

## Supplement 7

### – Multiple Regressions with SES Interactions and Model Comparisons

**Table 1S1.** Multiple regression coefficients to predict twin differences in Internalizing and Externalizing from twin differences in parenting with SES interactions.

|                                       | Estimate | SE  | z     | p(z) | CI - | CI + | $\beta$ |
|---------------------------------------|----------|-----|-------|------|------|------|---------|
| <b>INT</b>                            |          |     |       |      |      |      |         |
| Model C05 ( $N = 426$ , $R^2 = .05$ ) |          |     |       |      |      |      |         |
| CR Mother Positive Parenting          | .07      | .05 | 1.38  | .167 | -.03 | .17  | .11     |
| CR Mother Negative Parenting          | -.02     | .05 | -0.44 | .663 | -.11 | .07  | -.04    |
| CR Father Positive Parenting          | .02      | .06 | 0.39  | .698 | -.09 | .14  | .04     |
| CR Father Negative Parenting          | .01      | .06 | 0.12  | .907 | -.10 | .12  | .01     |
| PR Mother Positive Parenting          | .03      | .06 | 0.51  | .613 | -.09 | .16  | .03     |
| PR Mother Negative Parenting          | .04      | .05 | 0.84  | .403 | -.06 | .14  | .05     |
| PR Father Positive Parenting          | .06      | .06 | 0.94  | .348 | -.07 | .19  | .06     |
| PR Father Negative Parenting          | .00      | .07 | 0.06  | .953 | -.12 | .13  | .00     |
| SES*CR Mother Positive Parenting      | -.06     | .08 | -0.76 | .450 | -.21 | .09  | -.07    |
| SES*CR Mother Negative Parenting      | -.03     | .07 | -0.37 | .713 | -.17 | .11  | -.04    |
| SES*CR Father Positive Parenting      | -.03     | .08 | -0.40 | .686 | -.19 | .13  | -.05    |
| SES*CR Father Negative Parenting      | -.02     | .07 | -0.30 | .763 | -.17 | .12  | -.04    |
| SES*PR Mother Positive Parenting      | .11      | .09 | 1.25  | .212 | -.06 | .28  | .10     |
| SES*PR Mother Negative Parenting      | .02      | .06 | 0.35  | .725 | -.10 | .15  | .02     |
| SES*PR Father Positive Parenting      | -.08     | .08 | -1.09 | .276 | -.23 | .07  | -.08    |
| SES*PR Father Negative Parenting      | .10      | .07 | 1.48  | .140 | -.03 | .24  | .09     |
| Model C11 ( $N = 412$ , $R^2 = .08$ ) |          |     |       |      |      |      |         |
| CR Mother Positive Parenting          | -.08     | .03 | -2.54 | .011 | -.14 | -.02 | -.16    |
| CR Mother Negative Parenting          | .07      | .03 | 2.20  | .028 | .01  | .14  | .15     |
| CR Father Positive Parenting          | .02      | .03 | 0.71  | .481 | -.04 | .08  | .05     |
| CR Father Negative Parenting          | .04      | .03 | 1.40  | .161 | -.02 | .10  | .10     |
| PR Mother Positive Parenting          | .04      | .08 | 0.45  | .654 | -.12 | .19  | .02     |
| PR Mother Negative Parenting          | .03      | .07 | 0.37  | .711 | -.11 | .16  | .02     |
| PR Father Positive Parenting          | .03      | .11 | 0.31  | .755 | -.17 | .24  | .02     |
| PR Father Negative Parenting          | .02      | .08 | 0.24  | .814 | -.13 | .17  | .02     |
| SES*CR Mother Positive Parenting      | -.03     | .03 | -0.79 | .428 | -.09 | .04  | -.05    |
| SES*CR Mother Negative Parenting      | .07      | .04 | 2.05  | .041 | .00  | .14  | .14     |
| SES*CR Father Positive Parenting      | .03      | .03 | 0.99  | .325 | -.03 | .10  | .07     |
| SES*CR Father Negative Parenting      | -.04     | .03 | -1.16 | .247 | -.11 | .03  | -.08    |
| SES*PR Mother Positive Parenting      | .11      | .10 | 1.12  | .261 | -.08 | .30  | .06     |
| SES*PR Mother Negative Parenting      | .01      | .08 | 0.08  | .938 | -.14 | .15  | .00     |
| SES*PR Father Positive Parenting      | -.12     | .12 | -1.01 | .311 | -.34 | .11  | -.07    |
| SES*PR Father Negative Parenting      | -.03     | .09 | -0.38 | .704 | -.21 | .14  | -.03    |

