

## Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

## eMethods. Supplementary Methods

PSW is known to outperform conventional regression models by producing more efficient and stable estimates, and involved two stages of estimation<sup>1</sup>. The *first stage* used logistic regression to estimate the selection equation for the probability of experiencing positive family relations at Wave I conditional on covariates measured prior to or at the same time as family relations in adolescence (see eTable 2). The *second stage* estimated *weighted* gender-specific growth curve models of depressive symptoms. The weights were the inverse of the conditional probability of positive family relations estimated from the selection equation and assigned to each adolescent. Adolescents who were overrepresented in terms of their treatment (i.e. positive family relations) were assigned lower weights, while adolescents who were underrepresented were assigned higher weights, which generated a pseudo-population in which exposure to positive family relations was randomized with respect to observed confounders (e.g., self-esteem, moodiness, family structure, physical abuse before age 12, parental education, and parents' feeling of happiness)<sup>2</sup>. The growth curve models incorporated the inverse probability treatment (IPT) weights into the Add Health weights by multiplying IPT weights and individual-level Add Health weights.

Mixed modelling for growth curve models in Stata does not allow subpopulation analysis. However, our analytical sample maintains the integrity of the design with the full set of clusters (i.e., 132 schools of the original Add Health sample) such that variance parameters are estimated appropriately<sup>3</sup>.

We used a Chow test to test whether the entire process that we modeled (i.e., the association between our exposure variables, family relations in adolescence, and trajectories of depressive symptoms from age 12 to age 42, controlling for various covariates) varied by gender. In practical terms, the Chow test created an interaction term between every variable in the model and gender, and then tested for a significantly better fit between this fully-interactive model and the model without the full set of interactions<sup>4</sup>. The Chow test indicated that the process did significantly differ by gender (chi2=231.80 and degrees of freedom = 23 with p-value = 0.000 for family cohesion model; chi2=209.42 and degrees of freedom = 22 with p-value = 0.000 for parent-child conflict model), requiring stratified model by gender.

The Chow test also provides results for whether each variable in the model varied significantly by gender (e.g., the specific interaction terms), thus enabling us to test whether the exposure variables, family cohesion and family conflict, and their interaction with age variables were significantly different by gender.

Technically, Chow test can also be understood as “a test of whether the coefficients estimated over one group of the data are equal to the coefficients estimated over another.”<sup>5</sup>.

After we estimated the growth curve model separately by males and females as follows:

$$\begin{array}{ll} \text{Equation 1:} & y = X*b_1 + u_1 & \text{(equation for male (g1))} \\ \text{Equation 2:} & y = X*b_2 + u_2 & \text{(equation for female (g2))} \end{array}$$

We “pooled” the data by combining the male and female samples together and converted the two equations into one giant equation by follows:

$$\begin{array}{l} \text{Equation3:} \\ y = g1*(X_1*b1 + u1) + g2*(X_2*b2 + u2) \\ = g1*X*b1 + g2*X*b2 + g1*u1 + g2*u2 \end{array}$$

where X represented a list of x variables included in the original gender-specific growth curve model (e.g. variables in Model 3 of eTable 4a or eTable 5a), g1 was a variable coded as 1 when the data were for males and 0 otherwise, and g2 was coded as 1 when the data were for females and 0 otherwise.

A Wald test was conducted to test whether the coefficients for each set of individual x variables represented by g1 versus g2 (e.g. beta for g1\*family cohesion vs. beta for g2\*family cohesion) were significantly different by males and females. The Wald test results were shown in eTables 4a-5b.

## eReferences

1. Morgan SL, Winship C. *Counterfactuals and Causal Inference: Methods and Principles for Social Research*. Second Edition. New York, NY: Cambridge University Press; 2007.
2. Harris KM, Chen P. The Acculturation of Parent-Child Relations in Immigrant Families. In: Boston: MA; 2004.
3. Chen P, Chantala K. *Guidelines for Analyzing Add Health Data*. Chapel Hill, NC: Carolina Population Center, University of North Carolina at Chapel Hill; 2014.
4. Gould W. How Can I Compute the Chow Test Statistic? Available at: <https://www.stata.com/support/faqs/statistics/computing-chow-statistic/>. Accessed March 25, 2019.
5. Gould W. Can You Explain Chow Tests. Available at: <https://www.stata.com/support/faqs/statistics/chow-tests/>. Accessed March 23, 2019.

