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Optimal Assessment of Parenting [or] How I Learned to Stop Worrying and Love Reporter Disagreement

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Abstract

The purpose of this study was to examine differences and similarities across ratings of parenting by preadolescents, parents, and observers. Two hundred and forty-one preadolescents rated their parents on warmth and harshness. Both mothers and fathers self-reported on these same dimensions, and observers rated each parents' warmth and harshness during a ten minute interaction task with the preadolescent. For the majority of outcomes assessed, the differences between preadolescent, parent, and observer ratings accounted for significant amounts of variance, beyond the levels accounted for by the average of their reports. A replication sample of 929 mother-child dyads provided a similar pattern of results. This methodology can help standardize the study of reporter differences, supports modeling of rater-specific variance as true score, and illustrates the benefits of collecting parenting data from multiple reporters.

Keywords

rating; parenting; parenting style

Past research shows poor agreement between parent and child reports of family related variables, including parenting practices (Barnes & Olson, 1985). There is little consensus on how to handle disagreement between raters of parenting, in part, because differences between parent, child, and observer reports are generally viewed as uninformative. At the heart of this issue is the question of whether or not rater-specific variance is worth addressing, either at the stage of determining from how many sources one should gather parenting data (Zaslow et al, 2006), or later when assessing the degree to which rater-specific variance should be modeled as a predictor of developmental outcomes (Widaman, 2007). Although a growing literature shows that rater-specific variance contains true score, many researchers continue to treat rater-specific variance as error. One reason this issue has received such scattered and inconsistent attention may be because only a few studies have moved beyond difference scores to apply more sophisticated analytic methods. The current

study includes a novel application of an existing analytic approach to the issue of disagreement across raters; our purpose is to identify the degree to which differences across three reporters of parenting (parent, preadolescent, and observer), account for variance in preadolescent outcomes beyond the average of their reports.

Prior work has documented disagreement among reporters of parenting (Barnes & Olson, 1985; Callan & Noller, 1986; Feldman, Wentzel, & Gehring, 1989; Jessop, 1981; Noller & Callan, 1986; Simons, Lorenz, Wu, & Conger, 1993; Tein, Roosa, & Michaels, 1994). Some of this literature documents association-based differences in convergent validity (Schwarz et al. 1985; Sessa et al. 2001), or criterion validity (Zaslow et al., 2006; Roff, Sells, & Golden, 1972; Serot & Teevan, 1961; Sessa, Avenevoli, Steinberg, & Morris, 2001). Other literature focuses on mean level differences between parent and child reports (Callan & Noller, 1986; East, 1991; Edens, Cavell, & Hughes, 1999; Feldman et al., 1989; Gaylord, Kitzmann, & Coleman, 2003; Neimi, 1974; Ohannessian, Lerner, & Von Eye, 1994; Schwarz et al., 1985; Smetana et al., 1990).

In one of the earlier studies to use parent, child, and observer reports as indicators of a single latent parenting factor, Cook and Goldstein (1993) noted that the residuals or error variances of the indicators of parenting dimensions were correlated, which suggested the presence of systematic variance apart from that variance common to all three raters. This supported the notion that variables may be identified which could explain reporter differences. Additional studies support this notion that differences between raters of parenting are not random, but vary according to variables such as the child's gender (Feinberg, Howe, Reiss, & Hetherington, 2000), family income (Sessa, Avenevoli, Steinberg, & Morris, 2001), parental closeness (Bell, Rychener, & Munsch, 2001), parental depression (Youngstrom, Izard, & Ackerman, 1999), family structure (Tein, Roosa, & Michaels, 1994), age, level of family functioning, the type of variable being measured, and characteristics of the targeted family member (Smetana, Yau, Restrepo, & Braeges, 1990; Tein et al., 1994; Youngstrom et al., 2000). Together, these studies demonstrate that differences across reporters contain systematic variance.

Furthermore, differences between parent and child reports of parenting are associated with indicators of child development including child internalizing behavior (Gaylord, Kitzmann, & Coleman, 2003; Holombeck & O'Donnell, 1991), child externalizing behavior (Pelton and Forehand (2001), self-competence and self-esteem (Carlson, Cooper, & Spradling, 1991), depression and conduct problems (Tein, Roosa, & Michaels, 1994), dieting behavior (Paikoff, Carlton-Ford, & Brooks-Gunn, 1992), behavioral problems and lower social competence (Scherer, Melloh, Buyck, Anderson, & Foster, 1996), social functioning (Michaels, Messe, and Stollak, 1983), antisocial behavior (Feinberg, Howe, Reiss, & Hetherington, 2000), and the degree to which children reported their family as loving (Rohner, Khaleque, Riaz, Khan, Sadeque, & Laukkala, 2005). Not only do differences across reporters of parenting contain systematic variance, that variance accounts for variance in developmental outcomes.

However, this research has several limitations. First and foremost, there is the concern that outcomes are selected post-hoc and reflect capitalization on chance. This concern is

compounded by the lack of replicability for many of these reported effects. A second issue is the tendency to focus on differences between parent report and child report, one of which generally also supplies the outcome variable. That is, what is termed rater differences could in fact be shared-method variance. Third, this literature has not directly addressed how to consider reporter differences when there are more than two reporters.

Perhaps because of these limitations, research on rater differences has yet to reach a consensus on how to treat multiple reporters of parenting. Some researchers discourage the practice of aggregating across raters and advocate considering all reporter differences (Schwarz, Barton-Henry, & Pruzinsky, 1985; Tein, Roosa, & Michaels, 1994), whereas others recommend aggregation (Achenbach et al., 1987; Schwarz et al., 1985). Empirical support for either position is limited (Gonzales, Cauce, and Mason, 1996; van der Valk, van den Oord, Verhulst, & Boomsma, 2003). Although structural equation modeling is often applied to multiple reporters of parenting (Conger et al., 1993; Cook & Goldstein, 1993; Patterson & Bank, 1985), requiring information from multiple raters of parenting – who are not highly correlated – to form a single latent variable can result in poor factor loadings. Furthermore, there remains debate regarding what to do with variance that is not shared across raters (Kishton, & Widaman, 1994; Marsh & O’Neill, 1984).

