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Rebecca Waller
University of Pennsylvania

Arianna M. Gard, Christopher S. Monk, and Colter Mitchell
University of Michigan

Benjamin Bazzi
Howard University

Isaiah Sypher
University of Michigan

Jeanne Brooks-Gunn
Columbia University

Sara McLanahan
Princeton University

Luke W. Hyde
University of Michigan

Reliable, brief, and cost-effective methods to assess parenting are critical for advancing etiological research and translational efforts within parenting science. In the current study, we adapted the System for Coding Interactions and Family Functioning (SCIFF) for use among a sample of mostly racial minority adolescents aged 15 years old, growing up in a low-income urban setting. A multiethnic team coded videotapes of a family interaction task designed to elicit conflict. First, we assessed the reliability of SCIFF codes ($N = 187$; 54% female; 77% African American). Second, we tested whether SCIFF codes assessing harsh parenting, positive parenting, dyadic conflict, and dyadic closeness converged with parent–child reports of the same constructs. Third we explored links between observed harsh and positive parenting in early childhood (ages 3 and 5) and SCIFF codes at age 15. Our training and SCIFF coding protocols produced high interrater reliability. In support of convergent validity, we found specificity in the associations between negative aspects of parenting across methods: the SCIFF harsh parenting and dyadic conflict codes uniquely converged with concurrent parent–child reports of the same constructs. There was a longitudinal cross-construct association between more observed harshness in early childhood and lower dyadic closeness at age 15. Finally, the convergence of the SCIFF codes with other parenting measures was similar by gender and for families living below or above 200% of the poverty line. A modified version of the SCIFF can be used with reliability in low-income urban samples with variation in gender and race.

Public Significance Statement
This study showed that parent and adolescent behavior during a conflict-evoking task in the laboratory can be reliably coded using the System for Coding Interactions and Family Functioning.

Rebecca Waller, Department of Psychology, University of Pennsylvania; Arianna M. Gard, Department of Psychology, University of Michigan; Christopher S. Monk, Department of Psychology and Survey Research Center of the Institute for Social Research, University of Michigan; Colter Mitchell, Survey Research Center of the Institute for Social Research, University of Michigan; Benjamin Bazzi, Department of Psychology, Howard University; Isaiah Sypher, Department of Psychology, University of Michigan; Jeanne Brooks-Gunn, Teachers College and College of Physicians and Surgeons, Columbia University; Sara McLanahan, Center for Research on Child Wellbeing and Office of Population Research, Princeton University; Luke W. Hyde, Department of Psychology and Survey Research Center of the Institute for Social Research, University of Michigan.

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Correspondence concerning this article should be addressed to Luke W. Hyde, Department of Psychology, University of Michigan, 530 Church Street, Ann Arbor, MI 48109. E-mail: lukehyde@umich.edu

In addition, the codes generated by observers converged with parent and adolescent concurrent questionnaire reports about their relationship and with earlier observations of parenting in the home when children were 3 and 5 years old.

Keywords: adolescence, early childhood, family interactions, observational coding, parenting

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Psychological theory has long emphasized the critical role that parenting practices play in how children develop social competence, emotional adjustment, and educational attainment (Baumrind, 1991; Bornstein, 2001, 2005; Maccoby, 2000; Patterson, 1982). Indeed, parents provide the blueprint for how children will ultimately understand and interact with the world. The most effective forms of parenting include positive reinforcement of prosocial behaviors, frequent praise and reward, high emotional sensitivity and involvement, and consistent monitoring (Henderlong & Lepper, 2002). In contrast, parenting that is harsh, neglectful, or inconsistent is linked to developmental trajectories characterized by high rates of child psychopathology and poor educational outcomes (Conger et al., 1992; Shaw & Gross, 2008). Beyond a specific focus on parenting behavior (i.e., directed from the parent to the child), research also emphasizes the interdependency of parent and child behaviors (Belsky, 1984; Sameroff, 1975). Thus, researchers have explored the reciprocal nature of parent–child interactions, as described in family systems theory (Cox & Paley, 1997) and coercive family process theory (Patterson, 1982).

