**Supplementary file B**

In this supplementary file we present additional, more conservative, analyses which allow to better examine the direction of effects between the study variables. To this aim, we did not only test models in which parenting behavior is predicted by child behavior and parents’ needs, but we also tested the opposite direction of effects, with parenting behavior predicting child behavior and parents’ needs.

In tables 1-3, we present models in which we controlled for the reports of outcome variable the previous day**.** This allowed us to examine whether child behavior and parents’ psychological needs on a given day (i.e., day t) relate to changes in the parenting behaviors, relative to their scores reported specifically during the previous day (i.e., changes from day t-1 to day t). Similarly, we tested whether parenting behavior on a given day (i.e., day t) relates to changes in child behavior or parents’ needs, relative to their scores reported during the previous day (i.e., changes from day t-1 to day t). Because it is not possible to control for the previous day of the first day, these analyses were based on a truncated dataset (i.e., six days).

**Table 1.** *Daily parenting behavior as a function of daily child behavior and parents’ needs, while controlling for parenting behavior as reported on the previous day.*

|  |  |  |  |
| --- | --- | --- | --- |
|   | Autonomy support (day t) | Psychological control (day t) | Responsiveness (day t)  |
|  | B (SE) | B (SE) | B(SE) |
| *Fixed effects* |  |  |  |
| Overall Intercept | 3.34 (.10)\*\*\* | 1.54 (.05)\*\*\* | 3.91 (.08)\*\*\* |
| Day level predictors |  |  |  |
|  Externalizing child behavior (day t) | **-.25 (.08)\*\*** | **.35 (.06)\*\*\*** | **-.23 (.07)\*\*\*** |
|  Internalizing child behavior (day t) |  |  |  **.17 (.07)\*\*** |
|  Prosocial child behavior (day t) |  |  |  .08 (.05) |
|  Parents’ need-satisfaction (day t) | **.17 (.07)\*** |  |  .**20 (.06)\*\*\*** |
|  Parents’ need-frustration (day t) |  | **.12 (.06)\*** |  |
| Control variable |  |  |  |
| Previous day parenting (day t-1)a | -.02 (.06) | -.01 (.07) | .03 (.06) |
|  GMFCS | -.03 (.07) | -.07 (.03)\* | .11 (.06) † |
| *Random effects* |  |  |  |
|  u0 (intercept) | .48 (.10)\*\*\*\* | .10 (.02)\*\*\* | .33 (.07)\*\*\* |
|  e0 | .24 (.02)\*\*\* | .14 (.01)\*\*\* | .15 (.02)\*\*\* |
| -2\*loglikelihood | 509.684 | 309.811 | 400.493 |
| † *p* < .10, \**p* < .05, \*\**p* < .01, \*\*\* *p* < .001a The included variable is in accordance with the outcome variable of the model. |

**Table 2.** *Daily child behavior as a function of daily parenting, while controlling for child behavior as reported on the previous day.*

|  |  |  |  |
| --- | --- | --- | --- |
|   | Externalizing child behavior (day t) | Internalizing child behavior (day t) | Prosocial child behavior (day t) |
|  | B (SE) | B (SE) | B (SE) |
| *Fixed effects* |  |  |  |
| Overall Intercept | 1.43 (.07)\*\*\* | 1.53 (.07)\*\*\* | 3.256 (.10)\*\*\* |
| Day level predictors |  |  |  |
| Autonomy support (day t) | -.11 (.06) | -.11 (.06) |  .04 (.08) |
| Responsiveness (day t) | **-.16 (.07)\*** |  .13 (.07) |  .15 (.09) |
| Psychological control (day t) |  **.39 (.07)\*\*\*** |  **.26 (.07)\*\*\*** | -.12 (.10) |
| Control variable |  |  |  |
| Previous day child behavior (day t-1)a |  .00 (.06) | -.11 (.07) | -.20 (.07)\*\* |
| GMFCS | -.06 (.05) | -.10 (.05)\* | -.17 (.07)\*\* |
| *Random effects* |  |  |  |
| u0 (intercept) |  .26 (.06)\*\*\* |  .26 (.06)\*\*\* |  .49 (.11)\*\*\* |
| e0 |  .16 (.02)\*\*\* |  .17 (.02)\*\*\* |  .31 (.03)\*\*\* |
| -2\*loglikelihood | 393.63 | 408.46 | 561.11 |
| † *p* < .10, \**p* < .05, \*\**p* < .01, \*\*\* *p* < .001a The included variable is in accordance with the outcome variable of the model. |

