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Factor Structure of the Emotions as a Child Scale in Late Adolescence and Emerging Adulthood

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Abstract

Although the Emotions as a Child Scale (EAC) has been widely used in research with children and adolescents, no peer-reviewed studies have examined its factor structure using factor analytic methods. Likewise, the measurement equivalence of the scale across gender and race/ethnicity has never been investigated. To address these gaps, this study examines the factor structure of the scale in late adolescence and emerging adulthood, compares it to previous theory-driven models, and evaluates its measurement invariance across gender and 2 racial/ethnic groups. Participants were 1,087 individuals participating in a larger community-based study of adolescent health *(M* = 19.35 years, *SD* = 1.19). Results of exploratory and confirmatory factor analyses suggest that a 2-factor model from a shortened version of the scale (3 items were eliminated from each emotion scale), involving supportive and unsupportive socialization strategies, is a good alternative model to the original 5-factor structure for researchers interested in broader conceptualization of emotion socialization strategies. This 2-factor model of the shortened scale showed stronger measurement invariance across gender than racial/ethnic groups. Future studies addressing racial/ethnic differences with this measure should compare the results with and without imposing corresponding invariance constraints on noninvariant items. Findings of this study should be replicated in other age and racial/ethnic groups, and examine the predictive utility of the abbreviated 2-factor model for emotion-related outcomes across development.

Keywords

emotion socialization; factor structure; measurement invariance; late adolescence; emerging adulthood

Parents socialize their children's emotions by responding in certain ways to their children's emotions, expressing their own emotions, and communicating their own beliefs about emotional experience and display (Eisenberg, Cumberland, & Spinrad, 1998). Growing evidence shows that both indirect and direct processes of parental emotion socialization practices significantly influence children's emotional development (Klimes-Dougan &

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Zeman, 2007; O'Neal & Magai, 2005). In contrast to indirect emotion socialization strategies, such as parental modeling and parental expectancy communications (Klimes-Dougan et al., 2007), the current study focuses on the direct component of emotion socialization, that is, how parents respond to children's emotions. These responses provide feedback about the value and appropriate display of emotions (Nelson, O'Brien, Blankson, Calkins, & Keane, 2009), and represent the most influential method of direct emotion socialization (Eisenberg et al., 1998). In general, comforting parental responses to children's emotions are related to positive developmental outcomes, such as better emotion regulation skills, and more adaptive psychosocial functioning (Eisenberg et al., 1998; Morris, Silk, Steinberg, Myers, & Robinson, 2007). Conversely, punitive and dismissive parental responses are associated with more externalizing and internalizing problems (Dunsmore, Booker, & Ollendick, 2013; O'Neal & Magai, 2005). Finally, parental responses to negative emotions produce more opportunities for emotion socialization, and these responses are more useful for understanding the development of psychopathology (O'Neal & Magai, 2005; Shipman & Zeman, 2001). Therefore, the current study focused on socialization of three negative emotions most associated with externalizing and internalizing problems: anger, fear, and sadness (Byrne, 2000). These three emotions are included among the six basic emotions, besides happiness, surprise, and disgust (Ekman, 1992).

The Emotions as a Child Scale (EAC; Magai & O'Neal, 1997) is a commonly used measure assessing parental emotion socialization (Kehoe, Havighurst, & Harley, 2014; Sharp, Cohen, Kitzmann, & Parra, 2016; Silk et al., 2011). Across four emotions (anger, fear/anxiety, sadness, and shame), the scale assesses five dimensions of emotion socialization strategies that either encourage or discourage children's emotional expressions: Reward, Punish, Override, Neglect, and Magnify. Despite the scale's popularity, few studies have evaluated its factor structure. Additionally, the dimensions of this scale were grouped differently across studies (e.g., Garside & Klimes-Dougan, 2002; Klimes-Dougan, Brand, & Garside, 2001), so there is a need for evaluation and comparison of alternative factor structures that would inform future research with this scale. In addition, previous research indicates that perceptions of parental emotion socialization strategies differ by gender and race/ethnicity (Fivush, 1998; Pinderhughes, Dodge, Bates, Pettit, & Zelli, 2000). However, no studies have evaluated the measurement invariance of the EAC across gender and race/ethnicity. Thus, this study examines the factor structure of the EAC, compares it to previously used factor structures, and evaluates its measurement invariance across gender and race/ ethnicity, focusing on African American and European American youth.

The Emotions as a Child Scale

The Emotions as a Child Scale (EAC) was developed to measure how parents directly socialize their children's four common negative emotions—anger, fear/anxiety, sadness, and shame (Garside & Klimes-Dougan, 2002; Magai & O'Neal, 1997; O'Neal & Magai, 2005). Five core parental emotional socialization strategies were categorized that either encourage or discourage children's emotional expressions across each emotion scale. The first strategy, "Reward (or Support)," consists of parental behaviors that comfort, empathize, and assist the child in dealing with the issue that caused the emotion (e.g., "my parent helped me deal with the issue that made me sad"). The second strategy, "Punish," occurs when parents

discourage the child's emotional display, by behaviors such as expressing disapproval of the child's emotion, asking the child to stop feeling that way, and identifying the behavior as inappropriate for the child's age (e.g., "my parent let me know s/he did not approve of my being sad"). The third strategy, "Override," refers to parental behaviors that suppress the child's emotional expression by distracting or instructing the child to change the emotion (e.g., "my parent told me to cheer up"). "Neglect" is the fourth strategy and refers to parental behaviors that ignore the child's emotions (e.g., "my parent did not pay attention to my sadness"). The last strategy, "Magnify," consists of parental reactions that express strong emotions that may or may not mirror the child's emotion (e.g., "my parent/caregiver got very sad"). Each socialization strategy subscale consists of three items, for a total of 15 items per emotion. The current study focused on the anger, fear, and sadness scales of the EAC.

The EAC can be implemented through either parent report or youth report, which differ in the wording but not content of the items. This study used the youth version, where adolescents were asked to recall how parents responded to their emotions when they were children. An example item is "When I was angry, my parent/caregiver told me to cheer up." Although the validity of recalling information from childhood may be questioned, previous studies have shown that adults' reports of childhood parenting are moderately correlated with their parents' reports, and are consistent over time (Brewin, Andrews, & Gotlib, 1993; Leerkes, Supple, Su, & Cavanaugh, 2015).

This EAC is rooted in the functionalist perspective of emotions which posits that each discrete emotion has its own adaptive and regulatory functions (Campos & Barrett, 1984). For example, fear may act as a signal of danger or threat and activate appropriate coping behaviors (Steimer, 2002). Despite the importance of innate factors, the social environments, and parents in particular, provide the most extensive opportunities for children to learn and modify emotional triggers and associated responses (Tomkins, 1962). Especially, parents apply differential responses to children's discrete emotions (Izard, 1991; Tomkins, 1963, 1991), which may facilitate or discourage the expression of specific emotions over time. Under this framework, Malatesta-Magai and her colleagues (Malatesta & Wilson, 1988; Malatesta-Magai, 1991) proposed that parental emotion-specific socialization strategies influence how affective organizations develop, which is crucial to emotional well-being in children. The experience or expression of too much or too little of a particular emotion may put an individual at risk of emotion-related problems (Malatesta & Wilson, 1988).

