Does accessibility of positive and negative schema vary by child physical abuse risk?∗

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A R T I C L E   I N F O

Article history:
Received 2 November 2009
Received in revised form 7 April 2010
Accepted 6 May 2010

Keywords:
Child physical abuse
Information processing
Lexical decision making

A B S T R A C T

Objective: To examine differences in accessibility of positive and negative schema in parents with high and low risk for child physical abuse (CPA).

Methods: This study combined picture priming and lexical decision making methods to assess the accessibility of positive and negative words following presentation of child and adult faces. The child and adult faces depicted positive, ambiguous, and negative affective valences. The sample included 67 (51 low and 16 high CPA risk) general population parents.

Results: CPA risk status was associated with accessibility of positive/negative words only following priming with faces of the opposite affective valence. More specifically, high CPA risk parents were slower to respond to positive (negative) words following priming with negative (positive) faces. Exploratory analyses indicated that this pattern of findings was more clearly apparent when picture primes involved adult faces.

Conclusion: The present findings suggest that high and low CPA risk parents differ in how they process affectively incongruent information. Research is needed to further examine schema accessibility, as well as to examine whether processes involved in attention and affect integration play a role in CPA risk.

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Introduction

The social information processing (SIP) model of child physical abuse (CPA) posits that the manner in which at-risk and abusive parents process information during parent–child interactions increases their risk of engaging in abusive behaviors (Milner, 1993, 2000, 2003). Among the various components of the SIP model, attributions of hostile intent have received considerable support as a cognitive factor that may help explain the occurrence of parental aggression (e.g., Azar, 1986; Bauer & Twentyman, 1985; Laurence & Twentyman, 1983; Montes, de Paul, & Milner, 2001; Springer, 2001; Valle, 1999; however, see Mammen, Kolko, & Pilkonis, 2002). To the extent that attributions of hostile intent play a causal role in parent to child aggression, then research examining the mechanisms that lead some parents to more frequently attribute hostile intent to their children is needed.

Studies in the general literature on aggression and information processing suggest that the roots of hostile attributional biases may lie in one or more of the basic components of information processing (e.g., perceptions, interpretations, information integration). For example, research in the general literature on aggression indicates that aggression-prone individuals have perceptual biases that favor aggression-relevant stimuli (Bargh & Pratto, 1986; Bargh & Thein, 1985). Further, highly
accessible hostility-related schema have been shown to increase hostile interpretations of others (Bargh & Pietromonaco, 1982; Farc, Crouch, Skowrons, & Milner, 2008; Srull & Wyer, 1979, 1980) and/or increase aggressive behavior (Carver, Ganellen, Froming, & Chambers, 1983).

Studies examining encoding patterns associated with aggression, including CPA risk, have found that aggressive individuals display a greater tendency to encode ambiguous information in hostile terms, as well as a relative lack of encoding in semantically-related (nonhostile) terms. Interestingly, the largest difference between aggressive and nonaggressive individuals appears to be in the amount of information recalled to semantic (nonhostile) cues, such that aggressive, compared to nonaggressive, participants recall significantly less information to semantic cues (Zelli, Huesmann, & Cervone, 1995). Similarly, Crouch et al. (2010) found that high CPA risk parents spontaneously encoded information related to ambiguous caregiving contexts in less positive terms. More specifically, Crouch et al. found that although total recall for hostile cues did not differ by CPA risk status; high, compared to low, CPA risk parents obtained significantly lower recall scores to positive (nonhostile) cues.

A number of questions emerge from the studies that have examined the role of hostility-related schema in CPA risk. Is the tendency to arrive at more hostile judgments of child stimuli (Farc et al., 2008) driven by both greater accessibility of hostility-related schema and the relative inaccessibility of alternative (nonhostile) schema (Crouch et al., 2010; Zelli et al., 1995)? Further, is the differential accessibility of hostile and nonhostile schema apparent only when information is ambiguous or is it also apparent when stimuli are clearly negative or clearly positive? To advance our understanding in this area, the present study was designed to assess relative accessibility of positive and negative words following presentation of faces that were positive, ambiguous, or negatively valenced with regard to emotional expression.