Reflecting this lack of consensus, research continues to be published in which reporter differences are dealt with either by unit weighting and combining reporters (often by standardizing and averaging), by considering as valid only variance shared across all reporters, or by including only one reporter per construct in the model (even though the researcher has information available from multiple reporters). One variant of this approach involves conducting analyses with the same rater supplying both predictor and outcome (within-method), and then with one rater reporting the predictor variable, while another rater provides the outcome variable (between method). This strategy often fails to produce consistent results (Gecas & Schwalbe, 1986; Margolin, Blyth, & Carbone, 1988; Paulson, 1994; Paulson, Hill, & Holmbeck, 1991). Difference scores continue to be used despite their limitations. The use of product terms or polynomial equations in multiple regression has been advocated as a replacement to difference scores (Edwards, 1994), and has been applied to differences between parents and children in acculturation (Birman, 2006) as well as reporters of parenting (Laird & de los Reyes, 2013). This regression approach itself is not without limitations, such as requiring more a priori justification for model selection than researchers may be able to produce, difficulty in interpreting significant interactions (Costigan, 2010), and (when effects are constrained to equality) potential capitalization on chance due to the attenuating effect model constraints can have on standard errors.

Clearly, the field of parenting and child development would benefit from a technique which allows researchers to identify when the assumption of equal weighting across raters is supported, or when differences across raters are meaningful. As part of this shift, we will conceptualize differences across raters as rater-specific variance instead of disagreement between raters. Not only does this shift in perspective facilitate interpretation, it invites alternative analytic approaches (Feinberg, Howe, Reiss, & Hetherington, 2000). For example, Davison and Davenport (2002) provided a method of testing whether the pattern of scores on a set of predictors can explain variance in a criterion variable (Meel, 1950). Their

focus was on identifying patterns of predictor scores associated with high scores on the criterion. However, this same procedure can be applied to address the degree to which a set of ratings assigned to a construct (such as parenting) can predict additional variance in outcomes beyond that accounted for by the mean of the ratings. They outlined a three step analytic process. First, a regression procedure identifies a criterion pattern, or pattern of rater responses that corresponds to a high score on a criterion. Second, the amount of variance in the criterion that is associated with the variation in this criterion pattern is determined. Finally, a cross validation procedure is applied to estimate the drop in predictive power that would result in applying this criterion pattern to a new sample.

The current study compares parent, preadolescent, and observation-based reports of two different parenting dimensions to assess the degree to which the reporter-specific variance (i.e., disagreement) can reliably account for variance in preadolescent outcomes above and beyond the variance accounted for by the average of the three reporters. To conduct a more comprehensive test, these analyses are replicated across several preadolescent outcomes, using two independent samples.

The first parenting dimension is warmth. As used here, the concept of warm parenting involves central elements of various conceptualizations of parenting (Baumrind, 1971) such as warmth, acceptance, engagement, and responsiveness. Parents high on these dimensions of parenting demonstrate above average levels of affectionate intimacy, acceptance, involvement, and love toward their children (Rohner, 1986). These types of parenting behaviors are positively associated with healthy child and adolescent adjustment across cultures (Khaleque & Rohner, 2002) and particularly with social initiative and positive attitudes towards interpersonal interaction (e.g., Barber et al., 2005). The second parenting dimension is harshness, or hostile, rejecting, abusive or aggressive parenting which is associated with a range of developmental problems including aggressive, antisocial or delinquent behaviors (Dogan, Conger, Kim, & Masyn, 2007; Hops, Davis, Level, & Sheeber, 2003).

Study 1

Methods

Participants—The Riverside Economic Stress Project recruited 111 European American (56 boys and 55 girls) and 167 Mexican American (76 boys and 91 girls) families for participation in this study, with a target child who was in fifth grade at the time of the recruitment. School districts supplied researchers with a list of all fifth graders who were identified as either European American (EA) or Mexican American (MA) by the school records. Families of all children on these lists were called by office personnel from the child's school and asked to participate if they fit the criterion of ethnic homogeneity (i.e., mother, father, and child were either all MA or all EA), if both biological parents were married or cohabiting at the time of recruitment, and if the child had attended school in the United States starting in kindergarten. Participation rate for eligible families was 80%. Due to missingness on some of the measures, the effective sample size for the current study was 241 participants (241 mothers and 240 fathers). The mean age of the mothers and fathers was 38 years and 40 years, respectively. Education level ranged from 10 years of schooling

to 21 years for EA fathers and from 6 years of schooling to 22 years for EA mothers, with an average of 14 years for both (i.e., equivalent to attending some college). Education ranged from no schooling to 18 years of schooling and from no schooling to 19 years of schooling for MA fathers and mothers, respectively, with an average of 9 years for both (i.e., equivalent to attending high school in Mexico). The average total family income for the EA sample was \$59,300, compared to \$24,500 for the MA sample. More than 70% of the MA parents elected to be interviewed and to fill out surveys in Spanish, whereas only about 20% of their children elected to do so. The current analyses focus on the 241 children for whom observed parenting data were available.

Measures—The *Child Report of Parental Behavior Inventory (CRPBI)* (Schafer, 1967) assesses parenting practices with 56 questions rated on 3-point scales. These items are combined to create subscales, of which two were used: acceptance (eight items including “often speaks of the good things I do” and “smiles at me very often”), and rejection (eight items including “acts as though I’m in the way” and “often seems glad to get away from me for a while”). The *CRPBI* has high validity (Schaefer & Bayley, 1967) and these scales were reliable for both parent reports (mean $\alpha = .76$, range: $.64 - .93$) and child reports (mean $\alpha = .79$, range: $.70 - .94$).

