<center>**Supplemental Material**</center>

<center>**Longitudinal associations between mothers' and fathers' anger/irritability expressiveness, harsh parenting, and adolescents' socioemotional functioning in nine countries**</center>

Sensitivity Analyses Comparing Competing Models

Quantitative methodologists have long called for applied researchers to compare competing models to ensure that the models researchers ultimately report are not overly-restrictive or sample-specific (Lin, Huang, & Weng, 2017). Therefore, we compared the mother and father models reported above, which were theoretically derived according to Eisenberg and colleagues' model of parent emotion socialization, to a series of more complex models that were exploratory and atheoretical in nature. These "exploratory" competing models added two new variables to the model: age 14 EXTs and INTs. These competing models also added paths from age 13 harsh parenting, and paths from age 14 adolescent EXTs and INTs, predicting all subsequent study constructs. In these competing models, paths from age 13 predictors also predicted age 14 EXTs and INTs. Notably, parent self-efficacy in anger regulation (age 13), parent irritability (age 13), and adolescent irritability (age 14) were each only measured at a single time point; therefore, additional measures of these variables at other time points could not be added to the competing model. We designed this atheoretical model to predict age 15 EXTs and INTS from all available age 13 and 14 predictors (in contrast to the selected pathways to age 15 EXTs and INTs proposed by our apriori theoretical model).

These competing exploratory models could not simultaneously estimate age 15 adolescent EXTs and INTs due to their added complexity. Therefore, we examined EXTs and INTs models separately for mothers and fathers (i.e., for a total of 4 additional models; results available upon request). Given that these exploratory models included new variables, fit indices for non-nested models, including the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC),

and Sample-Adjusted Bayesian Information Criterion were used to compare these atheoretical, exploratory models to our reported theoretically-derived study models, as suggested by quantitative researchers (Lin et al., 2017). AIC generally favors more complex models with more parameters, whereas BIC generally favors less complex models (Lin et al., 2017). The lower the AIC and BIC values, the better the model fit. Across mother and father models, AIC, BIC, and Sample-Adjusted BIC values were all between 29% - 55% lower for the theoretically-derived mother and father models we presented, compared to the more atheoretical, exploratory models. In summary, significant indirect effects were found in some pathways (i.e., principally most of the age 13 parental irritability pathways), but not others (i.e., most of the age 13 parental self-efficacy pathways) in these sensitivity analyses. However, given the superior performance of our theoretically-derived models across all AIC/BIC fit indices, the ability of our models to simultaneously measure age 15 EXTs and INTs, and our models' similarity to other published cross-cultural, longitudinal emotion socialization models (e.g., Di Giunta et al., 2018), we are confident in the robustness of the mother and father models reported above (contact first author for further details). Thus, it appears that our theoretically-derived path analyses reported in the results are superior to more complex but atheoretical, exploratory models.

Additionally, methodologists have recently identified that separation of within and between group and person effects strengthens inferences made in structural equation modeling frameworks (e.g., Hamaker, Kupier, & Grasman, 2015). Therefore, we performed sensitivity analyses that disaggregated between- and within-culture effects within a multilevel structural equation modeling framework. Due to model complexity, age 15 EXTs and INTs could not be included in the same model for these sensitivity analyses, but all substantive study results were replicated in separate EXT and INT models except for one (the mediating effect of age 14 harsh parenting on the association between age 13 mother irritability and age 15 adolescent externalizing behavior). Unfortunately, we could not disaggregate findings at the between- and within-person level because doing so would require measuring study variables for at least 3 time points (Hamaker et al., 2015),

and we only measured each study variable at 1 or 2 time points. Future studies that investigate associations in autoregressive, cross-lagged fashion across 3 time points could disaggregate within-person effects.