Reading between the lines: Implicit assessment of the association of parental attributions and empathy with abuse risk.

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Abstract:

Objective

Researchers in the child maltreatment field have traditionally relied on explicit self-reports to study factors that may exacerbate physical child abuse risk. The current investigation evaluated an implicit analog task utilizing eye tracking technology to assess both parental attributions of child misbehavior and empathy.

Method

Based on the observation that readers experience comprehension difficulty when encountering passages inconsistent with their beliefs, an eye tracker gauged the extent of difficulty parents experienced reading vignettes that inappropriately characterized a child as culpable for misbehavior and that presented a non-empathic child interaction.

Results

Results suggest self-reports of attributions and empathy are related to both child abuse potential and discipline intentions; however, the eye tracking analog for empathy correlated with abuse potential but not punishment decisions whereas the analog for attributions correlated with punishment decisions but not abuse potential.

Conclusions

Such contrasts between self-report and analog assessment underscore the need for continued research studying theorized abuse risk constructs using alternative approaches to better identify the important risk markers associated with elevated child abuse risk and to minimize methodological overlap.

Article:

Introduction

Researchers have invested considerable energy attempting to predict the likelihood a parent will engage in abuse, a concept typically referred to as child abuse potential (Milner, 1994). Child abuse potential has been linked with harsh parenting style and more frequent use of parent-child aggression, including abusive tactics (Rodriguez, 2010a). Not surprisingly, abusive parents typically administer excessive, harsh discipline (Veltkamp & Miller, 1994). Greater confidence regarding which factors truly elevate child abuse risk is thereby critical for advancing prevention and intervention efforts. The current study presents a preliminary investigation into a novel approach to studying factors previously theorized to predict physical child abuse potential.

One model of cognitive processes that theoretically lead a parent to engage in physical abuse is Social Information Processing (SIP) theory, delineated by Milner (2000). SIP theory postulates that pre-existing cognitive schema (e.g., a parent's child- and discipline-related beliefs) exist prior to processing information from a new interaction. Then, when faced with a discipline situation, 4 stages begin. The parent must first accurately attend to and perceive the situation in Stage 1, then in Stage 2, the parent develops expectations and interpretations of the situation. Problems with accurate perceptions followed by biases in interpretation may be compounded by the parent's difficulty integrating mitigating information that could account for the child's behavior or difficulty considering alternative responses in Stage 3. In Stage 4, the parent who selects physical discipline encounters difficulty monitoring their implementation of discipline that could culminate in abuse. Considerable research supports individual elements of stages (e.g., Milner, 2000 and Rodriguez, 2010b) as well as multiple components from different stages (e.g., De Paúl et al., 2006 and Rodriguez and Richardson, 2007).

The present study examined 2 factors previously proposed in the SIP model, parental attributions (a Stage 2 process) and empathy (a Stage 3 process). Attributions that a child is misbehaving intentionally can affect a mother's decision to implement physical discipline (Ateah & Durrant, 2005). Abuse-risk mothers make negative dispositional attributions for children's negative behaviors yet attribute positive behaviors to external causes (Dadds, Mullins, McAllister, & Atkinson, 2003). Indeed, physically abusive mothers interpreted child misbehavior as intentional annoyance significantly more often than a matched sample of non-abusive mothers (Haskett, Scott, Willoughby, Ahern, & Nears, 2006). Collectively, research generally supports that parental attributions of children's behavior represent a potentially important component in

increased abuse risk, although others have suggested that higher abuse risk parents do not demonstrate more negative attitudes toward children (Risser, Skowronski, & Crouch, 2011) and questions have arisen regarding the optimal measurement of attributions (Milner, 2003).

Negative attributions can be potentially attenuated by integrating mitigating information in the third SIP stage, such as a parent's empathic ability that could inform of a situation-specific context that lessens a child's perceived responsibility (Milner, 2000). An inability to experience empathy has been previously linked to physically abusive parenting (Feshbach, 1989 and Milner and Dopke, 1997). Low empathic perspective-taking ability has been associated with greater child abuse potential in community (Rodriguez & Richardson, 2007) and at-risk samples (McElroy and Rodriguez, 2008). Empathy and attribution of child intent were specifically targeted for the current investigation because both suffer from one of the obstacles in confidently predicting their true role in elevated physical child abuse risk: our methodological reliance on measuring these concepts via self-report.