<b>eTable 1. Sample Demographics and Study Characteristics - Weighted and Unweighted Results</b>						
	Full Sample	(N = 18,185)	Male Sample	(N = 8,952)	Female Sample	(N = 9,233)
	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted
<b>Family Cohesion, No. (%)<sup>c</sup></b>						
Lower Family Cohesion	9413 (50.6)	(51.8)	4504 (49.3)	(50.3)	4909 (51.9)	(53.2)
Higher Family Cohesion	8772 (49.4)	(48.2)	4448 (50.7)	(49.7)	4324 (48.0)	(46.8)
<b>Parent-Child Conflict, No. (%)<sup>c</sup></b>						
Yes - Conflict	7021 (37.9)	(38.6)	3182 (34.5)	(35.6)	3839 (41.4)	(41.6)
No - Conflict	11164 (62.1)	(61.4)	5770 (65.5)	(64.5)	5394 (58.6)	(58.4)
<b>Age at Wave I, Mean (SD)<sup>a</sup></b>	15.42 (0.12)	15.65 (1.74)	---	---	---	---
<b>Gender, No. (%)<sup>a</sup></b>						
Male	8952 (49.2)	(49.2)	---	---	---	---
Female	9233 (50.8)	(50.8)	---	---	---	---
<b>Immigrant Generation, No. (%)<sup>a</sup></b>						
1st generation	1496 (5.5)	(8.2)	---	---	---	---
2nd generation	2732 (10.8)	(15.0)	---	---	---	---
3rd+ generation	13957 (83.8)	(76.8)	---	---	---	---
<b>Race/Ethnicity, No. (%)<sup>a,b</sup></b>						
Non-Hispanic White	9724 (67.7)	(53.5)	4797 (68.0)	(53.6)	4927 (67.4)	(53.4)
Non-Hispanic Black	3938 (16.0)	(21.7)	1857 (15.7)	(20.7)	2081 (16.4)	(22.5)
Non-Hispanic Asian	1305 (3.7)	(7.2)	692 (3.8)	(7.7)	613 (3.7)	(6.6)
Non-Hispanic Other Race	84 (0.4)	(0.5)	41 (0.3)	(0.5)	43 (0.4)	(0.5)
Hispanic	3134 (12.2)	(17.2)	1565 (12.2)	(17.5)	1569 (12.2)	(17.0)
<b>Parental education, No. (%)<sup>a,b</sup></b>						
< High School	2456 (13.0)	(13.5)	1140 (12.6)	(12.7)	1316 (13.5)	(14.3)
High School / GED	5304 (31.6)	(29.2)	2628 (31.6)	(29.4)	2676 (31.5)	(29.0)
Some College	3791 (21.3)	(20.9)	1828 (20.7)	(20.4)	1963 (21.9)	(21.3)
>=College	6355 (32.7)	(35.0)	3205 (33.6)	(35.8)	3150 (31.8)	(34.1)
Missing	279 (1.5)	(1.5)	151 (1.6)	(1.7)	128 (1.3)	(1.4)
<b>Family Structure, No. (%)<sup>a,b</sup></b>						
Two Biological/Two Adopted Parents	9885 (55.4)	(54.4)	4929 (56.0)	(55.1)	4956 (54.9)	(53.7)
One Biological/One Non-Biological Parent	2929 (16.5)	(16.1)	1479 (16.7)	(16.5)	1450 (16.2)	(15.7)
Single Parent	4553 (24.0)	(25.0)	2161 (23.2)	(24.1)	2392 (24.8)	(25.9)
Two Step Parents/Other	818 (4.1)	(4.5)	383 (4.1)	(4.3)	435 (4.1)	(4.7)
<b>Physical Abuse before Age 12, No. (%)<sup>a,b</sup></b>						
No	13919 (77.3)	(76.5)	6558 (74.5)	(73.3)	7361 (80.1)	(79.7)

Yes	2054 (10.7)	(11.3)	1110 (11.5)	(12.4)	944 (9.8)	(10.2)
	Full Sample	(N = 18,185)	Male Sample	(N = 8,952)	Female Sample	(N = 9,233)
	Weighted	Unweighted	Weighted	Unweighted	Weighted	Unweighted
Missing	2212 (12.1)	(12.2)	1284 (14.0)	(14.3)	928 (10.1)	(10.1)
<b>Parental Self-Perceived Happiness, No. (%)<sup>a</sup></b>						
No	654 (3.4)	(3.60)	---	---	---	---
Yes	14846 (84.0)	(81.64)	---	---	---	---
Missing	2685 (12.6)	(14.76)	---	---	---	---
<b>Moody (Range 0-8), Mean (SD)<sup>a</sup></b>						
	1.72 (0.02)	1.69 (1.42)	---	---	---	---
<b>Self-Esteem (Range 5-30), Mean (SD)<sup>a</sup></b>						
	24.69 (0.06)	24.63 (3.58)	---	---	---	---
<b>Sexual Abuse before Age 12, No. (%)<sup>b</sup></b>						
No	---	---	7555 (84.7)	(84.4)	7860 (85.0)	(85.1)
Yes	---	---	167 (1.79)	(1.9)	471 (5.3)	(5.1)
Missing	---	---	1230 (13.5)	(13.7)	902 (9.7)	(9.8)
<b>Sleep problem, No. (%)<sup>b</sup></b>						
No	---	---	7019 (77.7)	(78.4)	6906 (74.6)	(74.8)
Yes	---	---	1933 (22.3)	(21.6)	2327 (25.4)	(25.2)
<b>Long-Term Non-Familial Social Support (Range 0-12), Mean (SD)<sup>b</sup></b>						
	---	---	3.23 (0.07)	3.27 (2.15)	3.88 (0.07)	3.27 (2.15)
Abbreviations: PSW, propensity score weighting; SD, standard deviation.						
Note: percentages and means were calculated by applying survey weights, and adjusting for school clustering and stratification by region.						
<sup>a</sup> covariates that were used in PWS models (eTable 3).						
<sup>b</sup> covariates that were used in growth curve models (eTables 4a-5b).						
<sup>a, b</sup> covariates that were used in both PWS and growth curve models.						
<sup>c</sup> Each was used as Y variable in their PWS model and as X variable in their growth curve model.						