|                                       | Estimate | SE  | z     | p(z) | CI - | CI + | $\beta$ |
|---------------------------------------|----------|-----|-------|------|------|------|---------|
| Model C17 ( $N = 489$ , $R^2 = .08$ ) |          |     |       |      |      |      |         |
| CR Mother Positive Parenting          | -.07     | .03 | -2.56 | .011 | -.12 | -.02 | -.14    |
| CR Mother Negative Parenting          | -.04     | .03 | -1.53 | .127 | -.10 | .01  | -.09    |
| CR Father Positive Parenting          | .01      | .02 | 0.51  | .610 | -.03 | .06  | .03     |
| CR Father Negative Parenting          | .11      | .03 | 3.69  | .000 | .05  | .17  | .22     |
| PR Mother Positive Parenting          | -.04     | .06 | -0.66 | .511 | -.17 | .08  | -.04    |
| PR Mother Negative Parenting          | .09      | .06 | 1.43  | .154 | -.03 | .21  | .07     |
| PR Father Positive Parenting          | .07      | .08 | 0.88  | .377 | -.08 | .22  | .06     |
| PR Father Negative Parenting          | .04      | .08 | 0.52  | .603 | -.12 | .21  | .03     |
| SES*CR Mother Positive Parenting      | .04      | .04 | 1.08  | .282 | -.03 | .11  | .06     |
| SES*CR Mother Negative Parenting      | -.04     | .04 | -0.97 | .333 | -.11 | .04  | -.06    |
| SES*CR Father Positive Parenting      | -.02     | .03 | -0.50 | .615 | -.07 | .04  | -.03    |
| SES*CR Father Negative Parenting      | .02      | .04 | 0.54  | .588 | -.05 | .10  | .03     |
| SES*PR Mother Positive Parenting      | -.11     | .08 | -1.46 | .146 | -.26 | .04  | -.09    |
| SES*PR Mother Negative Parenting      | -.03     | .07 | -0.42 | .673 | -.17 | .11  | -.02    |
| SES*PR Father Positive Parenting      | -.02     | .10 | -0.18 | .859 | -.20 | .17  | -.01    |
| SES*PR Father Negative Parenting      | .07      | .10 | 0.69  | .493 | -.13 | .28  | .04     |
| <b>EXT</b>                            |          |     |       |      |      |      |         |
| Model C05 ( $N = 426$ , $R^2 = .12$ ) |          |     |       |      |      |      |         |
| CR Mother Positive Parenting          | .09      | .07 | 1.34  | .182 | -.04 | .23  | .12     |
| CR Mother Negative Parenting          | .08      | .07 | 1.24  | .216 | -.05 | .21  | .12     |
| CR Father Positive Parenting          | -.01     | .08 | -0.06 | .953 | -.17 | .16  | -.01    |
| CR Father Negative Parenting          | -.11     | .08 | -1.40 | .162 | -.27 | .05  | -.19    |
| PR Mother Positive Parenting          | -.22     | .09 | -2.57 | .010 | -.39 | -.05 | -.17    |
| PR Mother Negative Parenting          | .07      | .07 | 1.00  | .318 | -.06 | .19  | .06     |
| PR Father Positive Parenting          | .03      | .08 | 0.32  | .752 | -.14 | .19  | .02     |
| PR Father Negative Parenting          | .11      | .08 | 1.30  | .193 | -.06 | .28  | .09     |
| SES*CR Mother Positive Parenting      | -.17     | .11 | -1.57 | .117 | -.38 | .04  | -.17    |
| SES*CR Mother Negative Parenting      | -.15     | .10 | -1.47 | .141 | -.34 | .05  | -.16    |
| SES*CR Father Positive Parenting      | -.02     | .12 | -0.19 | .848 | -.26 | .21  | -.03    |
| SES*CR Father Negative Parenting      | .17      | .11 | 1.61  | .107 | -.04 | .37  | .22     |
| SES*PR Mother Positive Parenting      | -.06     | .12 | -0.46 | .647 | -.29 | .18  | -.04    |
| SES*PR Mother Negative Parenting      | .01      | .09 | 0.17  | .867 | -.16 | .18  | .01     |
| SES*PR Father Positive Parenting      | -.20     | .10 | -1.94 | .052 | -.39 | .00  | -.14    |
| SES*PR Father Negative Parenting      | .02      | .09 | 0.26  | .795 | -.15 | .20  | .02     |
| Model C11 ( $N = 412$ , $R^2 = .09$ ) |          |     |       |      |      |      |         |
| CR Mother Positive Parenting          | -.05     | .03 | -1.53 | .125 | -.11 | .01  | -.09    |
| CR Mother Negative Parenting          | .03      | .03 | 0.92  | .360 | -.04 | .10  | .06     |
| CR Father Positive Parenting          | -.05     | .03 | -1.58 | .113 | -.11 | .01  | -.10    |
| CR Father Negative Parenting          | .08      | .03 | 2.54  | .011 | .02  | .15  | .17     |
| PR Mother Positive Parenting          | -.09     | .09 | -1.01 | .313 | -.25 | .08  | -.06    |
| PR Mother Negative Parenting          | -.03     | .07 | -0.36 | .720 | -.17 | .12  | -.02    |

