
Maternal Depression and Trait Anger as Risk Factors for Escalated Physical Discipline

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To test the hypothesized anger-mediated relation between maternal depression and escalation of physical discipline, 122 economically disadvantaged mothers were assessed for current and lifetime diagnoses of depression using the Current Depressive Episode, Past Depression, and Dysthymia sections of the Structured Clinical Interview for DSM-IV (SCID) and a measure of current depressive symptoms, the Beck Depression Inventory–Second Edition (BDI-II). Escalation of physical discipline was assessed using a video analog parenting task; maternal anger not specific to discipline was assessed using the Spielberger Trait Anger Expression Inventory. Reports of anger were associated with the diagnosis of depression and depressive symptoms. Bootstrap analyses of indirect effects indicated that the link between depression and escalated discipline was mediated by anger. Parallel analyses based on BDI-II scores identified a marginally significant indirect effect of depression on discipline. Findings suggest that anger and irritability are central to the putative link between depression and harsh discipline.

Keywords: discipline; analog parenting task; depression; anger; high-risk parents

Depression is the most prevalent psychiatric disorder in the adult population (American Psychiatric Association [APA], 1994), with affected individuals evidencing a range of behavioral and affective symptoms. Within the general public, depression has been estimated to affect 6% of the female population at any one point in time (APA, 1994), with approximately 10% to 25% of women having at least

one major depressive episode during their lifetime (APA, 2000). Because depression not only affects the afflicted individuals, but also the people with whom they live and work, maternal depression and its effect on parenting has been investigated in several research contexts (e.g., Chi & Hinshaw, 2002; Kim-Cohen, Moffitt, Taylor, Pawlby, & Caspi, 2005).

Although some studies have established a link between maternal depression and both neglectful and physically abusive parenting, a comprehensive review of the abuse and neglect literature prior to 1995 indicated that maternal depression as a risk factor for abusive or neglectful parenting was equivocal (e.g., Knutson & Schartz, 1997). Moreover, the inconsistencies among findings could not be readily attributed to different indices of deficient parenting or the different methodologies used to assess maternal depression, or whether continuous (i.e., Beck Depression Inventory) or categorical criteria (e.g., Research Diagnostic Criteria) for depression were used. Recent research (i.e., post-1995) that was not included in the Knutson and Schartz (1997) review

Authors' Note: This research was supported in part by Grant RO1 MH 61731, funded by the National Institute of Mental Health and the Administration on Children, Youth and Families, and in part by Grant RO1 HD-46789, funded by the National Institute of Child Health & Human Development. The facilitation of the research by Barry Bennett, Cheryl Whitney, Marc Batey, Mark Schmidt, and Wayne McCracken (Iowa Department of Human Services) and the assistance of Katherine Barnett, Robin Barry, Allyson Bone, Kristy DePalma, Kathryn Holman, Eva Jorgenson-Briggs, Robert Latzman, Eunyoe Ro, Alicia Sutton, and Nizete-Ly Valles in data collection, and the statistical consultation of David DeGarmo is gratefully acknowledged. Address correspondence to John F. Knutson, E11 Seashore Hall, Iowa City, IA 52242; e-mail: john-knutson@uiowa.edu.

CHILD MALTREATMENT, Vol. 13, No. 1, February 2008 39-49
DOI: 10.1177/1077559507310611
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has provided some new evidence of maternal depression as a risk factor for abuse, but that research has not yet provided an empirical base for resolving the inconsistent connection between maternal depression and abusive parenting.

In a longitudinal study conducted with high-risk newborns (Kotch et al., 1995), maternal depression, assessed with the Center for Epidemiological Studies-Depression questionnaire (Radloff, 1977), was among the significant predictors that the child would be identified in the state Central Registry as having a substantiated or unsubstantiated record of abuse or neglect during the first year of life. In a 2 year follow-up (Kotch et al., 1997), patterns of recurrent maltreatment and new records of maltreatment from the child's second or third years of life caused the authors to argue that the risk factors assessed early in life, including maternal depression, continued to predict maltreatment. Taken together, the Kotch et al. (1995) and Kotch et al. (1997) findings provide support for the hypothesized link between maternal depression and child maltreatment; however, the findings did not distinguish between abuse and neglect and, therefore, did not identify the role of maternal depression in specific forms of deficient parenting. A prospective secondary analysis of the National Institute of Mental Health Epidemiologic Catchment Area study indicated that maternal depression was associated with increased risk for physical abuse but not neglect (Chaffin, Kelleher, & Hollenberg, 1996). Maternal depression was based on the Diagnostic Interview Schedule (DIS), and physical abuse and neglect were each established with a single question from the Antisocial Personality Module of the DIS. Thus, because of a reliance on a single self-report question regarding abusive and neglectful parenting, and the low base-rate of maltreatment in the sample, the Chaffin et al. (1996) study does not fully resolve inconsistencies in the literature with respect to the putative link between depression and seriously deficient parenting.

