

SUPPLEMENTARY DATA

Supplementary Table 1. The information of 97 BMI-associated SNPs and their main effects on BMI in US Hispanics/Latinos (HCHS/SOL).

SNP	Chr	Position	Effect Allele Frq	Effect Allele	Other Allele	Genes	Effect on BMI			Effect on Fat Mass			Effect on Fat Percentage			Effect on Fat Mass Index			Effect on Fat Free Mass			Effect on Waist Circumference			Genotyped (yes); Imputed (no)	Central Nervous System (CNS) related?
							Beta	SE	P	Beta	SE	P	Beta	SE	P	Beta	SE	P	Beta	SE	P	Beta	SE	P		
rs977747	1	47684677	0.559	T	G	TAL1	0.09	0.003	0.263	0.196	0.165	0.234	0.148	0.109	0.174	0.082	0.061	0.177	0.048	0.091	0.599	0.045	0.191	0.815	yes	no
rs657452	1	49589847	0.438	A	G	AGBL4	0.197	0.003	0.012	0.316	0.16	0.049	0.171	0.106	0.107	0.124	0.059	0.037	0.117	0.089	0.189	0.523	0.186	0.005	yes	no
rs11583200	1	50559820	0.52	C	T	ELAVL4	0.029	0.003	0.71	0.016	0.161	0.922	0.006	0.107	0.955	0.013	0.06	0.825	0.035	0.089	0.695	0.025	0.187	0.894	yes	yes
rs3101336	1	72751185	0.706	C	T	NEGR1	0.159	0.003	0.066	0.278	0.176	0.114	0.154	0.116	0.185	0.094	0.065	0.149	0.216	0.098	0.027	0.222	0.204	0.278	yes	yes
rs12566985	1	75002193	0.61	G	A	FPGT-TNNI3K	0.034	0.003	0.676	0.026	0.165	0.872	-0.001	0.109	0.991	0.004	0.061	0.948	0.117	0.091	0.201	0.104	0.191	0.588	no	no
rs12401738	1	78446761	0.281	A	G	FUBP1	0.121	0.003	0.17	0.273	0.18	0.13	0.136	0.119	0.252	0.091	0.066	0.172	0.249	0.1	0.013	0.152	0.209	0.467	no	yes
rs11165643	1	96924097	0.574	T	C	PTBP2	0.02	0.003	0.805	0.02	0.167	0.906	-0.03	0.11	0.786	0.006	0.061	0.92	0.028	0.092	0.762	-0.039	0.193	0.838	yes	yes
rs17024393	1	110154688	0.02	C	T	GNAT2	-0.206	0.008	0.459	-0.607	0.566	0.284	-0.494	0.375	0.187	-0.234	0.209	0.263	-0.051	0.313	0.871	-0.854	0.66	0.195	yes	no
rs543874	1	177889480	0.207	G	A	SEC16B	0.385	0.004	<0.001	0.787	0.197	<0.001	0.483	0.13	<0.001	0.292	0.073	<0.001	0.286	0.109	0.009	0.683	0.229	0.003	yes	no
rs2820292	1	201784287	0.42	C	A	NAV1	0.014	0.003	0.86	0.059	0.162	0.715	-0.001	0.107	0.991	0.016	0.06	0.792	0.065	0.09	0.467	0.07	0.188	0.709	yes	yes
rs13021737	2	632348	0.874	G	A	TMEM18	0.45	0.004	<0.001	0.829	0.239	0.001	0.464	0.158	0.003	0.326	0.088	<0.001	0.433	0.132	0.001	0.836	0.278	0.003	no	yes
rs10182181	2	25150296	0.417	G	A	ADCY3	0.081	0.003	0.337	0.02	0.173	0.908	0.147	0.114	0.196	0.071	0.064	0.265	-0.245	0.096	0.011	0.045	0.2	0.824	no	yes
rs11126666	2	26928811	0.192	A	G	KCNK3	0.105	0.003	0.286	0.15	0.2	0.455	0.135	0.132	0.306	0.087	0.074	0.236	-0.018	0.111	0.869	0.246	0.233	0.29	yes	yes
rs1016287	2	59305625	0.271	T	C	LINC01122	0.111	0.003	0.198	0.134	0.176	0.449	0.148	0.117	0.205	0.055	0.065	0.402	0.046	0.098	0.637	0.015	0.205	0.942	yes	no
rs11688816	2	63053048	0.558	G	A	EHBP1	0.13	0.003	0.1	0.243	0.16	0.129	0.18	0.106	0.089	0.104	0.059	0.079	0.015	0.089	0.864	0.181	0.186	0.331	yes	no
rs2121279	2	143043285	0.062	T	C	LRP1B	-0.028	0.004	0.861	-0.233	0.328	0.478	-0.169	0.217	0.437	-0.089	0.121	0.463	-0.091	0.182	0.617	-0.088	0.382	0.818	yes	no
rs1460676	2	164567689	0.13	C	T	FIGN	-0.006	0.004	0.96	0.097	0.239	0.684	0.037	0.158	0.812	0.01	0.088	0.909	0.054	0.132	0.682	-0.017	0.277	0.95	no	no
rs1528435	2	181550962	0.656	T	C	UBE2E3	0.136	0.003	0.098	0.266	0.167	0.112	0.218	0.11	0.048	0.122	0.062	0.047	-0.034	0.093	0.714	0.412	0.194	0.034	no	no
rs17203016	2	208255518	0.124	G	A	CREB1	-0.009	0.004	0.941	0.038	0.239	0.874	0.002	0.158	0.988	0.005	0.088	0.954	0.031	0.132	0.816	-0.097	0.278	0.729	yes	no
rs7599312	2	213413231	0.776	G	A	ERBB4	0.198	0.003	0.036	0.451	0.192	0.019	0.367	0.127	0.004	0.157	0.071	0.027	0.089	0.107	0.403	0.395	0.223	0.077	yes	yes
rs492400	2	219349752	0.417	C	T	USP37	0.209	0.003	0.008	0.37	0.16	0.021	0.278	0.106	0.008	0.168	0.059	0.004	0.055	0.089	0.533	0.415	0.186	0.025	yes	yes
rs2176040	2	227092802	0.243	A	G	LOC646736	0.123	0.003	0.184	0.224	0.189	0.237	0.174	0.125	0.163	0.102	0.07	0.145	0	0.105	1	0.343	0.219	0.118	no	no
rs6804842	3	25106437	0.548	G	A	RARB	0.058	0.003	0.457	0.07	0.16	0.661	0.045	0.106	0.671	0.028	0.059	0.633	0.121	0.089	0.172	0.067	0.186	0.719	yes	yes
rs2365389	3	61236462	0.36	C	T	FHIT	0.146	0.003	0.088	0.348	0.175	0.047	0.195	0.115	0.092	0.11	0.064	0.089	0.25	0.097	0.01	0.529	0.203	0.009	no	no
rs3849570	3	81792112	0.369	A	C	GBE1	0.027	0.003	0.738	-0.121	0.164	0.463	-0.051	0.109	0.64	-0.037	0.061	0.545	-0.007	0.091	0.942	-0.006	0.191	0.976	no	yes
rs13078960	3	85807590	0.129	G	T	CADM2	0.255	0.004	0.032	0.535	0.242	0.027	0.357	0.16	0.026	0.208	0.089	0.02	0.122	0.134	0.364	0.462	0.281	0.1	no	yes
rs16851483	3	141275436	0.181	T	G	RASA2	0.062	0.008	0.558	0.115	0.217	0.595	0.084	0.143	0.557	0.065	0.08	0.42	0.017	0.12	0.886	0.093	0.252	0.713	yes	no
rs1516725	3	185824004	0.9	C	T	ETV5	0.234	0.004	0.074	0.288	0.268	0.282	0.23	0.177	0.194	0.134	0.099	0.173	0.198	0.148	0.182	0.294	0.31	0.343	no	yes