Families also participated in a discussion task, which lasted approximately 10 minutes, based on a protocol developed by Conger, Elder, Lorenz, Simons, and Whitbeck (1994). Video recordings of these segments were watched by a group of raters who assessed parents behavior toward the child on a variety of scales including warmth (i.e., expressions of care, concern, support, or encouragement) and harshness (i.e., hostile, angry, critical, disapproving, rejecting, or contemptuous behavior), coded separately for both mothers and fathers. Reliability was determined by having all raters watch and rate approximately 10% of the families ($r_{ICC} > .70$ for all scales).

Mother and father, completed the Child Behavior Checklist (CBCL; Achenbach, 1991) as an assessment of internalizing and externalizing problems. A Spanish version has been cross-validated for internal consistency and concurrent validity (Rubio-Stipec et al., 1990), and was used with some of the MA families. The CBCL has been used with MA adolescents (Knight et al., 1994) and acceptable alphas were obtained (mean $\alpha = .90$, range: $.88 - .94$). One of the child’s schoolteachers completed the Teacher Report Form (TRF; Achenbach, 1991) to assess internalizing and externalizing problems (mean $\alpha = .89$, range: $.87 - .94$).

Preadolescents completed the Self-perception Profile for Children (Harter, 1985) to assess preadolescents’ feelings of self-worth. A Spanish version was translated and back-translated for use with the MA families. The global self-worth scale was reliable in this sample ($\alpha = .78$ English version, $.71$ Spanish version).

Preadolescents reported on their depression using the Child Depression Checklist (Kovacs, 1985) which had acceptable reliability ($\alpha = .88$ English version, $.80$ Spanish version).

Children reported on their loneliness using a 16-item scale (Asher, Hymel, & Renshaw, 1984), which had acceptable reliability ($\alpha = .90$ English version, $.80$ Spanish version).

Sociometric information was provided by the preadolescent's fifth grade teacher, who reported the degree to which the study preadolescent was accepted by peers, friendly, and popular. One item was dropped due to low reliability: "Student is shy, withdrawn." A total of 11 items were included in the final scale ($\alpha = .87$).

Grade point average in fifth grade was supplied by the participating school districts.

Analyses—Following the procedure outlined by Davison and Davenport (2002), we created means representing the average level of a given parenting construct for that family (i.e., *level effect*), as well as variables representing the pattern of predictor scores associated with high scores on a given preadolescent outcome (i.e., *criterion pattern*). The level effect was created by taking the average of the three reports of a given parenting dimension. This resulted in a total of 4 level effects (i.e., mother warmth, mother harshness, father warmth, father harshness).

The criterion patterns needed to be created not only for each of these four possible level effects, but also separately for each of the nine preadolescent outcomes. This resulted in a total of 36 criterion patterns, which were examined visually to assess potential trends. The pattern effects (i.e., the association between a person's pattern of scores, and the criterion pattern) were created by centering the scores across raters, and multiplying each centered score by the centered unstandardized regression coefficient for that predictor, when predicting that outcome. As an example, the criterion pattern effect for mother acceptance and child internalizing problems (as reported by the parents) involved centering the unstandardized regression coefficients: $-.151$ for observer report, $-.032$ for mother report, and $-.012$ for preadolescent report. After subtracting the mean (i.e., $-.065$), they become $-.086$, $.033$, and $.053$ respectively. These centered coefficients were then multiplied by the deviation of each predictor score from that person's mean, in this manner:

$$\text{Pattern effect} = .33 * [(X_{MWO_j} - M_{MW_j}) * -.086 + (X_{MWM_j} - M_{MW_j}) * .033 + (X_{MWC_j} - M_{MW_j}) * .053]$$

where X_{MWO_j} is the observation-based report of maternal acceptance for that family, X_{MWM_j} is the mother self-report of acceptance for that family, X_{MWC_j} is the preadolescent report of mother acceptance for that family, and M_{MW_j} is the level effect for that family (or the average of X_{MWO_j} , X_{MWM_j} , and X_{MWC_j} for that family). Finally, the entire quantity is multiplied by $1/V$ (where V is the number of variables); the $.33$ at the beginning of the formula above represents this final element. The level effect and the criterion pattern effect for a given outcome were then used to predict that outcome using full information maximum likelihood estimation (Muthén & Muthén, 2012).

Regression weights generated from one sample tend to account for less variance when applied to a new sample (Dawes, 1979). The current analyses using regression weight-based pattern effects were subject to this limitation. Therefore, the next step was to perform a cross validation procedure to estimate the degree to which the benefit associated with the pattern effect would attenuate in a new sample. This was accomplished by removing one family from the sample, and creating the pattern effect based on the remaining 140 families. That first family was then reintroduced to the sample, the next family in the sample was excluded,

and the pattern effect was created again, this time excluding that second family (but including the first). This was repeated for all 241 families, resulting in 241 pattern effect variables, each created excluding one family. That is, for each family, there was one set of predicted values calculated from a pattern effect that did not include them in its creation. Those predicted values for each family were compiled into a final set of cross validated predicted values. The cross validated values from this resampling technique allowed us to estimate the drop in predictive power that would result from applying this procedure in a second sample. The final step was to test for moderating effects of child gender, ethnicity, and family income on the associations between level/pattern effects and preadolescent outcomes.