<b>eTable 2. Percentage of Selected Demographic and Socioeconomic Characteristics from Full, Analytical and Non-Analytical Samples</b>			
	Full Sample	Analytical Sample	Respondents Not in Analytical Sample
N	20,745	18,185	2,391
<b><i>Race/Ethnicity</i></b>			
Non-Hispanic White	52.80	53.47	43.61
Non-Hispanic Black	21.42	21.66	26.83
Non-Hispanic Asian American	7.10	7.18	4.40
Non-Hispanic Other Race	1.56	0.46	9.99
Hispanic	17.12	17.23	16.63
<b><i>Parental Education</i></b>			
<High School	13.35	13.51	13.87
High School	28.74	29.17	26.95
Some College	20.72	20.85	20.31
>=College	34.30	34.95	25.54
Missing	2.90	1.53	13.32
<b><i>Family Structure</i></b>			
Two Biological/Adopted Parents	53.13	54.36	33.48
One Biological/One Non-Biological Parent	15.83	16.11	16.63
Single Parent	24.54	25.04	23.60
Two Step Parents/Other	6.49	4.50	26.60

<b>eTable 3. Odds Ratios from Logistic Regressions on Positive Family Relation Measures - PWS Models<sup>a</sup></b>				
	Model A		Model B <sup>b</sup>	
Covariates	High Family Cohesion <sup>c</sup>		No Parent-Child Conflict <sup>c</sup>	
	Beta	standard Error	Beta	Standard Error
<i>Age at Wave 1</i>	0.88***	(0.01)	1.02	(0.01)
<i>Female</i>	1.29***	(0.06)	1.02	(0.05)
<i>Immigrant Generation</i>				
1st generation	1.69***	(0.23)	1.51***	(0.16)
2nd generation	0.98	(0.09)	1.09	(0.09)
3rd+ generation	Reference		Reference	
<i>Race/Ethnicity</i>				
Non-Hispanic White	Reference		Reference	
Non-Hispanic Black	1.03	(0.07)	1.22**	(0.08)
Non-Hispanic Asian	0.68*	(0.12)	0.85	(0.11)
Non-Hispanic Other Race	0.99	(0.36)	1.11	(0.38)
Hispanic	1.20	(0.11)	0.85*	(0.07)
<i>Parental education</i>				
< High School	1.04	(0.08)	0.99	(0.07)
High School	Reference		Reference	
Some College	0.90	(0.05)	0.77***	(0.04)
>=College	0.98	(0.05)	0.93	(0.05)
Missing	1.15	(0.22)	1.10	(0.22)
<i>Family Structure</i>				
Two Biological/Two Adopted Parents	Reference		---	
One Biological/One Non-Biological Parent	0.74***	(0.04)	---	
Single Parent	0.77***	(0.04)	---	
Two Step Parents/Other	0.91	(0.09)	---	
<i>Physical Abuse before Age 12</i>				
No	Reference		Reference	
Yes	0.57***	(0.05)	0.74***	(0.05)
Missing	0.97	(0.07)	1.02	(0.08)

	Model A		Model B <sup>b</sup>	
Covariates	High Family Cohesion <sup>c</sup>		No Parent-Child Conflict <sup>c</sup>	
<i>Parental Self-Perceived Happiness</i>				
No	Reference		Reference	
Yes	1.42**	(0.18)	1.09	(0.15)
Missing	1.39*	(0.21)	1.13	(0.18)
<i>Moody</i>	0.80***	(0.01)	0.73***	(0.01)
<i>Self-Esteem</i>	1.25***	(0.01)	1.05***	(0.01)
<i>Intercept</i>	0.03***	(0.01)	0.57	(0.17)
N	18,185		18,185	
Abbreviation: PSW, Propensity Score Weighting.				
<sup>a</sup> PSW would be calculated by the inverse of conditional probabilities of high family cohesion (from Model A) and no parent-child conflict (from Model B)				
<sup>b</sup> Family structure was excluded because unexpectedly a significant negative association between non-two-biological-parent family types and family conflict was not found.				
<sup>c</sup> Logistic regressions accounted for sampling weights, stratification, and clustering.				
*** p<0.001, ** p<0.01, * p<0.05				



**eTable 4. Weighted Coefficients of Gender-Specific Growth Curve Models Predicting CES-D by Levels of Family Cohesion, Female Sample (N = 9,233), Add Health (1995 - 2017)**