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rs10938397	4	45182527	0.366	G	A	GNPDA2	0.205	0.003	0.012	0.262	0.167	0.116	0.145	0.11	0.188	0.108	0.062	0.08	0.195	0.093	0.035	0.325	0.194	0.093	yes	yes
rs17001654	4	77129568	0.223	G	C	SCARB2	0.121	0.005	0.202	0.323	0.193	0.094	0.269	0.128	0.035	0.104	0.071	0.142	-0.002	0.107	0.989	0.261	0.225	0.246	no	no
rs13107325	4	103188709	0.046	T	C	SLC39A8	-0.021	0.007	0.911	-0.051	0.381	0.894	-0.073	0.252	0.773	-0.048	0.141	0.732	0.249	0.211	0.238	-0.346	0.443	0.435	yes	no
rs11727676	4	145659064	0.945	T	C	HHIP	-0.138	0.006	0.421	-0.595	0.35	0.089	-0.516	0.231	0.026	-0.202	0.129	0.117	-0.044	0.193	0.819	-0.986	0.407	0.015	yes	no
rs2112347	5	75015242	0.625	T	G	POC5	0.07	0.003	0.389	0.166	0.164	0.313	0.109	0.109	0.315	0.065	0.061	0.286	0.051	0.091	0.578	0.281	0.191	0.141	yes	no
rs7715256	5	153537893	0.601	G	T	GALNT10	0.075	0.003	0.372	0.038	0.172	0.827	-0.075	0.113	0.507	-0.005	0.063	0.941	0.205	0.095	0.032	0.294	0.199	0.14	no	no
rs205262	6	34563164	0.286	G	A	C6orf106	0.003	0.003	0.971	0.093	0.182	0.609	0.08	0.12	0.506	0.038	0.067	0.576	-0.008	0.101	0.938	-0.118	0.211	0.575	yes	no
rs2033529	6	40348653	0.182	G	A	TDRG1	0.047	0.003	0.643	0.181	0.209	0.384	0.136	0.138	0.323	0.067	0.077	0.386	0.085	0.115	0.461	0.233	0.242	0.335	yes	yes
rs2207139	6	50845490	0.283	G	A	TFAP2B	0.188	0.004	0.041	0.294	0.187	0.116	0.23	0.123	0.063	0.132	0.069	0.056	-0.008	0.104	0.938	0.328	0.217	0.132	yes	no
rs9400239	6	108977663	0.581	C	T	FOXO3	0.152	0.003	0.061	0.331	0.165	0.045	0.229	0.109	0.036	0.107	0.061	0.079	0.226	0.092	0.014	0.32	0.192	0.096	no	yes
rs9374842	6	120185665	0.791	T	C	LOC285762	0.17	0.003	0.077	0.196	0.196	0.319	0.114	0.13	0.381	0.095	0.072	0.188	0.058	0.109	0.596	0.385	0.228	0.091	no	no
rs13201877	6	137675541	0.107	G	A	IFNGR1	0.132	0.004	0.293	0.108	0.257	0.673	0.124	0.17	0.464	0.071	0.095	0.45	-0.03	0.142	0.831	0.224	0.299	0.454	no	yes
rs13191362	6	163033350	0.914	A	G	PARK2	-0.133	0.005	0.343	-0.674	0.288	0.019	-0.407	0.19	0.032	-0.203	0.106	0.056	-0.048	0.159	0.764	-0.31	0.333	0.353	no	yes
rs1167827	7	75163169	0.474	G	A	HIP1	0.04	0.003	0.643	0.158	0.174	0.364	0.11	0.115	0.34	0.048	0.064	0.454	0.043	0.097	0.655	0.192	0.202	0.341	yes	yes
rs2245368	7	76608143	0.336	C	T	PMS2L11	0.061	0.005	0.485	0.149	0.178	0.403	0.114	0.117	0.33	0.057	0.066	0.382	0.024	0.099	0.805	0.196	0.206	0.341	yes	no
rs9641123	7	93197732	0.253	C	G	CALCR	0.099	0.004	0.284	0.164	0.188	0.385	0.098	0.124	0.431	0.047	0.069	0.496	0.043	0.104	0.681	0.28	0.218	0.201	no	no
rs6465468	7	95169514	0.228	T	G	ASB4	-0.03	0.003	0.754	-0.039	0.192	0.837	0.025	0.127	0.842	-0.023	0.071	0.743	0.036	0.106	0.738	0.031	0.223	0.888	yes	no