Another gap in the literature pertains to the question of whether differences in schema accessibility between high and low CPA risk parents are apparent for both child and adult stimuli. Zelli et al. (1995) found encoding differences between aggressive and nonaggressive respondents using vignettes that depicted characters in adult roles (e.g., policeman, secretary, etc.); however it is not clear whether these differences generalize to high versus low CPA risk parents. Crouch et al. (2010) found encoding differences between high and low CPA risk parents for sentences that depicted children behaving in an ambiguous fashion; however, differences in encoding for adult stimuli were not examined. Thus, it remains unclear whether hypothesized social information processing differences between high and low CPA risk parents are evident for adult as well as child stimuli.

Indeed, it seems probable that high CPA risk parents might evince problems in social information processing that are general in nature, impacting their ability to relate to their children as well as impairing their ability to sustain positive adult relationships. Supporting this contention are data that indicate that high CPA risk parents report more problems with family/others and more feelings of loneliness (Milner, 1986). Further, high CPA risk parents report significantly fewer adult relationships. Supporting this contention are data that indicate that high CPA risk parents report more problems as child stimuli.

Hypotheses

Based on the proposition that high CPA risk parents have highly accessible negative schema (Crouch & Milner, 2005; Farc et al., 2008), it was predicted that high, compared to low, CPA risk parents would have shorter latencies for negative words following presentation of ambiguous and negative face primes. Based on prior research suggesting low levels of accessibility of positive schema in high CPA risk parents (Crouch et al., 2010), it was predicted that high, compared to low CPA risk
Table 1
Demographic characteristics of high and low CPA risk groups.

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Low CPA risk (n = 51)</th>
<th>High CPA risk (n = 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>19.6</td>
<td>25.0</td>
</tr>
<tr>
<td>Female</td>
<td>80.4</td>
<td>75.0</td>
</tr>
<tr>
<td>Race/ethnicity (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>58.8</td>
<td>43.8</td>
</tr>
<tr>
<td>African American</td>
<td>31.4</td>
<td>43.8</td>
</tr>
<tr>
<td>Hispanic</td>
<td>3.9</td>
<td>6.2</td>
</tr>
<tr>
<td>Other</td>
<td>5.9</td>
<td>6.2</td>
</tr>
<tr>
<td>Marital status (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>49.0</td>
<td>31.3</td>
</tr>
<tr>
<td>Single</td>
<td>39.2</td>
<td>68.7</td>
</tr>
<tr>
<td>Separated/divorce/widowed</td>
<td>11.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Mean (SD) years of education</td>
<td>13.7 (3.7)</td>
<td>12.9 (3.6)</td>
</tr>
<tr>
<td>Mean (SD) age</td>
<td>35.1 (10.3)</td>
<td>28.8 (9.2)</td>
</tr>
<tr>
<td>Mean (SD) number of children</td>
<td>1.9 (1.0)</td>
<td>1.9 (0.7)</td>
</tr>
</tbody>
</table>

Note: CPA = child physical abuse.

Methods

Participants

To recruit parents for the study, informational flyers were distributed through local agencies (e.g., daycares, churches, social service agencies). The informational flyers stated that parents would be asked to “memorize pictures of faces, complete a word task, and fill out a questionnaire,” which would take approximately 30 min and for which participants would receive $25. In an attempt to obtain an adequate number of high-risk participants, we targeted our recruitment by distributing flyers in programs that served families with risk factors for abuse (e.g., voluntary home visiting programs, shelter services).

An initial pool of 93 general population parents was recruited to participate in this study. Despite our intention to recruit only individuals who were actively involved in parenting, 9 respondents (9.7%) indicated that no children lived with them at the time of this study and their data were dropped from subsequent analyses. Of the remaining parents, data from 3 parents were lost due to equipment malfunctions during the lexical decision making task. Further, 1 parent was excluded due to excessive blanks (more than 10% of responses missing), and 13 were invalid due to response distortion (i.e., faking good, randomly responding) on the Child Abuse Potential (CAP) Inventory, which precluded their reliable classification into a CPA risk group.

Thus, the final sample consisted of 67 parents (53 mothers and 14 fathers) with a mean age of 33.6 years (SD = 10.4; range 18–56). With regard to racial/ethnic composition, 55.2% of the parents indicated they were White, 34.3% Black, 4.5% Latino, 3.0% Asian, and 3.0% indicated that they belonged to some other racial/ethnic category. Nearly half of the parents were single (46.3%), while 44.7% were married, 7.5% separate/divorced, and 1.5% widowed. The mean number of children was 1.9 (SD = 0.9). Although all parents retained in the final sample had 1 or more children living with them, no restriction was placed on the age of the child(ren) living in the home. The mean highest grade completed by participating parents was 13.5 years (SD = 3.7).