Results—The means and standard deviations for all untransformed variables are presented in Table 1. The left side of Table 1 corresponds to Study 1. For example, teacher report of internalizing problems had a mean of 8.46 and a standard deviation of 7.81. Parent and preadolescent's reports correlated for harshness, and observer rating of warmth correlated with parent report (see Table 2). Consistent with other multitrait-multimethod matrices of parenting (Litovsky & Dusek, 1985; Louiselle, Misukanis, & Mueller, 1988), the within-rater correlations across traits were generally larger in magnitude than the across-rater correlations for the same trait.

The level effect variables were used to predict preadolescent outcomes (see Table 3). For example, the level effect for mother warmth on parents' report of the child's internalizing problems was significant ($r = -.26, p < .001$), reflecting that as the average rating of mother's warmth increased, the amount of child internalizing problems reported by the parents decreased. The criterion patterns were largely uncorrelated with the level effects (mean $r = .06$ for mother warmth, $.06$ for father warmth, $.05$ for mother harshness, and $.05$ for father harshness).

There were consistent pattern effects for externalizing problems, self-worth, depression, loneliness, sociometrics, and grade point average, but few pattern effects for internalizing (see Table 4). The average effect size for the average across reporters (i.e., level effect), was $r = .23$. The average effect size for the differences across raters (i.e., pattern effect), was $r = .18$. In 14 out of the 36 comparisons (39%), the pattern effect size was equal to or larger than the level effect size. That is, in 14 cases the differences between reporters explained as much or more variance in preadolescent outcomes than the average score or shared variance of all three reporters. Using the cross-validated values, the pattern effects dropped in magnitude by an average of 25% (range: 10% – 40%). In all cases where the original pattern effect was significant, the cross-validated pattern effect still increased the explanatory power of the model by more than 50%.

Family ethnicity moderated level effects in 12 of the 36 cases (33%), and pattern effects in 5 of the 36 cases (14%). For both level and pattern effects, the direction of moderation was that of associations between parenting and child outcomes being larger in EA families than MA families. Preadolescent gender moderated level effects in 3 of the 36 cases (8%), and pattern effects in 3 of the 36 cases (8%). For level effects and two of the pattern effects, the direction of moderation was that of associations between parenting and preadolescent

outcomes being larger for boys. Family income moderated one level effect (3%) and one pattern effect (3%).

Study 2

Methods

Participants—Participants were the families in the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development. These families were recruited in 1991, shortly after their child's birth, from hospitals at 10 sites across the United States (Little Rock, AR; Irvine, CA; Lawrence, KS; Boston, MA; Philadelphia, PA; Pittsburgh, PA; Charlottesville, VA; Morganton, NC; Seattle, WA; and Madison, WI). When infants were 1 month old, 1,364 mothers completed a home interview and became part of the initial study sample. This sample included a substantial proportion of low education parents (30% had no more than a high school degree), ethnic minority families (13% were African American compared with the national proportion of 12%), and the mean income level was the same as the U.S. average (\$37,000). The current analyses focus on data collected at or near fifth grade to approximate the developmental period of Study 1, provided by the 929 families for which observed parenting was coded.

Measures—Mothers reported on their parenting when the study child was in fifth grade using a revised version of the Raising Children Checklist (Greenberger & Goldberg, 1989). Authors report good validity for the scales. Two scales are used in the current study: Responsive/firm ($\alpha = .57$) and harshness ($\alpha = .69$). Responsive firm items include “praise child when he/she does something you like” and “give child lots of hugs and kisses.” Harshness items include “think praising child will spoil him/her” and “expect child to obey without question.”

Preadolescents reported on their mother's parenting using the Behavioral Affect Rating Scale (Conger, 1989). Both scales are used in the current study: warmth/support ($\alpha = .89$) and hostility ($\alpha = .75$). Warmth/support items include “listen carefully to your point of view” and “have a good laugh with you about something that was funny.” Hostility items include “shout or yell at you because he/she was mad at you” and “ignore you when you tried to talk to him/her.”

Parenting behaviors were assessed during fifth grade through observations of mothers when interacting with their preadolescent children. Videotapes of parent-child interactions involving play scenarios and problem-solving tasks were sent to a single site for central coding. Warmth/support was the average of two 7-point ratings: supportive presence (e.g., pay attention to the child when the child talks, have a positive tone of voice) and respect for autonomy (e.g., acknowledge the child's perspective, validate the child's individual identity). Observed hostility was also rated (use a negative or sarcastic tone of voice, verbally disapprove of child or child's attributes, activities, products, or choices). Inter-coder reliability was established by having two coders assess approximately 20% of the tapes, randomly drawn from each assessment period ($r_{ICC} > .70$).

Mothers completed age-appropriate versions of the Child Behavior Checklist (CBCL; Achenbach 1991) when children were in fifth grade. Teachers also completed the Teacher Report Form (TRF; Achenbach, 1991) when children were in fifth grade. Unlike Study 1, T-scored transformations are used for this study.

Preadolescents reported on their depression using the 10-item short form of the Child Depression Checklist (Kovacs, 1992) which had acceptable reliability ($\alpha = .73$).

Preadolescents reported on their loneliness using a 16-item scale (Asher, Hymel, & Renshaw, 1984), which had acceptable reliability ($\alpha = .91$).

Sociometric information was provided by the preadolescents' fifth grade teacher, who answered seven items assessing the degree to which the study child was socially and emotionally developed with peers in the school context ($\alpha = .94$).

Grade point average was supplied by the principals in the participating schools.

Results—We used the method described in Study 1 to create level and pattern effects. We then used the level and pattern effects to predict preadolescent outcomes (see Table 5). There were consistent pattern effects for externalizing problems, depression, loneliness, sociometrics, and grade point average. Consistent with study 1, there were fewer pattern effects for internalizing problems. The average effect sizes were $r = .21$ for the mean across reporters and $r = .12$ for differences between reporters. In 2 out of the 16 comparisons, the differences between reporters explained more variance in preadolescent outcomes than the average score or shared variance of all three reporters. Child gender moderated level effects in 1 of the 16 cases, and pattern effects in 1 of the 16 cases. For both, the direction of moderation was that of associations between parenting and child outcomes being larger for girls. Family income moderated one level effect.

