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Correction of distortion in distressed mothers' ratings of their preschool-aged children's Internalizing and Externalizing scale score

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ABSTRACT

Increased maternal psychopathology may bias mothers' ratings about child psychopathology. In this study we examined whether internalizing and externalizing behavior problems in young children were biased through maternal psychopathology. The clinical sample comprised 247 preschool-age patients who attended the Family Day Hospital in Münster, Germany. Internalizing and externalizing behavior problems were assessed by the CBCL/1.5-5, and maternal psychopathology was assessed by the SCL-90-R Global Severity Index (GSI). Three theoretical perspectives were tested by comparing the model fit of three structural equation models, namely the accuracy, distortion, and combinatory model. All of the models aimed to integrate multi-informant ratings from mother, therapists, and kindergarten teachers, but differed in the question which paths had to be significant. The distortion model fit the data best and supported the notion that there was a psychopathology-related bias in mothers' ratings. On the basis of this finding, we developed correction formulas comparable to Müller and Furniss (2013), in order to statistically control for this distortion. We discussed post-hoc explanations about why mothers with increased psychopathology gave higher ratings on the CBCL/1.5-5, including a better recall of internalizing symptoms, less flexible and effective parenting, and more perceived distress by child externalizing behavior.

1. Introduction

There is considerable evidence that depressed adults show specific cognitive, perceptual, and affective biases (Matthews and MacLeod, 2005) that may cause depressed parents to overestimate their child's emotional and behavioral problems. In child psychiatric research, this is known as the *depression–distortion hypothesis* (De Los Reyes and Kazdin, 2005). Müller and Furniss (2013; see also Müller et al., 2011) reported evidence for the depression-related distortion in maternal ratings of their child's psychopathology in a clinical preschool sample. This paper addresses whether child Externalizing and Internalizing scale scores are also biased in a clinical preschool sample, and if this is the case, presents specific correction equations to adjust for the bias.

The *depression–distortion hypothesis* can nowadays be conceptualized according to De Los Reyes and Kazdin (2005) who reframed a reporting bias like the depression-related distortion within their broader system named 'Attribution Bias Context Model', or briefly ABC Model. Within this model, depression-related distortion is one cause of disagreement among other factors. The ABC Model covers several conditions which influence disagreement between informants in a diagnostic setting, like age, gender and observed behavior (like Internalizing and Externalizing) of the child, but also attributes of the informant. However, the data in the critical review of De Los Reyes and Kazdin (2005) were too sparse on the level of main factors to allow a quantitative meta-analysis, and were therefore discussed only on a qualitative level. Consequently, De Los Reyes and Kazdin (2005) recommended conducting more studies to accept or reject a distortion-related bias for a specific diagnostic situation. As far as we know, no evidence pro or contra a depression-related distortion is available for our diagnostic setting, comprising a preschool sample of psychiatric children, their distressed mothers, and their ratings about their children.

Note that in order to disentangle a bias in a maternal report about her child's externalizing or internalizing behavior from the valid proportion of the maternal report, several methodological preconditions have to be met. Richters (1992) noted that there is no 'gold standard' as external criterion, but research should rely on a 'conventional standard of relative reliability, […] and validity' [p. 490] to identify a biased maternal report. A second note of Richters, namely that this disagreement could be directly

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interpreted as depression-related distortion, nowadays appears as too much abridged. Alternatively, De Los Reyes and Kazdin (2005) distinguished between depression as an attribute of an observer/informant, and the causing mechanisms, which explain the bias. The causing mechanisms in the context of maternal depression could be a recall bias, but probably also a greater stress-vulnerability when faced with a given level of child externalizing/demanding behavior (see de De Los Reyes and Kazdin, 2005). Third, Richters emphasized that all informants ought to base their ratings on cross-situational observations. Forth, a greatly neglected but mandatory condition to collect empirical evidence pro or contra a depression-related distortion is that the design includes 'normal' as well as depressed mothers (variation in the predictor), who rate children without or with increased problem behavior (variation in the criterion). Note that with the aforementioned methodological preconditions, we focused on aspects of data collection. Next, we will focus on how to analyze multi-informant data with structural equation modeling. This will enable us reformulate the classical 'depression-related distortion'.

1.1. The distortion, accuracy, and combinatory model

There are three competing models (accuracy, distortion, and combinatory), which all aim to integrate multi-informant ratings from mothers, therapists, and kindergarten teachers, and can be defined by structural equation modeling. The three models, which are described below in detail, can best be summarized in a generic model by the paths *a, b* and *c* (see Fig. 1).