	Model 1	Model 2	Model 3
	Coefficient (95% CI)	Coefficient (95% CI)	Coefficient (95% CI)
Linear Age	0.051 (0.018, 0.084)**	-0.022 (-0.063, 0.019)	-0.027 (-0.067, 0.014)
Quadratic Age	-0.0083 (-0.011, -0.0054)***	-0.005 (-0.0082, -0.0019)**	-0.0045 (-0.0077, -0.0014)**
Cubic Age <sup>a</sup>	0.00024 (0.00017, 0.00032)***	0.00021 (0.00013, 0.00028)***	0.00019 (0.00012, 0.00027)***
High Family Cohesion (FH) <sup>a***</sup>		-1.22 (-1.38, -1.05)***	-1.04 (-1.20, -0.88)***
FH X Linear Age <sup>a**</sup>		0.11 (0.079, 0.14)***	0.11 (0.079, 0.14)***
FH X Quadratic Age <sup>a†</sup>		-0.0032 (-0.0044, -0.0021)***	-0.0032 (-0.0043, -0.0021)***
Non-Hispanic White (reference)			Reference
Non-Hispanic Black			0.21 (0.12, 0.30)***
Non-Hispanic Asian American			0.16 (0.022, 0.30)*
Non-Hispanic Other Race			0.5 (0.054, 0.95)
Hispanic			0.16 (0.029, 0.29)*
<i>Parental Education</i>			
<High School			0.17 (0.042, 0.31)*
High School (reference)			Reference
Some College			-0.073 (-0.19, 0.045)
>=College			-0.17 (-0.25, -0.087)***
Missing			0.19 (-0.14, 0.51)
<i>Family Structure</i>			
Two Biological/Adopted Parents (reference)			Reference
One Biological+One Non-Biological Parent			0.2 (0.071, 0.32)**
Single Parent			0.23 (0.14, 0.32)***
Two Step Parents/Other			0.42 (0.19, 0.65)***
Physical Abuse before Age 12			0.29 (0.15, 0.42)***
No Physical Abuse before Age 12 (reference)			Reference
Missing Physical Abuse Report			-0.17 (-0.64, 0.30)
Sexual Abuse before Age 12			0.3 (0.12, 0.49)**
No Sexual Abuse before Age 12 (reference)			Reference
Missing Sexual Abuse Report			0.17 (-0.32, 0.67)
Sleep Problem			0.52 (0.43, 0.61)***
Long-Term Non-Family Social Support			-0.063 (-0.081, -0.046)***
Intercept <sup>a***</sup>	1.57 (1.47, 1.68)***	2.23 (2.07, 2.40)***	2.13 (1.95, 2.31)***

Abbreviations: Add Health, National Longitudinal Study of Adolescent to Adult Health; FH, family cohesion; CES-D, the Center for Epidemiologic Depression Scale; CI: confidence interval.

Notes: <sup>1</sup> Sleep problem is binary (no and yes) and measured at Wave I.

<sup>2</sup> **Long-term non-family social support** (range: 0-12) is an index of engagement in school activities during adolescence, attendance of religious services and friendship from adolescence to adulthood, involvement in volunteer work and romantic relationships during adulthood.

<sup>3</sup> Factors, including immigrant generation and physical activity, which were not significant at the p<.05 level, were dropped from the growth curve models.

<sup>4</sup> All growth curve models applied Add Health weights for national representation, and IPT weights to generate a pseudo-population so that exposure to positive family relations can be randomized.

<sup>5</sup> Random effects were estimated but not displayed in the table.	
<sup>6</sup> Chow tests showed that coefficients were significantly different at the $P < .001$ level by males and females.	
<sup>a</sup> Wald test results from the "pooled" sample showed that the coefficients for each set of X variables from Model 3 were significantly different by males and female.	
$P^{***} < .001, P^{**} < .01, P^* < .05$	

**eTable 5. Weighted Coefficients of Gender-Specific Growth Curve Models Predicting CES-D by Levels of Family Cohesion, Male Sample (N = 8,952), Add Health (1995 - 2017)**

	Model 1	Model 2	Model 3
	Coefficient (95% CI)	Coefficient (95% CI)	Coefficient (95% CI)
Linear Age	0.058 (0.027, 0.089)***	0.0079 (-0.031, 0.047)	0.013 (-0.026, 0.052)
Quadratic Age	-0.0054 (-0.0081, -0.0027)***	-0.0029 (-0.0060, 0.000075)	-0.0031 (-0.0061, -0.00015)*
Cubic Age <sup>a</sup>	0.00014 (0.000076, 0.00021)***	0.0001 (0.000033, 0.00017)**	0.0001 (0.000034, 0.00017)**
High Family Cohesion (FH) <sup>a***</sup>		-0.7 (-0.84, -0.55)***	-0.58 (-0.73, -0.43)***
FH X Linear Age <sup>a**</sup>		0.054 (0.024, 0.083)***	0.05 (0.020, 0.079)**
FH X Quadratic Age <sup>a†</sup>		-0.0013 (-0.0025, -0.00014)*	-0.0012 (-0.0024, 0.000041)
Non-Hispanic White (reference)			Reference
Non-Hispanic Black			0.18 (0.098, 0.26)***
Non-Hispanic Asian American			0.13 (0.019, 0.24)*
Non-Hispanic Other Race			0.12 (-0.64, 0.88)
Hispanic			0.15 (0.035, 0.26)*
<i>Parental Education</i>			
<High School			0.2 (0.069, 0.33)**
High School (reference)			Reference
Some College			-0.031 (-0.13, 0.071)
>=College			-0.13 (-0.21, -0.051)**
Missing			0.41 (0.0036, 0.82)*
<i>Family Structure</i>			
Two Biological/Adopted Parents (reference)			Reference
One Biological+One Non-Biological Parent			0.069 (-0.025, 0.16)
Single Parent			0.14 (0.045, 0.23)**
Two Step Parents/Other			0.14 (-0.071, 0.36)
Physical Abuse before Age 12			0.24 (0.13, 0.35)***
No Physical Abuse before Age 12 (reference)			Reference
Missing Physical Abuse Report			-0.03 (-0.34, 0.28)
Sexual Abuse before Age 12			0.37 (0.12, 0.63)**
No Sexual Abuse before Age 12 (reference)			Reference
Missing Sexual Abuse Report			0.09 (-0.23, 0.41)
Sleep Problem			0.49 (0.39, 0.58)***
Long-Term Non-Familial Social Support			-0.042 (-0.058, -0.026)***
Intercept <sup>a***</sup>	0.93 (0.84, 1.03)***	1.37 (1.22, 1.51)	1.21 (1.05, 1.38)***

Abbreviations: Add Health, National Longitudinal Study of Adolescent to Adult Health; FH, family cohesion; CES-D, the Center for Epidemiologic Depression Scale; CI: confidence interval.