The Child Abuse Potential Inventory (described below) was used to classify parents with respect to their CPA risk status. Of the 67 parents retained in the final sample, 51 parents (76.1%) were classified as low CPA risk, whereas the remaining 16 (23.9%) were classified as high CPA risk. Mean CAP scores were 76.0 (SD = 42.5; range = 9–162) for low CPA risk parents and 242.6 (SD = 64.6; range = 180–353) for high CPA risk parents. Demographic characteristics of the CPA risk groups are presented in Table 1. With the exception of age, low and high CPA risk groups did not differ significantly on the demographic characteristics examined (all p’s > .05). As may be noted in Table 1, high CPA risk parents were younger than low CPA risk parents, F(1, 64) = 4.63, p < .05, r = .25. To minimize the potential confounding influence of age on analyses involving CPA risk status, age was entered as a covariate in the planned analyses.

Materials

Priming task stimulus photographs. Sixty digital, color photographs of child and adult faces available for download from the internet (www.punchstock.com) were used as the priming stimuli in this study. The 60 photographs were selected from a larger pool of 332 photographs based on positive and negative ratings obtained in a preliminary study. The preliminary study included 103 undergraduate students who were asked to view each of the 332 photographs on a computer monitor and to rate each face on a 7-point Likert scale, with responses ranging from −3 (very negative) to +3 (very positive).
Mean ratings were used to classify child and adult photographs into negative (mean less than −1.5), ambiguous (mean rating between −1.0 and 1.0), and positive (mean rating greater than 1.5) categories. The final set of 30 child and 30 adult photos were selected such that child and adult photos within positive/ambiguous/negative categories were matched with regard to ethnicity and gender. Mean ratings for faces within the 3 valence categories were as follows: negative faces, M = −2.37 to −1.51, SDs = .85 to 1.36; ambiguous faces, M = −.96 to .87, SDs = 1.00 to 1.54; and positive faces, M = 1.83 to 2.54, SDs = .70 to 1.10.

Stimulus word sets. A second preliminary study was conducted to select 10 negative, 10 neutral, and 10 positive words from an initial pool of 60 words thought to be positive (e.g., love, hug), neutral (e.g., number, from), or negative (e.g., hostile, hit) with regard to caregiving. The second preliminary study was conducted to ensure that parents could reliably classify words as words (versus nonword letter strings) and that parents could reliably sort the word sets as to whether they represented constructs associated with being “mean,” “nice,” or “neither mean nor nice.” A lexical decision making task was used to determine reliable classification of words as words, whereas a card sort task was used to determine reliable classification within word type (negative, neutral, positive).

Thirty parents participated in this second preliminary study and completed both the lexical decision making trials (which included 2 trials per word per person) and the card sort task for the initial pool of 60 words. Words included in the final set of 10 negative/neutral/positive words met the following criteria: (1) 90% correct classification as a word versus a nonword on the lexical decision making task, (2) negative/positive words were never classified as nice/mean and were not misclassified as “neither mean nor nice” more than 10% of the time, and (3) neutral words were never classified as either “mean” or “nice.”

The final set of negative words included: negative, hostile, enemy, angry, spank, hate, mean, slap, kick, and hit. The final set of neutral words included: something, number, other, every, small, long, what, many, from, and the. The final set of positive words included: positive, playful, peace, happy, sweet, love, care, nice, kind, and hug.

CPA risk status. CPA risk status was determined using the Child Abuse Potential (CAP) Inventory abuse scale (Milner, 1986). The CAP is a 160-item, agree–disagree, self-report questionnaire designed to screen for CPA risk. The CAP Inventory abuse scale (77 items) is the primary clinical scale and should be the only scale employed for CPA risk screening purposes (Milner, 1986). The CAP Inventory abuse scale is comprised of 6 factor scales: distress (36 items), rigidity (14 items), unhappiness (11 items), problems with child and self (6 items), problems with family (4 items), and problems from others (6 items). Scores on the CAP Inventory abuse scale range from 0 to 486. The CAP Inventory also contains 3 validity indices (i.e., random responding, faking good, and faking bad) which were used to detect response distortion. Using the signal detection theory cut–score suggested by Milner (1986), respondents in the present study who obtained CAP Inventory abuse scores greater than or equal to 166 were classified as high CPA risk; those with scores below 166 were classified as low CPA risk.