rs17405819	8	76806584	0.748	T	C	HNF4G	-0.064	0.003	0.482	-0.12	0.184	0.513	-0.048	0.121	0.695	-0.052	0.068	0.445	-0.075	0.102	0.463	-0.137	0.214	0.52	no	yes
rs16907751	8	81375457	0.929	C	T	ZBTB10	0.148	0.006	0.332	0.292	0.311	0.347	0.143	0.206	0.488	0.112	0.115	0.329	0.216	0.172	0.208	0.266	0.361	0.461	no	no
rs2033732	8	85079709	0.783	C	T	RALYL	0.021	0.003	0.826	-0.032	0.19	0.866	-0.086	0.126	0.493	-0.002	0.07	0.977	-0.006	0.105	0.956	-0.108	0.222	0.626	yes	no
rs4740619	9	15634326	0.405	T	C	C9orf93	0.148	0.003	0.072	0.239	0.168	0.154	0.131	0.111	0.237	0.083	0.062	0.179	0.074	0.093	0.426	0.343	0.194	0.077	yes	yes
rs10968576	9	28414339	0.229	G	A	LINGO2	0.332	0.003	<0.001	0.644	0.189	0.001	0.406	0.125	0.001	0.238	0.07	0.001	0.242	0.105	0.021	0.605	0.219	0.006	yes	yes
rs6477694	9	111932342	0.403	C	T	EPB41L4B	0.189	0.003	0.018	0.408	0.163	0.013	0.266	0.108	0.014	0.154	0.06	0.01	0.078	0.091	0.388	0.462	0.19	0.015	yes	no
rs1928295	9	120378483	0.553	T	C	TLR4	0.107	0.003	0.17	0.193	0.159	0.224	0.104	0.105	0.322	0.069	0.059	0.237	0.08	0.088	0.364	0.303	0.185	0.101	yes	no
rs10733682	9	129460914	0.566	A	G	LMX1B	0.105	0.003	0.193	0.15	0.165	0.362	0.074	0.109	0.495	0.075	0.061	0.215	0.024	0.091	0.789	0.141	0.191	0.46	yes	yes
rs7899106	10	87410904	0.05	G	A	GRID1	0.204	0.007	0.256	0.391	0.368	0.288	0.254	0.243	0.295	0.135	0.136	0.321	0.129	0.203	0.524	0.468	0.423	0.268	no	yes
rs17094222	10	102395440	0.219	C	T	HIF1AN	0.029	0.004	0.759	0.069	0.194	0.721	0.105	0.128	0.415	0.019	0.072	0.788	-0.043	0.108	0.69	-0.092	0.226	0.682	no	yes
rs11191560	10	104869038	0.154	C	T	NT5C2	0.001	0.005	0.994	0.038	0.221	0.865	-0.013	0.146	0.931	-0.008	0.081	0.924	0.141	0.122	0.248	0.236	0.257	0.359	yes	no
rs7903146	10	114758349	0.751	C	T	TCF7L2	0.32	0.003	<0.001	0.599	0.187	0.001	0.353	0.123	0.004	0.236	0.069	0.001	0.232	0.103	0.025	0.509	0.217	0.019	yes	no
rs4256980	11	8673939	0.571	G	C	TRIM66	0.235	0.003	0.003	0.422	0.163	0.01	0.274	0.108	0.011	0.167	0.06	0.005	0.166	0.091	0.067	0.452	0.189	0.017	no	yes
rs11030104	11	27684517	0.844	A	G	BDNF	0.227	0.004	0.036	0.468	0.22	0.033	0.266	0.145	0.067	0.175	0.081	0.03	0.19	0.122	0.119	0.427	0.256	0.095	yes	yes
rs2176598	11	43864278	0.406	T	C	HSD17B12	0.161	0.003	0.049	0.276	0.166	0.097	0.206	0.11	0.061	0.095	0.061	0.121	0.181	0.092	0.05	0.204	0.193	0.288	yes	no
rs3817334	11	47650993	0.393	T	C	MTCH2	0.102	0.003	0.2	0.173	0.162	0.284	0.093	0.107	0.382	0.066	0.06	0.266	0.039	0.09	0.667	0.238	0.188	0.207	yes	no
rs12286929	11	115022404	0.522	G	A	CADM1	0.164	0.003	0.035	0.334	0.159	0.035	0.152	0.105	0.149	0.105	0.059	0.073	0.278	0.088	0.002	0.407	0.184	0.027	yes	yes
rs7138803	12	50247468	0.248	A	G	BCDIN3D	0.176	0.003	0.053	0.37	0.185	0.046	0.232	0.122	0.058	0.136	0.068	0.047	0.165	0.103	0.107	0.477	0.215	0.026	yes	yes

