**SUPPLEMENTARY MATERIAL**

Table S1. Demographic characteristics by study for twin samples with depressive symptoms data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Study | N Individuals | % Women | Baseline year | # Twin Pairs with Complete Data\*N pairs = 9186 | Mean Age(SD) |
| MZ | SSDZ | OSDZ |
| satsa | 1798 | 58.5% | 1987 | 218 | 384 | 0 | 61.3 (13.7) |
| octo-Twin | 598 | 65.9% | 1991 | 114 | 148 | 0 | 83.0 (3.1) |
| gender | 1117 | 48.8% | 1994 | 0 | 0 | 496 | 74.7 (5.0) |
| toss | 1601 | 62.9% | 1997 or 2004 | 314 | 416 | 0 | 44.8 (4.9) |
| lsadt | 4466 | 58.8% | 1995 | 438 | 634 | 16 | 77.0 (5.4) |
| madt | 4303 | 49.0% | 1998 | 661 | 599 | 615 | 56.4 (6.3) |
| mtsada | 1331 | 58.5% | 1984-94 | 328 | 277 | 0 | 58.1 (10.9) |
| vetsa | 1229 | 0.0% | 2003-07 | 345 | 261 | 0 | 55.4 (2.5) |
| midus | 380 | 58.4% | 2007 | 81 | 37 | 28 | 57.0 (11.4) |
| FTC | 8240 | 55.4% | 2011 | 1009 | 1767 | 0 | 59.8 (3.8) |
| Total | 25063 | 53.1% | ---- | 3509 | 4522 | 1156 | 62.3 (11.3) |

Table S2. Mean scores on depressive symptoms and physical illness (with standard deviations), and phenotypic correlations, intra-pair correlations, and cross-twin cross-trait correlations (with 95% confidence intervals), by age group

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Age Group |  |
|  |  | 40-49 | 50-59 | 60-69 | 70-79 | 80-90 | Total |
| N complete pairs | MZM | 161 | 762 | 448 | 178 | 72 | 1621 |
| MZW | 263 | 564 | 548 | 265 | 122 | 1762 |
| DZM | 213 | 844 | 624 | 231 | 72 | 1984 |
| DZW | 294 | 789 | 764 | 377 | 192 | 2416 |
| DZOS | 109 | 303 | 283 | 351 | 107 | 1153 |
| Depressive symptoms mean (SD) | Men | 18.88 (3.91) | 19.45 (4.24) | 19.43 (3.99) | 19.31 (4.04) | 20.39 (4.98) | 19.43(4.17) |
| Women | 19.91 (4.55) | 20.39 (4.83) | 20.32 (4.59) | 20.43 (4.84) | 21.26 (5.33) | 20.42 (4.80) |
| I-CIRS mean (SD) | Men | 0.65(0.97) | 1.27(1.45) | 1.74(1.74) | 2.17(1.72) | 2.53(1.84) | 1.59(1.66) |
| Women | 0.84(1.11) | 1.59(1.62) | 2.06(1.81) | 2.49(1.79) | 2.95(1.95) | 1.97(1.80) |
| Phenotypic correlation | Men | .15(.08;.21) | .21(.18;.23) | .19(.16;.23) | .20(.16;.24) | .15(.08;.22) | .20(.18;.21) |
| Women | .08(.03;.14) | .19(.16;.22) | .14(.10;.17) | .19(.15;.23) | .13(.08;.18) | .17(.15;.18) |
| Depressive symptoms- intra-pair correlation | MZM | .31(.16;.44) | .33(.24;.37) | .34(.26;.42) | .23(.08;.36) | .38(.16;.57) | .33(.28;.37) |
| MZW | .33(.22;.44) | .34(.26;.41) | .36(.28;.42) | .39(.29;.49) | .45(.30;.58) | .36(.32;.40) |
| DZM | .27(.14;.39) | .23(.17;.29) | .11(.03;.18) | .07(-.06;.20) | .23(.01;.44) | .18(.14;.22) |
| DZW | .21(.10;.32) | .17(.10;.24) | .17(.10;.24) | .08(-.02;.18) | .15(.01;.29) | .16(.12;.20) |
| DZOS | -.04(-.22;.15) | .14(.03;.25) | .03(-.09;.15) | .15(.04;.25) | .26(.08;.43) | .15(.09;.21) |
| I-CIRS intra-pair correlation | MZM | .16(.01;.31) | .31(.24;.37) | .32(.24;.40) | .29(.15;.42) | .35(.13;.54) | .35(.31;.39) |
| MZW | .17(.05;.28) | .36(.29;.43) | .31(.23;.38) | .33(.21;.43) | .45(.30;.58) | .38(.34;.42) |
| DZM | .02(-.12;.15) | .16(.09;.22) | .19(.11;.26) | .07(-.06;.20) | .04(-.19;.27) | .20(.16;.24) |
| DZW | .02(-.09;.14) | .14(.07;.20) | .20(.13;.26) | .13(.02;.22) | .28(.15;.41) | .24(.20;.27) |
| DZOS | .32(.14;.48) | .04(-.07;.15) | .06(-.05;.18) | .12(.01;.22) | .05(-.19;.27) | .24(.19;.29) |
| Cross-twin cross-trait correlation | MZM | .05(-.10;.21) | .07(.01;.14) | .09(.01;.19) | .09(-.06;.23) | .08(-.15;.31) | .08(.03;.13) |
| MZW | .08(-.04;.20) | .13(.05;.21) | .11(.02;.19) | .15(.03;.27) | .07(-.11;.25) | .11(.06;.15) |
| DZM | .05(-.08;.18) | .12(.05;.18) | .07(-.01;.15) | .10(-.03;.22) | .05(-.18;.28) | .10(.05;.14) |
| DZW | -.05(-.17;.06) | .10(.03;.17) | .05(-.02;.12) | .03(-.07;.13) | .01(-.13;.15) | .04(.01;.08) |
| DZOS | .04(-.15;.22) | .02(-.09;.14) | .11(-.01;.23) | .06(-.04;.17) | .14(-.01;.36) | .12(.06;.17) |

