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Emotion Knowledge in Young Neglected Children

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Abstract

Young neglected children may be at risk for emotion knowledge deficits. Children with histories of neglect or with no maltreatment were initially seen at age 4 and again 1 year later to assess their emotion knowledge. Higher IQ was associated with better emotion knowledge, but neglected children had consistently poorer emotion knowledge over time compared to non-neglected children after controlling for IQ. Because both neglected status and IQ may contribute to deficits in emotional knowledge, both should be assessed when evaluating these children to appropriately design and pace emotion knowledge interventions.

Keywords

neglect; preschool; emotion knowledge; development

Emotion knowledge (EK), the ability to discriminate expressions and understand the contexts in which emotions occur, helps children to understand others' behavior and is related to greater social and emotional functioning (Arsenio, 2003; Denham et al., 2002; Dodge, Laird, Lochman, Zelli, & Group, 2002; Izard et al., 2001). In this study, we examined early differences in EK among neglected children, a group at high risk for social and emotional problems.

It is reasonable to expect that maltreated children, who experience atypical parent-child interactions, will differ in their emotional socialization. Studies report differences in young children's emotion recognition, one aspect of EK, as a function of neglect and physical abuse that appear to reflect these children's socialization experiences (Camras et al., 1990; Camras, Grow, & Ribordy, 1983; Smith & Walden, 1999). Physically abused children were more accurate in recognizing anger expressions than nonmaltreated children, but were less likely to detect sad and happy expressions compared to comparison children (Pollak, Cicchetti, Hornung, & Reed, 2000; Pollak, Cicchetti, Klorman, & Brumaghim, 1997). Abused children were also more likely to overextend the anger label to ambiguous, nonanger contexts. Although abused children need less visual and auditory input to recognize anger, they needed more sensory input to recognize sad expressions (Pollak &

Kistler, 2002; Pollak, Klorman, Thatcher, & Cicchetti, 2001; Pollak & Sinha, 2002). Maltreated children may be more sensitized to anger expressions because they live in environments that provide frequent and salient examples of this emotion. Recognition and arousal differences between maltreated and comparison children in the processing of anger expressions may lead to a bias toward perceiving and attributing anger to social contexts. Such a bias is similar to the hostile attribution biases observed in children with histories of aggressive behavior (Dodge, Bates, & Pettit, 1990). Although the literature on EK in neglected children is more limited than that of physically abused children, studies consistently suggest that EK is likely to differ between neglected and comparison children. Neglected children are less accurate in their recognition of anger, less able to match expressions to contexts, and have poorer EK compared to nonmaltreated and abused children (Pollak, Cicchetti, Hornung, & Reed, 2001; Shipman, Edwards, Brown, Swisher, & Jennings, 2005). Neglected children also select sad expressions preferentially in ambiguous contexts compared to comparison children (Pollak et al., 2000; Pollak & Kistler, 2002; Pollak & Sinha, 2002). Neglected children may develop a perceptual bias toward sad expressions because neglecting mothers are likely to be depressed, thereby making sadness relatively frequent and salient (Chaffin, Kelleher, & Hollenberg, 1996; Zuravin, 1988). Alternatively, neglected children may show general deficits in EK (Edwards, Shipman, & Brown, 2005). Neglectful mothers are also less responsive to their children's emotions and provide them with a more limited emotion vocabulary than non-neglectful mothers, thus providing a poor environment for emotion learning (Hildyard, 2005). Adopted, formerly institutionalized children, who presumably had deprived early social environments, performed poorly on happy, sad, and fearful expressions but were able to identify and match anger expressions to context as well as comparison children (Wisner Fries & Pollak, 2004). These results support the general finding that early neglect is detrimental to emotion learning and are consistent with a social deprivation model of neglect.

The effect of intelligence (IQ) on the acquisition of EK also needs to be considered. Children from low-risk environments with intelligent mothers have been found to have greater EK than their peers (Bennett, Bendersky, & Lewis, 2005). Given that neglected children are likely to have poorer cognitive skills (Veltman & Browne, 2001), IQ should be controlled when examining differences in EK. Some studies have found differences between maltreated and comparison children's EK after controlling for verbal ability (Camras et al., 1990; Pollak et al., 2000), but many have not examined the role of general cognitive ability.