Because of the emphasis on discrete emotions, one strength of the EAC is that the socialization of each negative emotion is measured separately. Indeed, measurement of emotion-specific socialization strategies has been more useful for identifying gender-typed parenting behaviors and links to psychopathology than a more global approach that combines socialization strategies across emotions (Fivush, 1998; O'Neal & Magai, 2005). Another strength of the EAC is that the measurement of emotion socialization is not limited to specific situations, but refers to parental responses to negative emotions in general. Scores on the EAC dimensions have acceptable levels of reliability and validity (Gar- side & Klimes-Dougan, 2002; Klimes-Dougan et al., 2001; Morris et al., 2007). For example, internal reliability of the five strategy subscale scores ranged from .66 to .94 in an adult

sample (Magai & O'Neal, 1997). Test-retest reliability for the five strategy subscale scores ranged from .49 to .86 among adolescents and young adults (Klimes-Dougan et al., 2001). Acceptable convergent validity was indicated by modest correlations between parent and youth reports (Kehoe et al., 2014).

Factor Structure of the EAC Scale

Several theory-driven models have been proposed for the scale. Based on Malatesta-Magai's model (Malatesta-Magai, 1991) that parents typically use five independent strategies (Reward, Punish, Override, Neglect, and Magnify) to socialize children's emotions, the five subscales are retained as separate factors (Model 1; Figure 1). Alternatively, two-factor models have been proposed based on the notion that emotion socialization strategies can be grouped as to whether they facilitate or inhibit children's emotional expressions (Magai & O'Neal, 1997). In one such model (Model 2; Figure 1), parental emotional socialization strategies expected to facilitate emotional expressions include items from Reward and Override subscales, whereas those expected to inhibit emotional expressions include items from Punish, Neglect, and Magnify subscales (O'Neal & Magai, 2005). In another theory-driven model (Model 3; Figure 1), Override is included among inhibitive strategies, whereas Magnify falls under facilitative strategies (Gar- side & Klimes-Dougan, 2002).

Surprisingly, there are no published peer-reviewed studies validating the factor structure of the EAC using factor analytic methods, with only an unpublished dissertation (Garside, 2004) and a conference poster (Klimes-Dougan et al., 2001) cited in the literature. Furthermore, these two studies have produced mixed evidence on the underlying structure of the EAC, with the major controversy focusing on the Override and Magnify dimensions (Klimes-Dougan et al., 2014). In support of both theory-driven models (Models 2 and 3), Reward has been found to be a facili- tative strategy, whereas Punish and Neglect have clustered together as inhibitive strategies (Garside, 2004; Klimes-Dougan et al., 2001). The unpublished factor analyses have identified Override as a supportive strategy (Klimes-Dougan et al., 2001), whereas some empirical studies found associations between Override and children's behavioral problems, questioning this classification (Hastings & De, 2008). Magnify is generally grouped with other supportive strategies for fear and sadness, but its role in anger is more ambiguous, perhaps because parental magnification of anger may be directed toward their child (Klimes-Dougan et al., 2001).

These inconsistencies between the theory-driven models of EAC and the two unpublished studies on factor structure of the EAC may have negative impact on the measure's validity and reliability, as well as comparability of results across studies, yet no investigation has compared previously described factor structures. In addition, previous studies utilizing this scale have focused mostly on infancy, childhood, and early adolescence (Denham et al., 2000; O'Neal & Magai, 2005), so less is known about the factor structure of the EAC in late adolescence and emerging adulthood. Yet, this developmental period is characterized by intense, extreme moods (Arnett, 1999, 2000) and high risk of emotional problems (Kessler et al., 1994). Late adolescent depression also predicts mental health problems in young adulthood and later in the life span (Cuijpers & Smit, 2004; Rao, Hammen, & Daley, 1999), making emotion socialization an important construct to study at this time. Further, given the

importance of discrete emotions (Fivush, 1998; O'Neal & Magai, 2005), examining factor structure of each emotion scale separately is more informative and flexible for studies focusing on discrete emotion socialization practices.

Measurement Invariance Across Gender and Race/Ethnicity

Evidence suggests that perceptions of parental emotion responses may differ by gender and race/ethnicity. Generally, boys report more negative parental responses to their expressions of fear (Casey & Fuller, 1994) and sadness (Fuchs & Thelen, 1988), but experience more tolerance of expressions of anger than girls (Fi- vush, 1998). Previous research also indicated that boys are more likely to report punishment for their expressions of anger, fear, and sadness, whereas girls are more likely to report support for their expressions of fear (Garside & Klimes-Dougan, 2002). In addition, parents generally discuss emotions with their daughters more than with their sons and tend to discourage anger in their daughters (Klimes-Dougan et al., 2007). These differences in parental socialization strategies will likely be reflected in boys' and girls' differential experiences and perceptions of emotion socialization.

Racial/ethnic differences on emotion socialization also have been suggested (Montague, Magai, Consedine, & Gillespie, 2003). Cultural context influences caregivers' beliefs and expectations about appropriate displays of emotions as well as endorsed socialization strategies (Friedlmeier, Corapci, & Cole, 2011). For instance, African American parents tend to use more physical punishment than European American parents (McGroder, 2000; Pinderhughes et al., 2000). Because parental discipline is an important part of children's socialization, many researchers have speculated that the harsh discipline might contribute to greater emotion inhibition and self-isolation in African American children (Consedine & Magai, 2003; Plasky & Lorion, 1984). However, some have speculated that more stringent and harsh discipline is beneficial and adaptive within African American families, as it may better protect children in unstable and challenging environments (Pinderhughes et al., 2000). Thus, it is possible that emotion socialization strategies also vary by race/ethnicity, especially between African American and European American families.

Despite research suggesting gender and racial/ethnic differences in emotion socialization, existing studies have not assessed measurement invariance across these groups. Measurement invariance assumes that the instrument measures the same constructs that can be interpreted in the same way across population subgroups (Byrne & Watkins, 2003). The different types of measurement invariance include configural, metric, scalar, and residual variance invariance (Wu, Li, & Zumbo, 2007). Previous research has demonstrated that each type of measurement invariance plays an essential albeit different role in the validity and reliability of heterogeneous group comparisons (Chen, 2008). Without the premise of measurement invariance, artifacts of measurements may obscure true group differences (Byrne & Stewart, 2006; Chen, 2008; Cotter, Evans, & Smokowski, 2015).

Given the lack of published studies examining the factor structure of the EAC, as well as no research on its factor structure in late adolescence and emerging adulthood and its measurement invariance across gender and race/ethnicity, the present study aims to (a)

explore the factor structure of the EAC (youth-report version) in late adolescence and emerging adulthood; (b) compare the factor structure of the anger, fear, and sadness scales to previously described theory-driven factor structures; and (c) evaluate measurement invariance of the EAC across gender and race/ethnicity. In addition, we examined the convergent validity of the best fitting model scores with a measure of parent-child connectedness.

Method

Participants

Participants were 1,087 adolescents and young adults (*M* age = 19.35 years, *SD* = 1.19; range = 16–23; 58% were 16–19 years old and 42% were 20–23 years old) participating in a larger community-based study of adolescent health (Windle et al., 2004). Participants were recruited from fifth grade classrooms in public schools in a large city in the Southeast U.S. (Birmingham, Alabama) and followed throughout adolescence and emerging adulthood. Because perceived emotion socialization was assessed only at the last wave (Wave 4), data from previous assessments are not included in this report. Of the current participants, 49.8% (*n* = 541) were male and 50.2% (*n* = 546) were female. Approximately 61.4% (*n* = 667) of participants were African American, 35.7% (*n* = 388) were European American, and 2.9% (*n* = 32) were other races/ethnicities.

Procedures

All study procedures were approved by the University of Alabama at Birmingham Institutional Review Board. After providing informed consent, each participant was interviewed individually by a trained interviewer using computer-assisted technology. During the last wave (Wave 4) of the study, most participants were interviewed in person at a university research lab, but a small portion of individuals who had moved away from the local area (9%) were interviewed over the phone.