Notes: <sup>1</sup> Sleep problem is binary (no and yes) and measured at Wave I.

<sup>2</sup> **Long-term non-family social support** (range: 0-12) is an index of engagement in school activities during adolescence, attendance of religious services and friendship from adolescence to adulthood, involvement in volunteer work and romantic relationships during adulthood.

<sup>3</sup> Factors, including immigrant generation and physical activity, which were not significant at the p<.05 level, were dropped from the growth curve models.

<sup>4</sup> All growth curve models applied Add Health weights for national representation, and IPT weights to generate a pseudo-population so that exposure to positive family relations can be randomized.

<sup>5</sup> Random effects were estimated but not displayed in the table.	
<sup>6</sup> Chow tests showed that coefficients were significantly different at the $P < .001$ level by males and females.	
<sup>a</sup> Wald test results from the "pooled" sample showed that the coefficients for each set of X variables from Model 3 were significantly different by males and female.	
$P^{***} < .001, P^{**} < .01, P^* < .05$	

**eTable 6. Weighted Coefficients of Gender-Specific Growth Curve Models Predicting CES-D by Levels of Parent-Child Conflict, Female Sample (N = 9,233), Add Health (1995 - 2017)**

	Model 1	Model 2	Model 3
	Coefficient (95% CI)	Coefficient (95% CI)	Coefficient (95% CI)
Linear Age	0.051 (0.018, 0.084)**	0.03 (-0.0042, 0.064)	0.024 (-0.010, 0.057)
Quadratic Age	-0.0083 (-0.011, -0.0054)***	-0.0081 (-0.011, -0.0051)***	-0.0074 (-0.010, -0.0045)***
Cubic Age <sup>a*</sup>	0.00024 (0.00017, 0.00032)***	0.00024 (0.00017, 0.00031)***	0.00022 (0.00015, 0.00030)***
No Parent-Child Conflict <sup>a***</sup>		-0.83 (-0.95, -0.70)***	-0.74 (-0.86, -0.63)***
No Conflict X Linear Age <sup>a**</sup>		0.031 (0.022, 0.040)***	0.03 (0.022, 0.039)***
Non-Hispanic White (reference)			Reference
Non-Hispanic Black			0.23 (0.14, 0.31)***
Non-Hispanic Asian American			0.18 (0.044, 0.32)*
Non-Hispanic Other Race			0.51 (0.068, 0.95)
Hispanic			0.12 (-0.00055, 0.25)
<i>Parental Education</i>			
<High School			0.19 (0.060, 0.32)**
High School (reference)			Reference
Some College			-0.09 (-0.21, 0.027)
>=College			-0.2 (-0.28, -0.12)***
Missing			0.2 (-0.14, 0.54)
<i>Family Structure</i>			
Two Biological/Adopted Parents (reference)			Reference
One Biological+One Non-Biological Parent			0.18 (0.068, 0.29)**
Single Parent			0.26 (0.18, 0.35)***
Two Step Parents/Other			0.46 (0.22, 0.69)***
Physical Abuse before Age 12			0.3 (0.17, 0.43)***
No Physical Abuse before Age 12 (reference)			Reference
Missing Physical Abuse Report			-0.19 (-0.64, 0.26)
Sexual Abuse before Age 12			0.29 (0.11, 0.48)***
No Sexual Abuse before Age 12 (reference)			Reference
Missing Sexual Abuse Report			0.2 (-0.27, 0.67)
Sleep Problem			0.55 (0.46, 0.64)***
Long-Term Non-Familial Social Support			-0.068 (-0.085, -0.051)***
Intercept <sup>a***</sup>	1.57 (1.47, 1.68)***	2.08 (1.94, 2.21)***	2.03 (1.87, 2.20)***

Abbreviations: Add Health, National Longitudinal Study of Adolescent to Adult Health; CES-D, the Center for Epidemiologic Depression Scale; CI: confidence interval.

Notes: <sup>1</sup> Sleep problem is binary (no and yes) and measured at Wave I.

<sup>2</sup> **Long-term non-family social support** (range: 0-12) is an index of engagement in school activities during adolescence, attendance of religious services and friendship from adolescence to adulthood, involvement in volunteer work and romantic relationships during adulthood.

<sup>3</sup> Factors, including immigrant generation and physical activity, which were not significant at the p<.05 level,

were dropped from the growth curve models.	
<sup>4</sup> All growth curve models applied Add Health weights for national representation, and IPT weights to generate a pseudo-population so that exposure to positive family relations can be randomized.	
<sup>5</sup> Random effects were estimated but not displayed in the table.	
<sup>6</sup> Chow tests showed that coefficients were significantly different at the $P < .001$ level by males and females.	
<sup>a</sup> Wald test results from the "pooled" sample showed that the coefficients for each set of X variables from Model 3 were significantly different by males and female.	
$P^{***} < .001, P^{**} < .01, P^* < .05$	