Many researchers in this field often conclude their studies citing as a limitation their dependence on eliciting information directly from participants via questionnaires, often not even anonymously. This limitation is exacerbated by designs investigating both the risk factors and the dependent variables using self-report from the same source, which raises concerns about source bias as well as questions about item or conceptual overlap between questionnaires for the predictors and the proposed outcome(s). Even in those instances when participants are assured of anonymity, such designs rely on the participants' candor and accuracy. This strategy of obtaining self-report is considered an explicit assessment technique. Unfortunately, with more controversial constructs, explicit self-reports are more likely to lead to responses that are manipulated by participants (Fazio & Olson, 2003). Clearly this self-report design flaw is problematic for researchers in a number of fields, but this approach is particularly challenging for researchers studying child abuse risk and its related constructs (DeGarmo, Reid, & Knutson, 2006). In fact, honesty in reporting could lead to negative consequences which may be realistically appraised as threatening for parents (Bennett, Sullivan, & Lewis, 2006), inducing participants to inaccurately respond to self-report questions. Those already substantiated for abuse seem especially likely to distort their responses. Thus, respondents to questionnaires may intentionally misrepresent their true attitudes but some respondents may even unconsciously present a socially desirable image because they want to believe this positive self-perception (Fazio & Olson, 2003). Yet this field continues to rely heavily on self-report to assess risk because alternative assessment approaches are limited.

To better control biases in responding, analog tasks strive to assess a concept using implicit means (Fazio & Olson, 2003). Analog tasks are designed to assess the concept without the participant being explicitly aware of what the task is attempting to measure and/or how it is being scored. If a respondent is not overtly aware of what is being measured, they are less able to misrepresent their response. Analog tasks differ in how much automatic, unconscious processing is engaged in the task, wherein more conscious processing enables a participant to manipulate their responses (Fazio & Olson, 2003). Designing analog tasks thus demands creativity to minimize participant awareness. Another challenge for the application of analog tasks lies in the fact that some may be labor-intensive or costly. However, such assessment approaches are essential when evaluating models for abuse risk (DeGarmo et al., 2006); questions continue to arise about whether a given factor is indeed associated with abuse risk because of doubts about whether the assessment tools simply overlap in content or are manipulated by the respondent. For example, if an analog task can demonstrate an association with self-report measures of a given concept, then those utilizing the self-report measure can be more confident in the latter's use as a proxy.

Relatively few analog approaches have been considered in the child maltreatment field. Some early research investigated parents' punitive responses under stress (Passman & Mulhern, 1977) or elicited discipline responses in real time while parents watched a video of child misbehavior (Fagot, 1992), moderately implicit approaches attempting to approximate parent discipline behavior. More recently, subliminal priming with photos has been used to study implicit parental attitudes of hostility, where abuse risk parents rated ambiguous child pictures as more hostile relative to low-risk parents (Farc, Crouch, Skowronski, & Milner, 2008), although higher abuse risk parents did not evidence more negative attitudes toward children (Risser et al., 2011). Higher abuse risk parents have greater difficulty processing either positive or negative stimuli when it is incongruent with a subliminal prime rather than simply evidencing a bias toward negative stimuli only (Crouch et al., 2010). This recent line of research highlights the need to clarify some of the implicit cognitive processing occurring in parents.

The current study evaluated an analog approach based on eye tracking technology that requires no participant response and thus would be relatively free from conscious processing. Eye trackers monitor and analyze the movement of the eye during reading (Rayner, 1998). While reading, eyes display short ballistic movements, known as saccades, or pause on sections of text, known as fixations. English is read left to right but readers occasionally evidence right-to-left eye movements, known as regressions, to review previously read material (Rayner, 1998). Reading speed is affected by the frequency and duration of fixations and regressions as well as one's overall comprehension of the material (Rayner, Chace, Slattery, & Ashby, 2006). Reading researchers have found that readers spend more time reading and rereading text inconsistent with