To date, most studies of EK have been cross-sectional. These studies find recognition of happy, sad, angry, and surprise expressions, but not fear and disgust, improves to near-adult level by age 5 (Camras & Allison, 1985; Michalson & Lewis, 1985; Widen & Russell, 2003). The ability to match expressions to appropriate social contexts also shows improvement by this age (Michalson & Lewis, 1985). Because rapid learning about emotions occurs during the preschool period, the present longitudinal study followed children from 4 to 5 years of age. We expected that change in EK over time would be a function of neglect, after controlling for IQ. Besides age change, we also were interested in whether there was any evidence of overextension of anger and sadness as a function of neglect. That is, do neglected children mislabel less familiar expressions as sadness or anger? We expected that neglected children would err by making more sad than anger responses based on previous research.

METHOD

Participants

From urban neighborhoods in central New Jersey and Philadelphia, 53 children participated as part of a larger longitudinal study examining emotional development in maltreated

children. All were recruited from preschool and community programs known to serve maltreated children and their families among their clients. Fliers were sent home from school or were distributed directly to parents. All parents signed consent forms indicating that the study was about children's emotional development and that Child Protective Services (CPS) records would be examined to verify whether they had a history of neglect or abuse. Foster children were excluded from the study as were children with a history of sexual abuse.

A total of 19 children (10 boys, 9 girls) were neglected as verified by CPS records. The remaining 29 children (15 boys, 14 girls) had no record at enrollment or 1-year follow-up and were the comparison group. Neglect was determined by at least one substantiated CPS report in the prior year and/or an open case record at the time of enrollment. Abstraction of the records, including all substantiated and unsubstantiated allegations, indicated that 15 cases had neglect but no physical abuse and four cases had a single instance of physical abuse in addition to neglect. Neglected children had an average of 2.4 ($SD = 1.39$) allegations of physical and/or supervisory neglect in their case records. Comparison children were matched to the maltreated children for age and city and had no CPS involvement.

Attrition—Longitudinal studies of high-risk samples typically have attrition (e.g., Lounds, Borkowski, & Whitman, 2006). Of the 49 children in this sample, 31 had complete data (12 neglected and 19 comparison). The children with missing data were from both the comparison (10) and neglected groups (7). To rule out the possibility that attrition might have influenced our results, multiple imputation (MI) was used to estimate the missing data points, allowing evaluation of the hypotheses for the full sample of children. MI has been shown to provide accurate statistical estimates based on available data (Schafer & Graham, 2002). The technique randomly estimates values for the missing data across a set of imputed datasets based on the data available for the full sample of children. In all, 10 imputations were conducted using AMELIA (version 2; <http://gking.harvard.edu/amelia>). Summary statistics on the imputed data sets were examined to assess the reliability of the maltreatment and IQ effects. The imputed data yielded very similar distributions of EK scores compared to the participants with complete data, so attrition does not appear to have biased the results.

Demographics—The neglected children in both the original and the final sample did not differ from the comparison children on child or demographic variables. Characteristics of the full sample and subsample ($n = 49$ vs. 31) on these variables were: gender (48% vs. 56%), minority status (86% vs. 85%), percentage with US-born parents (82% vs. 89%), English the primary language of the child (92% vs. 94%), maternal full-time employment (41% vs. 44%), mother married or cohabiting (51% vs. 56%), years of maternal schooling (12.0, $SD = 1.3$, vs. 11.8, $SD = 1.6$), and receiving any public assistance (64% vs. 69%). Neglected children came from homes with more children residing in the household than the comparison group (1.5, $SD = 1.0$, vs. 2.8, $SD = 1.7$). Overall, the sample was predominantly minority and African American (68%) with 14% Hispanic and 4% mixed minority heritage.

Procedures

Children were 48.4 months old on average when seen initially. The mean time between the age 4 and age 5 assessments was 12.4 months (± 5 months; age $M = 60.1$, $SD = 1.5$). There were no group differences in age at either time point. All children were administered the Test of Nonverbal Intelligence for Children to estimate IQ (TONI-3; Brown, Sherbenou, & Johnsen, 1997) as part of the longitudinal protocol in a separate visit following the final EK assessment.