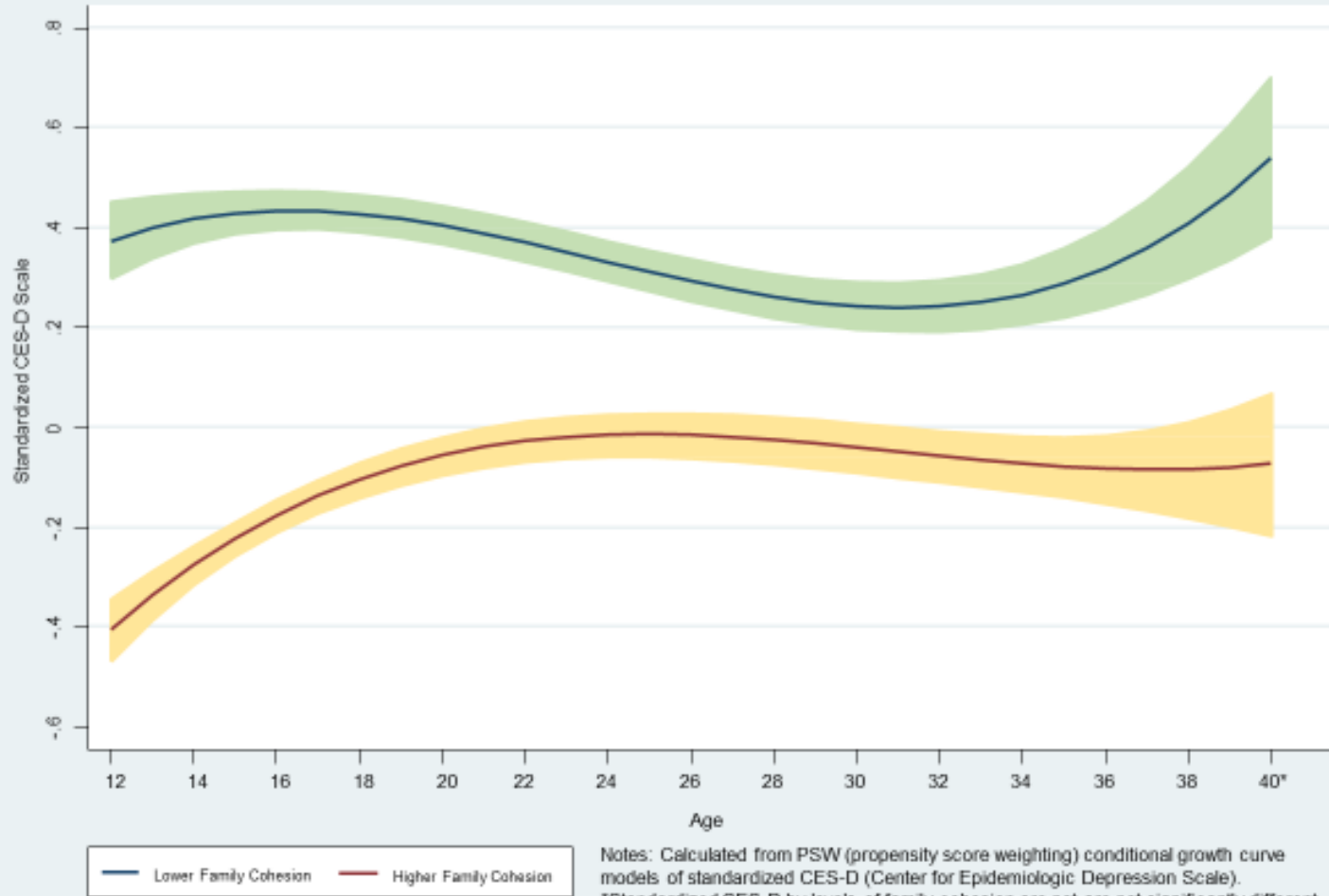
**eTable 7. Weighted Coefficients of Gender-Specific Growth Curve Models Predicting CES-D by Levels of Parent-Child Conflict, Male Sample (N = 8,952), Add Health (1995 - 2017)**

	Model 1	Model 2	Model 3
	Coefficient (95% CI)	Coefficient (95% CI)	Coefficient (95% CI)
Linear Age	0.058 (0.027, 0.089)***	0.049 (0.017, 0.081)**	0.05 (0.018, 0.081)**
Quadratic Age	-0.0054 (-0.0081, -0.0027)***	-0.0053 (-0.0080, -0.0026)***	-0.0052 (-0.0078, -0.0025)***
Cubic Age <sup>a</sup>	0.00014 (0.000076, 0.00021)***	0.00014 (0.000074, 0.00021)***	0.00014 (0.000070, 0.00020)***
No Parent-Child Conflict <sup>a***</sup>		-0.5 (-0.61, -0.39)***	-0.44 (-0.55, -0.34)***
No Conflict X Linear Age <sup>a**</sup>		0.012 (0.0028, 0.021)*	0.012 (0.0025, 0.021)*
Non-Hispanic White (reference)			Reference
Non-Hispanic Black			0.17 (0.095, 0.25)***
Non-Hispanic Asian American			0.16 (0.054, 0.27)**
Non-Hispanic Other Race			0.28 (-0.48, 1.04)
Hispanic			0.12 (0.0092, 0.22)*
<i>Parental Education</i>			
<High School			0.19 (0.059, 0.31)**
High School (reference)			Reference
Some College			-0.032 (-0.13, 0.068)
>=College			-0.13 (-0.21, -0.053)**
Missing			0.44 (0.018, 0.86)
<i>Family Structure</i>			
Two Biological/Adopted Parents (reference)			Reference
One Biological+One Non-Biological Parent			0.082 (-0.0095, 0.17)
Single Parent			0.15 (0.063, 0.24)**
Two Step Parents/Other			0.2 (-0.018, 0.41)
Physical Abuse before Age 12			0.23 (0.13, 0.34)***
No Physical Abuse before Age 12 (reference)			Reference
Missing Physical Abuse Report			-0.025 (-0.32, 0.27)
Sexual Abuse before Age 12			0.38 (0.14, 0.63)***
No Sexual Abuse before Age 12 (reference)			Reference
Missing Sexual Abuse Report			0.058 (-0.25, 0.37)
Sleep Problem			0.49 (0.40, 0.59)***
Long-Term Non-Familial Social Support			-0.049 (-0.065, -0.034)***
Intercept <sup>a***</sup>	0.93 (0.84, 1.03)***	1.26 (1.13, 1.39)***	1.16 (1.01, 1.32)***
Abbreviations: Add Health, National Longitudinal Study of Adolescent to Adult Health; CES-D, the Center for Epidemiologic Depression Scale; CI: confidence interval.			
Notes: <sup>1</sup> Sleep problem is binary (no and yes) and measured at Wave I.			
<sup>2</sup> <b>Long-term non-family social support</b> (range: 0-12) is an index of engagement in school activities during adolescence, attendance of religious services and friendship from adolescence to adulthood, involvement in volunteer work and romantic relationships during adulthood.			
<sup>3</sup> Factors, including immigrant generation and physical activity, which were not significant at the p<.05 level, were dropped from the growth curve models.			
<sup>4</sup> All growth curve models applied Add Health weights for national representation, and IPT weights to generate a pseudo-population so that exposure to positive family relations can be randomized.			