Criterion patterns that consistently emerged include: (a) sociometrics and GPA were higher when observer ratings of parent warmth were the highest and observer ratings of parent harshness were the lowest, (b) depression and loneliness were higher when parent reports of their warmth were the highest and parent reports of their harshness were the lowest, (c) self-worth was highest when parent reports of their warmth were the lowest, (d) parent report of the preadolescent's externalizing problems was higher when the preadolescent's rating of mother acceptance was the highest, (e) teacher report of the preadolescent's internalizing problems was higher when parents report of their warmth was the highest and when preadolescent's report of parent harshness was the highest, and (f) teacher report of the preadolescent's externalizing problems was higher when the observer ratings of parent warmth were the lowest and when preadolescent's rating of parent harshness was the lowest.

Discussion

The purpose of the current study was to assess the degree to which rater differences in parenting across parent, preadolescent, and observers could account for variance in preadolescent outcomes beyond the average of their scores. These results illustrate the utility of the approach offered by Davison and Davenport (2002), which could be used to

standardize the study of reporter differences when there are more than two reporters. These results also illustrate that rater specific variance contains true score, and can notably increase the predictive capacity of parenting behavior (Figure 1). However, this was more the case for some outcomes (i.e., externalizing problems, grade point average, self-worth) than others (i.e., internalizing). Feinberg et al. (2000) observed that the degree to which the role of rater discrepancies is outcome- or predictor-specific is unknown. Although a larger body of research using this method is needed to definitively resolve this issue, the current findings show that internalizing problems was the only outcome that did not consistently benefit from including reporter-specific variance (i.e., reporter differences) as a predictor. Finally, these results demonstrate the benefit of collecting and using data from multiple reporters.

Overall, the associations for warmth and harshness were similar in magnitude, suggesting that both parenting dimensions were equally associated with preadolescent outcomes. The pattern effects suggest that when parents self-enhance in rating their behavior towards their child, the preadolescent is more likely to manifest depression, loneliness, and internalizing problems. In contrast, when parents have a severity bias in rating their own behavior towards their child, the preadolescent is more likely to manifest higher self-worth. When preadolescents show a leniency bias (rate their parents more favorably than all the other reporters), they are more likely to manifest externalizing problems. Finally, observer ratings were particularly associated with school-related outcomes (sociometrics and grade point average). Replication in additional samples is necessary to increase confidence in these exploratory findings. Nevertheless, they demonstrate the possible implications of this method's widespread application to extant multiple-informant data.

The current results support the perspective that each reporter is uniquely biased by different variables and approximately equally valid. Reporter specific variance likely in part reflects true score variance, representing the unique ability of the preadolescent, the parent, or an observer to provide information on a given parenting dimension. Traditionally, multi-informant datasets approach this problem by running analyses separately by reporter (using only one-third of the data at a time) or try to force three reporters into a latent variable, which often gives poor fit. Importantly, the portion of true score variance that is common across all three reporters may be only moderate in magnitude. Additionally, if two reporters correlate more highly than the third, their loadings to the latent factor will be higher due to that correlation, and the lower-loading reporter will be represented less in the model (Cole, Ciesla, & Steiger, 2007). Researchers then are forced to fall back on 'just-so-stories' or post-hoc interpretations to explain those unequal loadings. If observer and adolescent reports load higher than parent reports, researchers talk about self-enhancement bias, social desirability bias, or the fact that observers and adolescents are basing their scores on observable parent behaviors, while the parents' self reports also includes their cognitions and intents. If adolescent and parent reports load higher than observer-based reports, researchers suggest family-level biases, or poorly-trained observers as explanations. If observer and parent reports load higher than adolescent reports, researchers suggest adolescents are poor raters of parenting due to their position of low status, their inability to see eye-to-eye with parents, and so on. Because we are scientists (and not Jedi knights) this hand-waving is unnecessary. Multiple reporters allow us to triangulate in on constructs (Funder, 2009). The low

correlation between different raters of parenting is a strength, as it likely indicates the raters are providing non-redundant true score.

These analyses contain several limitations. First, we focused on warmth and harshness, and different results could emerge for other parenting dimensions, or parent-offspring discrepancies at other points in development (Mandemakers & Dykstra, 2008). Second, these omnibus tests may demonstrate the overall validity of reporter disagreement, but they do not address more focused questions (e.g., is observation-based assessment of parenting more valid than either parent or child reports). Third, although we offer a manifest-based approach for researchers less familiar with latent variable modeling, these effects would likely have been even larger were our measures of higher reliability or corrected for measurement error. Fourth, some of these results may be partially attributable to shared method variance. However, this concern is reduced by the similar effects seen in cases where the outcome was provided by a different reporter than any of the three reporters of parenting. Finally, although the cross-validation results from the first sample and the high degree of replication in the second sample suggest that the magnitude of effects will remain robust across samples, additional replication is needed.

Future research could apply this method to couples research, as well as other family subsystems. As researchers come to understand when patterns among raters are useful, future research can optimally design from whom they will collect data, in order to maximize useful variance, while maintaining the efficiency (in time and cost) of data collection. Researchers and funding agencies can increase the explanatory power of parenting by over 50% for many outcomes by including multiple reporters. Funding agencies should support funding requests to measure construct like parenting across multiple reporters. Constructs worth measuring are worth measuring well.