Assessment of Parenting

Parenting is traditionally assessed via parent or child ratings on questionnaires, which can be limited by subjective reports that are distorted as a function of social desirability or other well-recognized survey rating biases (Gardner, 2000). Observational methods allow for a more objective assessment of parenting and the parent–child relationship, as well as an opportunity to assess interpersonal dynamics that are difficult to capture in self-report measures. Moreover, observational assessments can capture nonverbal behaviors, tone, and withdrawal, which are processes that can be automatic and fast moving but have important implications for the overall tenor of the parent–child relationship (Gardner, 2000). However, there are several ongoing challenges for research seeking to effectively integrate observational research into the study of parent–child relationships and parenting more broadly. First, it can be costly and labor-intensive to collect and reliably code observational data, emphasizing the need for coding schemes that are easy to implement in clinical and research settings. Second, such settings may not be conducive to participants behaving as they would at home. To generate valid representations of the parent–child relationship, researchers have used problem-solving or "Hot Topics" tasks, which briefly evoke emotional arousal within parent–child dyads (Hetherington, 1992). The use of such tasks is salient given that family conflict and poor problem solving strategies are thought to provide the emotional context through which parenting increases risk for psychopathology (Forgatch & Stoolmiller, 1994), making them common targets of family centered interventions for reducing child problem behaviors (Chiapa, Parra Morris, Véronneau, & Dishion, 2016). Finally, coding schemes need to assess the most informative aspects of the interaction. Observational studies often implement microsocial coding, which captures fine-grained, moment-to-moment aspects of interactions, or macrosocial coding, which assesses broader summary ratings of behavior (Hawes, Dadds, & Pasalich, 2013; Heyman, Lorber, Eddy, & West, 2014). Macrosocial codes can be administered with greater speed and simplicity than microsocial coding systems. Moreover, researchers typically collapse microsocial codes into composite variables that correlate highly with macrosocial data. Thus, it has been argued that the most useful coding schemes code macrosocial aspects of the parent–child interactions, while accounting for the frequency, intensity, and duration of behaviors (Hawes et al., 2013; Heyman et al., 2014).

The System for Coding Interactions and Family Functioning (SCIFF)

A coding scheme that combines global impressions with coding of frequency, intensity, and duration is the System for Coding Interactions and Family Functioning (SCIFF; Lindahl & Malik, 2001). The SCIFF can be used with a variety of family interaction tasks, including parent–child conflict or problem-solving tasks. This coding scheme assesses parenting that is directed from the parent to the child (e.g., rejection, invalidation, emotional support) and parent–child dyadic functioning (e.g., dyadic conflict and dyadic cohesiveness), taking into account visual cues (e.g., facial expressions, body language), verbal content, and tone of voice. Each global code is rated on a five-point Likert scale (1 = *very low*, 5 = *high*), indicating the degree to which the behaviors are characteristic of the duration of the interaction. Importantly, SCIFF coding captures both the intensity and frequency of behaviors. For example, emotionally intense behaviors that occur very frequently receive high ratings (e.g., four or more coercive statements or gestures), as do behaviors that only occur once or twice but that are particularly intense (e.g., parent swears at or hits the child or the child cries).

The SCIFF was originally developed in a majority Hispanic American sample of 7 to 11 year olds from two-parent households, with a focus on interactions within the family unit as a whole. Martial conflict was found to be cross-sectionally related to harsher and less emotionally supportive parenting and more child externalizing psychopathology (Lindahl & Malik, 1999a). Since then, most studies using the SCIFF have focused on Hispanic American or European American samples (Lindahl & Malik, 2001), and samples assessed during the preschool or late-childhood period (Klein et al., 2016; Ruberry, Klein, Kiff, Thompson, & Lengua, 2018). Other studies that have used the SCIFF have explored triadic family interactions (i.e., two-

parent families) or marital conflict (DeBoard-Lucas, Fosco, Raynor, & Grych, 2010; Kaczynski, Lindahl, Malik, & Laurenceau, 2006; Lindahl & Malik, 1999b).