|                                           | Estimate | SE  | z     | p(z) | CI - | CI + | $\beta$ |
|-------------------------------------------|----------|-----|-------|------|------|------|---------|
| PR Father Positive Parenting              | .01      | .11 | 0.07  | .941 | -.20 | .22  | .01     |
| PR Father Negative Parenting              | .08      | .08 | 0.98  | .325 | -.08 | .23  | .06     |
| SES*CR Mother Positive Parenting          | .03      | .03 | 0.84  | .400 | -.04 | .09  | .05     |
| SES*CR Mother Negative Parenting          | .02      | .04 | 0.58  | .563 | -.05 | .09  | .04     |
| SES*CR Father Positive Parenting          | .03      | .04 | 0.75  | .456 | -.04 | .10  | .05     |
| SES*CR Father Negative Parenting          | -.05     | .04 | -1.46 | .145 | -.12 | .02  | -.10    |
| SES*PR Mother Positive Parenting          | .10      | .11 | 0.98  | .328 | -.10 | .31  | .06     |
| SES*PR Mother Negative Parenting          | -.04     | .08 | -0.42 | .676 | -.20 | .13  | -.02    |
| SES*PR Father Positive Parenting          | -.18     | .12 | -1.54 | .125 | -.41 | .05  | -.10    |
| SES*PR Father Negative Parenting          | .01      | .09 | 0.15  | .884 | -.17 | .19  | .01     |
| Model C17 (N = 489, R <sup>2</sup> = .11) |          |     |       |      |      |      |         |
| CR Mother Positive Parenting              | -.08     | .02 | -3.30 | .001 | -.13 | -.03 | -.17    |
| CR Mother Negative Parenting              | .03      | .03 | 1.02  | .308 | -.02 | .08  | .06     |
| CR Father Positive Parenting              | .01      | .02 | 0.45  | .656 | -.03 | .05  | .02     |
| CR Father Negative Parenting              | .06      | .03 | 2.34  | .020 | .01  | .12  | .13     |
| PR Mother Positive Parenting              | -.05     | .06 | -0.79 | .427 | -.16 | .07  | -.04    |
| PR Mother Negative Parenting              | .14      | .06 | 2.49  | .013 | .03  | .25  | .12     |
| PR Father Positive Parenting              | .05      | .07 | 0.74  | .460 | -.09 | .19  | .05     |
| PR Father Negative Parenting              | -.04     | .08 | -0.55 | .583 | -.19 | .11  | -.03    |
| SES*CR Mother Positive Parenting          | -.03     | .03 | -1.06 | .289 | -.09 | .03  | -.06    |
| SES*CR Mother Negative Parenting          | -.04     | .03 | -1.19 | .233 | -.11 | .03  | -.07    |
| SES*CR Father Positive Parenting          | -.01     | .03 | -0.33 | .741 | -.06 | .04  | -.02    |
| SES*CR Father Negative Parenting          | .10      | .03 | 3.04  | .002 | .04  | .17  | .18     |
| SES*PR Mother Positive Parenting          | -.04     | .07 | -0.54 | .587 | -.18 | .10  | -.03    |
| SES*PR Mother Negative Parenting          | .05      | .06 | 0.81  | .421 | -.07 | .18  | .04     |
| SES*PR Father Positive Parenting          | -.07     | .09 | -0.81 | .416 | -.24 | .10  | -.06    |
| SES*PR Father Negative Parenting          | .11      | .09 | 1.11  | .266 | -.08 | .29  | .07     |