the reader's expectations or general world knowledge (Cook and Guéraud, 2005, Cook and Myers, 2004 and Rayner et al., 2006). Based on these findings, we measured parents' eye movements as they read two types of vignettes: stories either appropriately or inappropriately represented children as culpable for an incident; stories that portrayed either an empathic or non-empathic scenario. Consider the first example in Table 1. In the culpable condition, the child is instructed not to touch the cupcakes, but the child eats them anyway. The subsequent target sentence, "The child knew their behavior was wrong…." should be easy to comprehend, and reading times should be relatively fast. However, in the non-culpable condition, where the child is instructed to get their father and does so, the subsequent target sentence should be much more difficult to comprehend. Thus, reading times for the target sentence in the non-culpable condition should be much slower than in the culpable condition. The second example in Table 1 contains a target sentence ("Fred saw Mary and laughed at the look on her face") that either represents an empathic or non-empathic response. The target sentence should be more difficult to understand, and thus should be read more slowly, in the non-empathic condition than in the empathic condition. Based on these principles, we utilized eye tracking technology to assess reading speed, evaluating whether individuals would evidence greater difficulties reading material that inappropriately presented children as culpable or presented a non-empathic scenario.

Table 1. Sample attribution and empathy vignettes used in the analog task.

Culpable attribution vignette

A parent just finished making cupcakes for a neighbor child's birthday party. The parent tells their child not to touch any of them until the party. A few hours later, the parent finds two cupcakes missing and the child admits to eating them. The child knew their behavior was wrong on this occasion but did it anyway.

Non-culpable attribution vignette

A mother sitting on the sofa asks their child to quickly run and get their father. The child runs off to go get the father. The child pulls on the father's arm interrupting while the father is talking on the phone with his boss. The child knew their behavior was wrong on this occasion but did it anyway.

Empathic vignette

Fred was outside with Mary at school. Mary was happy and acting very silly. There were lots of kids playing near them. Fred saw Mary and laughed at the look on her face. Then it was time to go back inside.

Non-empathic vignette

Fred was outside with his friend Mary at school. Mary was upset and looked very serious. There were a lot of kids playing near them. Fred saw Mary and laughed at the look on her face. Then it was time to go back inside.

Purpose of current investigation and hypotheses

The present study investigated whether an analog task based on the reading inconsistency paradigm could assess both parental attribution of child intentionality and empathy as it may relate to physical abuse risk and punishment intentions. Parents self-reported on their child abuse potential and punishment intentions as well as on their perception of their empathic ability and attributions of child intent. Analog scores from the eye tracking task were compared to scores on explicit measures of self-reported empathy and attributions and abuse potential and punishment intentions. Because the analog approach is entirely implicit (no participant response is required), eye tracking scores were expected to show modest correlations with explicit measures.

Specifically, parents who demonstrated greater difficulty reading non-empathic vignettes were predicted to self-report greater empathy, obtain lower child abuse potential scores, and indicate less inclination to punish children. Similarly, parents who demonstrated greater difficulty reading inappropriate implications of child culpability were expected to self-report less inclination to believe children misbehave intentionally to be annoying and would demonstrate lower abuse potential and less intention to punish misbehavior. Such a design will provide a novel approach to considering how these two theorized SIP processes, attributions and empathy, may indeed relate to elevated child abuse risk.

Method

Participants

The study recruited 37 parents for a study of novel approaches to investigating parenting. However, 3 participants could not be accurately tracked to begin eye tracker recording and 8 others demonstrated poor calibration or missing/inaccurate tracking data. It is not uncommon for participant data to be dropped due to such calibration issues (Rayner, 1998) so we retained participants for whom we were confident in the quality of their eye tracking data. Those retained

did not differ from the recruited sample on demographics or self-report scores. (Analyses, including the self-report correlations in Table 2, are reported for the final group of 26 participants who could be calibrated with the eye tracking equipment. The magnitude of the self-report only correlations was comparable between the 37 participants recruited and the 26 participants calibrated. Thus, even though we have data for the self-report correlations for the full 37 participants, for ease in comparing results between self-report and analog sections, all results reported reflect the eye tracking subsample.)

The 26 participants retained were parents (19 mothers, 7 fathers) of at least 1 child below 10 years of age. Parents were on average 30.85 years old (SD = 6.37) and the majority (84%) indicated they were White and non-Hispanic (96%). Most of the parents were living with the biological parent of their child (70%) with 15% living with step-parents and 15% living alone. Most of the participants had some college or vocational training (46%) or college degree (27%), with a median annual combined family income between $40 and $49,999.