Importantly, although the empirical data on maternal depression leading to child abuse continues to be unclear, the possibility of maternal depression contributing to child physical abuse is consistent with other research linking maternal depression to problems in parenting and poor child outcomes. For example, in a recent meta-analysis examining 46 studies, Lovejoy, Graczyk, O'Hare, and Neuman (2000) concluded that maternal depression led to deficient parenting that was characterized by negative and coercive maternal behaviors and, secondarily, by disengagement from the child. To the extent that coercive parenting can escalate to

harsher forms of discipline and physically abusive parenting (cf. Greenwald, Bank, Reid, & Knutson, 1997), the Lovejoy et al. (2000) findings implicate depression as a process factor in the emergence of physical abuse. Additionally, in a recent study of parent management training and child behavior problems, DeGarmo, Patterson, and Forgatch (2004) reported that maternal depression increased with increases in child behavior problems and declined with reductions in child behavior problems. To the extent that problem child behaviors evoke punitive discipline (cf. Greenwald et al., 1997), the Lovejoy et al. (2000) findings and the DeGarmo et al. (2004) findings together suggest that maternal depression could set the stage for coercive discipline, increasing the risk for problem child behavior, thereby further increasing maternal depressed affect, and ultimately increasing the risk for harsher and more punitive discipline. In short, these articles suggest that the link between maternal depression and abusive parenting is plausible, albeit not simple.

With evidence linking maternal depression to child physical abuse being inconsistent, and the possibility of child behavior contributing to maternal depression (DeGarmo et al., 2004), it is plausible that a third variable could mediate the putative connection between maternal depression and punitive discipline. Because depression is a construct that comprises multiple symptoms and associated problems, some specific attributes associated with depression could serve the role of the third variable leading to abusive parenting through a mediated effect. Consistent with that possibility, Mammen, Kolko, and Pilkonis (2002) suggested that the negative affectivity associated with depression could play a central role in mild child physical abuse. Because a general pattern of irritability, and being quick to anger, has been recognized as an attribute commonly associated with depression (APA, 2000; Painuly, Sharan, & Madoo, 2005) and because irritability has been identified as a contributing factor to abusive parenting (Kayama, Sagami, Watanabe, Senoo, & Ohara, 2004), the Mammen et al. (2002) position has some support. Additionally, depressed mothers have been shown to be more hostile toward their children (Burke, 2003; Hops, Sherman, & Biglan, 1990; Lovejoy et al., 2000; Seagull, 1987; Webster-Stratton & Hammond, 1988). Thus, a depressed mother's greater irritability, coupled with annoying behaviors from her child, could create the ideal situation for coercive interactions that could evolve into physical abuse (Burke, 2003; Factor & Wolfe, 1990). Such a pattern is consistent with the discipline-mediated model of abusive parenting

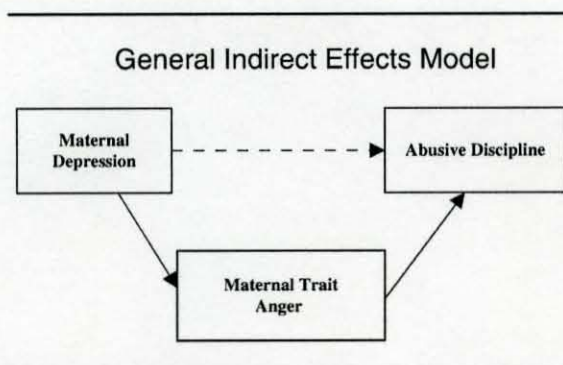


FIGURE 1: General Indirect Effects Model

advanced by Greenwald et al. (1997), in which parental irritability coupled with ineffective parenting leads to escalated discipline that is increasingly harsh and punitive. Indeed, Chaffin et al. (1996) suggested that the link between maternal depression and child physical abuse could be due to irritability of the depressed mothers that results in an escalated response to parenting stressors.