C, cohort; INT, internalizing; EXT, externalizing; CR, child report; PR, parental report; SES, socio-economic status; SE, standard error; CI, 95% confidence interval,  $\beta$ , standardized estimate.

**Table 2S7. Model comparisons.**

|                                | <i>df</i> | <i>AIC</i> | <i>BIC</i> | $\chi^2$ | $\chi^2$ diff | <i>df diff</i> | <i>p</i> |
|--------------------------------|-----------|------------|------------|----------|---------------|----------------|----------|
| <b>INT</b>                     |           |            |            |          |               |                |          |
| <b>C05</b>                     |           |            |            |          |               |                |          |
| full model                     | 0         | 1020.0     | 1709.3     | 0.00     |               |                |          |
| without SES interactions       | 8         | 1009.2     | 1666.0     | 51.54    | 51.54         | 8              | .741     |
| <b>C11</b>                     |           |            |            |          |               |                |          |
| full model                     | 0         | 5645.7     | 6329.2     | 0.00     |               |                |          |
| without SES interactions       | 8         | 5637.3     | 6288.7     | 76.79    | 76.79         | 8              | .465     |
| <b>C17</b>                     |           |            |            |          |               |                |          |
| full model                     | 0         | 6928.1     | 7640.8     | 0.00     |               |                |          |
| without SES interactions       | 8         | 6918.2     | 7597.3     | 60.52    | 60.52         | 8              | .641     |
| <b>EXT</b>                     |           |            |            |          |               |                |          |
| <b>C05</b>                     |           |            |            |          |               |                |          |
| full model                     | 0         | 1201.7     | 1891.0     | 0.00     |               |                |          |
| without SES interactions       | 8         | 1199.1     | 1855.9     | 13.36    | 13.36         | 8              | .100     |
| <b>C11</b>                     |           |            |            |          |               |                |          |
| full model                     | 0         | 5698.0     | 6381.6     | 0.00     |               |                |          |
| without SES interactions       | 8         | 5689.8     | 6341.2     | 78.01    | 78.01         | 8              | .453     |
| <b>C17a</b>                    |           |            |            |          |               |                |          |
| full model                     | 0         | 6833.8     | 7546.5     | 0.00     |               |                |          |
| without SES interactions       | 8         | 6836.1     | 7515.2     | 18.33    | 18.33         | 8              | .019     |
| <b>C17b</b>                    |           |            |            |          |               |                |          |
| full model                     | 0         | 6833.8     | 7546.5     | 0.00     |               |                |          |
| with sig. SES interaction only | 7         | 6829.0     | 7512.4     | 9.26     | 9.26          | 7              | .234     |

INT, internalizing; EXT, externalizing; C, cohort; SES, socio-economic status.