Participants who were identified as engaging in response distortion were excluded from the final sample, with 1 exception. According to Milner (1986), parents identified as faking good but who still obtain CAP abuse scores above 166 may be classified as high CPA risk cases; therefore these individuals were included in the final sample.

Research has documented adequate internal consistency estimates (ranging from .92 to .95 for general population and maltreating parents), and adequate test–retest reliabilities in general population samples (.91 for 1-day, .90 for 1-week, .83 for 1-month, and .75 for 3-month intervals; Milner, 1986). Internal consistency (KR-20) for the CAP Inventory abuse scale for the present sample was .91.

Numerous studies report construct validity data for the CAP Inventory abuse scale (see Milner, 1986, 1994, 2004). CAP Inventory abuse scores are significantly associated with measures of aggression in parents (McCurdy, 1995; Miller, Smyth, & Mudar, 1999; Montes et al., 2001; Nayak & Milner, 1998; Sachs & Hall, 1991; Zelenko et al., 2001) and, with one exception (Dopke & Milner, 2000), the use of harsh discipline strategies in parents (Chilmakurti & Milner, 1993; Dolz, Cerezo, & Milner, 1997; Dopke, Lundahl, Dunsterville, & Lovejoy, 2003; Haskell, Scott, & Fann, 1995; McCurdy, 1995; Miller et al., 1999; Monroe & Schellenbach, 1989; Montes et al., 2001; Schellenbach, Monroe, & Merluzzi, 1991; Whissell et al., 1990).

Classification rates for child physical abusers and matched comparison parents are in the mid-80% to low-90% range (see Milner, 1986, 1994, 2004). Studies examining the CAP’s specificity indicate 100% correct classification of nurturing foster parents, low-risk mothers, and nurturing mothers. Prospective research revealed a significant association between CAP abuse scores and subsequent child physical abuse.

Procedures. The following procedures were reviewed and approved by the institutional review board at the first author’s institution. Upon arrival, parents were asked to review and sign a consent form that provided them with information regarding the procedures, risks, benefits, and voluntary nature of their participation. Data were collected individually and the procedures included the following phases: (1) training for the lexical decision making task, (2) picture recognition task training, (3) lexical decision making task with picture priming test trials, (4) picture recognition task, and (5) completion of the CAP Inventory and demographic survey.

Training for the lexical decision making task. The first phase of the study involved training participants to perform the word/nonword judgments for the lexical decision making task. Parents were instructed to attend to letter strings that would be presented on the computer screen. Parents were asked to press the Z key if the letter string represented a word (mean) and the M key if the letter string was not a word (lenp). Parents were asked to work as quickly and as accurately
as possible. Parents completed a set of 10 practice trials (in which 5 words and 5 nonwords were presented). Each letter string/word was presented for 315 ms and was preceded by a brief presentation of a row of asterisks. After completing the practice trials, parents were reminded of the instructions for the task and were asked to complete a set of 60 baseline trials (which included 15 word and 15 nonword letter strings presented in 2 randomized blocks of 30 trials).

**Face recognition task.** The second phase of the procedure involved training parents to attend carefully to faces presented on the computer screen. During the face recognition task parents were instructed to view and remember a series of six child and six adult faces presented on the computer screen. Parents were told that after the initial presentation of the faces to be remembered, they would be presented with a series of faces (some previously presented and some new) and asked to decide whether they had seen each face before. Parents were instructed to press the A key if a photograph was previously presented or the L key if the photograph was new. A row of asterisks preceded the presentation of each photograph. Twenty-four photographs (six previously presented child photos, six new child photos, six previously presented adult photos, and six new adult photos) were presented individually and remained on the computer screen until the parent responded by pressing one of the two response keys. None of the faces used in the face recognition task training were among the pictures used as priming stimuli in the next phase of the study.