Table S3. Means (and standard deviations) on depressive symptoms by study

|  |  |  |
| --- | --- | --- |
| Study | Men | Women |
| Age Group | Age Group |
| 40s | 50s | 60s | 70s | 80s | 40s | 50s | 60s | 70s | 80s |
| satsa | 19.4(4.7) | 19.3(4.3) | 20.3(4.4) | 20.8(4.7) | 23.8(5.7) | 20.3(4.9) | 20.8(5.1) | 21.9(5.7) | 22.7(6.0) | 23.3(6.2) |
| octo-Twin |  |  |  |  | 19.3(4.5) |  |  |  |  | 19.8(4.6) |
| gender |  |  | 19.4(3.7) | 19.1(3.8) | 19.1(3.8) |  |  | 20.6(4.5) | 20.6(4.8) | 19.7(3.7) |
| toss | 19.7(3.8) | 20.3(4.4) |  |  |  | 20.9(4.9) | 21.9(5.5) |  |  |  |
| lsadt |  |  |  | 19.2(4.1) | 21.0(5.2) |  |  |  | 20.1(4.6) | 22.0(5.6) |
| madt | 17.9(3.6) | 17.7(2.9) | 18.3(3.5) |  |  | 17.8(3.0) | 18.5(3.7) | 18.7(3.9) |  |  |
| mtsada | 19.3(4.2) | 20.2(4.8) | 18.6(3.3) | 18.5(2.5) | 18.3(1.7) | 20.7(4.5) | 19.5(4.3) | 20.1(4.5) | 19.3(3.5) |  |
| vetsa |  | 19.8(4.6) |  |  |  |  |  |  |  |  |
| midus | 19.1(3.8) | 20.5(4.4) | 18.6(3.6) | 18.4(2.8) |  | 19.5(3.7) | 19.2(4.4) | 19.0(3.6) | 18.6(3.4) |  |
| FTC |  | 20.2(4.3) | 20.1(4.1) |  |  |  | 21.2(5.0) | 20.9(4.6) |  |  |

Note: Cells shown only where N = 15 or greater

Table S4. Results of analysis of variance comparing depressive symptoms in two cohorts of 50-59 year olds. Cohort 1 tested 1987-1991. Cohort 2 tested 2003-2007.