Escalation to physical abuse in response to child transgressions by depressed mothers who are irritable is also consistent with a large body of research on coercion theory (cf. Patterson, 1982; Patterson, Reid, & Dishion, 1992). In Patterson's (1982) model of coercive discipline, there are two critical factors that contribute to a consistent pattern of escalation. One is a history of negative reinforcement for high intensity attacks. The second is the irritable evocation of aggression that is caused by a combination of the initial aversive act, as well as any negative attributions and irritable emotions of the respondent (Patterson, 1985). Thus, consistent with coercion theory, the irritability associated with maternal depression could be the mediating factor that contributes to the escalation of discipline in response to child transgressions by a depressed mother. Such a general model of depression and abusive discipline is shown in Figure 1, where the impact of maternal depression on abusive discipline is mediated by maternal irritability. In this model, it is important to note that irritability is a maternal attribute (trait) that is not specific to interacting with the child. That is, irritability by a depressed mother that emerges in response to a child's act would be a direct effect of depression on discipline. In the hypothesized model, the mediating irritability would need to be assessed as a more general pattern of emotion and behavior independent of child care circumstances. Being quick to anger, or anger prone in response to minimal provocation, would be an appropriate index of such irritability (cf. Averill, 1982).

Escalation in discipline can be manifested as either a change in form or an increase in aversive severity. Thus, within the context of harsh discipline, escalation can be evidenced as a shift from nonphysical punishment to physical punishment or from mild physical punishment to severe physical punishment (Knutson & Bower, 1994). Such patterns have been described in studies of abusive families (e.g., Reid, 1986; Reid, Taplin, & Lorber, 1981) and in studies in which abuse is seen as emerging in the context of discipline (e.g., Herrenkohl, Herrenkohl, & Egloff, 1983). It is in the context of ineffective parenting and escalated discipline that irritability associated with maternal depression could contribute to physical child abuse. That is, ineffective parenting can result in an increased probability of annoying child misbehavior; the irritability of a depressed mother who is ineffective in discipline would increase the probability of escalated physical discipline as a reaction to persistent annoying child behaviors. This hypothesized link among ineffective discipline, child misbehavior, and maternal irritability and harsh discipline is supported by evidence that mothers perceiving low controllability of child behaviors become more aroused and are more likely to be abusive (Bugental, Blue, & Cruzcosa, 1989; Bugental & Cortez, 1988). Moreover, a mother's attributions regarding the source of her child's behavior may determine disciplinary harshness (Slep & O'Leary, 1998). Thus, maternal irritability and ineffective discipline leading to escalated physical discipline is consistent with coercion theory (Patterson, 1982), several lines of research related to ineffective parenting (Bugental et al., 1989; Bugental & Cortez, 1988; Greenwald et al., 1997), and the Chaffin et al. (1996) account of the association between depression and physical abuse, as well as other evidence of an association between depression and physical abuse (e.g., Zuravin, 1989). Thus, the present study was designed to specifically test the hypothesized indirect effect of maternal depression, mediated by trait anger, on escalated discipline in response to persistent child transgressions.

METHOD

Participants

One-hundred twenty three economically disadvantaged biological mothers who had previously enrolled in a 3-year longitudinal study of parenting and children's social development participated in the present study, with 122 providing complete data. The parent project from which the current sample was drawn consisted of 335 parent-child dyads. Of

the original sample, 77 failed to participate in any follow-up sessions (i.e., attrition) and were not available. Additionally, 135 participants had either completed the parent project before this study commenced or had relocated outside the area. Because the current study commenced after the parent project had been underway, all of the subjects in the present study participated during either the initial follow-up year or the second follow-up year, depending on where they were in the longitudinal project when the present study commenced. Participation in the current project was determined by the timing of appointments and no subject selection process was followed. The attrition of participants in the parent project after enrollment was virtually all attributable to families relocating outside the area—only two from the Year 1 sample actively withdrew. Analyses contrasting those potential participants who were lost to follow-up and those who continued to participate failed to identify any statistically significant (with $\alpha < .1$) differences on any demographic variables (e.g., race or ethnicity, maternal age) or other variables that might be directly or indirectly related to the current study (e.g., maternal IQ, child IQ, maternal reading level, child behavior ratings). In short, the sample of the present study can be considered representative of the full sample in the larger project.

To be eligible for the original longitudinal study, the participants had to be recipients of some form of government-based economic assistance (e.g., Temporary Assistance for Needy Families, Medicaid, Food Stamps) or other social services. This low-socioeconomic status (SES) sample was chosen for the current project because the risk of child maltreatment is increased in comparison to a middle- or upper-SES sample (Christmas, Wodarski, & Smokowski, 1996; Sedlak & Broadhurst, 1996). All participants were recruited from small urban, suburban, and rural areas of eastern Iowa. The mothers described themselves as 63% Caucasian, 25% African American, 5% Latina, and 7% mixed race; 57% were single mothers with no partner in the home. The mothers' occupational level consisted of 6.5% unemployed, 17.9% homemakers, 17.9% unskilled laborers, 13.8% semiskilled laborers, 8.1% skilled laborers, 17.9% professionals, and 17.9% students. Education levels were on the lower end as well, with 15.5% having less than a high school diploma, 19.5% having a high school diploma, 39% having attended some college, 9.8% with an associate's degree, and 16.2% with a bachelor's degree or higher. The study was conducted under The University of Iowa Institutional Review

Board approval and with a certificate of confidentiality issued from the National Institute of Mental Health Office of the Department of Health and Human Services. Participants were compensated \$50 for each session in which they participated.