Measures

Emotions as a Child Scale (EAC; Youth report).—The EAC(Magai & O'Neal, 1997) was used to measure youth-reported parent/caregiver emotion socialization practices for anger, fear, and sadness (15 items for each emotion). Participants were asked to rate how often their parent responded to each emotion when they were children on a scale ranging from 1 *(never)* to 5 *(very often).* Each emotion scale includes five subscales of three items each: Reward (e.g., "comforted me"), Neglect (e.g., "focused on me"; reverse-coded), Override (e.g., "told me to cheer up"), Punish (e.g., "let me know s/he did not approve"), and Magnify (e.g., "got very sad"). Higher scores reflect greater use of each socialization strategy. For the anger scale, Cronbach's as in the current study were .82, .58, .68, .57, and .77 for the Reward, Neglect, Override, Punish, and Magnify subscale, respectively. For the fear scale, Cronbach's s were .84, .68, .63, .50, and .75, respectively. For the sadness scale, Cronbach's as were .83, .74, .65, .54, and .66, respectively. Considering the multidimensional nature of the EAC, McDonald's Omega values were also examined: For the anger scale, McDonald's Omegas were .82, .38, .70, .60, and .73 for the Reward, Neglect, Override, Punish, and Magnify subscale, respectively. For the fear scale,

McDonald's Omegas were .84, .53, .68, .60, and .75, respectively. For the sadness scale, Cronbach's as were .83, .43, .67, .60, and .67, respectively.

Parent-child connectedness scale.—Participants reported the quality of their relationships with their parents using a 5-item parent-child connectedness scale (Resnick et al., 1997). Sample items include, "How close do you feel to your parents?" and "Most of the time, your parents are warm and loving toward you." Responses were rated on a 5-point scale ranging from 1 *(not at all*) to 5 *(very much)* or from 1 *(strongly agree)* to 5 *(strongly disagree).* Cronbach's a was .81 in the current study.

Data Analyses

Descriptive statistics were first performed on the entire sample. To increase the generalizability of the results, the data were randomly divided into two samples. Sample 1 had 547 participants and Sample 2 had 540. The two samples were equivalent in age (p = . 95), gender (p = .38), and race/ethnicity *(*p = .20). Sample1 was randomly chosen for exploratory factor analyses (EFAs), whereas Sample 2 was used for confirmatory factor analyses (CFAs) and tests of measurement invariance across gender and race/ethnicity.

Using SPSS 22.0, the EFAs were conducted on Sample 1 to explore the factorial structure of the measure separately for the three emotions scales: anger, fear, and sadness. Factorability of the items was first examined with item intercorrelations, the Kaiser- Meyer-Olkin Measure of Sampling Adequacy (KMO), and the Bartlett's test of sphericity. Then, EFA was conducted using principal axis factor extraction and oblique rotation. If factor correlations were less than .32, the EFA would be rerun with orthogonal rotation (Tabachnick & Fidell, 2007). Multiple criteria were utilized to inform factor retention, including (a) eigenvalues >1 (Kaiser, 1960), (b) the scree test (Cattell, 1966), and (c) Horn's parallel analysis (HPA; Horn, 1965). Among these approaches, HPA tends to be the best criteria for determining the number of factors (Frazier, Youngstrom, Glutting, & Watkins, 2007; Velicer, Eaton, & Fava, 2000). For a final factor solution, several items were eliminated based on low factor loadings (<.40), low communalities (≤.30), or cross-loadings across factors (>.40). Cronbach's a was used to examine internal consistency of the final factors. Detailed information on the dropped items and internal consistency of the final factors is provided in the Results section under EFA.

Following the EFAs, CFAs with maximum-likelihood (ML) estimation were conducted on Sample 2 in Mplus 7.0 (Muthén & Muthén, 2012) to compare alternative factorial structures and to test measurement invariance of the measure. These analyses were then rerun with the weighted least squares with mean and variance adjustment (WLSMV) estimation because of violations of normality. First, comparisons were made among four nonnested models: the original five-factor solution (Model 1), the two theory-driven models (Models 2 and 3), and the Model indicated by the EFAs. The factors were allowed to correlate in each model. Based on the recommendation of Hu and Bentler (1998), the following indices were used to evaluate model fit: Comparative Fit Index (CFI; Bentler, 1990), Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), root-mean-square error of approximation (RMSEA; Steiger & Lind, 1980), and standardized root-mean-square residual (SRMR; Bentler, 1995). Among those

four indices, TLI and RMSEA are less sensitive to sample size (Sharma, Mukherjee, Kumar, & Dillon, 2005). Good fit was indicated by CFI and TLI ≥.95 and SRMR and RMSEA ≤ .05; acceptable fit was suggested by CFI and TLI ≥.90, SRMR ≤.10, and RMSEA ≤08 (Marsh, Hau, & Wen, 2004; Schermelleh-Engel, Moosbrugger, & Muller, 2003). Independent samples t test was used to examine age differences (late adolescents vs. emerging adults) in reports of emotion socialization strategies using the best fitting model. Convergent validity of the best fitting model scores was examined with Pearson's correlations with parent-child connectedness.

Finally, measurement invariance across gender and race/ethnicity (African American vs. European American) was evaluated for the final model using multiple Group CFAs (Millsap & Yun-Tein, 2004). A sequence of model comparisons between the nested models were performed by constraining a set of parameters in an increasingly hierarchical order (Wu, Li, & Zumbo, 2007), testing the following: (a) Configural invariance evaluates whether the same factor model exists across groups. In this situation, the parameters are free to vary across groups. It serves as the baseline model for higher levels of invariance to be examined. (b) Metric invariance tests whether the factor loadings of a construct are equal across groups, which shows that the strength of relations between individual items and their corresponding underlying constructs are the same across groups. It is evaluated by comparing the metric invariance model with the configural invariance model. (c) Scalar invariance specifies both intercepts and factor loadings to be equivalent across groups, which implies that no systematic response biases exist across groups. Comparison is made between the metric invariance model and the scalar invariance model. Factor means can be compared when scalar invariance is achieved. (d) Residual variance invariance is the most constrained model in which the variance of item residual is equal across groups in addition to factor loadings and intercepts. It implies that the latent construct is measured with the same degree of measurement error in both groups. Residual variance invariance is investigated by comparing the residual variance invariance model with the scalar invariance model. In addition to x^2 difference test, the following criteria recommended by Chen (2007) were applied: For testing metric invariance, a change in CFI of ≥ —.010, supplemented by a change in RMSEA of ≥ .015 or a change in SRMR of ≥ .030, would indicate noninvariance; for testing scalar and residual variance invariance, a change in CFI of ≥ —.010, supplemented by a change in RMSEA of ≥ .015 or a change in SRMR of ≥ .010, would indicate noninvariance. Partial measurement invariance was tested if full invariance was not satisfied in each step. The modification index was used to identify noninvariant items, with the large modification indices indicative of noninvariance (Bagheri, Jafari, Tashakor, Kouhpayeh, & Riazi, 2014). In this situation, the equality constraints on the parameter of the item with the largest modification index value is freed one at a time through an iterative process (Byrne, Shavelson, & Muthén, 1989).

Results

Exploratory Factor Analyses

Means and *SD*s of the EAC items on the entire sample are displayed in Table 1. Sample 1 data was then used to explore the factorial structure of the EAC. Factorability of the 15

emotion socialization items was supported for each emotion scale by a number of correlations greater than .30, KMO values of .88 to .90 (above the recommended value of .60; Kaiser & Rice, 1974), and significant Bartlett's tests of sphericity ($x^2_{(1o5)} = 3259.77$ to 3772.39, all $p < .001$).