Eye tracking apparatus/analog measure

Parents' eye movements were recorded with an Applied Sciences Laboratory (ASL) Model 501 head-mounted eye tracker with a magnetic head tracker. A Hewlett-Packard 1.8 GHz computer interfaced with and controlled the eye tracker. Independently, another Hewlett-Packard computer attached to a Samsung 21.3-inch flat panel monitor rotated 90 degrees into portrait mode controlled delivery of the experimental stimuli. Parents had free head-and-eye movement where such movement and orientation was recorded using the ASL EyeHead Integration System. The eye tracker did not touch the eye at any point. The tracker has an accuracy of one half degree of visual angle (approximately 4 characters of text). Viewing was binocular, with eye location recorded from the right eye with position sampled at 60 Hz (approximately every 16.67 ms). Each sample was compared with the previous sample to determine whether the eye was fixated or moving. Monitor luminance was held constant and the room kept dark except for an indirect light to enable the experimenter, who was seated out of eyesight, to take notes. The eye tracker was calibrated individually to each participant, requiring 5–10 minutes. Participants were seated in a comfortable arm chair approximately 25 inches from the computer monitor. The screen was relatively large to fill most of the participant's visual field, minimizing peripheral distractions.

Vignettes were presented on the monitor individually, with empathy and attribution passages interspersed. The attribution vignettes included 10 scenarios where the child would be considered culpable and 10 where the child would be considered not culpable. Potential vignettes were first trialed with 52 undergraduates and the best 30 vignettes from this undergraduate trial

were than piloted with a sample of 33 parents from a different parenting study. This group of parents was asked to indicate the culpability/non-culpability of each of the 30 situations describing a child's behavior, half where the child appears to have engaged in purposeful misbehavior whereas in the other half, the child's behavior was accidental. Parents were asked to indicate Yes or No if "the child knew their behavior was wrong on this occasion." The best 10 culpable (average 89% agreement) and 10 non-culpable (average 93% agreement) scenarios were selected for presentation in this eye tracker study. The last sentence of every attribution vignette on the eye tracker was "the child knew their behavior was wrong on this occasion, but did it anyway," with the target region being "knew their behavior was wrong."

The empathy vignettes included 10 scenes in which 2 children engaged in an interaction. Participants read either a version in which 1 member of the dyad behaves in an empathically consistent manner or a version in which the behavior of 1 member is non-empathic. In each scene, the target region is identical but the circumstances in the scene make the target region empathically consistent or inconsistent. In the example in Table 1, the target region is "laughed at the look." Across all 10 empathy vignettes, the mean length of the target region was 22.8 characters, with spaces. Each participant saw an equal number of empathic and non-empathic vignettes, and across all participants, each vignette appeared in each condition. These vignettes were created for an unrelated study investigating implicit measures of social empathy in autism (Speer, 2007).

As described earlier, scores in this analog were based on the degree of difficulty individuals had in processing the target region. Processing difficulty was measured as total time spent reading the target region, and this includes all initial reading and any subsequent rereading of the region. For the attribution task, the analog score was the within-subject mean difference in total time spent reading the culpable versus non-culpable conditions, such that a larger difference score indicated that the individual experienced more processing difficulty reading inappropriate implications of culpability, meaning a tendency to believe that children are less culpable. For the empathy vignettes, the analog score was the within-subject mean difference in total time spent reading the target region of the empathic and non-empathic conditions, such that a larger difference score indicated more processing difficulty for non-empathic scenes, in other words, more empathy.

Self-report measures

The Child Abuse Potential Inventory (CAPI; Milner, 1986) is a widely used measure of abuse potential, with 160 statements on which the respondent indicates Agree/Disagree. Intended to

screen for physical abuse risk, the measure evaluates rigidity and intrapersonal and interpersonal qualities observed in those identified as physically abusive. Only 77 items are variably weighted to yield an overall Abuse Scale; the remaining statements serve as experimental scales or measures of response distortion. Higher scores on the Abuse Scale are considered reflective of greater child abuse potential. The CAPI has strong psychometric support, wherein previous research has established high internal consistency for the Abuse Scale (Milner, 1986), with split-half reliability ranging from .96 (for control groups) to .98 (for abuse samples), and Kuder–Richardson reliability coefficients ranging from .92 (for control samples) to .95 (for abuse groups). With regard to predictive validity, studies indicate that CAPI scores demonstrate a correct classification rate of 89.2% of confirmed child abusers and 99% of controls (Milner, 1994).