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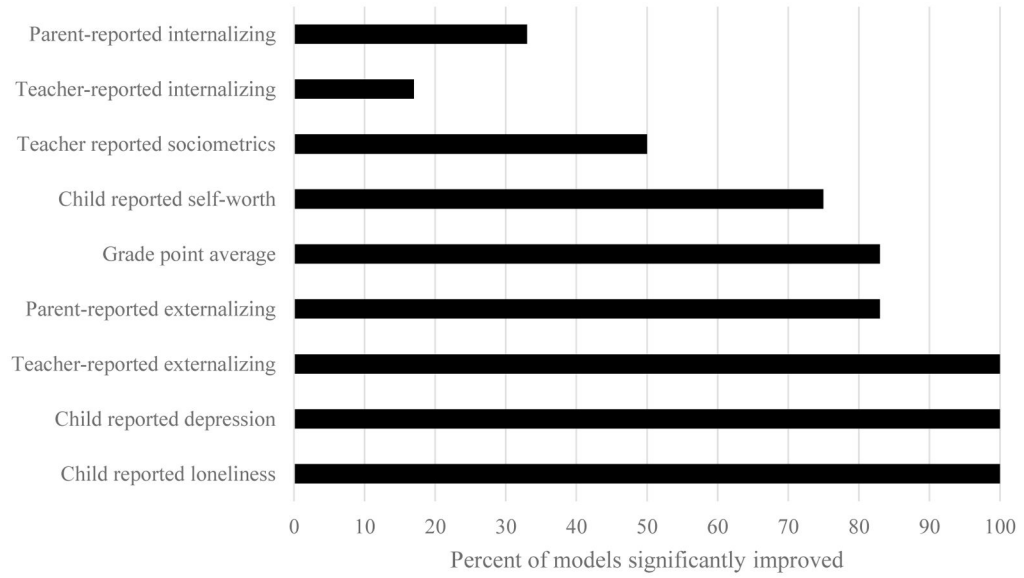


Figure 1.
When Treated as True Score, Rater Differences Significantly Increase Explanatory Power
For Most Child Outcomes

Table 1

Means and Standard Deviations

| | Study 1 (N = 241) | | Study 2 (N = 929) | |
|-----------------------------------|-------------------|-------|-------------------|-------|
| | M | SD | M | SD |
| Teacher report of Internalizing | 8.46 | 7.81 | 50.46 | 9.48 |
| Mother report of Internalizing | 39.57 | 6.62 | 48.73 | 9.78 |
| Father report of Internalizing | 38.33 | 6.46 | - | - |
| Teacher report of Externalizing | 5.93 | 8.77 | 50.95 | 9.15 |
| Mother report of Externalizing | 42.55 | 7.12 | 45.80 | 10.01 |
| Father report of Externalizing | 41.32 | 7.45 | - | - |
| Teacher report of Sociometrics | 9.80 | 9.69 | 3.66 | 0.89 |
| Self-worth | 3.33 | 0.60 | - | - |
| Depression | 32.44 | 6.00 | 1.28 | 1.95 |
| Loneliness | 29.15 | 10.28 | 25.72 | 9.02 |
| Grade point average | 2.76 | 0.82 | 2.95 | 0.92 |
| Observer report: mother warmth | 3.10 | 0.77 | 5.04 | 0.88 |
| Mother report: mother warmth | 21.28 | 2.62 | 20.88 | 1.99 |
| Child report: mother warmth | 20.23 | 4.48 | 31.65 | 4.39 |
| Observer report: mother harshness | 1.61 | 0.63 | 1.58 | 0.87 |
| Mother report: mother harshness | 11.10 | 2.56 | 24.50 | 3.84 |
| Child report: mother harshness | 13.21 | 3.99 | 11.50 | 2.71 |
| Observer report: father warmth | 3.29 | 0.67 | - | - |
| Father report: father warmth | 20.71 | 2.54 | - | - |
| Child report: father warmth | 19.91 | 4.25 | - | - |
| Observer report: father harshness | 1.62 | 0.67 | - | - |
| Father report: father harshness | 10.81 | 2.64 | - | - |
| Child report: father harshness | 12.46 | 3.99 | - | - |

Note. Means are not comparable across the studies due to different measurement.

Correlations Among Parenting Reports

Table 2

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1. O: mother warmth | - | .17* | .08 | <u>-.30*</u> | <u>-.20*</u> | <u>-.18*</u> | <u>.53*</u> | .20* | .09 | <u>-.18*</u> | <u>-.21*</u> | <u>-.17*</u> |
| 2. M: mother warmth | .13* | - | .06 | <u>-.12†</u> | <u>-.30*</u> | <u>-.07</u> | .03 | .09 | .05 | .01 | <u>-.14*</u> | .00 |
| 3. C: mother warmth | .10* | .03 | - | .11 | <u>-.12†</u> | <u>-.56*</u> | <u>-.06</u> | <u>-.02</u> | <u>.70*</u> | <u>.26*</u> | <u>-.05</u> | <u>-.52*</u> |
| 4. O: mother harshness | <u>-.64*</u> | <u>-.07*</u> | <u>-.11*</u> | - | <u>-.09</u> | <u>-.09</u> | <u>-.38*</u> | <u>-.10</u> | <u>.13*</u> | <u>.61*</u> | <u>-.04</u> | <u>-.09</u> |
| 5. M: mother harshness | <u>-.28*</u> | <u>.02</u> | <u>-.01</u> | .16* | - | .28* | <u>-.09</u> | <u>-.12†</u> | <u>-.17*</u> | <u>-.04</u> | <u>.12†</u> | <u>.32*</u> |
| 6. C: mother harshness | <u>-.24*</u> | <u>-.04</u> | <u>-.41*</u> | .23* | .16* | - | <u>-.08</u> | <u>-.02</u> | <u>-.45*</u> | <u>-.17*</u> | <u>.15*</u> | <u>.72*</u> |
| 7. O: father warmth | - | - | - | - | - | - | - | .24* | .02 | <u>-.50*</u> | <u>-.12†</u> | <u>-.12†</u> |
| 8. F: father warmth | - | - | - | - | - | - | - | - | .04 | <u>-.22*</u> | <u>-.25*</u> | <u>-.03</u> |
| 9. C: father warmth | - | - | - | - | - | - | - | - | - | .16* | <u>-.13*</u> | <u>-.56*</u> |
| 10. O: father harshness | - | - | - | - | - | - | - | - | - | - | -.08 | -.10 |
| 11. F: father harshness | - | - | - | - | - | - | - | - | - | - | - | .17* |
| 12. C: father harshness | - | - | - | - | - | - | - | - | - | - | - | - |