Anger scale.—The criterion of eigenvalue greater than 1 suggested the extraction of three factors accounting for 32.28, 19.34, and 7.29% of the total variance, respectively. However, the eigenvalue of the third factor (1.09) was only slightly greater than 1, making the retention of the third factor an arbitrary decision (Zwick & Velicer, 1986). The scree plot showed a significant slope change after two factors, indicating a two-factor solution. In addition, HPA showed that only the first two eigenvalues were greater than the 95th percentile eigenvalues from random data, indicating the presence of two factors. Given these results, two factors were retained.

Over several runs of the EFA, three items were eliminated because of low communalities (<.30; Items 10, 14), and crossloadings (>.40; Item 2). The EFA was repeated with the remaining 12 items, yielding two factors with 7 and 5 items, respectively. Factor 1 included items from 3 dimensions: Reward (Items 3, 6, 15), Neglect (Items 1, 12), and Override (Items 7, 11). Therefore, the first factor was named "supportive responses." Factor 2 included items from the remaining two dimensions: Punish (Items 5, 9) and Magnify (Items 4, 8, 13). Thus, the second factor was named "unsupportive responses." Cronbach's as for the supportive and unsupportive responses subscales were .90 and .76, respectively. Overall, the two factors accounted for 58.23% of the total variance. All items had factor loadings above .55 and were free from cross-loadings. The factor loadings for the original 15-item solution and the final 12-item solution are presented in Table 2, together with eigenvalues and percentages of variance explained by each factor.

Fear scale.—Eigenvalues of two factors were greater than 1, with the first factor accounting for 35.74% and the second factor for 19.71% of the total variance. In addition, both the scree test and HPA suggested a two-factor solution. Therefore, two factors were retained.

Based on the EFA results, Item 10 was dropped because of low communalities (= .30). Item 2 and 14 were dropped because Cronbach's a increased with the two items excluded. In addition, both items had low correlation with the composite score of the other items (the corrected item-total correlation for Items 2 and 14 were .52 and .34, respectively). The EFA was repeated with the remaining 12 items. The factorial structure of the Fear scale mirrored that of the Anger scale. Thus, Factor 1 was named supportive responses and Factor 2 was named unsupportive responses. Cronbach's as were .91 and .76 for the supportive and unsupportive responses subscales, respectively. Overall, the two factors accounted for 61.93% of the total variance. All items had factor loadings above .55 with no cross-loadings. The factor loadings, eigenvalues and variance explained by each factor for the original and final solutions are presented in Table 2.

Sadness scale.—A three-factor solution was indicated by eigenvalues greater than one, with the first factor accounting for 35.86%, the second factor for 15.53%, and the third

factor for 7.75% of the total variance. Similar to the Anger scale, the eigenvalue of the third factor (1.16) was close to 1, not providing strong support for retaining this factor. Both the scree test and HPA suggested a two-factor solution. Given these results, a two-factor solution was adopted.

Over several runs of the EFA, Item 10 was dropped because of low communalities (<.30) and low factor loading (<.40). Item 14 was dropped because Cronbach's a increased with the item excluded. In addition, Item 14 had low correlation with the composite score of the other items (the corrected item-total correlation for Item 14 was .51). Item 2 showed the lowest communalities (.32) and factor loading (.45) after the elimination of Items 10 and 14. Additionally, subsequent analyses showed great increase in model fit with Item 2 excluded. Considering that elimination of Item 2 also contributed to the consistency of the EAC, Item 2 was dropped from the final model. In the final solution, 7 and 5 items loaded on Factor 1 and Factor 2, respectively. The factorial structure of the Sadness scale paralleled those of the Anger and Fear scales. Thus, Factor 1 was named supportive responses and Factor 2 was named unsupportive responses. Cronbach's αs were .90 and .69 for the supportive and unsupportive responses subscales, respectively. Overall, the two factors accounted for 57.36% of the total variance. All items had factor loadings above .50 with no cross-loadings. The factor loadings, eigenvalues and variance explained by each factor for the original and final solutions are presented in Table 2.

Overall, the EFAs indicated identical two-factor structures across anger, fear, and sadness scales. The first factor supportive responses included items from three dimensions: Reward (Items 3, 6, 15), Neglect (reverse-coded items; Items 1, 12), and Override (Items 7, 11). The second factor unsupportive responses included items from the remaining two dimensions: Punish (Items 5, 9) and Magnify (Items 4, 8, 13).

Confirmatory Factor Analyses

Results of the EFAs showed a two-factor model (Model 4; Figure 2); however, it is not consistent with both theory-driven models (Model 2 and 3). The two reverse-coded Neglect items (1 and 12) were included among supportive strategies in Model 4, whereas the Neglect subscale fell under unsupportive strategies in Models 2 and 3. However, similar to Model 2, Override was grouped as a supportive strategy and Magnify as an unsupportive strategy in Model 4.

Comparisons were made among the original five-factor solution (Model 1), the 2 two-factor theory-driven models (Model 2 and 3), and the two-factor EFA solution (Model 4) using Sample 2 data. First, the four structures were compared using the original 15-item scale. Next, model fit indices on the abbreviated scale were also compared. The better fitting models from the 15- and 12-item versions were then compared. As shown in Table 3, the five-factor solution (Model 1) for the abbreviated scale had the best model fit, but the model fit of the two-factor abbreviated EFA solution (Model 4) was also adequate (sadness scale had the lowest model fit among the three emotion scales, but was still marginally ac ceptable). The model fit of the other two-factor models (Model 2 and 3) was poor. However, the Cronbach's as for some subscales of the abbreviated five-factor model were below acceptable levels (e.g., .52 to .56 for the Punish subscale; Table 4). Although these low

values could be because of some scales only having two items, they remained unacceptable even in the full model with three items per subscale (e.g., .50 to .57 for the full Punish subscale). In addition, since three items were dropped from each emotion scale, there were only two items loading on most dimensions of the abbreviated five-factor model (i.e., Neglect, Override, and Punish). Because a minimum of three items are recommended for each factor of a multidimensional scale (Raubenheimer, 2004), the second best fitting model (the abbreviated Model 4) was retained for further analyses. Because of violations of normality according to the Mardia's test of normality across the three emotion scales (ps < .01), the analyses were rerun with WLSMV estimation and the pattern of results was identical. Finally, there were few differences in emotion socialization strategies reported by late adolescents (ages 16–19) and emerging adults (ages 20–23) using abbreviated Model 4; the two groups only differed on unsupportive responses to anger, which were slightly lower in the younger group ($M_{younger}$ = 12.06, SD = 4.15; M_{older} = 12.63, SD = 3.98; $t(1085)$ = 2.29, p = .02).

Convergent Validity

Items from the abbreviated Model 4 were summed to form supportive and unsupportive parental response subscales across the three emotions. Perceived supportive parental responses across all three emotions were moderately correlated with parent-child connectedness (anger: r = .43, p < .01; fear; r = .37, p < .01; sadness: r = .47, p < .01). In addition, perceived unsupportive parental responses to anger were negatively correlated with parent-child connectedness, r = —.15, p < .01, although perceived unsupportive responses to fear and sadness were not related to parent-child connectedness (fear: r = —.002,p = .95; sadness: r = —.04, p = .20). These results support the convergent validity of the Model 4 scale scores, particularly the supportive parental responses scale scores.

Measurement Invariance

Gender and race/ethnicity measurement invariance were evaluated for the abbreviated Model 4 for the anger, fear, and sadness scales using Sample 2 data. All fit indices of the measurement invariance models by gender are presented in Table 5, and for invariance by race/ethnicity in Table 6.