The Adult-Adolescent Parenting Inventory-2 (AAPI-2) is a self-report of parenting and child-rearing attitudes consistent with abusive and neglectful parenting (Bavolek & Keene, 2001). This 40-item measure has been proposed to measure beliefs associated with child abuse potential (Conners, Whiteside-Mansell, Deere, Ledset, & Edwards, 2006). Participants report their level of agreement using a 5-point Likert scale. The AAPI-2 Total score is oriented such that high scores suggest lower abuse potential. Examination of the psychometrics of the AAPI-2 (Conners, Whiteside-Mansell, Deere, Ledet, & Edwards, 2006) with a low-income sample of parents of preschoolers yielded acceptable internal consistency for the full score ($\alpha = .85$), comparable to that obtained in the current study sample ($\alpha = .84$).

The Plotkin Child Vignettes (PCV; Plotkin, 1983) is a measure previously used to assess parental attributions for child behavior (Haskett et al., 2006). Presenting 18 short vignettes, the parent is asked to imagine the situation occurred with their own child, indicating how much they believe their child behaved intentionally to annoy them on a scale of 1 ("my child did not mean to annoy me at all") to 9 ("the only reason my child did this was to annoy me"). Thus, higher PCV Annoyance scores reflect greater attribution of children's intentional annoyance. Parents also indicate how much they would punish their child, from 1 ("I would not punish my child at all") to 9 ("I would punish my child a great deal"). This score was included as a measure of punishment intentions, with higher PCV Punish scores indicative of greater willingness to punish. Previous research has suggested that abusive parents perceive greater child intentionality and expect to implement more punishment than comparison parents, and the two scales are intercorrelated (.69) with reported internal consistency at .83 for both PCV Annoyance and Punish scores (Haskett et al., 2006). The current study sample also attained adequate internal consistency for the PCV Annoyance and Punish scores ($\alpha = 83$ for Annoyance and $\alpha = 84$ for Punish).

The Empathy Quotient-Short (EQ-Short; Wakabayashi et al., 2006) is a 22-item self-report measure of perceived general empathy. Participants indicate on a 4-point Likert scale the extent to which they agree with statements suggestive of greater perspective-taking ability and responsiveness, with higher scores indicative of low empathy. For example, participants indicate the extent to which they agree with "I find it easy to put myself in somebody else's shoes." The developers of the short form of the EQ-Short report good internal consistency, with $\alpha = .88$ (Wakabayashi et al., 2006), consistent with that attained in the current sample, $\alpha = .86$.

Procedures

Institutional Review Board approval was obtained for this study from the university. Flyers were distributed to after-school programs and participants contacted the research lab if they were interested in scheduling a 60–90 minute individual session. Participants' identification numbers were never attached to their identity and thus they were assured of confidentiality in their self-reporting. After providing consent, participants were seated in front of a computer screen to be fitted and calibrated on the eye tracker. After adequate calibration was established, participants proceeded with reading the vignettes one at a time, with attribution and empathy passages randomly alternated. Upon completing a passage, the participant was instructed to press the space bar to continue, which prompted a fixation screen to appear for three seconds between each passage. Participants were instructed to look at the middle of the screen, then to the top left corner where the next passage would begin, to facilitate continued calibration. Upon completion of the eye tracking task, participants proceeded to privately complete the self-report measures (demographics, AAPI-2, CAPI, and PCV) which they submitted in plain envelopes. A computerized task unrelated to the present study ended the protocol, and based on their performance on this final task, they were compensated either $29 or $30 for their participation.