SCIFF Coding in Samples Representative of Low-Income Urban Contexts

However, no studies have tested the reliability or validity of the SCIFF for specifically assessing parenting and the parent–child relationship among older samples of adolescents. Moreover, no prior studies of the SCIFF have examined whether it is a reliable and meaningful measure for assessing parenting or the parent–child relationship among representative samples of adolescents living in low-income urban centers, who are generally an underrepresented group in parenting research, as well as within developmental psychology more broadly (Nielsen, Haun, Kärtner, & Legare, 2017). Further, no studies have assessed the SCIFF among predominantly African American families, which is important given that parenting practices have been shown to vary across cultural or racial–ethnic group (McLoyd, Kaplan, Hardaway, & Wood, 2007; McLoyd & Smith, 2002). In addition to racial–ethnic group membership, parenting practices have also been shown to vary depending on adolescent attributes, including gender and poverty. However, no studies have tested whether the SCIFF codes converge with other measures of parenting and the parent–adolescent relationship to the same extent among boys versus girls or adolescents from families living below or above 200% of the poverty line. That is, studies are needed to test whether the convergent validity of the SCIFF is similar across subgroups based on sex and income.

Prospective Associations of SCIFF Codes

Beyond cross-sectional associations and potential moderators of the convergent validity of the SCIFF, another important gap in the literature is that no studies have adopted a prospective design to explore how parenting in early childhood is related to scores on the SCIFF. Many longitudinal studies of parenting exist that have used alternative observation methods of parenting (i.e., not using the SCIFF). However, these prior studies have typically explored observed parenting within narrow developmental periods (e.g., within early childhood or within adolescence; Chiapa et al., 2016; Dallaire & Weinraub, 2005; Sitnick et al., 2015; Van Heel et al., 2017), with few examples of studies that have examined relationships between measures of observed parenting from early childhood to adolescence (although see Trentacosta et al., 2011 for an example of trajectories of parenting from middle childhood to adolescence). This is a surprising gap in the literature given that both the toddler and adolescent years are critical periods of transition in the parent–child relationship. During the early childhood period (2 to 5 years old), children master a range of developmental tasks and show more physically mobility, but without the requisite cognitive understanding to appreciate behavioral consequences, which can present challenges to parents (Waller et al., 2015).

Likewise, adolescence can be a time of challenge for the parent–child relationships often characterized by poorer communication, more conflict, and lower levels of parental involvement and monitoring (Arnett, 1999; Chiapa et al., 2016; Smetana, Campione-Barr, & Metzger, 2006). Accordingly, the transition to adolescence often requires parents to change their parenting behaviors in a number of ways, including with regards to flexibility and responsivity to the growing autonomy and independence of the adolescent (Holmbeck, Paikoff, & Brooks-Gunn, 1995) and ability to manage inevitable conflict (Bornstein, 2005; Steinberg, 2001). To further establish the convergent validity of the SCIFF and to explore how observations of parenting in early childhood lay the foundation for the subsequent parent–adolescent relationship, studies are needed to test the convergence of scores on SCIFF codes in adolescence with observations of parenting in early childhood. We addressed this gap in the literature by examining whether a widely used and established measure of the parenting environment (the Home Observation for Measurement of the Environment [HOME] scales; Caldwell & Bradley, 1984) assessed during early childhood converged with later observations of parenting at age 15 using SCIFF coding.

Assessment of Different Types of Parenting

A final issue centers on the distinction between "directed parenting" (i.e., the behavior directed from the parent to the child) and "dyadic parenting" (i.e., the interaction of parent and child behaviors; Belsky, 1984) as well as the valence of the parenting construct (i.e., negative or positive). The SCIFF coding is capable of distinguishing all four. Specifically, the SCIFF contains directed parenting codes that are both positive and negative in valence: rejection (negative), coercion (negative), and emotional support (positive). The SCIFF also includes dyadic parenting codes that are both positive and negative in valence: dyadic conflict and negativity (negative) and dyadic cohesiveness (positive). Interestingly, a recent meta-analysis that tested the overall association between observed and parent reports of parenting across 36 studies reported a small overall effect size ($r = .17$) with the magnitude of the association notably stronger for the assessment of negative forms of parenting behaviors, including parental harshness (Hendriks, Van der Giessen, Stams, & Overbeek, 2018). However, no studies have yet explored the convergent validity of the SCIFF separating by type of parenting (directed vs. dyadic) and valence of parenting (i.e., negative vs. positive). Isolating these dimensions could help to improve on the effect size found for any association between observed and parent–child reports of parenting relative to the findings of the recent meta-analysis. Accordingly, in the current study, we explored four separate constructs: negative directed parenting (harsh parenting), positive directed parenting (positive parenting), negative dyadic parenting (dyadic conflict), and positive dyadic parenting (dyadic closeness).