Gender invariance.—As shown in Table 5, the configural invariance model fit the data well for the anger, fear, and sadness scales. The fit index values supported full metric invariance (equal factor loadings) in all three emotion scales across gender: ΔCFI < .01, ΔRMSEA < .01, and ΔSRMR < .02. These results imply that the associations of all items with their corresponding latent construct (supportive or unsupportive emotion socialization strategies) are equivalent across gender. Next, full scalar invariance (equal intercepts and factor loadings) was supported by values of ΔCFI, ΔRMSEA, and ΔSRMR less than .01. Finally, the residual variance invariance model (equal residual variance, intercepts, and factor loadings) did not result in a significant loss of model fit over the scalar invariance model in all three emotion scales: ΔCFI, ΔRMSEA, and ΔSRMR were all less than .01 for anger and sadness scale; ΔCFI = .01 for fear scale, but ΔRMSEA and ΔSRMR were both less than .01. In addition, tests of mean differences indicated lower endorsement of

unsupportive responses to anger and higher endorsement of supportive responses to fear in women compared with men (see Table 7).

Race/ethnicity invariance.—Because 97.1% of current participants were African American or European American, measurement invariance across race/ethnicity was conducted in these two subgroups only. As shown in Table 6, the configural fit indices indicated an acceptable fit for all three emotion scales. Metric invariance (equal factor loadings) was fully supported for the anger and fear scales, with ΔCFI < .01, ΔRMSEA < .01, and ΔSRMR < .02. However, ΔCFI > .01 for the sadness scale implied that full metric invariance was not present. Modification indices indicated that Item 7 "told me not to worry" had factor loadings that varied across groups. After allowing loadings of Item 7 to vary across groups, partial metric invariance of the sadness scale was met: CFI < .01, ΔRMSEA < .01, and ΔSRMR < .02. Item 7 had a higher loading on the sadness supportive scale for African American individuals (.65) compared with European Americans (.40).

The scalar invariance model (equal intercepts and factor loadings) resulted in a noticeable loss of fit over the metric invariance model for all three emotion scales: ΔCFI ≥ .01. Using modification indices as a guide, Item 11 "told me to cheer up" on all three emotion scales and Items 7 "not to worry" and 9 "no approval of the emotion" of the sadness scale were relaxed from the equality constraints of intercepts, resulting in partial scalar invariance for the three emotion scales: ΔCFI, ΔRMSEA, and ΔSRMR were all less than .01. Noninvariant intercepts of the above items indicated that there were systematic measurement biases that influenced the way participants responded to items across groups. Specifically, African American individuals reported higher levels of parental responses of "cheer up" to anger, fear, and sadness. They also reported higher level of parental responses of "not to worry" and "no approval of my being sad" to sadness.

Finally, invariance of partial residual variance was met by relaxing the equality of the residual variance of most items except for Items 5 "I acted younger than my age," 6 "asked me the reason," 7 "not to worry," 8 "parent expressed anger," 12 "focused on me," and 15 "comforted me" of the anger scale; Items 5 "I acted younger than my age," 6 "asked me the reason," 7 "not to worry," and 9 "no approval of my fear" of the fear scale; and Items 1 "responded to my sadness," 4 "parent got very sad," 8 "parent expressed sadness," and 15 "comforted me" of the sadness scale. Specifically, European Americans had lower measurement error for all the noninvariant items than African Americans, except for Items 7 "not to worry" of sadness scale and 11 "cheer up" across the three emotion scales (see supplemental Table S1). In addition, because different levels of partial measurement invariance existed for all three emotion scales, latent means were further compared both with and without imposing invariance constraints on noninvariant items across racial/ethnic groups. As shown in Table 7, the same pattern of results was obtained under both conditions. Specifically, African Americans and European Americans did not differ in endorsement of anger socialization strategies, but African Americans reported lower levels of supportive responses to fear and higher levels of unsupportive responses to fear and sadness.

Discussion

This is the first study examining the factor structure of the EAC in late adolescence and emerging adulthood, comparing it to previously described factor structures, and evaluating measurement invariance of the scale across gender and two race/ethnicity groups (African American vs. European American). The results suggest that the abbreviated two-factor EFA solution (supportive and unsupportive socialization strategies; Model 4 in Figure 2) is a good alternative model for late adolescence and emerging adulthood to the original five-factor structure that had poor internal consistency for most subscales. Measurement invariance of this two-factor EFA solution (Model 4) over gender showed full measurement invariance for all three emotion scales. Different levels of partial measurement invariance were observed for the three emotion scales across race/ethnicity.

Consistent with previous theory-driven models, results of factor analyses confirmed a two-factor structure of the EAC. One major difference of the current model (Model 4) from previous theory- driven two-factor models (Models 2 and 3) is that items from the Neglect dimension factored under supportive strategy in Model 4. Specifically, this occurred for the two reverse-coded Neglect items (e.g., responded to my anger; focused on me), so it is not surprising that these items clustered together with other supportive strategies. By contrast, the third Neglect item (did not pay attention) was dropped because of low communalities and low factor loading (anger scale) or low correlation with the composite score of the other items (fear and sadness scales), suggesting that the Neglect subscale may be problematic because of the combination of reverse-coded and nonreverse-coded items (as also indicated by low Cronbach's as of .58 to .74). Overall, elimination of this and two other items greatly improved the fit of Model 4, as well as the original five-factor model (Model 1). Future research should validate the performance of this shortened scale and examine the test-retest reliability of the revised measure. In addition, although the model fit of the sadness scale (Model 4) was not as good as the fit of the anger and fear scales, it was still marginally acceptable. Finally, convergent validity of Model 4 scale scores was acceptable. In general, our findings suggest that perceived emotion socialization can be divided into two separate types of strategies that occur across all three emotions: supportive and unsupportive socialization strategies.

Measurement invariance analyses provide some useful insights into the measurement properties of the EAC. Full measurement invariance across gender was supported for all three emotion scales, suggesting that results from the three emotion scales can be interpreted in the same way for men and women. In addition, comparisons of latent means revealed lower endorsement of unsupportive responses to anger and higher endorsement of supportive responses to fear in women compared with men, contrary to some prior research indicating that women are more discouraged from expressing anger than men (Klimes-Dougan et al., 2007). It is possible that men experience more tolerance of anger expressions than women, but because they display anger more frequently or more overtly, they report unsupportive parental responses more frequently than women (Garside & Klimes-Dougan, 2002). Overall, the evidence suggests strong measurement invariance for the EAC across gender.

Analyses across race/ethnicity showed that different levels of partial measurement invariance existed for all three emotion scales. The sadness scale showed partial metric invariance with Item 7 “told me not to worry” being noninvariant. Factor loading differences indicated that this item was more related to the “supportive” dimension in African American than in European American participants. This discrepancy may be explained by greater use of harsh discipline in African American families (Pinder- hughes et al., 2000), which may make “override” parental responses perceived as more supportive compared with European American families. In addition, all three emotion scales were observed to be partial scalar invariant. It is worth noticing that Item 11 “told me not to worry” of the sadness scale and Item 11 “told me to cheer up” of the three emotion scales demonstrated intercept noninvariance. Both items were from the “override” dimension of the original five-factor Model. Specifically, African American participants tended to report higher levels of parental responses of both “do not worry” and “cheer up,” as well as “did not approve” of sadness. The scores on most of these items also had lower measurement error among the African American participants. Together with the partial metric invariance of the “do not worry” item, these differences suggest that African American parents may be more likely to utilize override socialization responses and do so more consistently. Given the paucity of research on emotion socialization in African American culture (Cole & Tan, 2007), it would be interesting to directly examine the role of override parental responses in African American adolescent’s emotion socialization processes in future research. In addition, it would be important to replicate the present invariance results, as the theoretical significance of some items’ lack of invariance was not clear.

