DCID: Deep Canonical Information Decomposition - Supplementary Material

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1 Synthetic Experiments - Additional Plots

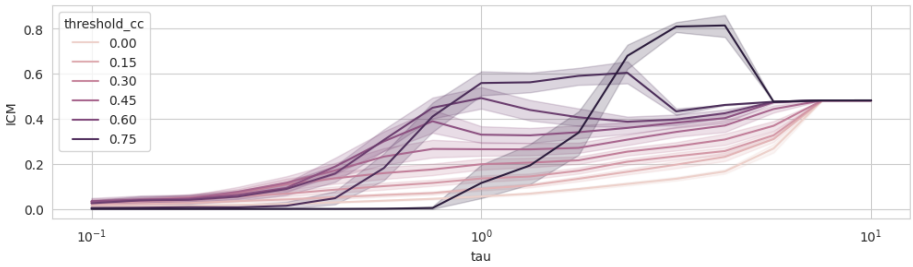

Fig. 1. Performance of the DCID model plotted wrt. different values of the threshold hyperparamter T.

2 Brain MRI Experiments - Results for Y_1 = *weight, body mass index (BMI)*

Table 1. Pearson correlation coefficients between volumes of Regions of Interest (ROIs) in brain MRI scans (columns) and two variables - Y_1, being the measurements of weight (first row), and a surrogate variable $\psi_1(Z)$, isolating the signal of the shared variables Z contributing to Y_1. Standard deviation of the coefficients over 3 model training runs over different subsets of data is reported in the parentheses.

Variable	Brain Stem	CSF	Gray Matter	Hippocampus	Ventricles
Y_1	-0.17 (± 0.00)	0.14 (± 0.01)	-0.15 (± 0.01)	-0.14 (± 0.00)	0.14 (± 0.01)
$\psi_1(Z)$	-0.27 (± 0.00)	0.30 (± 0.03)	-0.24 (± 0.04)	-0.26 (± 0.07)	0.27 (± 0.09)

Table 2. Pearson correlation coefficients between volumes of Regions of Interest (ROIs) in brain MRI scans (columns) and two variables - Y_1, being the measurements of body mass index (BMI) (first row), and a surrogate variable $\psi_1(Z)$, isolating the signal of the shared variables Z contributing to Y_1. Standard deviation of the coefficients over 3 model training runs over different subsets of data is reported in the parentheses.

Variable	Brain Stem	CSF	Gray Matter	Hippocampus	Ventricles
Y_1	-0.10 (± 0.00)	0.09 (± 0.00)	-0.05 (± 0.00)	-0.05 (± 0.00)	0.06 (± 0.00)
$\psi_1(Z)$	-0.22 (± 0.05)	0.21 (± 0.02)	-0.19 (± 0.07)	-0.18 (± 0.02)	0.23 (± 0.05)

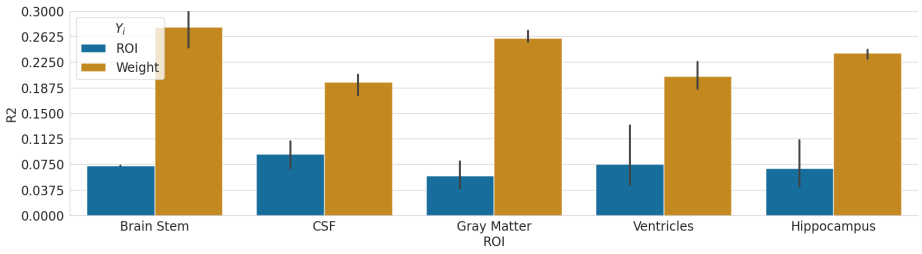

Fig. 2. Ratio of total variance explained by the surrogate variable $\psi_1(\mathbf{Z})$ in different brain Regions of Interest (ROIs) (blue bars) and in body weight (yellow bars).

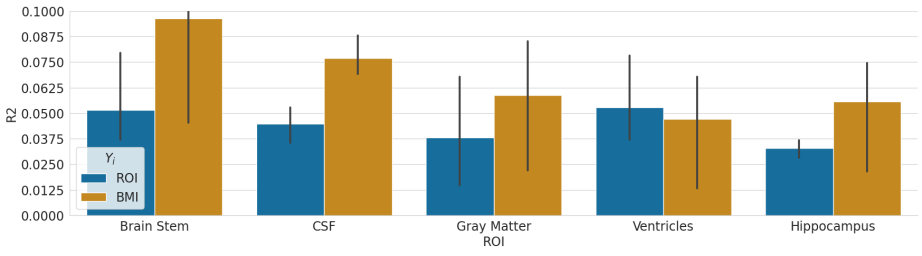

Fig. 3. Ratio of total variance explained by the surrogate variable $\psi_1(\mathbf{Z})$ in different brain Regions of Interest (ROIs) (blue bars) and in BMI (yellow bars).