All participants in the larger longitudinal project had to meet a number of criteria for eligibility beyond economic disadvantage. First, the family had to have a child between the ages of 4 and 8 years at the time of enrollment. When more than one child was in the age range, only one child was enrolled (random selection) per family. Although only one child was enrolled in the original study, most of the mothers in the present study had other children in the home who were both younger and older than the enrolled child; the mean number of siblings of enrolled children was 2.0 ($SD = 1.67$). Second, because the longitudinal study was focused on parent-child relations, families in which the children had been in an out-of-home placement (i.e., foster care, kinship care) were not eligible. Children known to have been sexually abused were not eligible for inclusion; however, families who had been identified as physically abusive or neglectful were eligible. Some of the mothers who participated in the present study were included in a recent study of parenting and the development of children's aggression (Knutson, DeGarmo, Koepl, & Reid, 2005) where a more detailed description of the protocol of the parent project can be obtained.

Instruments

To assess depressive symptoms in the previous 2 weeks, the Beck Depression Inventory-II (BDI-II; Beck, 1996) was used. The BDI-II, a 21-item self-report measure, is the most frequently used screening instrument in research on depression, with potential scores ranging from 0 to 63. The BDI-II total score correlates significantly with diagnoses of clinical depression (Archer, Maruish, Imhof, & Piotrowski, 1991; Beck, Steer, & Garbin, 1988; Piotrowski & Keller, 1992; Piotrowski, Sherry, & Keller, 1985; Steer, Beck, & Garrison, 1986), and it has well-established psychometric properties in both psychiatric and nonpsychiatric samples (Beck et al., 1988), and it has been used in successful and unsuccessful studies of the putative link between maternal depression and child abuse.

Participants were interviewed using the Current Depressive Episode (the past month), Past Depressive Episode (lifetime prevalence), and Dysthymia portions of the Structured Clinical Interview for *Diagnostic and Statistical Manual of Mental Disorders-IV* (SCID; First, Spitzer, Gibbon, & Williams, 1998). The SCID

is the most commonly used *DSM-IV* diagnostic interview, with evidence of high reliability and validity when administered by properly trained interviewers (Riskind, Beck, Berchick, & Brown, 1987). Five trained PhD students who were enrolled in a clinical psychology program conducted all interviews. The interviews were videotaped and then randomly checked for reliability by an independent research clinician who was highly experienced in SCID interviewing and scoring; the calibrating clinician was uninformed with respect to other aspects of the research project and the source of the participants. The kappa scores for agreement between the interviewers and the calibrating clinician on the presence or absence of current major depression and past major depression were both 1.0. Dysthymia was not considered in any of the reliability analyses because of low occurrence in the sample, and the meaningfulness of agreement statistics for nonoccurrence.

To assess escalated disciplinary responses from the mothers, a video analog parenting task developed by Knutson and Zaidi (1989) and described by Knutson and Bower (1994) was used. The analog task was selected as a measure of discipline because it can provide a set of standardized and realistic stimuli to evoke discipline. Analog parenting tasks have been used successfully to assess the role of environmental stress (e.g., Passman & Mulhern, 1977), child culpability (e.g., Rodriguez & Sutherland, 1999), and parenting experiences (e.g., Knutson, Johnson, & Sullivan, 2004) as factors in determining disciplinary preferences, as well as in tests of transgenerational models of abuse (e.g., Zaidi, Knutson, & Mehm, 1989). Those studies, as well as the use of analog measures to test hypotheses regarding escalation in discipline-mediated models of abuse (e.g., Knutson & Bower, 1994), suggest the utility of analog measures for studies of escalated discipline and maternal depression. Further support for the use of an analog measure in the present study was provided by DeGarmo, Reid, and Knutson (2006), who used structural modeling to determine whether analog parenting tasks could contribute to the development of multimethod/multisource constructs of harsh punitive discipline. In two parallel studies using different high-risk clinical populations, DeGarmo et al. (2006) established that analog tasks could be combined statistically with self-report indices of abusive discipline and direct observational measures of negative discipline to develop a harsh discipline construct. Importantly, although these three indicators were significantly correlated, each accounted for significant added variance in modeling deficient parenting. Thus, the analog measures served as

useful indicators in the development of the harsh discipline construct, and provided empirical evidence of the construct validity of analog measures of harsh discipline. Taken together, the findings from several laboratories indicate that the analog measure could be profitably used to test the hypothesized role of maternal irritability in the association between maternal depression and escalated discipline. Importantly, the analog task that was adopted for the present study had been specifically developed to assess escalation in response to persistent child transgressions.