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rs11057405	12	122781897	0.931	G	A	CLIP1	0.21	0.005	0.169	0.298	0.311	0.338	0.215	0.206	0.295	0.133	0.115	0.245	0.116	0.172	0.499	0.224	0.361	0.535	yes	yes
rs12016871	13	28017782	0.102	T	C	MTIF3	0.258	0.005	0.046	0.425	0.264	0.107	0.17	0.174	0.329	0.144	0.097	0.14	0.383	0.146	0.009	0.684	0.307	0.026	yes	no
rs12429545	13	54102206	0.262	A	G	OLFM4	0.131	0.004	0.165	0.365	0.192	0.057	0.222	0.127	0.08	0.119	0.071	0.093	0.174	0.107	0.103	0.308	0.223	0.167	yes	no
rs9540493	13	66205704	0.486	A	G	MIR548X2	0.096	0.003	0.218	0.181	0.159	0.256	0.097	0.105	0.358	0.064	0.059	0.273	0.111	0.088	0.207	0.247	0.185	0.182	yes	yes
rs1441264	13	79580919	0.673	A	G	MIR548A2	0.247	0.003	0.003	0.383	0.169	0.023	0.227	0.112	0.042	0.161	0.062	0.01	0.181	0.094	0.053	0.659	0.196	0.001	yes	no
rs10132280	14	25928179	0.683	C	A	STXBP6	0.273	0.003	0.001	0.451	0.171	0.008	0.249	0.113	0.028	0.17	0.063	0.007	0.188	0.095	0.048	0.493	0.199	0.013	yes	yes
rs12885454	14	29736838	0.743	C	A	PRKD1	0.051	0.003	0.576	0.08	0.184	0.663	0.077	0.122	0.525	0.034	0.068	0.612	0.019	0.102	0.856	0.145	0.214	0.497	no	yes
rs11847697	14	30515112	0.088	T	C	PRKD1	0.168	0.007	0.237	0.32	0.29	0.27	0.138	0.191	0.471	0.112	0.107	0.295	0.176	0.16	0.271	0.598	0.336	0.075	yes	no
rs7141420	14	79899454	0.634	T	C	NRXN3	0.005	0.003	0.948	0.044	0.166	0.791	0.079	0.11	0.473	-0.003	0.061	0.957	0.004	0.092	0.967	-0.062	0.193	0.746	yes	yes
rs3736485	15	51748610	0.477	A	G	DMXL2	0.006	0.003	0.938	0.022	0.16	0.893	0.02	0.106	0.849	0.014	0.059	0.817	-0.012	0.089	0.891	0.029	0.186	0.875	yes	yes
rs16951275	15	68077168	0.532	T	C	MAP2K5	0.282	0.004	0.001	0.596	0.174	0.001	0.306	0.115	0.008	0.194	0.064	0.002	0.348	0.097	<0.001	0.508	0.202	0.012	no	yes
rs7164727	15	73093991	0.54	T	C	LOC100287559	-0.005	0.003	0.955	0.058	0.164	0.724	0.033	0.108	0.762	0.024	0.06	0.688	-0.032	0.091	0.722	-0.008	0.19	0.964	no	yes
rs758747	16	3627358	0.31	T	C	NLRC3	0.098	0.004	0.267	0.133	0.181	0.462	0.049	0.12	0.682	0.059	0.067	0.375	0.1	0.1	0.317	0.178	0.21	0.395	yes	no
rs12446632	16	19935389	0.919	G	A	GPRC5B	0.011	0.004	0.937	0.24	0.292	0.411	0.1	0.193	0.606	0.055	0.108	0.608	0.021	0.162	0.897	0.353	0.339	0.297	no	yes
rs2650492	16	28333411	0.141	A	G	SBK1	0.093	0.003	0.417	0.272	0.235	0.247	0.175	0.155	0.26	0.086	0.087	0.323	-0.028	0.13	0.832	0.293	0.273	0.282	no	no
rs3888190	16	28889486	0.405	A	C	ATP2A1	0.174	0.003	0.034	0.38	0.167	0.022	0.267	0.11	0.015	0.141	0.061	0.022	0.046	0.092	0.62	0.498	0.193	0.01	yes	yes
rs4787491	16	30015337	0.429	G	A	INO80E	0.137	0.003	0.083	0.262	0.161	0.105	0.128	0.107	0.229	0.09	0.059	0.13	0.19	0.089	0.033	0.236	0.187	0.208	yes	yes