**Lexical decision making task with picture priming test trials.** For this phase of the study, parents were told that the previous 2 tasks (word–nonword judgments and face recognition task) would be combined. Parents were told that it is believed that the recognition of words is an automatic skill and they should be able to recognize words/nonwords even if they are performing a second task. In this case, the second task was attending to and remembering faces. Parents were told that it was important that they attend to the faces that preceded the words because they would be asked to judge whether or not they had seen the faces previously. Parents also were instructed to judge whether letter strings presented were words or nonwords. A row of asterisks preceded each of the 60 color photographs of child and adult faces. The photographs were displayed for 315 ms before the onset of a lexical decision making trial (i.e., presentation of a word or nonword letter string). Fazio (2001) reported that a stimulus onset asynchrony (the interval between prime presentation and target presentation) of about 300 ms is optimal for detecting automatic schema activation.

Following these instructions, parents were asked to complete a set of 30 practice trials. Photos and word stimuli for the practice trials were drawn from the initial pool of pictures/words but were not the same as those used in the test phase that followed. After completing the practice trials, the test phase of the lexical decision making task with picture priming was conducted. The test phase involved 240 trials that were divided into 4 blocks. Each block consisted of 60 trials in which each of the 60 photos (30 child and 30 adult) were presented once, each paired randomly with 1 of the 30 words or 30 nonword letter strings. To rule out the possible confounding effects of order, picture order and picture-word pairs were randomly generated for each participant. Latency of responses on the lexical decision making trials served as the dependent measure.

**Second face recognition task.** Because parents were told that they would later be asked to recall the pictures presented in the test phase of the lexical decision making task with picture priming, a final face recognition task was included in the procedure. That is, parents were presented with a set of 24 photographs (6 previously presented and 6 new child/adult faces) and were instructed to press A if they had previously seen the photo and L if the photo was new.

**Demographic survey and CAP Inventory.** After completing the final face recognition task, parents were asked to provide demographic information and complete the CAP Inventory. Parents were then debriefed and paid $25.

**Analytic strategy.** As mentioned earlier, response latencies on the lexical decision making trials following picture priming served as the dependent measure in this study. Response latencies were analyzed using a 2 (CPA risk status: high, low) × 2 (word type: positive, negative) × 3 (face valence: positive, ambiguous, negative) × 2 (face type: adult vs. child) analysis of covariance (ANCOVA) with repeated measures on the last 3 factors and age entered as a covariate. The effect size estimates \( r_{es} = \sqrt{F/(F + df_{within})} \) could range from 0 to 1, with a small effect = .10 to .29, medium effect = .30 to .49, and a large effect greater than .50.

**Results**

**Response latency analyses**

Results of the ANCOVA revealed that the covariate, age, was not significantly associated with response latencies \( (p > .05) \). Of the interactions involving age, only the face valence by age interaction was significant, \( F(2, 128) = 3.43, p < .05 \), with longer latencies obtained by older respondents following negative (but not ambiguous or positive) faces.

The summary table for the ANCOVA is presented in **Table 2**. For the sake of brevity, the effects involving the covariate (described above) are not presented in **Table 2**. Response latencies on the lexical decision making trials did not differ by CPA risk, face type (adult vs. child), or face valence (positive, ambiguous, or negative). The main effect for word type was significant, with longer latencies for negative \( (M = 648.24, SE = 14.10) \) relative to positive \( (M = 631.16, SE = 12.19) \) words.
Table 2
Summary statistics for analysis of covariance for response latency data.

