# Online Appendix

**Patterns and Life Course Determinants of Black–White Disparities in Biological Age Acceleration: A Decomposition Analysis**

Courtney E. Boen, Y. Claire Yang, Allison E. Aiello, Alexis C. Dennis, Kathleen Mullan Harris, Dayoon Kwon, and Daniel W. Belsky

Table A1. Multivariable models of Black-White disparity in KDM biological age acceleration (HRS)

| | **Model 1**<br>*Basic adjusted*<br>Coeff. (SE) | **Model 2**<br>*M1 + SES*<br>Coeff. (SE) | **Model 3**<br>*M2 + Race*SES*<br>Coeff. (SE) | **Model 4**<br>*M1 + Stress*<br>Coeff. (SE) | **Model 5**<br>*M4 + Race*Stress*<br>Coeff. (SE) | **Model 6**<br>*Fully adjusted*<br>Coeff. (SE) |
|---|---|---|---|---|---|---|
| Racial disparity (1=Black) | 18.893** | 15.171* | 15.282* | 17.576* | 23.930** | 19.401** |
| | (6.961) | (6.905) | (6.891) | (6.976) | (7.269) | (7.216) |
| Age | -0.450 | -0.108 | -0.076 | -0.286 | -0.257 | 0.026 |
| | (0.606) | (0.599) | (0.599) | (0.606) | (0.606) | (0.600) |
| Black * Age | -0.116 | -0.117 | -0.109 | -0.106 | -0.189^ | -0.167 |
| | (0.102) | (0.102) | (0.102) | (0.102) | (0.106) | (0.106) |
| Sex (1=female) | 25.797*** | 25.424*** | 25.515*** | 25.930*** | 25.700*** | 25.429*** |
| | (5.074) | (5.019) | (5.016) | (5.069) | (5.069) | (5.016) |
| Female * Age | -0.474*** | -0.477*** | -0.478*** | -0.473*** | -0.469*** | -0.474*** |
| | (0.072) | (0.071) | (0.071) | (0.071) | (0.071) | (0.071) |
| $Age^2$ | 0.005 | 0.002 | 0.002 | 0.004 | 0.004 | 0.001 |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| Birth cohort | -0.420 | -0.713 | -0.657 | -0.453 | -0.471 | -0.687 |
| | (1.019) | (1.007) | (1.006) | (1.019) | (1.018) | (1.005) |
| Region of birth (1=South) | 1.770* | 0.747 | 0.765 | 1.851* | 1.801* | 0.832 |
| | (0.733) | (0.725) | (0.725) | (0.733) | (0.732) | (0.724) |
| SES (factor score) | | -4.770*** | -5.032*** | | | -4.714*** |
| | | (0.349) | (0.374) | | | (0.381) |
| Black * SES | | | 1.568 | | | 1.243 |
| | | | (1.022) | | | (1.034) |
| Stress burden (factor score) | | | | 1.972*** | 2.687*** | 1.803*** |
| | | | | (0.365) | (0.413) | (0.414) |
| Black * Stress burden | | | | | -2.516** | -1.895* |
| | | | | | (0.851) | (0.853) |
| Intercept | 13.622 | 6.790 | 5.243 | 6.044 | 4.555 | -0.054 |
| | (27.990) | (27.629) | (27.602) | (27.969) | (27.979) | (27.626) |

*** p<0.001, ** p<0.01, * p<0.05, ^ p<0.1

Notes: Results of OLS regression models with clustered standard errors at the household. n=6,782.

Table A2. Multivariable models of Black-White disparity in homeostatic dysregulation (log) (HRS)