rs9925964	16	31129895	0.605	A	G	KAT8	0.13	0.003	0.108	0.34	0.164	0.039	0.187	0.109	0.086	0.111	0.061	0.066	0.197	0.091	0.031	0.263	0.191	0.169	no	yes
rs2080454	16	49062590	0.362	C	A	CBLN1	0.087	0.003	0.295	0.106	0.169	0.528	0.11	0.111	0.325	0.057	0.062	0.356	-0.02	0.093	0.83	0.087	0.196	0.658	yes	yes
rs1558902	16	53803574	0.251	A	T	FTO	0.466	0.003	<0.001	0.696	0.188	<0.001	0.4	0.124	0.001	0.28	0.069	<0.001	0.365	0.104	<0.001	0.9	0.218	<0.001	yes	yes
rs9914578	17	2005136	0.282	G	C	SMG6	0.035	0.004	0.686	0.018	0.178	0.92	0.016	0.118	0.893	0.01	0.066	0.88	0.03	0.098	0.763	0.017	0.207	0.936	no	yes
rs1000940	17	5283252	0.345	G	A	RABEP1	-0.003	0.003	0.97	-0.067	0.166	0.685	-0.071	0.11	0.517	-0.03	0.061	0.625	0.026	0.092	0.775	0.031	0.194	0.874	no	no
rs12940622	17	78615571	0.658	G	A	RPTOR	0.175	0.003	0.036	0.325	0.17	0.056	0.234	0.113	0.038	0.118	0.063	0.06	0.207	0.094	0.028	0.348	0.198	0.079	yes	no
rs1808579	18	21104888	0.421	C	T	C18orf8	0.107	0.003	0.192	0.218	0.167	0.192	0.056	0.11	0.615	0.063	0.062	0.307	0.149	0.093	0.108	0.217	0.194	0.264	yes	yes
rs7239883	18	40147671	0.325	G	A	LOC284260	-0.117	0.003	0.172	-0.175	0.175	0.316	-0.112	0.116	0.332	-0.067	0.065	0.298	-0.14	0.097	0.15	-0.211	0.203	0.298	yes	yes
rs7243357	18	56883319	0.765	T	G	GRP	0.014	0.004	0.882	-0.062	0.187	0.74	-0.043	0.123	0.726	-0.011	0.069	0.874	0.006	0.103	0.953	-0.05	0.217	0.816	yes	yes
rs6567160	18	57829135	0.143	C	T	MC4R	0.287	0.004	0.011	0.505	0.229	0.028	0.217	0.152	0.152	0.175	0.085	0.038	0.414	0.127	0.001	0.445	0.266	0.095	yes	yes
rs17724992	19	18454825	0.676	A	G	PGPEP1	0.136	0.003	0.118	0.109	0.177	0.538	0.052	0.117	0.659	0.074	0.065	0.254	0.149	0.098	0.129	0.129	0.205	0.531	yes	no
rs29941	19	34309532	0.648	G	A	KCTD15	0.021	0.003	0.802	0.055	0.171	0.745	0.058	0.113	0.605	0.025	0.063	0.69	-0.026	0.095	0.782	0.132	0.198	0.505	yes	yes
rs2075650	19	45395619	0.897	A	G	TOMM40	0.02	0.004	0.877	-0.068	0.257	0.792	0.018	0.17	0.917	0.001	0.095	0.994	-0.032	0.142	0.822	-0.245	0.299	0.414	yes	yes
rs2287019	19	46202172	0.873	C	T	QPCTL	0.127	0.004	0.278	0.329	0.239	0.169	0.209	0.158	0.188	0.1	0.088	0.256	0.159	0.132	0.231	0.314	0.278	0.259	yes	yes
rs3810291	19	47569003	0.505	A	G	ZC3H4	0.182	0.004	0.023	0.482	0.163	0.003	0.222	0.108	0.04	0.128	0.06	0.033	0.37	0.09	<0.001	0.61	0.19	0.001	yes	yes
rs6091540	20	51087862	0.688	C	T	ZFP64	-0.035	0.003	0.687	0.006	0.174	0.973	0.024	0.115	0.837	0	0.064	0.996	-0.111	0.097	0.253	-0.055	0.203	0.785	yes	no
rs2836754	21	40291740	0.425	C	T	ETS2	-0.029	0.003	0.722	-0.067	0.168	0.691	-0.061	0.111	0.579	-0.026	0.062	0.673	0.004	0.093	0.962	-0.071	0.194	0.715	yes	yes