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>F</th>
<th>r_{es}</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPA risk</td>
<td>1</td>
<td>.91</td>
<td>.12</td>
<td>.15</td>
</tr>
<tr>
<td>Error</td>
<td>64</td>
<td>(94352.11)</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td>Within subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word</td>
<td>1</td>
<td>9.04*</td>
<td>.35</td>
<td>.84</td>
</tr>
<tr>
<td>Word by CPA risk</td>
<td>1</td>
<td>0.22</td>
<td>.06</td>
<td>.07</td>
</tr>
<tr>
<td>Error (word)</td>
<td>64</td>
<td>(6322.72)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Face</td>
<td>1</td>
<td>1.60</td>
<td>.15</td>
<td>.23</td>
</tr>
<tr>
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<td>.31</td>
</tr>
<tr>
<td>Error (face)</td>
<td>64</td>
<td>(11818.86)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valence</td>
<td>2</td>
<td>0.77</td>
<td>.10</td>
<td>.17</td>
</tr>
<tr>
<td>Valence by CPA risk</td>
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<td>2.20</td>
<td>.18</td>
<td>.45</td>
</tr>
<tr>
<td>Error (valence)</td>
<td>128</td>
<td>(9342.04)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word by face</td>
<td>1</td>
<td>0.73</td>
<td>.10</td>
<td>.13</td>
</tr>
<tr>
<td>Word by face by CPA risk</td>
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<td>3.99</td>
<td>.24</td>
<td>.50</td>
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<tr>
<td>Error (word by face)</td>
<td>64</td>
<td>(8869.74)</td>
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<tr>
<td>Word by valence</td>
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<td>1.85</td>
<td>.16</td>
<td>.38</td>
</tr>
<tr>
<td>Word by valence by CPA risk</td>
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<td>7.59*</td>
<td>.32</td>
<td>.94</td>
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<tr>
<td>Face by valence</td>
<td>2</td>
<td>1.31</td>
<td>.14</td>
<td>.28</td>
</tr>
<tr>
<td>Face by valence by CPA risk</td>
<td>2</td>
<td>0.12</td>
<td>.04</td>
<td>.06</td>
</tr>
<tr>
<td>Error (face by valence)</td>
<td>128</td>
<td>(6281.45)</td>
<td></td>
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<tr>
<td>Word by face by valence</td>
<td>2</td>
<td>2.62</td>
<td>.19</td>
<td>.51</td>
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<tr>
<td>Word by face by valence by CPA risk</td>
<td>2</td>
<td>4.45*</td>
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<tr>
<td>Error (word by face by valence)</td>
<td>128</td>
<td>(7137.85)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Values in parentheses represent mean square errors. CPA = child physical abuse.

* $p < .05$  
** $p < .01$  

Hypotheses 1 and 2 predicted that response latencies would vary as a function of CPA risk, face valence, and word type. As expected, the CPA risk by Word by Face Valence interaction was significant ($r_{es} = .32$). Follow-up analyses revealed that the CPA risk by Face Valence interaction was significant for both positive words, $F(2, 128) = 5.42, p < .01, r_{es} = .28$, and negative words, $F(2, 128) = 4.14, p < .05, r_{es} = .25$, and that the pattern of this interaction varied by word type.

For negative words, it was predicted that high, compared to low, CPA risk parents would have shorter latencies for negative words following presentation of ambiguous and negative face primes (hypothesis 1); however, this prediction was not supported ($p's > .05$). Although not predicted, response latencies for negative words were significantly longer for high CPA risk parents following priming with positive faces, $F(1, 64) = 4.28, p < .05, r_{es} = .25$ (see Fig. 1).

For positive words, it was predicted that high, compared to low, CPA risk parents would respond significantly slower to positive words following positive, ambiguous, and negative faces primes (hypothesis 2). Only partial support for this prediction was found. Response latencies for positive words were significantly longer for high CPA risk parents following priming with negative faces, $F(1, 64) = 5.04, p < .05, r_{es} = .27$ (see Fig. 2); however, response latencies did not differ by CPA risk status following priming with positive or ambiguous faces ($p's > .05$). Collectively, the pattern of findings across negative

![Fig. 1](image-url)  
**Fig. 1.** Response latencies for negative words for high and low CPA risk parents primed with positive, ambiguous, and negative faces.
and positive words suggests that high CPA risk parents were slower to classify both positive and negative words when they were preceded by faces depicting the opposite affective valence.

**Exploratory analyses for face type**

In the absence of literature on how CPA risk might relate to information processing in response to adult stimuli, the analyses involving face type (child versus adult) were considered exploratory. As shown in Table 1, the 3-way interaction described above (Risk by Word by Face Valence) was qualified by the significant 4-way interaction involving face type (adult vs. child). Follow-up analyses revealed that the Word by Face Valence by CPA risk interaction was small in magnitude and only approached significance when child faces were used as primes, $F(2, 128) = 2.46, p = .089, r_{es} = .19, power = .49$; whereas the Word by Face Valence by CPA risk interaction was moderate in magnitude and statistically reliable for trials primed with adult faces, $F(2, 128) = 8.61, p < .001, r_{es} = .34, power = .96$.