|  | **N (men/women)** | **Men****Mean (SD)** | **Women****Mean (SD)** |
| --- | --- | --- | --- |
|
| **Cohort 1** | 173/229 | 19.20 (4.13) | 20.76 (5.09) |
| **Cohort 2** | 295/105 | 19.90 (4.34) | 20.43 (5.15) |

| **Source** | **DF** | **Type III SS** | **Mean Square** | **F Value** | **p** |
| --- | --- | --- | --- | --- | --- |
|
| **sex** | 1 | 188.64 | 188.64 | 8.79 | <0.01 |
| **cohort** | 1 | 5.83 | 5.83 | 0.27 | 0.60 |
| **sex\*cohort** | 1 | 45.48 | 45.48 | 2.12 | 0.15 |

Table S5. Model comparison results for depressive symptoms from univariate age-moderated models

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Model | -2LL | Df | AIC | BIC | Δ-2LLΔdf | Comp | p |
| 1. Full ACE model-Quantitative sex differences and spline at age 75 | 174903.20 | 23677 | 127551 | -52480 | - | - | - |
| 2. Remove quantitative sex differences | 175050.89 | 23686 | 127549 | -52489 | 147.69 (9) | 1 | <0.01 |
| 3. Remove sex differences on A | 174913.24 | 23679 | 127555 | -52498 | 10.05 (3) | 1 | 0.02 |
| 4. Remove sex differences on E | 174924.30 | 23679 | 127566 | -52487 | 21.11 (3) | 1 | <0.01 |
| 5. Drop C-All | 174907.73 | 23683 | 127542 | -52542 | 4.53 (6) | 1 | 0.61 |
| 6. Remove 75-90- variance age moderation | 174962.92 | 23687 | 127589 | -52526 | 55.19 (4) | 3 | <0.01 |
| 7. Remove 40-75- variance age moderation | 174917.11 | 23687 | 127543 | -52571 | 9.38 (4) | 3 | 0.05 |
|  Men |  |  |  |  |  |  |  |
| 8. Full AE model –age 75 turning point | 174907.73 | 23683 | 127542 | -52542 | - | - | - |
| 9. Drop all age moderation | 174956.58 | 23687 | 127583 | -52532 | 48.85 (4) | 6 | <0.01 |
| 10. Drop A age 75+ slope | 174911.81 | 23684 | 127544 | -52548 | 4.08 (1) | 6 | 0.04 |
| 11. Drop A age 40-75 slope | 174914.69 | 23684 | 127547 | -52545 | 6.97 (1) | 6 | 0.01 |
| 12. Drop A both slopes | 174916.35 | 23685 | 127546 | -52553 | 8.62 (2) | 6 | 0.01 |
| 13. Drop E age 75 slope | 174911.42 | 23684 | 127543 | -52548 | 3.70 (1) | 6 | 0.05 |
| 14. Drop E age 40-75 slope | 174908.73 | 23684 | 127541 | -52551 | 1.00 (1) | 6 | 0.32 |
| 15. Drop E both slopes | 174914.95 | 23685 | 127545 | -52554 | 7.22 (2) | 6 | 0.03 |
| Women |  |  |  |  |  |  |  |
| 16. Full AE model –age 75 turning point | 174907.73 | 23683 | 127542 | -52542 | - | - | - |
| 17. Drop all age moderation | 174927.86 | 23687 | 127554 | -52562 | 20.14 (4) | 14 | <0.01 |
| 18. Drop A age 75 slope | 174910.57 | 23684 | 127543 | -52549 | 2.85 (1) | 14 | 0.09 |
| 19. Drop A all age slope | 174908.07 | 23684 | 127540 | -52542 | 0.34 (1) | 14 | 0.56 |
| 20. Drop A both slopes | 174912.41 | 23685 | 127542 | -52557 | 4.68 (2) | 14 | 0.10 |
| 21. Drop E age 75 slope | 174907.76 | 23684 | 127540 | -52552 | 0.03 (1) | 14 | 0.85 |
| 22. Drop E all age slope | 174907.79 | 23684 | 127540 | -52552 | 0.06 (1) | 14 | 0.81 |
| 23. Drop E both slopes | 174907.80 | 23685 | 127538 | -52561 | 0.07 (2) | 14 | 0.97 |

Note: -2LL equals the fit of the model, df= degrees of freedom from the model, AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, LRT = difference in model fit between current model and comparison model, Δdf = difference in degrees of freedom between models, p = probability of the difference between the two models if null hypothesis is true.