**Table 3.** *Daily psychological needs as a function of daily parenting, while controlling for the psychological needs as reported on the previous day.*

|  |  |  |
| --- | --- | --- |
|   | Need satisfaction (day t) | Need frustration (day t) |
|  | B (SE) | B (SE) |
| *Fixed effects* |  |  |
| Overall Intercept | 3.89 (.06)\*\*\* | 1.72 (.07)\*\*\* |
| Day level predictors |  |  |
| Autonomy support (day t) |  .09 (.06) | -.01 (.06) |
| Responsiveness (day t) |  **.19 (.07)\*\*** | -.13 (.07) |
| Psychological control (day t) | **-.19 (.08)\*\*** |  **.24 (.08)\*\*\*** |
| Control variable |  |  |
| Previous day needs (day t-1)a | -.04 (.06) | -.29 (.07)\*\*\* |
| GMFCS |  .04 (.05) | -.07 (.05) |
| *Random effects* |  |  |
|  u0 (intercept) |  .19 (.04)\*\*\* |  .20 (.05)\*\*\* |
|  e0 |  .19 (.02)\*\*\* |  .19 (.02)\*\*\* |
| -2\*loglikelihood | 421.45 | 414.05 |
| \**p* < .05, \*\**p* < .01, \*\*\* *p* < .001a The included variable is in accordance with the outcome variable of the model. |

The results presented in Table 1 indicate that most of the significant effects, reported in the manuscript, remain significant when controlling for parenting behavior the day before. Only the association between prosocial child behavior and responsiveness was no longer significant when controlling for responsiveness as reported the previous day. Table 2 presents the models in which the parenting variables were included as predictors of child behavior. Daily externalizing problem behavior related positively with daily psychological control (b = .39, *p* < .001) and negatively with daily responsiveness (b = -.16, *p* < .05), while controlling for externalizing behaviors on the previous day. Daily internalizing child behavior was related to daily psychological control (b = .26, *p* < .001), while controlling for internalizing behavior of the day before. Daily prosocial child behavior did not relate to any of the parenting behaviors. Concerning parents’ daily need-related experiences (Table 3), we found that daily need satisfaction related with daily psychological control (b = -.19, *p* < .01) and with daily responsiveness (b = .19, *p* < .01), while controlling for need satisfaction of the previous day. Daily need frustration related with daily psychological control (b = .24, *p* < .001), while controlling for need frustration of the day before. Taken together, these analyses indicate that associations are significant in both directions and suggest that parenting, child behavior, and parents’ needs do affect each other in a reciprocal fashion.

In order to examine also how the study variables affect each between days (rather than only within days), we further conducted lagged analyses. Lagged analyses allow to examine, for instance, whether parents who experience high levels of need frustration on a given day, would be more psychologically controlling the next day. Or vice versa, whether parents who report high levels of psychologically controlling parenting on a given day, would report more need frustration the next day. In other words, lagged analyses allow to examine whether the level of a variable on a given day is predictive of a change in another variable across days. The results of these analyses are presented in tables 4-6.

**Table 4.** *Daily parenting behavior on day t+1 as a function of daily child behavior, parents’ needs, and parenting behavior on day t.*

|  |  |  |  |
| --- | --- | --- | --- |
|   | Autonomy support (day t+1) | Psychological control(day t+1) | Responsiveness (day t+1) |
|  | B (SE) | B (SE) | B(SE) |
| *Fixed effects* |  |  |  |
| Overall Intercept | 3.33 (.10)\*\*\* | 1.55 (.05)\*\*\* | 3.92 (.08)\*\*\* |
| Day level predictors on day t |  |  |  |
|  Externalizing child behavior | -.10 (.08) |  .14 (.07)† | -.04 (.07) |
|  Internalizing child behavior |  |  |  .05 (.08) |
|  Prosocial child behavior |  |  | -.01 (.06) |
|  Parents’ need-satisfaction  |  .09 (.08) |  |  .01 (.07) |
|  Parents’ need-frustration |   | -.03 (.07) |   |
| Parenting behaviora |  -.08 (.07) | -.10 (.08) |  -.05 (.07) |
| Control variable |  |  |  |
|  GMFCS | -.03 (.07) | -.07 (.03)\* |  .10 (.06) |
| *Random effects* |  |  |  |
|  u0 (intercept) |  .48 (.10) |  .09 (.02) |  .32 (.07) |
|  e0 |  .26 (.03) |  .17 (.02) |  .18 (.02) |
| -2\*loglikelihood | 527.293 | 355.366 | 424.11 |
| † *p* < .10, \**p* < .05, \*\**p* < .01, \*\*\* *p* < .001a The included variable is in accordance with the outcome variable of the model. |