| | **Model 1**<br>*Basic adjusted*<br>Coeff. (SE) | **Model 2**<br>*M1 + SES*<br>Coeff. (SE) | **Model 3**<br>*M2 + Race*SES*<br>Coeff. (SE) | **Model 4**<br>*M1 + Stress*<br>Coeff. (SE) | **Model 5**<br>*M4 + Race*Stress*<br>Coeff. (SE) | **Model 6**<br>*Fully adjusted*<br>Coeff. (SE) |
|---|---|---|---|---|---|---|
| Racial disparity (1=Black) | 1.106*** | 1.005*** | 1.009*** | 1.068*** | 1.296*** | 1.173*** |
| | (0.213) | (0.212) | (0.212) | (0.214) | (0.223) | (0.223) |
| Age | 0.010 | 0.019 | 0.020 | 0.014 | 0.015 | 0.023 |
| | (0.020) | (0.020) | (0.020) | (0.020) | (0.020) | (0.020) |
| Black * Age | -0.009** | -0.009** | -0.009** | -0.009** | -0.012*** | -0.011*** |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Sex (1=female) | 0.325* | 0.315* | 0.318* | 0.329* | 0.320* | 0.314* |
| | (0.159) | (0.158) | (0.158) | (0.159) | (0.159) | (0.158) |
| Female * Age | -0.007** | -0.007** | -0.007** | -0.007** | -0.007** | -0.007** |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| $Age^2$ | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Birth cohort | 0.001 | -0.006 | -0.004 | 0.000 | -0.000 | -0.005 |
| | (0.034) | (0.034) | (0.034) | (0.034) | (0.034) | (0.034) |
| Region of birth (1=South) | 0.104*** | 0.077** | 0.077** | 0.106*** | 0.104*** | 0.079*** |
| | (0.024) | (0.024) | (0.024) | (0.024) | (0.024) | (0.024) |
| SES (factor score) | | -0.127*** | -0.137*** | | | -0.126*** |
| | | (0.012) | (0.013) | | | (0.013) |
| Black * SES | | | 0.057^ | | | 0.046 |
| | | | (0.031) | | | (0.031) |
| Stress burden (factor score) | | | | 0.056*** | 0.082*** | 0.058*** |
| | | | | (0.013) | (0.015) | (0.015) |
| Black * Stress burden | | | | | -0.090** | -0.073** |
| | | | | | (0.028) | (0.028) |
| Intercept | 2.606** | 2.417** | 2.360* | 2.390* | 2.336* | 2.196* |
| | (0.931) | (0.924) | (0.923) | (0.930) | (0.929) | (0.922) |

*** p<0.001, ** p<0.01, * p<0.05, ^ p<0.1

Notes: Results of OLS regression models with clustered standard errors at the household. n=6,782.

Table A3. Multivariable models of Black-White disparity in biological age acceleration by sex (PhenoAge algorithm) (HRS)

| | Males (n=2,836) | | | | | | Females (n=3,946) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| Racial disparity (1=Black) | 9.035* | 8.263* | 8.069* | 8.481* | 10.757** | 9.247* | 8.476** | 6.773* | 6.796* | 8.069** | 10.705*** | 8.713** |
| | (3.782) | (3.796) | (3.776) | (3.790) | (4.037) | (4.043) | (2.832) | (2.800) | (2.792) | (2.841) | (2.961) | (2.931) |
| Age | 0.099 | 0.219 | 0.247 | 0.155 | 0.173 | 0.285 | -0.076 | 0.043 | 0.046 | -0.024 | -0.010 | 0.081 |
| | (0.317) | (0.315) | (0.315) | (0.316) | (0.316) | (0.314) | (0.248) | (0.246) | (0.245) | (0.247) | (0.247) | (0.245) |
| Black * Age | -0.094^ | -0.101^ | -0.087 | -0.089 | -0.118* | -0.103^ | -0.077^ | -0.073^ | -0.072^ | -0.075^ | -0.110* | -0.099* |
| | (0.056) | (0.056) | (0.056) | (0.056) | (0.059) | (0.059) | (0.041) | (0.041) | (0.041) | (0.041) | (0.043) | (0.043) |
| $Age^2$ | 0.000 | -0.001 | -0.001 | -0.000 | -0.000 | -0.001 | 0.001 | -0.000 | -0.000 | 0.001 | 0.000 | -0.000 |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Birth cohort | -0.472 | -0.587 | -0.538 | -0.483 | -0.481 | -0.540 | -0.453 | -0.538 | -0.532 | -0.476 | -0.481 | -0.553 |
| | (0.502) | (0.497) | (0.496) | (0.502) | (0.501) | (0.496) | (0.435) | (0.428) | (0.427) | (0.435) | (0.435) | (0.428) |
| Region of birth (1=South) | 1.169** | 0.911* | 0.952* | 1.205** | 1.193** | 0.979** | 0.574^ | 0.138 | 0.138 | 0.600* | 0.572^ | 0.156 |
| | (0.377) | (0.370) | (0.370) | (0.377) | (0.377) | (0.369) | (0.300) | (0.297) | (0.297) | (0.299) | (0.299) | (0.296) |
| SES (factor score) | | -1.412*** | -1.653*** | | | -1.562*** | | -1.837*** | -1.862*** | | | -1.732*** |
| | | (0.177) | (0.188) | | | (0.192) | | (0.146) | (0.156) | | | (0.160) |
| Black * SES | | | 1.739** | | | 1.646** | | | 0.135 | | | -0.008 |
| | | | (0.544) | | | (0.553) | | | (0.422) | | | (0.427) |
| Stress burden (factor score) | | | | 0.586** | 0.789*** | 0.494* | | | | 0.733*** | 1.072*** | 0.749*** |
| | | | | (0.186) | (0.195) | (0.194) | | | | (0.159) | (0.179) | (0.182) |
| Black * Stress burden | | | | | -0.811^ | -0.525 | | | | | -1.109** | -0.890* |
| | | | | | (0.480) | (0.480) | | | | | (0.377) | (0.381) |
| Intercept | -4.713 | -7.140 | -8.464 | -7.202 | -8.054 | -10.349 | 2.286 | -0.287 | -0.435 | -0.046 | -0.790 | -2.251 |
| | (14.364) | (14.209) | (14.185) | (14.313) | (14.335) | (14.176) | (11.709) | (11.555) | (11.545) | (11.686) | (11.683) | (11.539) |