Table S6. Unstandardized parameter estimates (95% confidence intervals) from age-moderated univariate biometric (ACE) models of depressive symptoms

|  |  |  |
| --- | --- | --- |
|  | Men | Women |
|  |  | 95% CI |  | 95% CI |
| Parameter | Estimate | Lower | Upper | Estimate | Lower | Upper |
| Additivegenetic |  |  |  |  |  |  |
| a | 4.14 | 2.68 | 5.14 | 6.45 | 5.44 | 7.20 |
| βa40c | -.03 | -.10 | .03 | .05 | -.01 | .11 |
| βa75c | .21 | -.11 | .42 | .12 | -.10 | .28 |
| Common Environmental |  |  |  |  |  |  |
| c | 1.43 | -3.15 | 3.15 | .38 | -2.46 | 2.46 |
| βc40c | -.06 | -.15 | .15 | -.10 | -.17 | .17 |
| βc75c | .01 | -.01 | .04 | .03 | -.37 | .41 |
| Non-sharedEnvironmental |  |  |  |
| e | 7.72 | 7.24 | 8.19 | 8.15 | 7.66 | 8.66 |
| βe40 | .01 | -.01 | .04 | -.01 | -.03 | .02 |
| βe75c | .01 | .12 | .26 | .12 | -.10 | .28 |

Notes: arepresents the additive genetic path estimate for depression at age 75; βa40 = the estimate of the linear slope on additive genetic variance for participants aged 40 to 75; βa75 = the estimate of the linear slope on the additive genetic covariance for participants aged 75 to 90; The parameters denoted with c and e represent analogous parameter estimates for the shared and non-shared environmental contributions. None of the shared parameter estimates was significant.

Table S7. Bivariate model comparisons for depressive symptoms for males

| **Model**  | **Estimated Parameters** | **-2LL** | ***df*** | **AIC** | **BIC** | **Δ-2LL****Δdf** | **Comp** | ***p*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Men** |  |  |  |  |  |  |  |  |
| 1. Full ACE Bivariate Moderation Model | 39 | 108024 | 14850 | 78324 | -14251 | - | - | - |
| 2. Drop C | 28 | 108032 | 14861 | 78310 | -14334 | 8.14 (11) | 1 | 0.70 |
| 3. AE Bivariate drop all CIRS moderation | 24 | 108317 | 14865 | 78587 | -14082 | 285.03 (4) | 2 | <0.01 |
| 4. AE Bivariate drop all CIRS A moderation | 26 | 108043 | 14863 | 78316 | -14340 | 9.91 (2) | 2 | 0.01 |
| 5. AE Bivariate drop all CIRS E moderation | 26 | 108083 | 14863 | 78357 | -14299 | 51.03 (2) | 2 | <0.01 |
| **Depression and CIRS common variance** |  |  |  |  |  |  |  |  |
| 6. Drop A CIRS common moderation | 27 | 108040 | 14862 | 78316 | -14335 | 7.46 (1) | 2 | 0.01 |
| 7. Drop A age 75-90 common moderation | 27 | 108032 | 14862 | 78308 | -14342 | 0.01 (1) | 2 | 0.97 |
| 8. Drop A age 40-75 common moderation | 27 | 108034 | 14862 | 78310 | -14340 | 2.27 (1) | 2 | 0.13 |
| 9. Drop E CIRS common moderation | 27 | 108045 | 14862 | 78321 | -14329 | 12.55 (1) | 2 | <0.01 |
| 10. Drop E age 75-90 common moderation | 27 | 108033 | 14862 | 78309 | -14341 | 0.63 (1) | 2 | 0.43 |
| 11. Drop E age 40-75 common moderation | 27 | 108033 | 14862 | 78309 | -14341 | 1.11 (1) | 2 | 0.29 |
| **Unique variance Depression** |  |  |  |  |  |  |  |  |
| 12. Drop A CIRS unique moderation | 27 | 108033 | 14862 | 78309 | -14341 | 1.01 (1) | 2 | 0.32 |
| 13. Drop A age 75-90 unique moderation | 27 | 108034 | 14862 | 78310 | -14340 | 2.10 (1) | 2 | 0.15 |
| 14. Drop A age 40-75 unique moderation | 27 | 108036 | 14862 | 78312 | -14338 | 4.24 (1) | 2 | 0.04 |
| 15. Drop E CIRS unique moderation | 27 | 108072 | 14862 | 78348 | -14302 | 39.66 (1) | 2 | <0.01 |
| 16. Drop E age 75-90 unique moderation | 27 | 108036 | 14862 | 78312 | -14338 | 4.10 (1) | 2 | 0.04 |
| 17. Drop E age 40-75 unique moderation | 27 | 108039 | 14862 | 78315 | -14335 | 6.59 (1) | 2 | 0.01 |