SUPPLEMENTARY DATA

Supplementary Table 2. The effects of 1-SD increment (6-unit) of overall GRS on BMI, obesity, fat mass, fat percentage, fat free mass, and waist circumference in US Hispanics/Latinos

Outcome	Effect	SE	P-value
BMI (kg/m ²)	0.65	0.05	1.1×10 ⁻³⁹
Obesity (BMI ≥ 30 vs BMI < 30)*	0.21	0.02	3.32×10 ⁻²³
Fat mass (kg)	1.20	0.11	2.7×10 ⁻²⁶
Fat percentage (%)	0.74	0.07	5.9×10 ⁻²³
Fat mass index (kg/m ²)	0.45	0.04	1.4×10 ⁻²⁷
Fat free mass (kg)	0.54	0.06	3.7×10 ⁻¹⁸
Waist circumference (cm)	1.34	0.13	1.6×10 ⁻²⁴

* log-odds ratio

Supplementary Table 3. Power calculation from 10,000 simulations with sample size = 9,537, comparing the powers to detect MVPA × GRS, sedentary behavior × GRS, or both by a model with one interaction (model 1) and by a model with two interactions (model 2).

Power	Scenario 1		Scenario 2		Scenario 3	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
MVPA × GRS	96%	72%	99%	99%	54% (type I error)	5% (type I error)
Sedentary Behavior × GRS	88%	37%	52% (type I error)	5% (type I error)	99%	97%
MVPA × GRS and Sedentary Behavior × GRS	NA	20%	NA	5%	NA	5%

Model 1: BMI ~ MVPA × GRS, or BMI ~ Sedentary Time × GRS

Model 2: BMI ~ MVPA × GRS + Sedentary Time × GRS

MVPA and sedentary time were simulated according to their covariance structure, GRS was simulated according to its distribution, and residual standard deviation was estimated from the real data.

Scenario 1: Both MVPA and sedentary behavior have modification effects with GRS on BMI, assuming the effect sizes estimated from the corresponding model. The data was simulated with the following model:

$$\text{BMI} = 0.115 \times \text{GRS} - 0.023 \times \text{MVPA} + 0.001 \times \text{Sedentary Time} - 0.0006 \times \text{MVPA} \times \text{GRS} + 0.0001 \times \text{Sedentary time} \times \text{GRS} + e,$$

where $\text{GRS} \sim N(0, 6^2)$,

$$(\text{MVPA}, \text{Sedentary Time})^T \sim N\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 26^2 & -0.47 \times 26 \times 100 \\ -0.47 \times 26 \times 100 & 100^2 \end{pmatrix}\right),$$

$$e \sim N(0, 3.18^2).$$

Scenario 2: Only MVPA has a modification effect with GRS on BMI, assuming the effect sizes estimated from the corresponding model. The data was simulated with the following model:

$$\text{BMI} = 0.115 \times \text{GRS} - 0.023 \times \text{MVPA} + 0.001 \times \text{Sedentary Time} - 0.0009 \times \text{MVPA} \times \text{GRS} + e,$$

where $\text{GRS} \sim N(0, 6^2)$,

$$(\text{MVPA}, \text{Sedentary Time})^T \sim N\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 26^2 & -0.47 \times 26 \times 100 \\ -0.47 \times 26 \times 100 & 100^2 \end{pmatrix}\right),$$

$$e \sim N(0, 3.18^2).$$

Scenario 3: Only sedentary time has a modification effect with GRS on BMI, assuming the effect sizes estimated from the corresponding model. The data was simulated with the following model:

$$\text{BMI} = 0.115 \times \text{GRS} - 0.023 \times \text{MVPA} + 0.001 \times \text{Sedentary Time} + 0.00024 \times \text{Sedentary time} \times \text{GRS} + e,$$

where $\text{GRS} \sim N(0, 6^2)$,

$$(\text{MVPA}, \text{Sedentary Time})^T \sim N\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 26^2 & -0.47 \times 26 \times 100 \\ -0.47 \times 26 \times 100 & 100^2 \end{pmatrix}\right),$$

$$e \sim N(0, 3.18^2).$$

SUPPLEMENTARY DATA

Supplementary Table 4. Sensitivity analysis for interaction of physical activity, MVPA and sedentary behavior with the overall GRS excluding subjects with diabetes or prevalent coronary heart disease§

		Continuous*		Tertiles†		
		Beta for Interaction (SE)	P-value	T1	T2	T3
BMI (kg/m²)	Total physical activity					
	Model 1	-0.12 (0.05)	0.014	0.85 (0.12)	0.75 (0.10)	0.40 (0.10)
	MVPA					
	Model 1	-0.06 (0.02)	0.01	0.74 (0.11)	0.80 (0.11)	0.41 (0.09)
	Model 2 ‡	-0.03 (0.03)	0.165	0.68 (0.12)	0.8 (0.11)	0.45 (0.11)
	Sedentary time					
	Model 1	0.10 (0.04)	0.006	0.40 (0.10)	0.82 (0.11)	0.74 (0.11)
	Model 2 ‡	0.07 (0.04)	0.075	0.39 (0.11)	0.82 (0.11)	0.74 (0.12)
	Fat mass (kg)	Total physical activity				
Model 1		-0.26 (0.1)	0.007	1.72 (0.24)	1.44 (0.21)	0.7 (0.19)
MVPA						
Model 1		-0.13 (0.04)	0.004	1.52 (0.23)	1.57 (0.22)	0.7 (0.19)
Model 2 ‡		-0.08 (0.05)	0.13	1.34 (0.25)	1.57 (0.22)	0.85 (0.22)
Sedentary time						
Model 1		0.23 (0.07)	0.002	0.65 (0.19)	1.61 (0.22)	1.5 (0.23)
Model 2 ‡		0.17 (0.08)	0.037	0.65 (0.22)	1.59 (0.21)	1.48 (0.25)
Fat mass index (kg/m²)		Total physical activity				
	Model 1	-0.1 (0.04)	0.004	0.66 (0.09)	0.54 (0.08)	0.25 (0.07)
	MVPA					
	Model 1	-0.05 (0.02)	0.002	0.58 (0.09)	0.59 (0.08)	0.25 (0.07)
	Model 2 ‡	-0.03 (0.02)	0.082	0.52 (0.09)	0.59 (0.08)	0.29 (0.08)
	Sedentary time					
	Model 1	0.09 (0.03)	0.002	0.24 (0.07)	0.62 (0.08)	0.55 (0.09)
	Model 2 ‡	-0.1 (0.04)	0.004	0.66 (0.09)	0.54 (0.08)	0.25 (0.07)
	Fat percentage (%)	Total physical activity				
Model 1		-0.16 (0.07)	0.014	1.1 (0.15)	0.94 (0.14)	0.47 (0.14)
MVPA						
Model 1		-0.07 (0.03)	0.013	0.94 (0.15)	1.09 (0.14)	0.45 (0.14)
Model 2 ‡		-0.03 (0.03)	0.313	0.81 (0.16)	1.09 (0.14)	0.56 (0.16)
Sedentary time						
Model 1		0.16 (0.05)	0.002	0.42 (0.14)	1.04 (0.14)	1.01 (0.15)
Model 2 ‡		0.13 (0.06)	0.019	0.42 (0.15)	1.02 (0.14)	1 (0.17)
Fat free mass (kg)		Total physical activity				
	Model 1	0 (0.05)	0.934	0.61 (0.12)	0.52 (0.11)	0.47 (0.11)
	MVPA					
Model 1	0 (0.02)	0.859	0.52 (0.12)	0.57 (0.12)	0.49 (0.11)	