<sup>5</sup> Random effects were estimated but not displayed in the table.	
<sup>6</sup> Chow tests showed that coefficients were significantly different at the $P < .001$ level by males and females.	
<sup>a</sup> Wald test results from the "pooled" sample showed that the coefficients for each set of X variables from Model 3 were significantly different by males and female.	
$P^{***} < .001, P^{**} < .01, P^* < .05$	

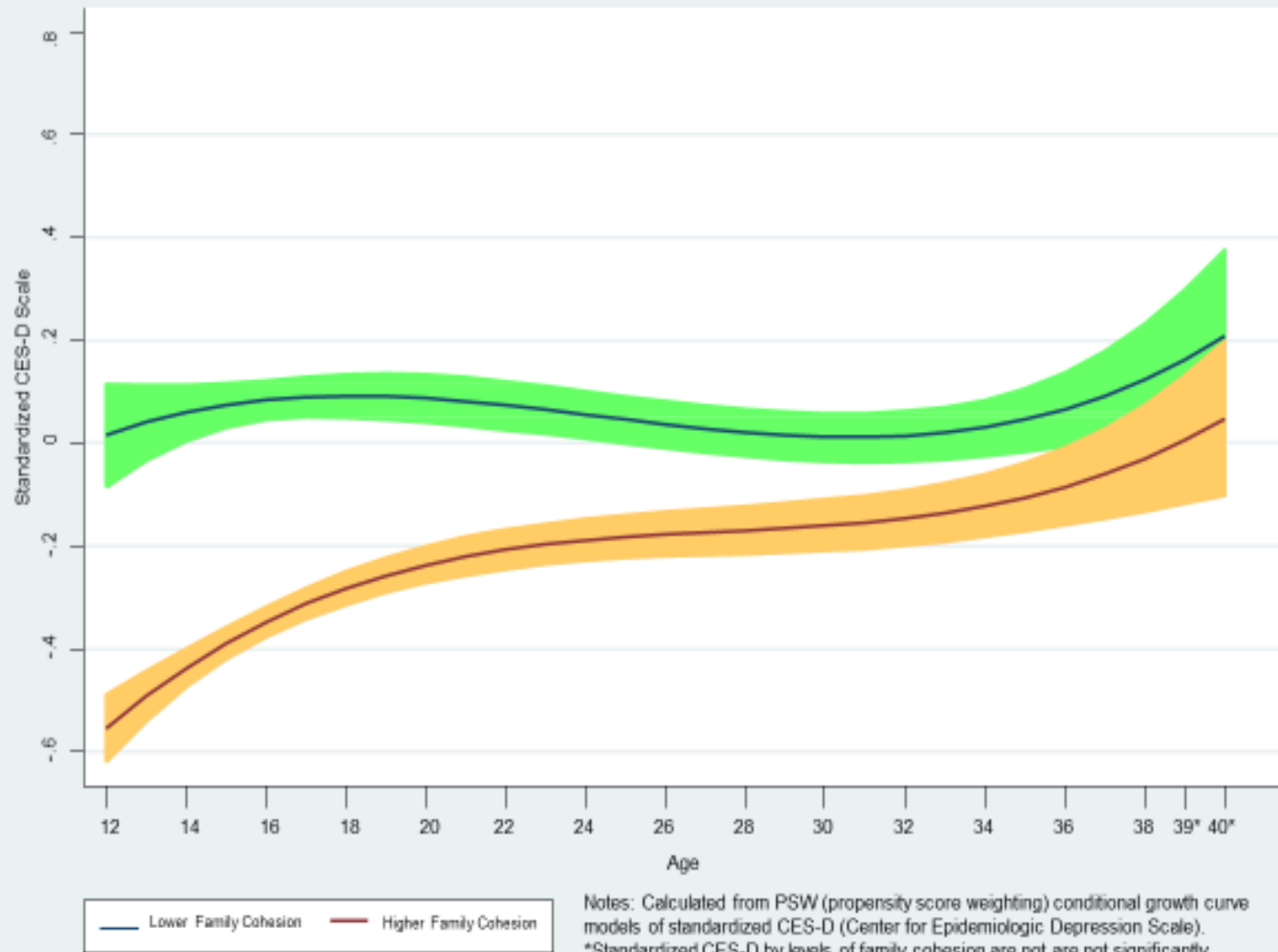


eFigure 1. Growth Curve of Standardized CES-D by Levels of Family Cohesion across Ages 12-40 - Female