In the analog task, each participant viewed nine video episodes in which there were one to six sequentially ordered scenes. Each episode depicted a child (aged 4 to 9 years) behaving in a potentially irritating or concerning manner, with the sequence of scenes within episodes scripted to reflect continuations or terminations of the child behaviors. The behaviors of the depicted child included dangerous, rule-violating, destructive, or annoying acts, depending on the scene. All scenes were filmed using "point-of-view" camera work so that only the child is observed in the scene and the viewer gets the impression that she is involved in the scene with the child. At the completion of each scene the episode is interrupted and participants are asked to respond to a series of questions pertaining to their evaluation of the behavior and to select a single disciplinary choice from a list of 10 (e.g., do nothing, explain why the behavior is wrong, yell at the child, spank the child, hit the child with an object) that they would use to cause the child to cease the depicted behavior or to induce the child to perform an alternative behavior. With the exception of the episode comprising a single scene, immediately following a participant's disciplinary response, the episode is continued into an extension of the scene. In the scene extension, the child either persists in the behavior, ceases the behavior, or increases the intensity of the behavior. The disciplinary choice of the participant in response to each successive scene provides the basic score. By exposing participants to repeated child transgressions following a disciplinary choice, the analog task is designed to approximate the coercive process between a misbehaving child and a parent (cf. Patterson, 1982).

Analog parenting scores of escalated discipline were calculated within episodes and summed across episodes. When a participant initially indicated that she would respond in a nonphysical manner (e.g., explaining, yelling, time out) to the depicted child in one scene and then indicated that she would respond in a physical manner (e.g., spanking, hitting)

to a subsequent scene within that episode, she would receive an escalation score of one for that episode. If she did not change her punishment selection from nonphysical to physical, she received a score of zero for that episode. If a participant were to shift from mild physical discipline (e.g., spanking) to more severe physical discipline (e.g., hitting with an object) she would also receive an escalation point; however, no participants in the sample responded in that manner. The total escalation score was the sum of escalated punishments across episodes.

Because the irritability associated with depression is not specific to parenting, and to avoid inflating an association between the index of irritability and the measure of parenting, a measure of anger and irritability that was not derived from measures of parenting was adopted. Thus, to assess maternal irritability, the Spielberger Trait Anger Expression Inventory (STAXI; Spielberger et al., 1985) was administered. The STAXI is an objective inventory asking participants to rate their anger in a variety of contexts on 4 point Likert-type scales. Adequate to high reliability has been established in both normal and psychiatric populations (Deffenbacher, 1992; Moses, 1992). Although the full STAXI was administered to the participants, because the mediated model to be tested focused on distal influences and trait patterns of irritability, only the Trait subscale scores were included in the analyses, with all analyses based on raw scores.

Procedure

Each participant in the parent project participated in three or four sessions during a follow-up year in the longitudinal parent project. Participants in the current study were administered the BDI-II during the first session. The analog parenting task and the SCID were administered during the third session of the follow-up year, which was typically scheduled within 30 days of the first session. The STAXI was administered at any of the laboratory sessions scheduled during the follow-up.

RESULTS

Based on the SCID, 12.2% of the 122 participants providing complete data were classified as having a current episode of depression and an additional 38.2% of the mothers (not including those currently depressed) were classified as having a past depressive episode. Classification of a current episode was based on *DSM-IV* criteria being met in the past month, whereas classification of past depression was based on meeting *DSM-IV* criteria anytime during

one's lifetime, excluding the past month. None of the mothers reported an initial episode of depression during the SCID interview. That is, all mothers who met criteria for current depression reported a previous history of depression. Based on BDI-II normative standards provided in the BDI-II manual (Beck, Steer, & Brown, 1996), 4.9% of the sample reported current depressive symptoms in the severe range (BDI-II score greater than 28), 6.6% of the sample reported moderate current depressive symptoms (BDI-II score between 20 and 28), and 13.9% of the sample reported mild current depressive symptoms (BDI-II score between 14 and 19). The mean score of the sample on the trait subscale of the STAXI was 14.59, $SD = 4.24$, with only 22% of the sample falling above the mean reported in the manual. Furthermore, only 5% of the sample fell one standard deviation above that mean. The Spielberger anger scales have been used in studies with clinical and nonclinical samples that can be used to place the scores in a broader normative context (see Spielberger, 1996; Spielberger, Jacobs, Russell & Crane, 1983; Spielberger et al., 1985; Spielberger, Reheiser, & Sydeman, 1995). When the scores from the present sample are contrasted with clinical (e.g., cardiovascular risk) and nonclinical (e.g., university students, community recruits) samples of adult women, the mean of the current sample falls below those reported means.