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	Model 2 ‡	0.01 (0.03)	0.704	0.49 (0.13)	0.57 (0.12)	0.52 (0.13)
	Sedentary time					
	Model 1	0.04 (0.04)	0.308	0.48 (0.11)	0.52 (0.12)	0.64 (0.13)
	Model 2 ‡	0.05 (0.05)	0.271	0.47 (0.13)	0.51 (0.12)	0.71 (0.14)
Waist circumference (cm)	Total physical activity					
	Model 1	-0.29 (0.11)	0.009	1.84 (0.27)	1.69 (0.24)	0.74 (0.23)
	MVPA					
	Model 1	-0.12 (0.05)	0.023	1.52 (0.26)	1.85 (0.25)	0.84 (0.22)
	Model 2 ‡	-0.03 (0.06)	0.603	1.41 (0.29)	1.85 (0.25)	1.01 (0.25)
	Sedentary time					
	Model 1	0.31 (0.08)	<0.001	0.64 (0.23)	1.91 (0.25)	1.62 (0.27)
	Model 2 ‡	0.29 (0.1)	0.002	0.59 (0.26)	1.89 (0.24)	1.69 (0.29)

*Data are interaction effect sizes per 1-SD (6-unit) increment of GRS × per 100-counts/min increment of total physical activity, per 1-SD increment of GRS × per 10-minute increment of MVPA, and per 1-SD increment of GRS × per 1-hour increment of sedentary time on BMI, fat mass, fat mass index, fat percentage, fat free mass, and waist circumference, respectively.

†Data are effect sizes per 1-SD increment of GRS on BMI, fat mass, fat mass index, fat percentage, fat free mass, and waist circumference, according to tertiles of total physical activity, MVPA and sedentary time, respectively.

Model 1, adjusted for log of sampling weight, field center, age, sex, 5 principal components for population structure, education, income, employment, smoking, alcohol use, energy intake, alternative healthy eating index as fixed effects and genetic relatedness, household, block groups as random effects.

‡ Model 2, simultaneously tested for MVPA × GRS and sedentary behavior × GRS.

§After excluding subjects with diabetes (N=1957) or prevalent coronary heart disease (N=526), total of 7379 subjects were included in the analysis.

Supplementary Table 5. Interactions of the overall GRS with overall health score and physical activity variables on BMI.

	Beta for interaction with physical activity variables (SE)*	P-value for interaction	Beta for interaction with overall health (SE)†	P-value for interaction
Total physical activity	-0.13 (0.04)	0.003	0.002 (0.009)	0.815
MVPA	-0.06 (0.02)	0.003	0.002 (0.009)	0.825
Sedentary behavior	0.09 (0.03)	0.005	0.001 (0.009)	0.905

A model includes interactions of GRS with overall health and one of environment variables (total physical activity, MVPA, or sedentary behavior) adjusted for log of sampling weight, field center, age, sex, 5 principal components for population structure, education, income, employment, smoking, alcohol use, energy intake, alternative healthy eating index.

* Data are interaction effect size per 1-SD (6-unit) increment of GRS × per 100-counts/min increment of total physical activity, per 1-SD increment of GRS × per 10-minute increment of MVPA, and per 1-SD increment of GRS × per 1-hour increment of sedentary time on BMI.

†Data are interaction effect size per 1-SD (6-unit) increment of GRS × per 1 score increment of overall health score on BMI.

Supplementary Table 6. Negative control tests of randomly selected environment groups.

Randomly selected groups (10,000 random selections)			
	Observed P_{int}	Median of P_{int} from data with randomized environment groups†	% of P_{int} from data with randomized environment groups < Observed P_{int}
Total Physical Activity* × GRS	0.001	0.40	0.48
MVPA* × GRS	0.00008	0.37	0.05
Sedentary Behavior* × GRS	0.009	0.48	1.2

Adjusted for sampling weight, age, sex, 5 PCs, and center.

*Total physical activity was grouped into two groups (tertile 1 +tertile 2 vs tertile 3), MVPA was grouped into two (tertile 1 +tertile 2 vs tertile 3), and sedentary behavior was grouped as (tertile 1 vs tertile 2+tertile 3).