Further comparisons of latent means provide meaningful information. In this study, African Americans reported lower levels of supportive responses to fear and higher levels of unsupportive responses to fear and sadness; however, they did not differ in endorsement of anger socialization strategies. Although studies of racial/ethnic differences in emotion socialization are rare (Nelson, Leerkes, O’Brien, Calkins, & Marcovitch, 2012), our findings demonstrated the importance of considering emotion socialization practices and goals within cultural context (Cole & Tan, 2007; Halberstadt et al., 2013). For instance, one study found that the display of submissive negative emotions, especially fear and sadness, is viewed as less acceptable in African American families, and elicits more negative consequences than in European American families (Nelson et al., 2012). This is consistent with our results suggesting less supportive and more unsupportive parental responses to fear and sadness reported by African American youth. It is possible that African American parents’ attempts to suppress their children’s submissive negative emotions are adaptive, for instance, by helping to prepare the children for dealing with unstable and chronically stressful environments (Leerkes et al., 2015). Indeed, unsupportive emotion socialization was associated with more depressive symptoms in European American but not for African American children and women (Leerkes et al., 2015; Vendlinski, Silk, Shaw, & Lane, 2006), further indicating that these culturally specific strategies may be adaptive. An interesting find was that unsupportive emotion socialization was related to elevated anger in both ethnic groups (Leerkes et al., 2015), which is consistent with our results of no ethnic differences in the levels of supportive and unsupportive emotion socialization for anger. Future studies should provide more in-depth examination of parental beliefs and responses to different

types of negative emotions, as well as the adaptability of each emotion specific socialization strategy in different cultural contexts.

The current study has important implications for future emotion socialization research. The results demonstrate that the EAC is an appropriate measure to make comparisons across gender, at least in late adolescence and emerging adulthood. In addition, despite greater extent of measurement variance, the EAC appears to be a useful measure for studying racial/ethnic differences in emotion socialization. It should be noted that guidelines for dealing with noninvariant items remain unresolved in the literature (Cotter, Evans, & Smokowski, 2015). Chen (2008) recommends comparing the groups of interest with and without imposing corresponding invariance constraints on noninvariant items. If the differences are small, it may be appropriate to make group comparisons. In the current study, the results for latent mean comparisons yielded similar results when all the noninvariant items were constrained to be equal across racial/ethnic groups (see Table 7). To account for violations of measurement invariance, future studies addressing racial/ethnic differences with this measure should compare the results after allowing noninvariant items to vary and after fixing all items to be equal. Further, the present study found moderate correlations between perceived supportive and unsupportive parental responses in the two-factor EFA model. This suggests that there may be common underlying constructs between the two types of perceived parental responses that need further examination. Finally, future studies may wish to utilize the abbreviated two-factor EFA structure of the EAC (Model 4), which was the best fitting and reliable model in this study.

Findings of this study should be considered in light of its limitations. First, participants were recruited from one metropolitan area in the Southeast United States, so the results may not generalize to other geographic areas or cultures. Second, we only evaluated measurement invariance of the EAC across two race/ ethnicity groups (European American vs. African American). Future studies should examine the measure's invariance for other racial/ethnic groups (e.g., Hispanic/Latino). Third, the current study used youth report that relies heavily on the recall of childhood information, whose accuracy might be influenced by the linguistic and cognitive skills of the participants (Klimes-Dougan & Zeman, 2007). Finally, the study was conducted in a cohort that is older than the cohorts used in prior studies (Denham et al., 2000; O'Neal & Magai, 2005). Therefore, the abbreviated two-factor EFA structure may be an outcome of developmental changes. For example, it is possible that late adolescents and emerging adults' memory becomes more homogenized over time relative to the younger samples in prior research. It is also possible that late adolescents and emerging adults tend to report parenting in a more generalized way. However, there were few differences in emotion socialization strategies reported by late adolescents (ages 16–19) and emerging adults (ages 20–23) in this sample. Nevertheless, future research should examine measurement invariance of the two-factor EFA structure across various developmental periods. Finally, the final model selected for invariance testing (Model 4) had only acceptable or marginally acceptable fit for fear and sadness, compared with excellent fit for anger.

Despite these limitations, this study adds to the literature by exploring the factor structure of the EAC and comparing it to previously described factor structures. The two-factor EFA model from an abbreviated version of the scale, involving supportive and unsupportive

socialization strategies, is a good alternative model to the original five-factor structure for researchers interested in broader conceptualization of emotion socialization strategies. Our findings are also noteworthy in evaluating measurement invariance of the EAC across gender and race/ethnicity, which has been understudied in prior research. Although the noninvariant items need further evaluation in future research, the EAC is well suited for studying gender and racial/ethnic differences in emotion socialization. Future research should replicate these results in other age and racial/ethnic groups, and examine the predictive utility of the abbreviated two-factor model for emotion-related outcomes across development.

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Public Significance Statement

This study suggested that a 2-factor structure (supportive and unsupportive socialization strategies) of the shortened Emotions as a Child Scale (EAC) is a good alternative to the original 5-factor structure in the population of late adolescence and emerging adulthood. Additionally, the shortened EAC is a useful measure for studying gender and racial/ethnic differences in emotion socialization.

