

Supplementary Table 4. Raw zipproxy upgrade and refined representative-proxy results

Summary of the exploratory raw carotid zipproxy branch added to the ATT-to-reaction-time manuscript line.

A. Screening overview	Value
Participants merged into the raw zipproxy branch	6,754
Candidate zipproxy features entering screening	129
Screening models evaluated against ATT/RT families	387
ATT-seed proxies surviving the screening FDR threshold	22
Component representatives after redundancy reduction	8
Final retained representative proxies	2

B. Top ATT-associated raw zipproxy shortlist	Family	n	Beta	p	FDR
right_screen_jpg_bytes	Screen-JPG burden	6748	6.82e-07	8.18e-05	0.004702
right_screen_jpg_compressed_bytes	Screen-JPG burden	6748	6.64e-07	8.96e-05	0.004702
bilat_screen_jpg_bytes_mean	Screen-JPG burden	6735	7.41e-07	0.000139	0.004702
bilat_screen_jpg_compressed_bytes_mean	Screen-JPG burden	6735	7.23e-07	0.000146	0.004702
bilat_screen_jpg_compress_ratio_mean	Screen-JPG compression	6735	1.71	0.000253	0.006226
right_screen_jpg_compress_ratio	Screen-JPG compression	6748	1.48	0.00029	0.006226
bilat_cin_bytes_abs_asym	Bilateral asymmetry	6753	3.48e-08	0.000395	0.007283
bilat_jpg_bytes_abs_asym	Bilateral asymmetry	6753	9.03e-08	0.000835	0.009943

Supplementary Table 4. Raw zipproxy upgrade and refined representative-proxy results (continued)

C. Refined representative proxies	Screening evidence	Partial RT + ATT result	Interpretive status
right_screen_jpg_bytes	Seed p=8.2e-05; FDR=0.004702	p=0.856; FDR=0.8555	ATT-linked upstream burden proxy; the RT signal attenuated markedly after ATT was included.
bilat_cin_bytes_abs_asym	Seed p=0.0004; FDR=0.007283	p=0.0208; FDR=0.04159	Residual asymmetry-related RT support remained in partial-aligned models, but still requires terminal confirmation.

D. Terminal recheck status	Value
Project covariate files available to the terminal recheck	4
Covariates resolved from retained project assets	14/18
Unresolved covariates preventing complete terminal confirmation	r_cov_hypertension; r_cov_sbp; r_cov_dbp; r_covses_qualifications
ATT full-18 aligned terminal models	0 estimable models
RT full-18 proxy-plus-ATT terminal models	0 estimable models

Interpretive note. The raw zipproxy branch adds an upstream mechanistic support layer rather than replacing the manuscript headline. After screening and redundancy reduction, the branch converged on a screen-JPG burden proxy and a bilateral cine-byte asymmetry proxy. The former behaved like an ATT-linked upstream burden signal, whereas the latter retained partial residual support for reaction time after ATT adjustment; however, a complete 18-covariate terminal confirmation was not estimable from the currently retained project covariate assets.