EK—Three tasks were administered in a fixed order at each age: (a) labeling, (b) expression recognition, and (c) matching expressions to context. Scores for the tasks were correlated (4 years: $r = .30$ to $.54$; 5 years: $r = .41$ to $.79$; all p values $< .07$ or better) suggesting that a summary EK score was warranted. Scores for each task were standardized and then summed within age to yield a total EK score. Alpha coefficients for the EK scores were $.59$ at 4 years and $.75$ at 5 years. These coefficients represent an acceptable level of internal consistency and are comparable to that obtained for similar EK measures with young children (Denham et al., 2002). EK also showed cross-age stability ($r = .73$, $p < .01$).

Detailed stimulus descriptions and specific procedures for each task appear in Bennett et al. (2005) and Michalson and Lewis (1985) but are described briefly. Black and white photographs of a minority child (“Felicia”) depicted six facial expressions: happy, surprise, anger, sad, fear, and disgust taken from a standard set of independently verified Facial Action Coding System photographs previously used with children (Camras et al., 1988). Children were shown the photographs in a fixed order, beginning with “happy.” The examiner presented each photo and asked: “What kind of face is Felicia making? How does she feel?” Children were scored as correct if they gave the target label or acceptable synonyms such as “*mad*” for anger, “*scared*” or “*afraid*” for fear, “*shocked*” for surprise, and “*yucky*” or “*nasty*” for disgust. Scores could range from 0 to 6.

To assess recognition, all six photographs were randomly placed in front of the child and the examiner told each child to point to the target face. The examiner asked, “How does Felicia look when she’s ____?” Because the term “*disgust*” was unlikely to be known to children but the term “*yucky*” was, for the disgust expression, the examiner stated, “When Felicia sees something yucky.” After the complete series, the pictures were reshuffled and the task was repeated. The recognition score was the number of expressions correctly recognized on both trials, with scores ranging from 0 to 6. A correct response on both trials was required to insure that children’s choices were reliable.

To assess children’s ability to match expressions to context, the examiner read each child 10 brief stories, illustrated by black and white line drawings in which the facial expressions of the people were not shown (however, two newly piloted stories were added for this study; see Michalson & Lewis, 1985). To assess ability to link emotion expressions to contexts, all six expressions were again randomly arrayed at the beginning of each story. The examiner then told the child, “Show me the face will Felicia have in this story. What will she look like?” After the child pointed to a picture, the examiner said, “Good. Did Felicia make any other faces?” If children said “yes”, the examiner asked them to point to a second face. Selection of the target emotion for each context in response to either query was counted as a correct response. The score range was 0 to 10.

Overextension—To assess whether neglected children overextended recognition of anger and sad to less familiar expressions, their errors at age 5 were tabulated. Age 5 data was used because this reflected children’s best performance in terms of both mean trends in the EK scores and the percentage of correct responses (85% of the 5-year-olds correctly labeled these expressions and 60% correctly recognized them). Counts focused on the children’s misidentification of less familiar expressions, and tallied the number of times the anger or sad expression was selected in error when children were asked to point to surprise, fear, and disgust (range 0 to 6 for each error type). Happy was excluded from this tally because few children made errors in recognizing the happy expression, and none made anger or sad errors. By age 5 children also rarely confused anger and sad expressions (3% error for each expression). This procedure differs somewhat from the previous use of “ambiguous” expressions in the literature, but is a reasonable measure of overextension (i.e., the degree to which children may “misread” expressions).

IQ—TONI-3 (Brown et al., 1997) provided an IQ estimate. TONI-3 meets psychometric standards for reliability and validity and correlates well with other IQ measures, such as the WISC full scale and verbal IQ (Brown et al., 1997; Wiederholt & Rees, 1998). A language-unbiased measure of IQ was important in this study because of the inclusion of Hispanic participants, some of whom came from bilingual homes, and the nonverbal, visual perceptual skills involved in expression recognition.

RESULTS

EK and IQ were correlated at both ages ($r = .25$ at 4, and $r = .37$, $p < .05$ at 5). Table 1 shows the means and standard errors by maltreated status for all the variables in the study. All scores are expressed as z-scores. Although IQ was correlated with EK, there were no IQ differences by group.

Repeated measures ANOVAs were used to examine the EK scores with Age (4, 5) as a within-subjects factor, maltreatment group (C, N) as a between-subjects factor, and IQ as the covariate because of its correlation with EK. Covariate-adjusted means are reported. Although observed power for detecting maltreatment effects was reduced from .96 to .82 by including the IQ covariate, its inclusion was justified because of its relation with EK. The significance and effect sizes of neglect were not altered significantly when IQ was covaried (.31 vs. .25).