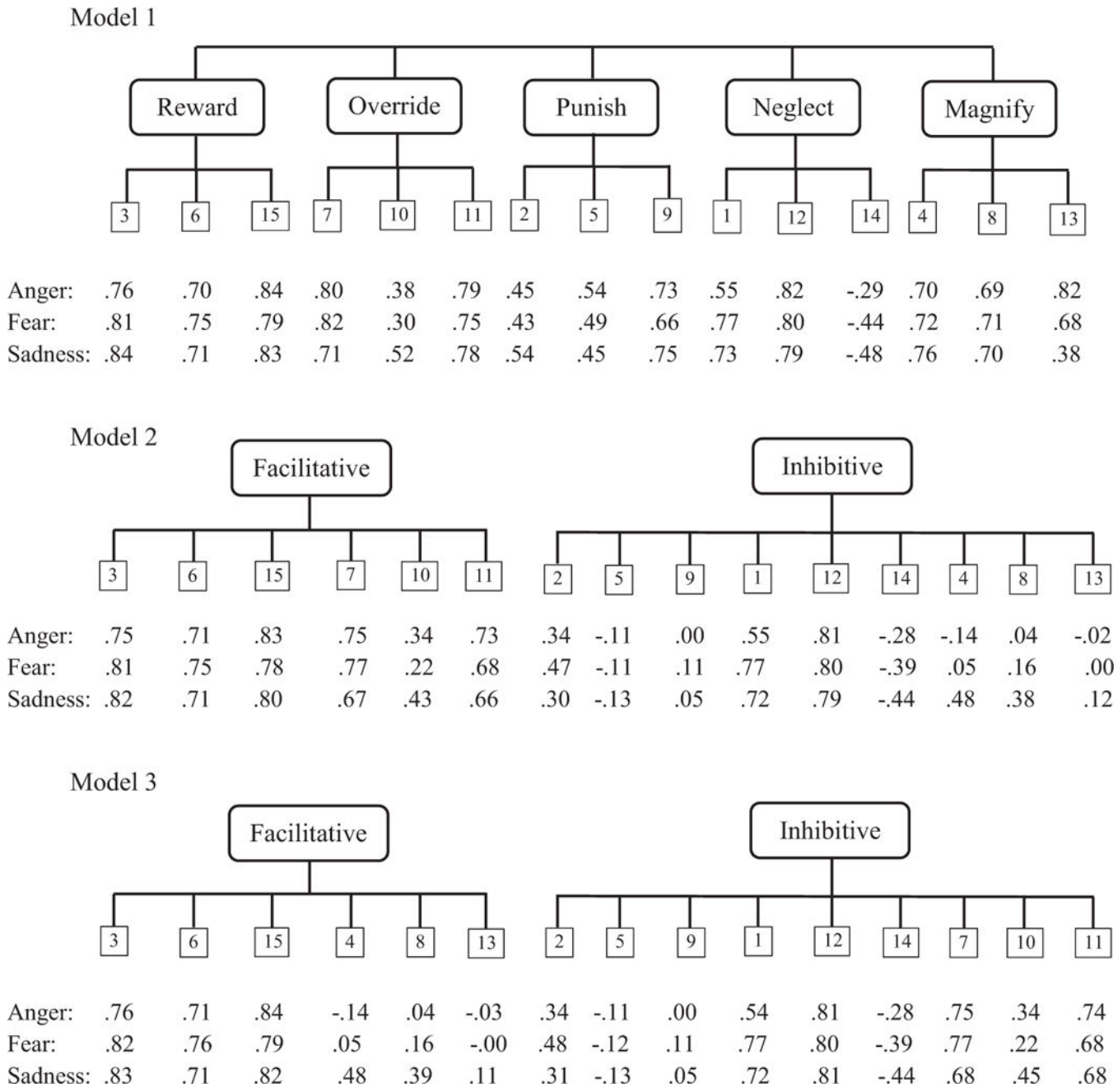

Figure 1.

Theory-driven models for the Emotions as a Child Scale (EAC) with loadings from confirmatory factor analyses (CFA) models below items.

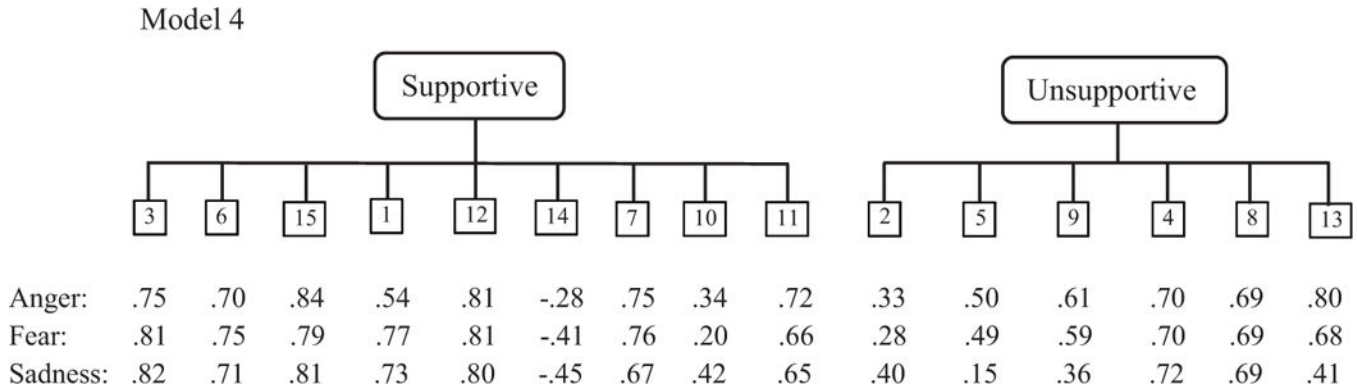

Figure 2.

EFA models for the Emotions as a Child Scale (EAC) with loadings from confirmatory factor analyses (CFA) models below items.

Table 1

Means and SDs of the Emotions as a Child Scale (N 1,087)

Item	Anger Scale		Fear Scale		Sadness Scale	
When I was angry/fearful/sad, parent/caregiver	**M**	**SD**	**M**	**SD**	**M**	**SD**
1. Responded to my anger/fear/sadness	3.81	.99	3.85	1.07	4.05	.99
2. Told me to stop being angry/fearful/sad	3.62	1.02	3.48	1.18	3.28	1.24
3. Helped me deal with the issue	3.68	1.03	3.82	1.07	3.96	1.05
4. Got very angry/fearful/sad	2.33	1.10	1.97	1.03	2.66	1.08
5. Told me that I was acting younger	2.33	1.19	1.88	1.05	2.03	1.09
6. Asked me what made me angry/fear/sad	3.81	.98	3.78	1.10	4.01	1.02
7. Told me not to worry	3.61	1.03	3.82	1.00	3.93	.95
8. Expressed that s/he was very angry/fearful/sad	2.39	1.05	2.08	1.09	2.66	1.06
9. Let me know s/he did not approve	2.75	1.22	2.22	1.19	2.23	1.20
10. Bought me something I liked	2.35	1.22	2.32	1.20	2.91	1.14
11. Told me to cheer up	3.55	1.06	3.58	1.07	3.76	1.00
12. Focused on me	3.62	1.04	3.75	1.05	3.85	1.00
13. Got very upset	2.50	1.07	2.07	1.05	2.29	1.07
14. Did not pay attention	2.14	1.01	1.92	.98	1.88	.99
15. Comforted me	3.63	1.05	3.84	1.07	3.89	1.03

Table 2

Factor Loading Matrix, Eigenvalues, and Variance Explained by Each Factor for the Original 15-Item Solution and the Final Solution

Item	Anger 15 Items[a]		Anger 12 Items		Fear 15 Items		Fear 12 Items		Sadness 15 Items		Sadness 12 Items	
When I was angry/fearful/sad, parent/caregiver	I	II	I	II	I	II	I	II	I	II	I	II
1. Responded to my anger/fear/sadness	.68		.68		.81		.82		.82		.83	
3. Helped me deal with the issue	.80		.82		.85		.86		.84		.85	
6. Asked me what made me angry/fear/sad	.79		.81		.82		.82		.78		.79	
7. Told me not to worry	.75		.76		.84		.83		.74		.76	
11. Told me to cheer up	.78		.77		.78		.77		.60		.64	
12. Focused on me	.86		.86		.85		.85		.83		.84	
15. Comforted me	.79		.80		.79		.81		.81		.82	
4. Got very angry/fearful/sad		.78		.79		.70		.74		.56		.61
5. Told me that I was acting younger		.56		.56		.60		.58		.48		.51
8. Expressed that s/he was very angry/fearful/sad		.72		.74		.72		.74		.66		.71
9. Let me know s/he did not approve		.71		.72		.73		.74		.71		.67
13. Got very upset		.74		.77		.76		.79		.71		.75
2. Told me to stop being angry/fearful/sad	.51				.57					.50		
10. Bought me something I liked	.44					.47						
14. Did not pay attention		.43				.50			−.65			
Eigenvalue	4.84	2.90	4.38	2.61	5.36	2.96	4.86	2.58	5.38	2.33	4.81	2.07
Explained Variance (%)	32.28	19.34	36.48	21.76	35.74	19.71	40.46	21.47	35.86	15.53	40.08	17.28

Note. Loadings < .40 omitted

[a]For the anger scale, Items 4 and 10 (low communalities) were first eliminated. After a re-run of the EFA, Item 2 was eliminated because of cross-loadings (loadings on factor 1 and factor 2 were .50 and .42, respectively)

Table 3

CFA Model Fit Statistics for the Emotions as a Child Scale (EAC)