**Table 5.** *Daily child behavior on day t+1 as a function of daily parenting behavior and child behavior on day t.*

|  |  |  |  |
| --- | --- | --- | --- |
|   | Externalizingchild behavior (day t+1) | Internalizingchild behavior (day t+1) | Prosocial child behavior (day t+1) |
|  | B (SE) | B (SE) | B (SE) |
| *Fixed effects* |  |  |  |
| Overall Intercept | 1.45 (.07)\*\*\* | 1.56 (.08)\*\*\* | 3.24 (.10) |
| Day level predictors on day t |  |  |  |
|  Autonomy supportive | .02 (.06) | -.04 (.06) | -.11 (.08) |
|  Responsiveness | .07 (.08) | -.05 (.07) | .00 (.09) |
|  Psychological control | -.02 (.09) | .12 (.08) | .01 (.10) |
| Child behaviora  | .07 (.08) | -.24 (.08)\*\*\* | -.20 (.07)\*\* |
| Control variable |  |  |  |
|  GMFCS | -.07 (.05) | -.11 (.06)\* | -.17 (.07)\* |
| *Random effects* |  |  |  |
|  u0 (intercept) | .27 (.06)\*\*\* | .32 (.07)\*\*\* | .53 (.11)\*\*\* |
|  e0 | .21 (.02)\*\*\* | .18 (.02)\*\*\* | .31 (.03)\*\*\* |
| -2\*loglikelihood | 457.28 | 429.83 | 574.67 |
| \**p* < .05, \*\**p* < .01, \*\*\* *p* < .001a The included variable is in accordance with the outcome variable of the model. |

**Table 6.** *Daily need satisfaction and frustration on day t+1 as a function of daily parenting behavior and parents’ needs on day t.*

|  |  |  |
| --- | --- | --- |
|   | Need satisfaction (day t+1) | Need frustration (day t+1) |
|  | B (SE) | B(SE) |
| *Fixed effects* |  |  |
| Overall Intercept | 3.85 (.07)\*\*\* | 1.709 (.07)\*\*\* |
| Day level predictors on day t |  |  |
|  Autonomy support | -.04 (.07) | -.05 (.07) |
|  Responsiveness | .02 (.09) | .03 (.08) |
|  Psychological control | .02 (.10) | -.05 (.09) |
| Parents’ needsa | -.11 (.09) | -.30 (.08)\*\*\* |
| Control variable |  |  |
|  GMFCS | .05 (.05) | -.07 (.05) |
| *Random effects* |  |  |
|  u0 (intercept) | .19 (.05)\*\*\* | .19 (.05)\*\*\* |
|  e0 | .30 (.03)\*\*\* | .23 (.02)\*\*\* |
| -2\*loglikelihood | 523.377 | 463.25 |
| \**p* < .05, \*\**p* < .01, \*\*\* *p* < .001a The included variable is in accordance with the outcome variable of the model. |

In these 8 lagged models, we do not find any lagged effect. Overall, these lagged analyses indicate that effects of parenting, child behavior, or parental needs do not carry over to the next day. In sum, these cross-lagged analyses provide no evidence for bidirectional effects across days. This is in contrast with the reported within-day associations.

Interestingly, similar findings have been reported in Mabbe et al.’s (2018) diary study with parents from the general population. As mentioned by Mabbe and colleagues (2018), this discrepancy might indicate that parenting, child behavior, and parents’ needs only affect each other within days, rather than between days. Thus, externalizing child behavior might cause parents to respond in a more psychologically controlling way, which relates to a further increase of these externalizing behaviors during that same day. However, this negative effect of externalizing behaviors on psychological controlling parenting might not transfer to the next day. This would mean that every day represents a new start for families, because there are no carry-over effects of parenting, child behavior, and parents’ needs to the next day. However, given that we rely on a relative small sample size and only few studies have examined these daily lagged effects (e.g. Mabbe et al., 2018), more research is needed to replicate and interpret these findings.