Results

Correlations between self-reports were first considered to confirm potential associations previously identified in the literature using more conventional approaches. As seen in Table 2, self-reported attributions of child intentionality on the PCV Annoyance scale were significantly associated with greater child abuse potential scores on both the AAPI-2 Total and CAPI Abuse Scale. Negative attributions toward children (PCV Annoyance) were predictably associated with their reported greater intention to punish the child, consistent in magnitude to that previously reported (Haskett et al., 2006). Lower self-reported empathy (EQ-Short) was significantly correlated with both child abuse potential measures and greater expected punishment on the

PCV. These associations affirm self-reported empathy and attributions relate to self-report measures of abuse risk and punishment intentions.

Table 2. Means, standard deviations, and Pearson correlations.

	M (SD)	AAPI-2[a] Total (r)	CAPI Abuse Scale (r)	PCV-Punish (r)	PCV-Annoy (r)	Empathy Quotient (r)
Self-Report						
PCV-Annoyance	33.08 (10.98)	−.49**	.59***	.75***		
Empathy Quotient-Short	40.48 (7.75)	−.49**	.61***	.50**	.43**	
Eyetracking Scores						
Attribution: Total time	.108 (.208)	.14	.00	−.50**	−.34*	
Empathy: Total time	.078 (.282)	.35*	−.26	−.06		−.55***
Mean (SD)		161.04 (13.37)	69.96 (60.87)	34.08 (9.17)		

Note: PCV, Plotkin Child Vignettes; AAPI-2, Adult-Adolescent Parenting Inventory-2; CAPI, Child Abuse Potential Inventory.

a High AAPI-2 scores indicative of lower abuse risk.

* $p \leq .05$.

** $p \leq .01$.

*** $p \leq .001$.

Turning to the eye tracking analog results, given the exploratory nature of this novel approach and sample size, we conducted one-tailed statistical tests based on our directional hypotheses. As seen in Table 2, the analog task results only partially mirror those of the self-report results. In terms of eye tracking scores for the attribution vignettes, analog scores were significantly correlated with self-reported attributions of children's intentions for misbehavior on the PCV Annoyance scale. Hence, participants who experienced less difficulty reading the non-culpable passages were more likely to self-report that children were behaving intentionally to annoy the parent. Eye tracking analog scores for attribution were also significantly correlated with PCV Punish scores, suggesting that those who had comparatively more difficulty reading the non-culpable vignettes were less likely to consider punishing child misbehavior. However, in stark contrast to the strong associations of the self-reported attributions of the PCV with child abuse potential, the reading processing difficulty scores were not significantly associated with either of the abuse potential scores. These findings suggest eye tracking may detect implicit attributions that may relate to punishment decisions but that may not map onto traditional measures of abuse potential.

With regard to the empathy vignettes, analog scores were indeed significantly related to self-reported empathy on the EQ-Short, such that greater difficulty reading non-empathic vignettes was associated with greater self-reported empathy (see Table 2). However, correlations with PCV Punish were clearly non-significant, suggesting that greater empathy may not relate to self-reported punishment expectations. The results regarding empathy eye tracking analog scores are not as straightforward for abuse potential. Generally, however, lower empathy analog scores appear to be potentially associated with increased child abuse potential, at least in the appropriate direction when the resultant correlation was not statistically significant. Note that analog scores on the attribution vignettes were significantly related to analog scores on the empathy vignettes ($r = -.45$, $p \leq 01$).

Discussion

The present study investigated a fully implicit analog assessment of parental attributions and empathy as they relate to physical child abuse potential. Parental attributions of child negative intentions and empathy were assessed implicitly by using eye tracking to measure parents' processing difficulty as they read vignettes relating to child culpability or empathic responses. Findings from this study suggest that parents who self-reported greater empathy indeed slowed when reading non-empathic scenes; similarly, parents who self-reported lower attributions of children's intentionality in misbehavior also slowed when reading inappropriate implications of child culpability. What is more complex is the pattern of relations between the analog scores and abuse risk and punishment intentions. Both self-reported empathy and attributions were strongly

related to self-reported child abuse potential and predicted punishment. However, the eye tracking analog for empathy was only potentially related to child abuse potential and unrelated to punishment intentions, whereas the analog for attributions was strongly related to punishment intentions but not at all with child abuse potential.