*** p<0.001, ** p<0.01, * p<0.05, ^ p<0.1

Notes: Results of sex stratified OLS regression models with clustered standard errors at the household. Coefficient estimates and standard errors presented.

Table A4. Sex Stratified Kitagawa-Oaxaca-Blinder Decomposition of Racial Disparities in Biological Age Acceleration

| | Males (n=2,836) | | | | | | | | | Females (n=3,946) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PhenoAge Acceleration | | | KDM Biological Age | | | Homeostatic Dysregulation | | | PhenoAge Acceleration | | | KDM Biological Age | | | Homeostatic Dysregulation | | |
| | Coeff. (SE) | *p*-value | % | Coeff. (SE) | *p*-value | % | Coeff. (SE) | *p*-value | % | Coeff. (SE) | *p*-value | % | Coeff. (SE) | *p*-value | % | Coeff. (SE) | *p*-value | % |
| Overall | | | | | | | | | | | | | | | | | | |
| *Black-White disparity in outcome* | *2.355* | *** | | *12.572* | *** | | *0.406* | *** | | *3.048* | *** | | *11.584* | *** | | *0.432* | *** | |
| | *(0.472)* | | | *(1.632)* | | | *(0.043)* | | | *(0.349)* | | | *(1.003)* | | | *(0.034)* | | |
| *Endowments* | 1.37999 | *** | 58.61% | 6.128 | *** | 48.74% | 0.061 | * | 15.04% | 1.458 | *** | 47.84% | 5.341 | *** | 46.11% | 0.077 | ** | 17.82% |
| | (0.284) | | | (0.927) | | | (0.030) | | | (0.201) | | | (0.563) | | | (0.023) | | |
| *Coefficients* | 3.083 | *** | 130.92% | 11.934 | *** | 94.93% | 0.529 | *** | 130.44% | 2.138 | *** | 70.13% | 8.729 | *** | 75.35% | 0.367 | *** | 84.95% |
| | (0.829) | | | (2.783) | | | (0.069) | | | (0.586) | | | (1.798) | | | (0.055) | | |
| *Interaction* | -2.1081 | ** | -89.53% | -5.490 | *** | -43.67% | -0.184 | ** | -45.37% | -0.548 | | -17.97% | -2.486 | | -21.46% | -0.012 | | -2.78% |
| | (0.719) | | | (2.386) | | | (0.063) | | | (0.541) | | | (1.584) | | | (0.050) | | |
| Endowments | | | | | | | | | | | | | | | | | | |
| *SES* | 1.461 | *** | 62.03% | 5.193 | *** | 41.30% | 0.104 | *** | 25.61% | 1.419 | *** | 46.56% | 3.350 | *** | 28.92% | 0.116 | *** | 26.85% |
| | (0.191) | | | (0.658) | | | (0.019) | | | (0.145) | | | (0.397) | | | (0.015) | | |
| *Stress burden* | 0.243 | * | 10.31% | 0.829 | * | 6.59% | 0.022 | * | 5.42% | 0.358 | *** | 11.74% | 0.839 | ** | 7.24% | 0.030 | ** | 6.94% |
| | (0.102) | | | (0.356) | | | (0.011) | | | (0.096) | | | (0.259) | | | (0.010) | | |
| *Age* | -0.318 | | -13.50% | -0.452 | | -3.59% | -0.096 | ** | -23.67% | -0.094 | | -3.08% | 0.887 | | 7.66% | -0.107 | *** | -24.77% |
| | (0.286) | | | (1.008) | | | (0.030) | | | (0.270) | | | (0.746) | | | (0.030) | | |
| *Cohort* | -0.515 | ^ | -21.85% | -1.003 | | -7.98% | -0.023 | | -5.67% | -0.418 | | -13.71% | -0.008 | | -0.07% | 0.010 | | 2.31% |
| | (0.297) | | | (1.028) | | | (0.029) | | | (0.281) | | | (0.768) | | | (0.031) | | |