Note. Correlations above diagonal are Study 1, below diagonal are Study 2. Convergent validity coefficients in boldface. O=observer report, M=mother report, F=father report, C=child report, Underline denotes within-rater correlations,

† $p < .08$,

* $p < .05$

Table 3

Level Effects Predicting Child Outcomes

| Outcome | Parenting dimension | Study 1 | | | Study 2 | | |
|-------------------------|---------------------|---------|-------|------|---------|-------|------|
| | | t | p | r | t | p | r |
| Internalizing (parent) | Mother warmth | -4.09 | <.001 | -.26 | -6.62 | <.001 | -.20 |
| | Father warmth | -4.86 | <.001 | -.30 | - | - | - |
| | Mother harshness | 2.85 | .005 | .18 | 2.96 | .003 | .09 |
| Externalizing (parent) | Father harshness | 5.52 | <.001 | .34 | - | - | - |
| | Mother warmth | -3.27 | <.001 | -.21 | -9.49 | <.001 | -.29 |
| | Father warmth | -3.72 | <.001 | -.23 | - | - | - |
| Internalizing (teacher) | Mother harshness | 4.56 | <.001 | .28 | 7.90 | <.001 | .24 |
| | Father harshness | 6.01 | <.001 | .36 | - | - | - |
| | Mother warmth | -2.39 | .020 | -.17 | -3.28 | .001 | -.11 |
| Externalizing (teacher) | Father warmth | -1.28 | .20 | -.09 | - | - | - |
| | Mother harshness | 0.68 | .49 | .05 | 3.70 | <.001 | .12 |
| | Father harshness | 0.99 | .34 | .07 | - | - | - |
| Self-worth | Mother warmth | -3.22 | .002 | -.23 | -6.11 | <.001 | -.20 |
| | Father warmth | -3.11 | <.001 | -.22 | - | - | - |
| | Mother harshness | 3.46 | <.001 | .24 | 8.40 | <.001 | .27 |
| Depression | Father harshness | 2.95 | <.001 | .21 | - | - | - |
| | Mother warmth | 3.27 | <.001 | .21 | - | - | - |
| | Father warmth | 3.38 | <.001 | .21 | - | - | - |
| Loneliness | Mother harshness | -1.65 | .10 | -.11 | - | - | - |
| | Father harshness | -4.27 | <.001 | -.27 | - | - | - |
| | Mother warmth | -3.43 | .001 | -.22 | -5.72 | <.001 | -.18 |
| Depression | Father warmth | -2.86 | .005 | -.18 | - | - | - |
| | Mother harshness | 2.87 | .004 | .18 | 6.30 | <.001 | .19 |
| | Father harshness | 3.56 | <.001 | .22 | - | - | - |
| Loneliness | Mother warmth | -3.40 | .001 | -.22 | -7.50 | <.001 | -.23 |
| | Father warmth | -3.60 | <.001 | -.23 | - | - | - |
| | Mother harshness | 2.53 | .012 | .16 | 4.61 | <.001 | .14 |

| Outcome | Parenting dimension | Study 1 | | | Study 2 | | |
|---------------------|---------------------|---------|-------|------|---------|-------|------|
| | | t | p | r | t | p | r |
| Sociometrics | Father harshness | 3.06 | .002 | .19 | - | - | - |
| | Mother warmth | 3.38 | .001 | .25 | 6.79 | <.001 | .22 |
| | Father warmth | 4.06 | <.001 | .30 | - | - | - |
| | Mother harshness | -3.02 | .003 | -.23 | -8.13 | <.001 | -.26 |
| Grade point average | Father harshness | -3.60 | <.001 | -.27 | - | - | - |
| | Mother warmth | 6.43 | <.001 | .40 | 6.19 | <.001 | .23 |
| | Father warmth | 5.12 | <.001 | .34 | - | - | - |
| | Mother harshness | -4.48 | <.001 | -.29 | -7.27 | <.001 | -.27 |
| | Father harshness | -5.38 | <.001 | -.34 | - | - | - |

Table 4
Level Effects and Criterion Pattern Effects Predicting Child Outcomes for Study 1