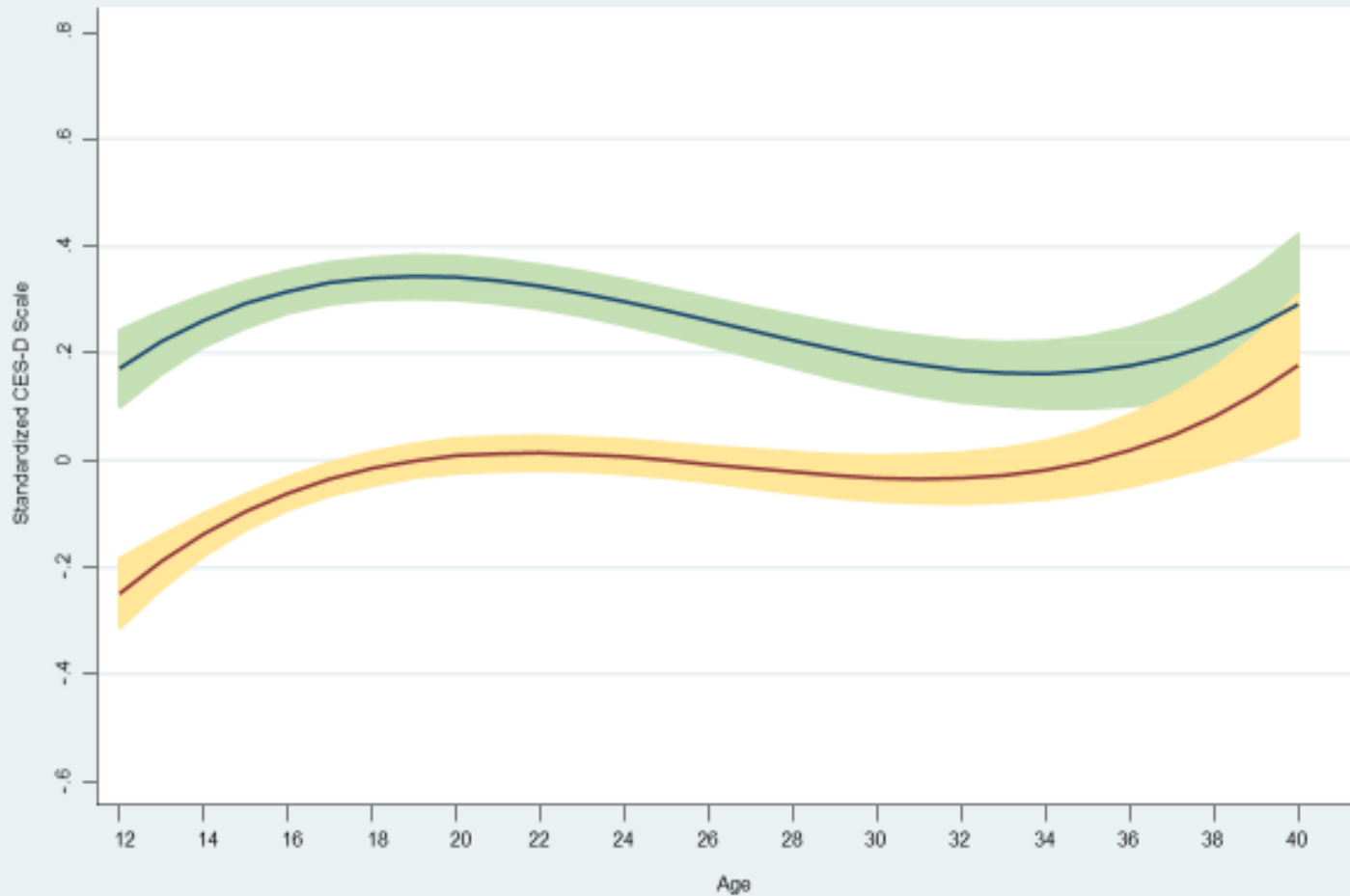


Notes: Calculated from PSW (propensity score weighting) conditional growth curve models of standardized CES-D (Center for Epidemiologic Depression Scale).  
\*Standardized CES-D by levels of family cohesion are not significantly different at the .05 level.

eFigure 2. Growth Curve of Standardized CES-D by Levels of Family Cohesion across Ages 12-40 -Male



eFigure 3. Growth Curve of Standardized CES-D by Levels of Parent-Child Conflict across Ages 12-40 - Female



— Yes - Conflict — No - Conflict

Notes: Calculated from PSW (propensity score weighting) conditional growth curve models of standardized CES-D (Center for Epidemiologic Depression Scale).  
\*Standardized CES-D by levels of family cohesion are not significantly different at the .05 level.

eFigure 4. Growth Curve of Standardized CES-D by Levels of Parent-Child Conflict across Ages 12-40 - Male

