
	Difficult	Total		4.77	6.63	-4.43 – 26.83	1.33 (0.39)	2.24 (0.77)	.90 (.01)
		Young		1.74	3.66	-4.43 – 13.06	1.48 (0.54)	5.07 (1.04)	.86 (.01)
		Old	1	7.79	7.59	-4.09 – 26.83	0.74 (0.54)	0.91 (1.04)	.96 (.59)

Table E2.

Dual Task in Balance (Assessment 1 and 2): Variable Descriptions of DTCs (in %) in Easy and Difficult Conditions

Assessment	Difficulty	Sample	Outlier	M	SD	Min.-Max.	Skew (SE)	Kurt (SE)	Shapiro-Wilk (p)
1	Easy	Total		9.96	17.36	-16.30 – 61.66	1.29 (0.39)	1.82 (0.77)	.90 (.01)
		Young		7.23	16.13	-16.30 – 54.29	1.49 (0.54)	3.23 (1.04)	.88 (.04)
		Old		12.68	18.54	-11.61 – 61.66	1.20 (0.54)	1.63 (1.04)	.92 (.11)
	Difficult	Total		1.77	15.11	-31.51 – 30.74	-0.08 (0.39)	-0.43 (0.77)	.98 (.65)
		Young		-2.24	14.03	-31.51 – 30.74	.019 (0.54)	1.17 (1.04)	.98 (.92)
		Old		5.78	15.47	-25.89 – 28.96	-0.46 (0.54)	-0.71 (1.04)	.93 (.25)
2	Easy	Total		3.65	14.19	-26.81 – 37.07	0.22 (0.39)	0.17 (0.77)	.98 (.81)
		Young		0.38	10.05	-23.13 – 19.75	-0.17 (0.54)	0.91 (1.04)	.98 (.88)
		Old		6.92	17.05	-26.81 – 37.07	-0.11 (0.54)	-0.44 (1.04)	.98 (.97)
	Difficult	Total		-0.57	14.22	-19.56 – 50.33	1.51 (0.39)	3.55 (0.77)	.89 (.01)
		Young		-6.00	8.34	-17.84 – 10.80	0.20 (0.54)	-0.88 (1.04)	.95 (.44)
		Old	1	4.85	16.86	-19.56 – 50.33	1.14 (0.54)	1.81 (1.04)	.93 (.25)