The primary dependent measure was the escalated discipline evidenced by the mothers in response to the episodes depicted in the analog parenting task. Not all physical discipline endorsed by a mother contributed to the escalation score; participants who selected a physical discipline response in the first scene of an episode, but did not shift to a more severe form of discipline, would not receive a point for escalation on that episode. Although not a focus of the present study, preliminary analyses of the selection of physical discipline in the absence of escalation indicated there were no statistically significant differences between the depressed and nondepressed participants in selecting physical discipline in their initial response to a depicted transgression. Thus, neither current nor past depression influenced the endorsement of physical discipline when initially exposed to an analog scene.

The escalation score reflected a change from nonphysical discipline to physical discipline across scenes within an episode or a shift from mild physical discipline (e.g., spanking) to more severe physical discipline across the scenes within an episode. Participants could only receive one escalation point within an episode. Summed across episodes, escalation

scores had a potential range from 0 to 8. As would be expected, escalated discipline was relatively infrequent, with only 26% of the sample escalating. For those who escalated, scores ranged from 1 to 4; the sample mean was 0.45.

Because the relation between maternal depression and escalated discipline was hypothesized to be mediated by maternal irritability, the first analysis was to determine whether maternal depression, as determined by SCID diagnosis, was associated with greater irritability, as measured by the STAXI. The mean STAXI scores of the group of currently depressed mothers, the group who had been depressed in the past, and the group who had never been depressed were compared. Contrasting those three groups with a one-way ANOVA indicated that the differences among groups were statistically significant $F(2, 120) = 7.44, p < .001 (\eta^2 = .11)$. Follow-up comparisons of group means using the Tukey HSD test indicated that the group of currently depressed mothers had higher STAXI scores than the nondepressed mothers ($p < .005$) but they did not differ from the mothers who were depressed in the past. The group of mothers depressed in the past also had higher STAXI scores than the group of nondepressed mothers ($p < .01$). Thus, both past and current depression was associated with elevated STAXI scores.

To test the irritability-mediated or intervening (cf. MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002) effect of maternal depression on escalated discipline, a bootstrap mediational analysis following the strategy recommended by Shrout and Bolger (2002) was conducted using AMOS 7.0 (Arbuckle, 2006) software and a bootstrap sampling of 1000. Based on simulation tests, MacKinnon et al. (2002) established that the approach to mediational analysis advocated by Baron and Kenny (1986) lacked statistical power, and they recommended alternative strategies for testing hypothesized mediation. Although the bootstrap approach was not included in the MacKinnon et al. (2002) simulation, Shrout and Bolger concluded that the bootstrap approach could be viewed as an approximation of the exact distribution approach recommended by MacKinnon et al. (2002). Based on additional simulation studies, MacKinnon, Lockwood, and Williams (2004) assessed a number of resampling strategies for mediational analyses and concluded that the bias-corrected bootstrap yielded the most accurate confidence limits for mediation analyses. Although all of the resampling procedures adjust for nonnormal data, MacKinnon et al. (2004) suggested that another benefit of using the bias-corrected bootstrap was the ability to deal

with severely nonnormal data, such as the data in the present study. In addition to detailing the use of bootstrap methodology in mediational analyses, Shrout and Bolger also offered recommendations regarding the necessity of conducting the first step (i.e., testing the bivariate X-Y path) in a mediational analysis advocated by Baron and Kenny. According to Shrout and Bolger, when the hypothesized mediational effect is temporally distal from the outcome variable, the analysis should skip the first step and proceed directly to the subsequent steps of the analysis using the bootstrap methodology. Because maternal depression and trait anger are presumed to be distal to the escalated discipline in the present study, the analyses followed the strategy outlined by Shrout and Bolger and the first step of the Baron and Kenny approach was not tested.

Because some studies of maternal depression and child maltreatment have used diagnostic criteria to measure maternal depression, the first mediational bootstrap analysis was conducted with the lifetime diagnosis of maternal depression as a distal predictor of escalated discipline. This analysis distinguished between mothers who were never depressed from those who had a lifetime diagnosis of depression (either current or past) based on SCID criteria. The hypothesized distal mediating irritability was based on the trait STAXI scores. As summarized in Table 1, the bootstrap analysis identified bias-corrected statistically significant paths between SCID diagnosis and trait anger ($p = .002$) and between trait anger and escalated discipline ($p = .022$), and a statistically significant indirect effect of maternal depression on escalated discipline mediated by trait anger (bias-corrected $p = .014$). The adjusted path between SCID diagnosis and escalated discipline was not significant. Thus, the bootstrap analyses established an indirect or mediated influence between maternal depression and escalated discipline as a function of the maternal trait anger.