Note: 2LL equals the fit of the model (2\* the negative log likelihood), df= degrees of freedom from the model, AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, Δ-2LL = difference in model fit between current model and comparison model, Δdf = difference in degrees of freedom between models, Comp = comparison model, p = probability of the difference between the two models if null hypothesis is true.

Table S8. Bivariate model comparisons for depressive symptoms for females

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model**  | **Estimated Parameters** | **-2LL** | ***df*** | **AIC** | **BIC** | **Δ-2LL****Δdf** | **Comp** | ***p*** |
| **Women** |  |  |  |  |  |  |  |  |
| 1. Full ACE Bivariate Moderation Model | 39 | 126727 | 17240 | 92247 | -17827 | - | - | - |
| 2. Drop C | 28 | 126742 | 17251 | 92240 | -17904 | 15.24 (11) | 1 | 0.17 |
| 3. AE Bivariate drop all CIRS moderation | 24 | 126904 | 17255 | 92394 | -17776 | 161.91 (4) | 2 | <0.01 |
| 4. AE Bivariate drop all CIRS A moderation | 26 | 1276744 | 17253 | 92238 | -17919 | 1.30 (2) | 2 | 0.52 |
| 5. AE Bivariate drop all CIRS E moderation | 26 | 126777 | 17253 | 92271 | -17886 | 34.50 (2) | 2 | <0.01 |
| **Depression and CIRS common moderation** |  |  |  |  |  |  |  |  |
| 6. Drop A CIRS common moderation | 27 | 126743 | 17252 | 92239 | -17912 | 0.29 (1) | 2 | 0.59 |
| 7. Drop A age 75-90 common moderation | 27 | 126742 | 17252 | 92238 | -17912 | 0.01 (1) | 2 | 0.95 |
| 8. Drop A age 40-75 common moderation | 27 | 126742 | 17252 | 92238 | -17912 | 0.09 (1) | 2 | 0.77 |
| 9. Drop E CIRS common moderation | 27 | 126764 | 17252 | 92260 | -17890 | 21.95 (1) | 2 | <0.01 |
| 10. Drop E age 75-90 common moderation | 27 | 126742 | 17252 | 92238 | -17912 | 0.23 (1) | 2 | 0.63 |
| 11. Drop E age 40-75 common moderation | 27 | 126744 | 17252 | 92240 | -17911 | 1.71 (1) | 2 | 0.19 |
| **Unique variance Depression** |  |  |  |  |  |  |  |  |
| 12. Drop A CIRS unique moderation | 27 | 126743 | 17252 | 92239 | -17911 | 0.93 (1) | 2 | 0.33 |
| 13. Drop A age 75-90 unique moderation | 27 | 126744 | 17252 | 92241 | -17910 | 2.66 (1) | 2 | 0.10 |
| 14. Drop A age 40-75 unique moderation | 27 | 126743 | 17252 | 92239 | -17912 | 0.30 (1) | 2 | 0.58 |
| 15. Drop E CIRS unique moderation | 27 | 126757 | 12752 | 92253 | -17898 | 14.38 (1) | 2 | <0.01 |
| 16. Drop E age 75-90 unique moderation | 27 | 126743 | 12752 | 92239 | -17912 | 0.32 (1) | 2 | 0.57 |
| 17. Drop E age 40-75 unique moderation | 27 | 126748 | 17252 | 92244 | -17907 | 5.53 (1) | 2 | 0.02 |

Note: 2LL equals the fit of the model (2\* the negative log likelihood), df= degrees of freedom from the model, AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, Δ-2LL = difference in model fit between current model and comparison model, Δdf = difference in degrees of freedom between models, Comp = comparison model, p = probability of the difference between the two models if null hypothesis is true.