Follow-up analyses of response latencies for positive and negative words primed with positive, ambiguous, and negative adult faces revealed that the pattern of the means was similar to that displayed in Figs. 1 and 2. For negative words, high ($M = 693.12, SE = 29.58$), compared to low ($M = 620.28, SE = 16.42$), CPA risk parents responded slower following priming with positive adult faces, $F(1, 64) = 4.57, p < .05, r_{es} = .25, power = .55$. Response latencies for negative words did not vary by CPA risk status following priming with ambiguous or negative adult faces ($p's > .05$). For positive words, response latencies did not vary by CPA risk status following priming with positive and ambiguous adult faces ($p's > .05$); however, high ($M = 770.61, SE = 45.11$), compared to low ($M = 628.88, SE = 25.04$), risk parents responded significantly slower to positive words following priming with negative adult faces, $F(1, 64) = 7.45, p < .01, r_{es} = .32, power = .76$.

**Discussion**

Based on the SIP model of CPA and existing empirical findings, it was predicted that high CPA risk parents would evince faster responses to negative words following ambiguous and negative faces. The present study failed to provide support for this hypothesis. Further, it was expected that high CPA risk parents would respond slower to positive words following positive, ambiguous, and negative faces and the present findings provided only limited support for this prediction. More specifically, high CPA risk parents responded slower to positive words only following priming with negative faces. Collectively, the pattern of findings across positive and negative words suggests that high CPA risk parents were slower to classify both positive and negative words when they were preceded by faces depicting the opposite affective valence. Although this "incongruity effect" among high CPA risk parents was not expected, post hoc interpretations point to the possibility that information processes other than schema accessibility may have produced this pattern of results.

More specifically, two alternate interpretations for the pattern of results obtained in this study seem plausible based on prior research: (1) high CPA risk parents may experience greater susceptibility to interference which slowed their responses on incongruent prime-word trials, and/or (2) high CPA risk parents may have less integrated stores of positive and negative information, which required them to "switch" between positive and negative schema on incongruent trials resulting in slower responses latencies. To the extent that one or both of these interpretations is plausible, the present findings underscore the need for research examining additional cognitive processes that may play a role in CPA risk.

The basis of the first post hoc interpretation comes from research conducted by Wentura (2000) in which he proposed that slower responses to incongruent prime-target pairs in a lexical decision making task can be understood as occurring due to interference effects across trials. More specifically, Wentura proposed that participants automatically process the congruence/incongruence of prime/word pairs and this automatic congruence "judgment" (p. 458) produces a behavioral
readiness to affirm (i.e., respond “yes”) following congruent prime-target pairs (e.g., a “smiling face” is “happy” produces a “yes” judgment which facilitates the “yes” lexical decision). In contrast, participants experience a tendency to disconfirm (say “no”) when the prime-target pair is incongruent (e.g., a “smiling face” is “sad” produces a “no” judgment which interferes with production of the “yes” lexical decision response). In other words, affectively incongruent prime-target word pairs produce longer latencies because they prepare respondents to say “no,” which interferes with the desired response (“yes”) for these word trials.

Thus, according to Wentura (2000) slower responses to affectively incongruent stimuli may result from interference effects that occur across trials. This explanation, however, raises yet another question in the context of the present findings. Why were only high, but not low, CPA risk parents slower following incongruent prime/word pairs? This question points to the fact that not all individuals are equally susceptible to interference effects. Moreover, individuals with good attentional control may override the influence of interference and exhibit little if any decrement in performance of goal-directed tasks. Recent data suggest that attentional control varies as a function of CPA risk (Shelton et al., 2010), with high CPA risk parents obtaining lower scores on a self-report measure of attentional control. In addition, greater susceptibility to interference has been noted among high CPA risk parents performing the Stroop color-word task and these findings indicate that high CPA risk parents have greater difficulty effectively directing their attention to overcome the influence of stimuli that interfere with production of a desired response (Lohr, 2001; Nayak & Milner, 1998). In terms of the present findings, it seems plausible that high CPA risk parents were slower to produce a “yes” response following affectively incongruent prime-word pairs because they were more susceptible to interference due to deficits in attentional control.

The second post hoc interpretation for the findings observed in the present study is that positive and negative information structures may be less integrated (i.e., more segregated/polarized) in high CPA risk parents. Said differently, longer latencies occurred when the valence of the prime and target words were incongruent because this required high CPA risk respondents to switch between positive and negative information sets. Findings from research examining individual differences in the extent to which positive and negative information is integrated are consistent with this possibility. For example, Graham and Clark (2006) found that individuals low in self-esteem were slower to make person judgments when the traits being judged alternated between positive and negative words. Lack of integration of positive and negative affective content also has been observed in individuals with borderline personality disorder (Cancienne, 1996); and is thought to underlie the phenomenon of “splitting” in which representations of self and others tend to vacillate between extremely positive and extremely negative characterizations.