As noted above, none of the currently depressed mothers were experiencing their first episode of depression. The lack of a difference on STAXI scores between the mothers with a past episode of depression and the mothers with a current episode of depression could be due to mothers in the past depression group who were at different points in remission, some being in partial remission and some in full remission. Mothers in both circumstances would not meet SCID diagnoses for current depression, but they could manifest significant depressed symptoms. Consequently, follow-up analyses were conducted to determine whether those women in partial remission in the past depression group were

TABLE 1: Bootstrap Mediation Analysis of the Effect of Maternal Depression (Lifetime SCID Diagnosis) on Escalated Discipline as Mediated Through Trait Anger (N = 122)

Effect	Standardized Bootstrap Coefficients		95% CI	
	M	SE	Bootstrap Percentile	Bias-Corrected
SCID-trait anger path	.32	.078	(.167, .475)	(.340, .697)
Trait anger-escalation path	.25	.118	(.028, .485)	(-.044, .503)
Adjusted SCID-escalation path	-.02	.097	(-.210, .161)	(-.033, .453)
Indirect effects	.08	.008	(.011, .377)	(-.012, .286)

NOTE: SCID = the Structured Clinical Interview for DSM-IV; CI = confidence interval.

responsible for the absence of a difference between the current and past depression groups on the hypothesized intervening variable. Within the past depression group, BDI scores ranged from 0 to 48, with a mean of 11.61. The correlation between the STAXI and BDI-II scores within the past depression group was $r = .63$, $p < .001$. These data, coupled with the notion that psychopathology should be measured continuously rather than categorically (cf. Widiger & Clark, 2000), suggest that the bootstrap mediational analysis be repeated with the BDI-II score serving as the index of depression rather than the SCID diagnosis. Such an analysis is also consistent with those studies of depression and maltreatment that have used the BDI-II as the index of depression. The results of this second mediational bootstrap analysis (see Table 2) identified a bias-corrected statistically significant path between the total BDI-II scores and trait anger ($p = .002$), but the path between trait anger and escalated discipline and the indirect effect of maternal depression (BDI-II) on escalated discipline mediated by trait anger only approached statistical significance (bias-corrected $p = .077$).

DISCUSSION

When the index of depression was based on the relatively stringent *DSM-IV* diagnostic criterion from the SCID interview, the results of the bootstrap analyses support the hypothesized indirect effect of maternal depression contributing to physical abuse as a function of the mediational process of trait anger. These findings are consistent with the hypotheses advanced in the Chaffin et al. (1996) and Mammen et al. (2002) articles. Importantly, the present findings also make it possible to place the role of maternal depression in abusive discipline in the broader context of a discipline-mediated model of child maltreatment (e.g., Greenwald et al., 1997) and models of family coercion (cf. Patterson, 1982). If harsher discipline increases risk for the emergence of deviant behavior (Knutson et al., 2005),

when the current findings are considered in the context of the DeGarmo et al. (2004) findings, it suggests that maternal depression and child misbehavior could interact in a reciprocating coercive process to yield harsh discipline and to further compromise both child behavior and maternal affect. Thus, the results of the present study contribute to a conceptualization of maternal depression as a process variable in parenting rather than a relatively static diagnostic risk factor in poor child outcomes. When the BDI-II was the index of depression, the findings were largely congruent with the SCID-based findings, but the results were not nearly so strong. Thus, the results of the present study also point to the possible contribution of method variance to tests of the hypothesized link between maternal depression and abusive discipline, but also the possibility that the SCID diagnosis is just a more stringent criterion. At the least, the findings suggest that future research on maternal depression and parenting consider alternative strategies for assessing depression.

When considered in the context of recent methodological articles on mediational analyses (MacKinnon et al., 2002; Shrout & Bolger, 2002), these two analyses of the indirect effect of maternal depression on escalated discipline help to understand the inconsistent findings in the literature regarding the link between maternal depression and physical abuse noted by Knutson and Scharz (1997). That is, if conventional, but less powerful, methods for assessing mediated processes are used, it is less likely that an indirect effect will be detected. Moreover, if the link between depression and physical abuse is largely indirect, then simple bivariate tests of the relation between depression and harsh physical discipline are less likely to be statistically significant. In the present sample, the standardized bivariate relation between SCID diagnosis and the escalation score did not approach significance, but the standardized regression coefficient between the BDI and the escalation score was .20 ($p = .027$).