Past research based on self-report methods has suggested that parents' attributions that children are misbehaving intentionally are related to child abuse risk (Haskett et al., 2006). Although the present study also demonstrated correlations between self-reported attributions and measures of child abuse potential and punishment intentions, analog attributions were only significantly associated with punishment decisions. Based on these preliminary findings, attributions, when not overtly assessed as in traditional self-report, may relate to whether a parent is inclined toward punishment but not necessarily to their increased abuse risk. Such a finding could lead to speculation that attributions are not important in elevating abuse risk. However, keep in mind the abuse potential measures themselves, which are self-reported, may not be sensitive to parental attributions. Future research could consider evaluating implicit attributions as they relate not to self-reported abuse potential but with implicit measures of abuse risk, actual abusive behavior, and parents substantiated for physical abuse. Notably, the current community sample of parents may be relatively less threatened and thereby inclined toward more accurate self-reporting; some of the observed current analog correlations may be attenuated in samples evidencing greater abuse risk. At-risk and substantiated perpetrators of abuse may be motivated to distort self-report, which would weaken any association of implicitly assessed attributions with explicit measures. Establishing the value of implicit assessment initially in low-risk parents thus represents an essential point for comparison.

Research has also previously implicated empathy in increasing abuse risk (Rodriguez & Richardson, 2007). Indeed, parental self-report of empathy was strongly related to abuse potential and punishment intentions. Analog scores for empathy were also strongly related to self-reported empathy. However, eye tracking analog scores for empathy were not significantly related to punishment decisions; empathy analog scores appear potentially more linked with child abuse potential. Given the small sample size, such findings require replication with a larger group of parents to clarify a link between parental empathy and abuse potential. More research on the implicit assessment of empathy is needed, but such findings suggest that empathy may be an important element to consider in both future research and intervention/prevention programming. Paralleling the recommendation above for future research on parental attributions, implicit assessment of empathy should be evaluated in conjunction with implicit measures of abuse potential and with samples identified as at-risk and physically abusive.

Some notable study limitations are apparent. Foremost among these is the small sample size, particularly because several individuals were removed from analysis. In conjunction with using one-tailed tests, our results must be considered preliminary. Moreover, we did not measure reading fluency or executive functioning; however, all vignettes were below 6 grade reading level and covarying educational level did not alter the correlational results for the analog. In addition, although studying low-risk and sub-abusive samples is important for prevention (Graziano, 1994), replication of this analog paradigm with at-risk parents or identified perpetrators would inform whether our findings are mirrored in those with greater abuse risk. Also, given the current sample demographics, future research should involve more fathers and greater racial/ethnic and socioeconomic diversity.

Additionally, eye tracking can be a costly, labor-intensive approach, which would be prohibitive in applied settings; but alternative options to assess reading speed/processing difficulty are available (e.g., Just, Carpenter, & Wooley, 1982), which can be computerized and cost-effective. Such approaches could determine whether reading speed can serve as an implicit means to gain insight into parents' beliefs. Another study limitation involves the nature of the empathy vignettes, which involved peer-to-peer scenes, tapping general empathy; optimally, future research should consider scenes that present empathy scenes depicting parent-child interactions to better elicit the empathy most relevant to predicting child abuse risk. The attribution vignettes were also worded in only one direction ("knew their behavior was wrong"), thus assessing positive attribution via reading difficulty, but they could be presented counterbalanced with both directions in future work, requiring a larger sample size.

With respect to how these findings inform theories such as the SIP model, parental attributions may be involved in discipline decision-making but perhaps not physical child abuse risk whereas empathy may relate more to abuse risk. Much of the available data supporting the SIP model is based on self-report, which in fact was mirrored in our findings based on the self-report measures alone. More creative strategies are needed to evaluate whether attributions are indeed a critical cognitive process in the SIP model and whether the model can be applicable to those at different levels of risk to engage in varying levels of parent-child aggression.

Reliance on self-report measures remains a major obstacle in child abuse research, although the use of implicit measures could serve to advance our understanding of many of the constructs in the study of child abuse (DeGarmo et al., 2006). Incorporating analog approaches to complement traditional approaches may provide an opportunity to obtain a more nuanced picture of the complex factors that combine to heighten physical child abuse risk. Otherwise, researchers will

continue to express doubts in their findings because of the methodological concerns about potential biases in reporting and item overlap when using mono-method designs.

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