| Outcome | Parenting dimension | R ² | Level effect | | | Pattern effect | | |
|-------------------------|---------------------|----------------|--------------|-------|-----------------|----------------|-------|-----------------|
| | | | t | p | r _{sp} | t | p | r _{sp} |
| Internalizing (parent) | Mother warmth | .070 | -4.04 | <.001 | -.25 | 1.04 | .30 | .07 |
| | Father warmth | .091 | -4.88 | <.001 | -.30 | 0.52 | .60 | .03 |
| Externalizing (parent) | Mother harshness | .066 | 2.48 | .014 | .15 | 2.92 | .004 | .18 |
| | Father harshness | .123 | 5.37 | <.001 | .33 | 1.63 | .10 | .10 |
| Internalizing (teacher) | Mother warmth | .124 | -3.19 | .002 | -.19 | 4.69 | <.001 | .28 |
| | Father warmth | .086 | -3.52 | <.001 | -.22 | 2.84 | .005 | .17 |
| Externalizing (teacher) | Mother harshness | .151 | 5.24 | <.001 | .31 | 4.46 | <.001 | .27 |
| | Father harshness | .171 | 6.40 | <.001 | .38 | 3.38 | <.001 | .20 |
| Self-worth | Mother warmth | .039 | -2.45 | .015 | -.18 | 1.36 | .18 | .10 |
| | Father warmth | .018 | -1.22 | .22 | -.09 | 1.36 | .18 | .10 |
| Depression | Mother harshness | .013 | 0.77 | .44 | .05 | 1.40 | .16 | .10 |
| | Father harshness | .009 | 0.94 | .35 | .07 | 0.88 | .38 | .06 |
| Loneliness | Mother warmth | .138 | -2.97 | .003 | -.20 | 4.34 | <.001 | .29 |
| | Father warmth | .083 | -2.72 | .007 | -.19 | 2.64 | .009 | .18 |
| Self-worth | Mother harshness | .100 | 3.79 | <.001 | .26 | 2.91 | .004 | .20 |
| | Father harshness | .068 | 3.12 | .002 | .22 | 2.20 | .029 | .16 |
| Depression | Mother warmth | .106 | 3.47 | <.001 | .21 | 4.08 | <.001 | .25 |
| | Father warmth | .103 | 3.77 | <.001 | .23 | 3.87 | <.001 | .24 |
| Loneliness | Mother harshness | .037 | -1.68 | .095 | -.11 | 2.53 | .012 | .16 |
| | Father harshness | .082 | -4.11 | <.001 | -.26 | 1.68 | .095 | .10 |
| Self-worth | Mother warmth | .082 | -3.59 | <.001 | -.23 | 3.00 | .003 | .19 |
| | Father warmth | .126 | -3.41 | <.001 | -.22 | 5.02 | <.001 | .31 |
| Depression | Mother harshness | .087 | 2.86 | .005 | .18 | 3.75 | <.001 | .24 |
| | Father harshness | .091 | 3.44 | .001 | .22 | 3.23 | .001 | .20 |
| Loneliness | Mother warmth | .092 | -3.59 | <.001 | -.23 | 3.49 | .001 | .22 |
| | Father warmth | .128 | -4.06 | <.001 | -.25 | 4.57 | <.001 | .28 |
| Self-worth | Mother harshness | .079 | 2.39 | .018 | .15 | 3.69 | <.001 | .23 |

| Outcome | Parenting dimension | R^2 | Level effect | | | Pattern effect | | |
|---------------------|---------------------|-------|--------------|-------|----------|----------------|-------|----------|
| | | | t | p | r_{sp} | t | p | r_{sp} |
| Sociometrics | Father harshness | .073 | 2.96 | .003 | .19 | 2.99 | .003 | .19 |
| | Mother warmth | .102 | 3.24 | <.001 | .24 | 2.70 | .008 | .20 |
| | Father warmth | .125 | 3.86 | <.001 | .28 | 2.62 | .010 | .20 |
| | Mother harshness | .062 | -3.17 | .002 | -.24 | 1.36 | .17 | .10 |
| Grade point average | Father harshness | .089 | -3.88 | <.001 | -.29 | 1.84 | .07 | .14 |
| | Mother warmth | .220 | 6.28 | <.001 | .37 | 4.18 | <.001 | .25 |
| | Father warmth | .167 | 5.65 | <.001 | .35 | 3.64 | <.001 | .22 |
| | Mother harshness | .156 | -3.98 | <.001 | -.25 | 4.35 | <.001 | .27 |
| | Father harshness | .188 | -5.47 | <.001 | -.34 | 2.77 | .006 | .17 |

Note. r_{sp} = semipartial correlations

Table 5
Level Effects and Criterion Pattern Effects Predicting Child Outcomes for Study 2

| Outcome | Parenting dimension | R ² | Level effect | | | Pattern effect | | |
|-------------------------|---------------------|----------------|--------------|-------|-----------------|----------------|-------|-----------------|
| | | | t | p | r _{sp} | t | p | r _{sp} |
| Internalizing (parent) | Mother warmth | .043 | -5.98 | <.001 | -.20 | 1.36 | .17 | .04 |
| | Mother harshness | .023 | 3.42 | .001 | .12 | 2.82 | .005 | .10 |
| Externalizing (parent) | Mother warmth | .087 | -8.83 | <.001 | -.29 | 1.37 | .17 | .05 |
| | Mother harshness | .075 | 8.00 | <.001 | .27 | 2.01 | .045 | .07 |
| Internalizing (teacher) | Mother warmth | .019 | -3.21 | .001 | -.12 | 2.01 | .045 | .07 |
| | Mother harshness | .021 | 3.66 | <.001 | .13 | 1.70 | .089 | .06 |
| Externalizing (teacher) | Mother warmth | .081 | -5.91 | <.001 | -.21 | 5.48 | <.001 | .20 |
| | Mother harshness | .088 | 8.22 | <.001 | .29 | 2.12 | .034 | .08 |
| Depression | Mother warmth | .054 | -5.22 | <.001 | -.18 | 4.55 | <.001 | .16 |
| | Mother harshness | .063 | 5.45 | <.001 | .18 | 5.14 | <.001 | .17 |
| Loneliness | Mother warmth | .091 | -7.72 | <.001 | -.25 | 4.97 | <.001 | .17 |
| | Mother harshness | .049 | 4.09 | <.001 | .14 | 5.13 | <.001 | .17 |
| Sociometrics | Mother warmth | .104 | 6.07 | <.001 | .23 | 6.59 | <.001 | .25 |
| | Mother harshness | .075 | -7.74 | <.001 | -.27 | 1.53 | .12 | .06 |
| Grade point average | Mother warmth | .096 | 5.78 | <.001 | .23 | 5.15 | <.001 | .21 |
| | Mother harshness | .062 | -6.16 | <.001 | -.25 | 0.83 | .41 | .03 |

Note. r_{sp} = semipartial correlations