EK differed by group, $F(1, 27) = 8.78$, $p < .01$, partial $\eta^2 = .25$; power = .82. Neglected children had lower EK than comparison children (M difference estimate = 1.5, $SE = 0.28$, $p < .01$) IQ was a significant covariate, $F(1, 27) = 5.10$, $p < .05$, partial $\eta^2 = .16$, power = .59. Age was not a significant factor and no interaction of age and IQ was observed. Analyses of the separate EK components yielded the same pattern of effects and so will not be described in detail. The finding of group differences in the composite EK score held for each of the three components, labeling, visual recognition, and matching to context.

Error scores were highly correlated (.77, $p < .01$) and each was inversely related to IQ (−.40 for sad, $p < .05$; −.50 for anger, $p < .01$). Both anger and sad errors were inversely related to EK scores at age 5, sad errors more so than anger ($r = -.23$ for sad, $p < .12$; $r = -.13$ for anger). That is, higher total EK at age 5 was associated with less overextension of sad but not anger expression.

Overextension z-scores were examined in a repeated measures ANOVA with Error (anger, sad) as the repeated measure and group (2) as the between-subjects factor with IQ covaried. Although the means suggested that neglected children showed more total overextensions, there were no main effects of overextension type or group.

DISCUSSION

The results support the hypothesis that neglected children have an early deficit in EK compared to non-neglected children, controlling for IQ. Moreover, neglected children's deficit in EK was evident across all three components. Neglected children also recognized the fewest expressions and assigned few expressions to context appropriately. Thus, the data corroborates previous reports of neglected children's deficits in EK but also shows that it persists over time. This suggests that without intervention, neglected children will continue to show poor EK as they enter the school system at age 5. Presumably, such deficits can affect their interactions with teachers, peers, and their own emotion coping.

Neglected children did not mislabel expressions as sad more so than anger. Rather, they mislabeled less familiar expressions in the same way that non-neglected children did.

Although we saw no differences in overextension between comparison and neglected groups at age 5, studies of 3- to 6-year-old physically abused children have been found to differ both in their recognition and their sensitivity to anger cues (Pollak et al., 2000). Studies of differential sensitivity to anger cues in 4- to 5-year-olds have used physiological and attention measures (Pollak, Vardi, Putzer Bechner, & Curtin, 2005). Such measures may have an advantage in detecting more subtle evidence of sensitivity to particular expressions. The assessments used in the current study were designed to discover what children know about emotion given standard stimuli, rather than how they might “read” emotions in actual social interaction. Other assessment techniques may detect more subtle biases toward anger or sadness. Nonetheless, our findings suggest that overextension of either anger or sad does not occur in neglected children. Thus, anger bias may be specific to physically abused, and not neglected children.

Because children’s EK rapidly increases between ages 4 and 5, preventative interventions may be best targeted at this time. Neglected children may benefit from curricula that specifically describe and label all emotions, their appropriate contexts, and provide structured opportunities to discriminate and become sensitive to emotion expressions in context. A number of social-emotional curricula developed for general use with high-risk urban minority children include components addressing the understanding and expression of emotions but the impact of such general curricula has had limited study thus far (Joseph & Strain, 2003). Studies of their efficacy with neglected children in particular are needed, given the current findings of EK deficits because few well-designed, objectively evaluated interventions with neglected children have targeted EK specifically (Allin, Walken, & MacMillan, 2005). The assessment of EK in young maltreated children may also have clinical importance for identifying risk and targeting specific intervention needs. The techniques used here have the advantage of being simple to administer, understandable, and enjoyable for young children. They might prove useful as pre- and posttests for intervention programs targeting EK among young children.

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TABLE 1

Means and Standard Deviations of Emotion Knowledge of Preschool Children

Variable	<u>Not Maltreated (n = 19)</u>		<u>Neglected (n = 12)</u>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Emotion knowledge at 4 years	0.44	0.97	−0.60	0.48
Emotion knowledge at 5 years	0.30	0.95	−0.70	1.03
Average emotion knowledge	0.39	1.04	−0.66	0.59
IQ	94.5	8.45	90.2	8.50
Anger overextension	−0.24	0.89	−0.13	1.15
Sad overextension	0.07	1.04	0.38	0.85

NOTE: *N* = 31. All scores except IQ are expressed as *z* scores.