1.2. The accuracy model

The *accuracy model* is a new term and different from the classical term *accuracy hypothesis*. The *accuracy model* assumes a path *a* (*a=accuracy*) which implies that a maternal rating is an indicator of her child's Externalizing or Internalizing problems. We assume that also therapists' and kindergarten teachers' ratings may contribute to measure the latent construct of child psychopathology. Therefore, an increase in child psychopathology should be indicated by an increase in mother's, therapists', and teachers' ratings. Moreover, the *accuracy model* assumes a relationship or covariation between maternal and child psychopathology (path *c; c=covariation*). However, the *accuracy model* does exclude a path *b* (*b=biased*), which represents a bias of the maternal rating caused by her own psychopathology. To test this model, we expect the paths *a* and *c* to be statistically significant, while the path *b* is fixed to zero and will therefore not appear in the model. If this model fit the data, a clinician may interpret a maternal rating as an unbiased indicator of the child's psychopathology. We expect, however, that this model will fail to fit the data, because we expect that there is a cognitive bias, which is not integrated in the *accuracy model*.

1.3. The distortion model

The *distortion model* assumes that a mother's rating about her child is an indicator of her own psychopathology (path *b*). This concept allows that her rating is also an indicator of her child's psychopathology (path *a*). Thus in contrast to the *accuracy model*, the maternal rating can be an additive result of both influences. The *distortion model* does not assume a covariation between maternal and child psychopathology (path *c*). In summary, the *distortion model* is tested by a mandatorily significant path *b*, and is also in agreement with an optional path *a*, but not with path *c*. If this model fit the data, then a clinician might not directly interpret a maternal rating as an indicator of her child's psychopathology. However, there is an indirect method to rely on maternal ratings as an indicator of their child's psychopathology, namely by adjusting for the undesirable influence of a psychopathology-related bias. This method will be explained in detail in the Results section.

1.4. The combinatory model

The *combinatory* model (see Fergusson et al., 1993) integrates both conceptualizations and comprises three statistically significant paths *a*, *b*, and *c*. Note that all three paths represent distinct hypotheses. The combinatory model implies that maternal psychopathology increases her child's psychopathology (path *c*). The maternal rating is therefore an indicator of her child's psychopathology (path *a*), but the rating may be additionally increased by a bias (path *b*). If the *combinatory* model holds the interpretation of a maternal rating is complex, because the rating is the product of all three paths *a*, *b*, *c*, and depends on the magnitude of each of the three paths.

1.5. Statistical analyses

First, means and standard deviations were reported to demonstrate that the sample of children showed a balanced variation of increased Internalizing and Externalizing symptoms. Second, we tested separately by structural equation models whether mother-reported Externalizing and Internalizing problems were biased by maternal psychopathology. For both scales, all three models were tested against each other in order to decide which model fit the data best. After identifying a bias, we determined equation formulas on the basis of a regression analysis to adjust for the bias.

2. Method

2.1. Procedure

The Family Day Hospital is a department of the child and adolescent psychiatry unit of the University Hospital in Münster/Germany and treats preschool children

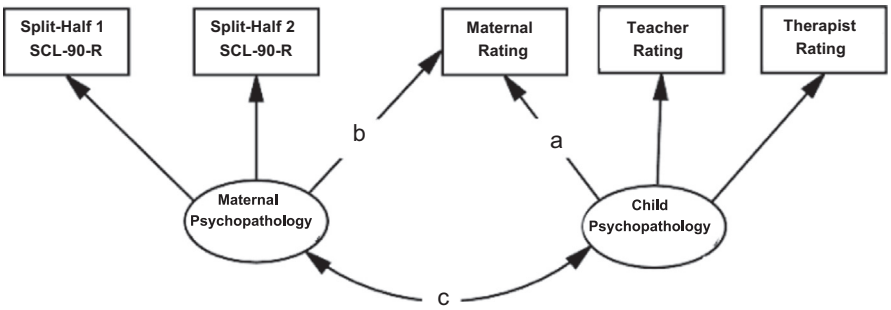

Fig. 1. Generic structural equation model for the distortion ($a,b>0$; $c=0$), accuracy ($a,c>0$; $b=0$), and combinatory models ($a,b,c>0$), with indicators of maternal and child psychopathology (see text).