Model Fit Index	15-item				12-item			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Anger								
CFI	.90	.64	.64	.87	.97	.68	.68	.95
TLI	.86	.57	.57	.85	.95	.60	.60	.94
SRMR	.09	.14	.14	.10	.05	.15	.15	.05
RMSEA	.09	.15	.15	.09	.06	.17	.17	.07
χ^2	399.73	1213.45	1212.57	490.66	132.28	915.09	915.55	185.26
df	80	89	89	89	44	53	53	53
Fear								
CFI	.84	.66	.66	.80	.95	.72	.72	.92
TLI	.79	.60	.60	.77	.92	.66	.66	.91
SRMR	.12	.15	.15	.13	.05	.14	.14	.06
RMSEA	.12	.16	.16	.12	.08	.17	.17	.09
χ^2	649.95	1272.11	1271.90	779.74	196.74	853.00	852.69	271.21
df	80	89	89	89	44	53	53	53
Sadness[a]								
CFI	.88	.74	.74	.80	.94	.81	.81	.88
TLI	.84	.69	.69	.76	.92	.76	.76	.85
SRMR	.09	.11	.11	.11	.06	.09	.09	.09
RMSEA	.09	.13	.13	.11	.08	.13	.13	.10
χ^2	449.65	908.97	895.41	716.62	181.63	551.90	540.32	359.87
df	80	89	89	89	44	53	53	53

Note. CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized root mean squareresidual; RMSEA = root mean square error of approximation

[a]Supportive responses with unsupportive responses were moderately correlated in Model 4 for the 12-item scale

Table 4

Cronbach's as for Subscales of the Full and Abbreviated Five-Factor Model (Model 1) and Two-Factor Model (Model 4)

	Model 1										Model 4			
	Reward		Neglect		Override		Punish		Magnify		Supportive		Unsupportive	
X'	Full	Abbr	Full	Abbr	Full	Abbr	Full	Abbr	Full	Abbr	Full	Abbr	Full	Abbr
Anger	.82	.81	.58	.62	.68	.77	.57	.56	.77	.78	.82	.90	.75	.76
Fear	.84	.83	.68	.76	.63	.76	.50	.52	.75	.74	.84	.91	.74	.76
Sadness	.83	.83	.74	.72	.65	.71	.54	.56	.66	.62	.79	.90	.68	.69

Note. Abbreviated (Abbr) Model 1 subscales include three items for Reward and Magnify, and two items for Neglect, Override, and Punish.

Table 5

Tests of Measurement Invariance of the Emotions as a Child Scale Across Gender

Invariance test	$\chi^2(df)$	χ^2/df	CFI (ΔCFI)	RMSEA (ΔRMSEA)	SRMR (ΔSRMR)	$\Delta\chi^2(\Delta df)$	*P*
Anger scale							
Configurai invariance	237.638 (106)	2.24	.951 (−)	.068 (−)	.058 (−)	—	—
Full metric invariance	269.104 (116)	2.32	.943 (−.008)	.070 (.002)	.076 (.018)	31.47 (10)	<.001
Full scalar invariance	283.514 (126)	2.25	.942 (−.001)	.068 (−.002)	.076 (.000)	14.41 (10)	.16
Full residual variance invariance	312.209 (138)	2.26	.935 (−.007)	.068 (−.000)	.078 (.002)	28.70 (12)	<.01
Fear scale							
Configural invariance	306.503 (106)	2.89	.931 (−)	.084 (−)	.065 (−)	—	—
Full metric invariance	327.279 (116)	2.82	.927 (−.004)	.082 (−.002)	.074 (.009)	20.78 (10)	<.05
Full scalar invariance	338.294 (126)	2.68	.927 (.000)	.079 (−.003)	.073 (−.001)	11.02 (10)	.36
Full residual variance invariance	376.318 (138)	2.73	.917 (−.010)	.080 (.001)	.079 (.006)	38.02 (12)	<.001
Sadness scale[a]							
Configural invariance	443.178 (106)	4.18	.869 (−)	.109 (−)	.087 (−)	—	—
Full metric invariance	454.746 (116)	3.92	.869 (.000)	.104 (−.005)	.094 (.007)	11.57 (10)	.32
Full scalar invariance	474.669 (126)	3.77	.865 (−.004)	.101 (−.003)	.095 (.001)	19.92 (10)	<.05
Full residual variance invariance	503.773 (138)	3.65	.858 (−.007)	.099 (−.002)	.103 (.008)	29.10 (12)	<.01

Note. CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized root mean square residual; RMSEA = root mean square error of approximation

[a]Supportive responses with unsupportive responses were moderately correlated at different levels of measurement invariance.

Table 6

Tests of Measurement Invariance of the Emotions as a Child Scale Across Race/Ethnicity

Invariance test	$\chi^2(df)$	χ^2/df	CFI (ΔCFI)	RMSEA (ΔRMSEA)	SRMR (ΔSRMR)	$\Delta\chi^2(\Delta df)$	*P*
Anger scale[b]							
Configurai invariance	264.498 (106)	2.50	.942 (−)	.076 (−)	.065 (−)	—	—
Full metric invariance	294.906 (116)	2.54	.934 (−.008)	.077 (.001)	.082 (.017)	30.41 (10)	<.001
Full scalar invariance	332.979 (126)	2.64	.924 (−.010)	.079 (.002)	.080 (−.002)	38.07 (10)	<.001
Partial scalar invariance	320.460 (125)	2.56	.928 (−.006)	.077 (.000)	.083 (.001)	25.55 (9)	<.01
Partial residual variance invariance	347.505 (131)	2.65	.921 (−.007)	.079 (.002)	.091 (.008)	27.05 (6)	<.001
Fear scale							
Configural invariance	340.321 (106)	3.21	.920 (−)	.092 (−)	.071 (−)	—	—
Full metric invariance	365.780 (116)	3.15	.915 (−.005)	.091 (−.001)	.085 (.014)	25.46 (10)	<.01
Full scalar invariance	408.737 (126)	3.24	.904 (−.011)	.093 (.002)	.081 (−.004)	42.96 (10)	<.001
Partial scalar invariance	390.034 (125)	3.12	.910 (−.005)	.090 (−.001)	.083 (−.002)	24.25 (9)	<.01
Partial residual variance invariance	414.238 (129)	3.21	.903 (−.007)	.092 (.002)	.095 (.012)	24.20 (4)	<.001
Sadness scale[a]							
Configural invariance	374.817 (106)	3.54	.895 (−)	.098 (−)	.084 (−)	—	—
Full metric invariance	413.076 (116)	3.56	.884 (−.011)	.099 (.001)	.103 (.019)	38.26 (10)	<.001
Partial metric invariance	400.057 (115)	3.48	.888 (−.007)	.097 (−.001)	.095 (.011)	25.24 (9)	<.01
Partial scalar invariance	418.421 (122)	3.43	.884 (−.004)	.096 (−.001)	.096 (.001)	18.36(7)	<.05
Partial residual variance invariance	435.702 (126)	3.46	.879 (−.005)	.097 (.001)	.101 (.005)	17.28 (4)	<.01

Note. CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized root mean square residual; RMSEA = root mean square error

[a]Supportive responses with unsupportive responses were moderately correlated at different levels of measurement invariance

[b]Supportive responses with unsupportive responses was negativelycorrelated at different levels of measurement invariance for European American group

Table 7

Latent Mean Comparisons Across Gender and Race/Ethnicity

Emotion	Female[a]	African American[a,b]	African American[a,c]
Anger			
Supportive	.14	−.09	−.05
Unsupportive	−.29**	.07	.07
Fear			
Supportive	.20*	−.23*	−.20*
Unsupportive	−.19	.50***	.50***
Sadness			
Supportive	.14	−.18	−.12
Unsupportive	.03	.28*	.36**

[a] Male and European American scores were fixed to 0

[b] No constraints on noninvariant items

[c] Constraints on noninvariant items

* $p < .05$

** $p < .01$

*** $p < .001$