†Two environment groups were randomly reassigned to have the same BMI distributions to its original distributions of each group, and tested for interaction with GRS on BMI, adjusting for sampling weight, age, sex, 5 PCs, and center.

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Supplementary Table 7. Negative control tests of simulated environment variables.

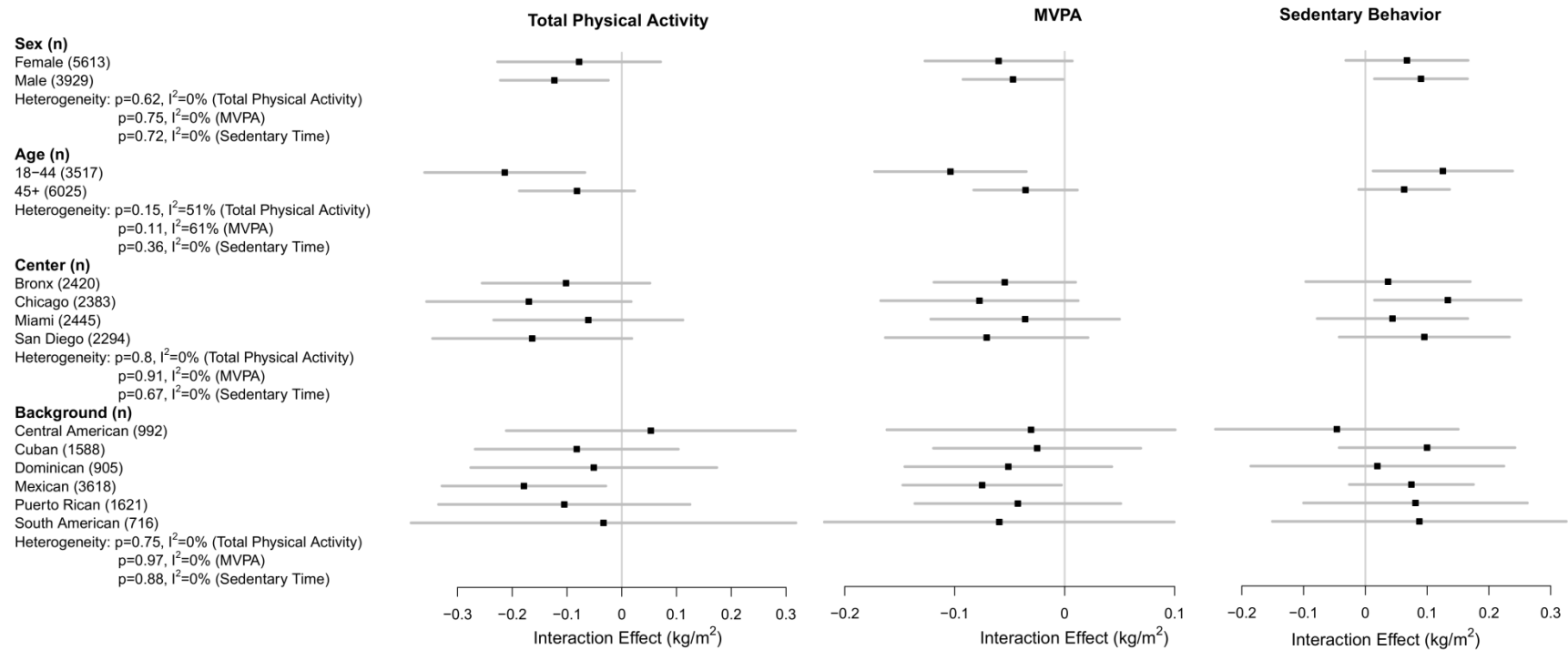
Simulated environment variables (10,000 simulations)			
	Observed P_{int}	Median of P_{int} from data with simulated environment variable†	% of P_{int} from data with simulated environment variable < Observed P_{int}
Total Physical Activity × GRS	0.008	0.51	0.76
MVPA × GRS	0.004	0.51	0.46
Sedentary Behavior × GRS	0.026	0.50	2.4

Adjusted for sampling weight, age, sex, 5PCs, and center.

†An environment variable (total physical activity, MVPA, or sedentary behavior) was simulated as the sum of predicted environmental value and permuted residual from the model of the environment variable to the predictors of age, sex, BMI, and overall GRS. The interaction of simulated environment variable and the overall GRS on BMI was tested, adjusting for sampling weight, age, sex, 5 PCs, and center.

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Supplementary Figure 1. Interactions of the overall GRS with total physical activity, MVPA and sedentary behavior on BMI, stratified by sex, age, center and genetically identified background.



* Data are interaction effects (95% CI) of overall GRS with total physical activity, MVPA and sedentary behavior on BMI, adjusted for sampling weight, field center, age, sex, 5 principal components for population structure, education, income, employment, smoking, alcohol use, energy intake, alternative healthy eating index as fixed effects and kinship relatedness, household, block groups as random effects. The units of interaction effects are per 1 SD (6-unit) of GRS \times 100 counts/min, per 1 SD of GRS \times 10 minutes, and per 1 SD of GRS \times 1 hour for interactions of overall GRS with total physical activity, MVPA, sedentary time, respectively. Heterogeneity tests did not account for low-level relatedness between groups. There are no significant heterogeneities between different stratifying variables except for moderate heterogeneity by age groups.