| *Region of birth (1=South)* | 0.509 | ** | 21.62% | 1.561 | ** | 12.42% | 0.054 | *** | 13.31% | 0.193 | | 6.33% | 0.273 | | 2.35% | 0.028 | * | 6.48% |
| | (0.151) | | | (0.514) | | | (0.015) | | | (0.126) | | | (0.361) | | | (0.014) | | |
| Coefficients | | | | | | | | | | | | | | | | | | |
| *SES* | 0.579 | ** | 24.57% | 1.031 | | 8.20% | 0.049 | * | 12.08% | -0.028 | | -0.92% | -0.121 | | -1.04% | -0.002 | | -0.46% |
| | (0.210) | | | (0.705) | | | (0.019) | | | (-0.105) | | | (0.299) | | | (0.010) | | |
| *Stress burden* | -0.001 | | -0.06% | -0.003 | | -0.03% | 0.000 | | -0.03% | 0.112 | * | 3.69% | 0.305 | * | 2.64% | 0.010 | * | 2.31% |
| | (0.012) | | | (0.032) | | | (0.001) | | | (0.049) | | | (0.134) | | | (0.004) | | |
| *Age* | 0.042 | | 1.78% | 23.177 | | 184.35% | 0.444 | | 109.48% | -4.771 | | -156.54% | -17.419 | | -150.37% | -0.892 | | -206.48% |
| | (15.608) | | | (53.806) | | | (1.339) | | | (11.175) | | | (34.010) | | | (1.064) | | |
| *Cohort* | 5.944 | | 252.44% | 16.928 | | 134.65% | 0.467 | | 115.15% | 0.573 | | 18.79% | -6.070 | | -52.40% | -0.058 | | -13.43% |
| | (6.028) | | | (20.809) | | | (0.530) | | | (4.419) | | | (13.853) | | | (0.429) | | |
| *Region of birth (1=South)* | -0.571 | * | -24.24% | -2.503 | * | -19.91% | -0.055 | * | -13.56% | -0.420 | ^ | -13.79% | -1.286 | * | -11.10% | -0.018 | | -4.17% |
| | (0.286) | | | (0.976) | | | (0.026) | | | (0.219) | | | (0.648) | | | (0.021) | | |
| Interaction | | | | | | | | | | | | | | | | | | |
| *SES* | -1.447 | ** | -61.47% | -2.579 | | -20.52% | -0.123 | * | -30.33% | 0.095 | | 3.12% | 0.407 | | 3.52% | 0.005 | | 1.16% |
| | (0.523) | | | (1.763) | | | (0.048) | | | (0.354) | | | (1.011) | | | (0.033) | | |
| *Stress burden* | -0.249 | | -10.58% | -0.624 | | -4.96% | -0.028 | | -6.90% | -0.441 | * | -14.47% | -1.198 | * | -10.34% | -0.039 | * | -9.03% |
| | (0.210) | | | (2.386) | | | (0.020) | | | (0.187) | | | (0.507) | | | (0.017) | | |
| *Age* | -0.496 | | -21.05% | -1.332 | | -10.59% | 0.025 | | 6.16% | 0.299 | | 9.80% | 1.090 | | 9.41% | 0.056 | | 12.96% |
| | (0.898) | | | (3.094) | | | (0.077) | | | (0.700) | | | (2.130) | | | (0.067) | | |
| *Cohort* | 0.862 | | 36.61% | 2.455 | | 19.53% | 0.068 | | 16.77% | 0.092 | | 3.01% | -0.974 | | -8.41% | -0.009 | | -2.08% |
| | (0.879) | | | (3.028) | | | (0.077) | | | (0.709) | | | (2.223) | | | (0.069) | | |
| *Region of birth (1=South)* | -0.778 | * | -33.03% | -3.411 | * | -27.13% | -0.075 | * | -18.49% | -0.592 | ^ | -19.43% | -1.812 | * | -15.64% | -0.025 | | -5.79% |
| | (0.392) | | | (1.343) | | | (0.035) | | | (0.309) | | | (0.915) | | | (0.026) | | |

*** p<0.001, ** p<0.01, * p<0.05, ^ p<0.1

Notes: Results of sex stratified three-fold decomposition that decomposes Black-White disparity in biological age measures.