Moreover, individuals with high CPA risk tend to have low self-esteem (McCurdy, 1995; Milner, 1994; Whissell et al., 1990), and borderline personality features have been noted as characterizing “abusive personalities” in research on intimate partner violence (Dutton, 2007). Thus, as is the case with individuals with low self-esteem, high CPA risk parents may tend to think of others in positive or negative terms (but not both at the same time); whereas low CPA risk parents may more often conceptualize others in both positive and negative terms. Results from the present study are consistent with this proposition; however, additional research is needed to further examine this possibility.

Although the precise mechanism underlying the slower responding to affectively incongruent face/word pairs remains an empirical question, it is clear that efforts to examine accessibility of positive and negative schema in high CPA risk parents would do well to take the possibility of incongruity effects into account. The methodology used in the present study (which involved numerous presentations of affectively incongruent stimuli) appears to have compromised our ability to detect the expected differences in accessibility of positive and negative interpersonal schema. Alternate methodologies, such as changing the task so that the response format required something other than a “yes” response (e.g., requiring positive/negative judgments such as that used by Fazio, 1995, 2001) and/or avoiding use of affectively incongruent prime-word pairs (e.g., using only neutral picture primes or blocking trials by affect type) may help reduce incongruity effects and result in a more sensitive test of affective schema accessibility.

Exploratory examination of the influence of child versus adult priming stimuli revealed that the pattern of findings observed in the present study may be more apparent in adult, versus child, relationships. Difficulty integrating positive and negative information has been found to be associated with relationship instability (Graham & Clark, 2006) and may contribute to high CPA risk parents’ difficulties in establishing stable, intimate and supportive adult relationships (Crouch et al., 2001; Thompson, 1995). The present findings suggest that it may be prudent to assess the extent to which high CPA risk parents have difficulty processing complex affective information as they attempt to relate to others, and that interventions promoting integration of positive and negative information may help to stabilize a high-risk parent’s support networks. For example, a number of techniques used in dialectical behavior training for borderline personality disorder (e.g., mindfulness skills such as increasing acceptance and nonjudgment; Linnehan & Dexter-Mazza, 2008) may prove useful in efforts designed to help high CPA risk parents increase buffering factors, such as supportive relationships with others.

Thus, the information processing patterns noted in the present study may indirectly affect CPA risk by increasing relationship stress and reducing stability in potentially supportive relationships, which in turn render the high-risk parent vulnerable to CPA perpetration. More specifically, difficulty processing affectively incongruent information may increase instability in adult relationships, which may serve to exacerbate a high-risk parent’s feelings of stress, as well as diminish their capacity to form stable relationships that could buffer the effects of stress on their parenting. Clearly, specification of the information processing patterns associated with CPA risk will undoubtedly involve understanding the complex interplay between information processing mechanisms and a variety of risk and protective factors (e.g., stress, social support) associated with CPA.
The present study has a number of limitations which warrant consideration. First, our high CPA risk sample was modest, which raises questions as to the extent to which our findings generalize to the larger population of at-risk parents. Moreover, given that CPA perpetration was not assessed in the present study, it is not clear whether the present findings generalize to abusive parents. Replication of this study with abusive parents would be informative, as would studies examining the extent to which the processing differences examined herein exist in high-risk individuals prior to any parenting experience. Further, the extent to which processes implicated in CPA risk generalize to other problems in caregiving (e.g., neglect) remains an empirical question. Finally, although our CPA risk groups did not vary with respect to educational attainment, it is nonetheless possible that they varied on other potentially confounding factors, such as attentional control, intelligence, and reading ability.

These limitations notwithstanding, the present study is noteworthy in that it extends paradigms common in the general social psychology literature to the study of individual differences in CPA risk. Given that the SIP model of CPA is still in the early stages of specification, a great deal of additional research is needed to clarify the cognitive processes that may be associated with CPA risk. Further, research is needed to clarify the extent to which risk potentiating processes might be specific to children versus more general deficits that impact social functioning more broadly. Ultimately, research paradigms connecting CPA risk status, information processes (e.g., schema accessibility, attentional control), and actual hostile, aggressive, and abusive behaviors are needed to advance our understanding of the role of information processes in CPA risk.

References