Current Study

In the current study, we tested the SCIFF among a low-income sample of predominantly African American adolescents in a research setting. Our overarching study goals were to assess the reliability of the SCIFF and establish whether SCIFF codes showed evidence of convergent validity—specifically whether they converged with parent–child reports of the same purported constructs. To further explore the convergent validity of the SCIFF at age 15, we examined its convergence with observations of parenting from early childhood. We differentiated between directed parenting (harsh vs. positive) and dyadic parenting (dyadic

conflict vs. closeness). We hypothesized that the SCIFF codes of harsh and positive parenting would be specifically related to parent–child reports of harsh parenting and positive parenting, and the SCIFF dyadic codes of conflict and closeness would be specifically related to parent–child reports of the same constructs. We also hypothesized that observed harshness in early childhood would be specifically related to the SCIFF harsh parenting code in adolescence and observed warmth in early childhood would be specifically related to the SCIFF positive parenting code. To test whether these relationships were the same across different subgroups, we explored whether gender or living below or above 200% of the poverty line moderated associations between the SCIFF codes and other measures of parenting. Finally, consistent with a recent meta-analysis (Hendriks et al., 2018), we hypothesized that parent–child reports of parenting would be more strongly related to SCIFF scores for negative aspects of parenting.

Method

Participants. The study sample was drawn from 237 who were part of the Study of Adolescent Neural Development (SAND), a substudy of the Fragile Families and Child Wellbeing Study (FFCWS; Reichman, Teitler, Garfinkel, & McLanahan, 2001). The FFCWS is a longitudinal cohort of 4,898 (52.4% boys) children born in 20 large U.S. cities between 1998 and 2000 (Reichman et al., 2001). The study was sampled to represent American children born in large urban centers (>200,000 population) between 1998 and 2000. Given the interest in the study of families at risk, the cohort was oversampled for nonmarital births (~3:1), resulting in a sample with substantial socioeconomic and racial–ethnic diversity. For example, at the birth of the target child, 40% of the mothers reported less than a high school education, 25.3% reported having a high school degree or equivalent, 24.3% reported some college or technical training, and 10.7% reported having college degree or higher (see Reichman et al., 2001 for additional sociodemographic characteristics of the core FFCWS). FFCWS families were interviewed in hospital following the birth of the target child, and when the child was 1, 3, 5, 9, and 15 years of age. After completing interviews when the child was age 15, families living in Detroit, Toledo, and Chicago were invited to take part in additional data collection at the University of Michigan as part of the SAND study. The current study uses child- and parent-reported and observational data on parenting collected from participants who took part in the SAND at age 15. We combine these data with observations of parenting at ages 3 and 5 that were collected as part of the core FFCWS. Note that we only used observational data from early childhood when the adult informant was the same as the adult informant during the SAND data collection at age 15.