TABLE 2: Bootstrap Mediation Analyses of the Effect of Maternal Depression (BDI-II) on Escalated Discipline as Mediated Through Trait Anger (N = 122)

Effect	Standardized Bootstrap Coefficients		95% CI	
	M	SE	Bootstrap Percentile	Bias-Corrected
BDI-II-trait anger path	.54	.092	(.336, .696)	(.166, .473)
Anger-escalation path	.20	.137	(-.049, .501)	(.028, .482)
Adjusted BDI-II-escalation path	.09	.153	(-.060, .439)	(-.134, .237)
Indirect effects	.11	.077	(-.033, .266)	(.018, .392)

NOTE: BDI-II = Beck Depression Inventory-Second Edition; CI = confidence interval.

Thus, in the present sample, if only a bivariate relation were assessed, or if the less powerful Baron and Kenny (1986) approach to mediation were followed, a more ambiguous picture of the link between maternal depression and harsh discipline would have emerged.

It must be acknowledged that the index of escalated discipline in the present study was based on an analog measure. Although questions might be raised about the suitability of analog tests, Kazdin (1978) has noted that virtually all experimental psychological research is analog in nature and that generalizations from that work have been very successful. Moreover, Kazdin also noted that analog measures provide a vehicle for strong tests of hypotheses, because of the direct control of confounding variables and elimination of nuisance variables, as well as greater analytical precision. In the context of analog tests of punitive discipline, a relatively large literature has provided evidence of the utility of analog measures similar to, or identical to, the analog task used in the present study (e.g., Fagot, 1992; Knutson & Bower, 1994; Knutson et al., 2004; Zaidi et al., 1989). Moreover, DeGarmo et al. (2006) used structural modeling with multisource/multimethod indicators of parenting to establish the construct validity of analog measures, and documented that analog measures can effectively augment information obtained from direct observations and self-report measures of parenting. Because the theoretical construct of escalated physical punishment is virtually impossible to measure directly in laboratory tests involving actual parent-child interactions, or in naturalistic observations of families, the analog parenting tasks are the best available method for assessing parent tendencies to escalate their physical discipline. Although families identified as physically abusive almost certainly escalate their discipline, administrative data would not typically provide a direct assessment of the escalation process. To determine stability of the analog score, the task was readministered to an available subsample ($n = 88$) after 12 months, resulting

in a test-retest correlation of .43 ($p < .01$). By way of comparison, the BDI-II scores obtained over that same interval had a test-retest correlation of .55 ($p < .01$). Consistent with the hypotheses that underlie the present study and the notion that the escalation should reflect the state of the mother as well as the evoking scene, the test-retest reliability of the analog parenting measure would not be expected to be more than moderate and not likely to exceed the test-retest stability of the BDI-II score. Thus, this test of the reliability of the analog measure adds support for its use.

The findings of the present study also contribute to an understanding of the existing literature on maternal depression and child maltreatment. First, the study had a moderately sized high-risk sample; the modest strength of the association between depression and punitive discipline would suggest that the association is not likely to be identified in studies with more limited power. Second, by using both a research-diagnostic measure of depression (SCID), and a continuous measure of depression (BDI-II), it was possible to conduct two mediational analyses. With largely parallel findings using different measures of depression, the current findings are consistent with the Knutson and Schartz (1997) conclusion that the equivocal nature of the link between maternal depression and maltreatment cannot be attributed to the methods used to assess maternal depression, but method variance continues to be a factor worthy of consideration. Finally, by using a measure of anger that was not derived from a measure of parenting and did not sample anger specific to discipline, the mediational analyses provide information about maternal irritability and anger proneness that goes beyond an emotional reactivity to child-care circumstances (cf. Lorber & O'Leary, 2005). Thus, the mediational role of irritability or anger is not compromised by method variance shared with the measure of discipline, and it parallels the more general (i.e., not specific to parenting) diagnosis of maternal depression.

In clinical contexts, the presumed link between maternal depression and child abuse is often assumed to be well-established and strong. The present findings, when integrated with the literature reviewed in support of this study, would suggest that **although depression is a risk factor that can emerge in a high risk sample, it is the irritability of the depressed mother that contributes to physical abuse.** Thus, to reduce the risk of abuse among depressed mothers, in addition to focusing on parent management training and helping depressed mothers to improve the behavior of their children (cf. DeGarmo et al. 2004), it may be worthwhile to focus some effort on increasing maternal tolerance for annoying behaviors of children. Additionally, more general efforts to reduce anger, such as anger-management training (e.g., Diguseppe & Tafrate, 2001), or psychiatric medications that could reduce mothers' depression and anger, could contribute to a reduction in risk for child maltreatment (cf. Jones, Finkelhor, & Halter, 2006).

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