Table S9. Parameter estimates and 95% Confidence Intervals for the full bivariate ACE model for men and women

|  |  |  |
| --- | --- | --- |
|  | Men | Women |
|  |  | 95% CI |  | 95% CI |
| Parameter | Estimate | Lower | Upper | Estimate | Lower | Upper |
| Additivegenetic |  |  |  |  |  |  |
| aCIRS | 5.68 | -6.68 | 6.68 | 5.24 | 4.09 | 6.03 |
| acommon | .93 | -0.41 | 2.10 | 1.12 | -.52 | 2.48 |
| aunique | -4.09 | -4.90 | 4.90 | 5.37 | 4.22 | 6.29 |
| βa40c | .01 | -.06 | .09 | .01 | -.08 | .09 |
| βa75c | .03 | -.42 | .44 | -.30 | -.67 | .12 |
| βaCIRSc | .03 | -.04 | .11 | .05 | -.02 | .12 |
| βa40u | .02 | -.05 | .08 | .01 | -.06 | .08 |
| βa75u | -.22 | -.49 | .37 | .12 | -.14 | .32 |
| βaCIRSu | .01 | -.06 | .08 | .05 | -.03 | .11 |
| CommonEnvironmental |  |  |  |
| ccirs | 1.65 | -3.42 | 3.42 | -1.39 | -3.10 | 2.02 |
| ccommon | -.03 | -2.04 | 2.04 | -.75 | -2.96 | 2.03 |
| cunique | -.01 | -2.55 | 2.55 | -.91 | -3.00 | 3.01 |
| βc40c | .13 | -.20 | .20 | .05 | -.15 | .16 |
| βc75c | .27 | -.46 | .81 | -.07 | -.39 | .22 |
| βcCIRSc | -.12 | -.18 | .18 | .03 | -.09 | .13 |
| βc40u | .01 | -.14 | .14 | .01 | -.16 | .16 |
| βc75u | .01 | -.73 | .73 | -.07 | -.45 | .45 |
| βcCIRSu | .01 | -13 | .13 | .10 | -.17 | .17 |
| Non-sharedEnvironmental |  |  |  |  |  |  |
| eCIRS | 7.96 | 7.41 | 8.53 | 7.13 | 6.71 | 7.57 |
| ecommon | 1.46 | .78 | 2.15 | 1.52 | .82 | 2.22 |
| eunique | 6.76 | 6.26 | 7.28 | 7.54 | 7.05 | 8.06 |
| βe40c | .02 | -.02 | .06 | .03 | -.01 | .06 |
| βe75c | -.12 | -.32 | .08 | -.04 | -.18 | .11 |
| βeCIRSc | .09 | .05 | .13 | .10 | .06 | .14 |
| βe40u | -.04 | -07 | -.01 | -.03 | -.06 | -.01 |
| βe75u | .13 | -.02 | .30 | .04 | -.08 | .17 |
| βeCIRSu | .10 | .07 | .13 | .05 | .02 | .08 |

Notes: aCIRS represents the additive genetic genetic path estimate to the additive genetic I-CIRS factor at age 75; acommon = the common pathway estimate of the additive genetic contributions of I-CIRS on depressive symptoms; aunique = the estimated variance unique to depressive symptoms at age 75; βaCIRSc = the estimate of the moderating effect of I-CIRS on the additive genetic covariance. βa40u = the estimate of the linear slope on the additive genetic variance unique to depressive symptoms for participants aged 40 to 75; βa75u = the estimate of the linear slope on the additive genetic variance unique to depressive symptoms for participants aged 75 to 90. βaCIRSu = the estimate of the moderating effect of I-CIRS on the additive genetic variance unique to depressive symptoms. The parameters denoted with *c* represent corresponding parameter estimates for the common environmental contributions. The parameters denoted with an *e* represent corresponding parameter estimates for the non-shared environmental contributions.

Figure S1. Graph of estimated depressive symptoms score from the mixed model regression with effects for age and sex