The current study includes 187 adolescents (54% female) from the SAND sample. Data were unavailable on 50 participants from the original SAND sample of 237 for several reasons: technical issues with videos ($n = 28$), adolescent/parent being out of the recording frame ($n = 13$), the family refused recording ($n = 6$), and inability to translate/understand the interaction ($n = 3$). Of the 187 dyads with valid SCIFF data, the primary caregiver was the biological mother 92% of the time ($n = 172$). Other primary caregivers included biological father ($n = 7$), adoptive parent ($n = 3$), grandmother ($n = 3$), or other biological family member ($n = 2$). Adolescent participants in the SCIFF sample of 187 endorsed membership in the following racial–ethnic groups: White/Caucasian, $n = 26$ (14%); non-Hispanic, African American, $n = 144$ (77%); Hispanic, African American, $n = 2$ (1%); Hispanic/Latino/a, $n = 5$ (3%); non-Hispanic other, $n = 2$ (1%). Almost half of the families in this subsample reported annual incomes under $25,000 (47%) with more than two thirds of families (68%) living at or below 200% of the poverty line. Thus, recruitment methods resulted in a sample that included many families living in poverty and large representation of African American families. The 187 participants included in the current study with SCIFF data available did not differ from the full SAND sample on any demographic variables, including income ($t = .30$, $p > .70$), child race (African American vs. other race/ethnicity; $\chi^2 = 1.05$, $p > .20$), parent race (African American vs. other race/ethnicity; $\chi^2 = .74$, $p > .20$), or gender ($\chi^2 = .47$, $p > .20$).

Procedures. At age 15, parents and adolescents in the SAND study participated in a 1-day protocol that included collection of self-report, interviewer, observational, and biological data. As part of the assessment, participants completed the "Hot Topics" task (described subsequently), which was used to code the SCIFF. Participants were provided lunch during the day and received compensation for their participation. At ages 3 and 5 as part of the FFCWS, families were interviewed via phone and/or in-person. All assessments and measures were approved by the IRB of the University of Michigan and the IRB at Princeton University (FFCWS protocol). SAND procedures included written consent by parents and verbal assent by adolescents.

Measures.

Observed parenting at age 15 (SCIFF). During a laboratory visit, parents and adolescents completed the "Hot Topics" task, which was designed to elicit conflict and negative emotion (Hetherington, 1992). At the start of the day, parents and adolescents had been asked to identify common areas of conflict. We then asked dyads to discuss the two conflicts rated most highly by both members of the dyad during an 8-min videotaped discussion. We read aloud from and provided dyads with a card that listed the two conflicts and asked them to address the following points: (a) how recent disagreements started, (b) who else was involved, (c) how the issue ended, and (d) how the dyad would deal with the issue in the future. The most commonly rated conflicts in our sample were consistent with those reported across cultures among samples of adolescents (e.g., Smetana et al., 2006; Smetana, Daddis, & Chuang, 2003; Yau & Smetana, 1996): chores (18%), the teen keeping his or her room tidy (13%), grades (11%), waking up in the morning (7%), and behavior toward siblings (4%). Families were instructed to take 8 min to describe what happened during the conflict and to try to reach a solution. Videotaped conflict discussions were later coded.

A multiethnic team of graduate research assistants coded the videotaped family interactions using the SCIFF. We made minor modifications to the SCIFF (with permission from the original, its developers) to adapt it for use among our low-income and urban sample of adolescents. Specifically, we removed codes that referenced "triangulation" (specific to two-parent families). Given the ubiquity of cellphone ownership (relative to when the SCIFF was first developed), we also modified codes for "withdrawal" to incorporate cellphone usage. Consistent with the manual, training involved an introduction to the system and manual followed by

meetings to discuss and practice coding training videos compiled by the master coder, a senior postdoctoral research fellow. Trainees were required to code 10 or more videos to establish interrater reliability before coding independently. Once coders began coding independently, weekly meetings were held with the master coder to maintain fidelity with the manual. Interrater reliability was calculated on a random 15% of videotapes stratified across coders using the intraclass correlation coefficient (ICC) with absolute agreement. ICC is considered a conservative estimate of reliability because it corrects for chance agreement and takes into consideration both rank order and absolute distance between two scores (Shrout & Fleiss, 1979).

