

Supplemental Information

Energy compensation and adiposity in humans

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Source	TEE as response variable				AEE as response variable				
	Estimate	± se	<i>t</i>	<i>p</i>	Estimate	± se	<i>t</i>	<i>p</i>	
(A) Overall compensation model									
Intercept	10.65	± 0.036			3.43	± 0.033			
Sex	-0.021	± 0.058	-0.36	0.716	-0.019	± 0.052	-0.36	0.716	
Age	-0.018	± 0.002	-9.18	<0.001	-0.016	± 0.002	-9.18	<0.001	
FFM	1.852	± 0.093	19.87	<0.001	1.666	± 0.084	19.87	<0.001	
FM	-0.154	± 0.036	-4.23	<0.001	-0.138	± 0.033	-4.23	<0.001	
BEE	0.723	± 0.049	14.64	<0.001	-0.349	± 0.044	-7.86	<0.001	
(B) Compensation by sex, age, and body composition									
Intercept	10.669	± 0.072			3.450	± 0.065			
Sex	0.053	± 0.062	0.86	0.389	0.048	± 0.056	0.86	0.389	
Age	-0.024	± 0.002	-10.99	<0.001	-0.022	± 0.002	-10.99	<0.001	
FFM	1.883	± 0.094	19.95	<0.001	1.695	± 0.085	19.95	<0.001	
FM	-0.068	± 0.041	-1.66	0.097	-0.061	± 0.037	-1.66	0.097	
BEE	0.639	± 0.052	12.25	<0.001	-0.425	± 0.047	-9.05	<0.001	
BEE × Sex	-0.045	± 0.063	-0.72	0.472	-0.041	± 0.057	-0.72	0.472	
BEE × Age	0.001	± 0.002	0.60	0.551	0.001	± 0.002	0.60	0.551	
BEE × FFM	0.090	± 0.063	1.44	0.150	0.081	± 0.056	1.44	0.150	
BEE × FM	-0.069	± 0.029	-2.34	0.019	-0.062	± 0.026	-2.34	0.019	
Sex × Age	-0.002	± 0.003	-0.78	0.435	-0.002	± 0.003	-0.78	0.435	
Sex × FFM	0.026	± 0.102	0.25	0.801	0.023	± 0.092	0.25	0.801	
Sex × FM	0.109	± 0.046	2.36	0.019	0.098	± 0.042	2.36	0.019	
Age × FFM	-0.015	± 0.004	-3.46	0.001	-0.014	± 0.004	-3.46	0.001	
Age × FM	-0.001	± 0.002	-0.73	0.466	-0.001	± 0.002	-0.73	0.466	

Table S1. Sources of variation in total energy expenditure in adult humans. Related to Figures 2 and 3. (A) Estimates, standard errors (se), *t*-values and *P*-values from multiple linear regression models of total energy expenditure (TEE; MJ·d⁻¹) and activity energy expenditure (AEE; MJ·d⁻¹) as a function of age (*y*), fat free mass (FFM, in kg, square-root transformed), fat mass (FM, in kg, square-root transformed) and basal energy expenditure (BEE; MJ·d⁻¹). **(B)** Same model as A but with the inclusion of interactions to test if compensation varies according to sex, age, FFM, and FM, while controlling for age- and sex-related differences in body composition (FFM and FM). All variables have been centered, such that main effects are estimated at the mean values for each variable.

Component-trait	Estimate	±	se	χ^2_1	<i>P</i>
(A) Bivariate mixed model of TEE and BEE					
$V_{\text{between - TEE}}$	0.653	±	0.186		
$V_{\text{between - BEE}}$	0.101	±	0.062		
COV_{between}	0.188	±	0.079	6.76	0.0093
$V_{\text{within - TEE}}$	0.658	±	0.116		
$V_{\text{within - BEE}}$	0.365	±	0.065		
COV_{within}	0.055	±	0.062	0.80	0.3710
(B) Bivariate mixed model of AEE and BEE					
$V_{\text{between - AEE}}$	0.291	±	0.143		
$V_{\text{between - BEE}}$	0.101	±	0.062		
COV_{between}	0.068	±	0.070	0.90	0.3426
$V_{\text{within - AEE}}$	0.799	±	0.141		
$V_{\text{within - BEE}}$	0.365	±	0.065		
COV_{within}	-0.315	±	0.078	26.71	<0.0001

Table S2. Energy trade-offs between vs. within individuals. Related to Figure 4. Between- and within-individual variance in (V_{between} and V_{within}) and covariance between (COV_{between} and COV_{within}) **(A)** total energy expenditure (TEE; MJ·d⁻¹) and basal energy expenditure (BEE; MJ·d⁻¹) and **(B)** activity energy expenditure (AEE; MJ·d⁻¹) and basal energy expenditure (BEE; MJ·d⁻¹) in 68 elderly men and women measured twice, 7 years apart. The significance of COV_{between} and COV_{within} was estimated using likelihood ratio tests.

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This group authorship contains the names of people whose data were contributed into the database by the analysis laboratory but they later could not be traced, or they did not respond to emails to assent inclusion among the authorship. The list also includes some researchers who did not assent inclusion because they felt their contribution was not sufficient to merit authorship, or their data were not used, e.g. studies of children.

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