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Author Correction: Testing the key assumption of heritability estimates based on genome-wide genetic relatedness

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In the original paper, we used the variable “URBRUR08,” from the 2008 survey wave as a measure of childhood urbanicity. Upon further investigation we realized that this variable actually measured Beale urban-rural code during the respondent’s adulthood.

Thus, we reran our analysis of the pseudo-heritability of childhood urbanicity using the variable, “B049”. As shown in Table 1, below, the original results hold such that even with the first 20 principal components held constant, childhood urban-rural status appears to be ~20% “heritable” in GREML models—a figure that is actually higher than the original estimate reported in the paper (14% controlling for 25 PCs, 15% controlling for 10 PCs, and 29% controlling for two PCs). Meanwhile, the heritabilities of the other phenotypes—height, BMI and education—still do not change when they are residualized on childhood urbanicity. In other words, the original results of the paper do not change. The new HRS variable is shown below as depicted in the 1995 Wave. This question was re-asked in 1996 and in subsequent waves in cases where there was not a valid response from 1995 or 1996. We used the earliest valid value and excluded those respondents who had missing values for all waves:

D718	A28.LIVE IN CITY/TOWN/RURAL		CAI Reference: Q718
	Section: A	Level: Respondent	
	Type: Numeric	Width: 1	Decimals: 0
	A28. Were you living in a rural area most of the time when you were (in grade school/in high school/about age 10)?		
	1994	1. YES	
	2883	5. NO	
	1	7. Other	

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D718 A28.LIVE IN CITY/TOWN/RURAL	
8	8. DK (don't know); NA (not ascertained) 9. RF (refused)
2141	Blank. INAP (Inapplicable); ([Q370:W1 INTERV] IS (1) AND [Q108:W1 R EDUCATION YEARS V125] IS (0)) OR ([Q370:W1 INTERV] IS (NE 1) AND [Q649:A3] IS (0))

The corresponding variables for this question in subsequent waves are the following: E718 (1996 core); F1038 (1998 core); G1125 (2000 core); HB049 (2002 core); SB049 (2002 exit); JB049 (2004 core); TB049 (2004 exit); KB049 (2006 core); LB049 (2008 core); VB049 (2008 exit); MB049 (2010 core); NB049 (2012 core); OB049 (2014 core); PB049 (2016 core).

GREML heritability estimates for shared childhood urbanicity, height, BMI and educational attainment

Table 1

	Number of PCs	Additive heritability (h^2)	Standard error	N	h^2 Controlling for childhood urbanity	Standard error	N
Height	2	0.404	0.067	7488	0.404	0.067	7488
BMI	2	0.098	0.069	7415	0.099	0.069	7415
Education (HGC)	2	0.334	0.066	7550	0.300	0.066	7550
Urbanity in adulthood	2	0.347	0.058	7564	0.306	0.059	7564
Urbanity in childhood	2	0.290	0.059	7564	NA	NA	NA
Height	10	0.389	0.068	7488	0.388	0.068	7488
BMI	10	0.115	0.068	7415	0.116	0.069	7415
Education (HGC)	10	0.319	0.066	7550	0.297	0.067	7550
Urbanity in adulthood	10	0.246	0.062	7564	0.214	0.063	7564
Urbanity in childhood	10	0.211	0.062	7564	NA	NA	NA
Height	20	0.376	0.069	7488	0.374	0.069	7488
BMI	20	0.106	0.069	7415	0.106	0.069	7415
Education (HGC)	20	0.323	0.066	7550	0.302	0.067	7550
Urbanity in adulthood	20	0.243	0.062	7564	0.213	0.063	7564
Urbanity in childhood	20	0.203	0.062	7564	NA	NA	NA

Analysis includes white, non-Hispanic respondents in the Health and Retirement Study (HRS) for cryptic relatedness cutoff of 0.025. Two PCs control for population stratification in first set of analyses (A,B), ten PCs in second set of analyses (C,D) and 20 PCs in third set

BMI body mass index, GREML genetic relatedness estimation through maximum likelihood, PC principal component