We focused on five of the SCIFF codes that were consistent with our study aims and hypotheses: (1) Harsh parenting was computed as the mean of the rejection and coercion codes. Rejection captured the frequency and intensity with which a parent made critical, insulting, blaming statements to the child. Coercion indexed the frequency with which a parent made threatening or manipulative statements to the child. (2) Positive parenting was indexed via the emotional support code, which captured the frequency and intensity with which parents were able to recognize and meet the child's emotional needs. (3) Dyadic conflict was assessed via the dyad negativity and conflict code, which captured the frequency and intensity of negative affect (e.g., tension, anger, irritation, hostility) within the dyad. (4) Dyadic closeness was indexed via the dyad cohesiveness code, which captured the frequency and intensity of closeness and unity within the dyad (e.g., comfortableness, togetherness). All ratings were made on a five-point Likert-type scale, with higher ratings indicating more observed rejection, coercion, emotional support, dyadic negativity and conflict, and dyadic cohesiveness. Interreliability was high across all SCIFF codes (mean intraclass correlation [ICC] = .87; see Table 1 for the ICCs for all SCIFF codes).

Parent and child reports of parenting in adolescence. To test the convergent validity of the SCIFF codes, we also assessed directed and dyadic parenting via parent and child reports on questionnaire measures from the SAND study protocol (see Table 1 in the online supplemental material, which presents scale reliabilities and intercorrelations between informant reports). In each case, averaged *z*-scored parent and child reports represent multi-informant constructs. (1) Harsh parenting was assessed by combining parent and child reports for the three-item corporal punishment and six-item inconsistent discipline scales of the Alabama Parenting Questionnaire (APQ; Frick, 1991; parent-reported: α = .73; child-reported: α = .62). (2) Positive parenting was assessed by combining parent and child reports of the six-item positive parenting scale of the APQ (parent-reported: α = .78; child-reported: α = .85). (3) Dyadic conflict was assessed via parent and child reports on the 10-item conflict scale of the Adult and Child Relationship Scale (ACRS; Pianta, 1997; parent-reported: α = .91; child-reported: α = .85). (4) Dyadic closeness was assessed via parent and child reports on the five-item closeness scale of the ACRS (parent-reported: α = .78; child-reported: α = .85).

Observed parenting in early childhood. Harsh and positive parenting in early childhood were assessed using interviewer-reported items from the widely used HOME scales (Caldwell & Bradley, 1984) during in-home visits carried out within the broader FFCWS at ages 3 and 5. Scores at ages 3 and 5 were combined into a mean for early childhood. Harsh parenting was assessed as a sum of four dichotomous items at both ages (e.g., "parent shouted at child"; αs = .72–.73). Positive parenting was assessed as a sum of eight items at ages 3 and 5 (e.g., "parent caresses, kisses, or cuddles [the child]"; αs = .78–.80).

Moderators. We explored whether associations between observed and parent–child reports of parenting at age 15 and between observed parenting at ages 3 through 5 and 15 were similar across participants based on (1) sex (0 = female, 1 = male) and (2) income (0 = below 200% of the poverty line, and 1 = above 200% of the poverty line).

Analytic strategy. Our analytic strategy proceeded in three steps. We first established the interrater reliability of our SCIFF coding (see the Method section and Table 1). Second, to establish the convergent validity of the SCIFF codes (i.e., do the SCIFF codes assess the constructs/parenting phenomena they are hypothesized to measure), we examined specificity in the convergence of the SCIFF codes both with multi-informant reports of directed and dyadic parenting at age 15 and observations of parenting during early childhood. Initially, we computed bivariate correlations. Next, we examined multivariate models testing unique associations between SCIFF codes and the different measures of directed and dyadic parenting, while accounting for the covariance of SCIFF codes and the other parenting measures. By modeling the covariance of different forms of parenting, we could account for the method employed (i.e., observed or parent–child reports) to isolate convergence within constructs. We compared the magnitude of effects for negative and positive forms of both directed and dyadic parenting. Finally, to test whether associations between the SCIFF codes and other measures of parenting and the parent–child relationship (both cross-sectional and longitudinal measures) were the same for boys versus girls and for families living below or above 200% of the poverty line, we ran a series of multigroup models. We compared the fit of models where pathways between the SCIFF codes with other measures of parenting were systematically fixed versus freed across groups. We conducted analyses in Mplus

Table 1
Summary of Interclass Coefficients (ICCs) Indicating High Reliability of SCIFF Coding in a Random 15% of the Full Sample

SCIFF code	ICC
Parent rejection and invalidation	.93
Parent coerciveness	.88
Parent emotional support	.89
Parent withdrawal	.97
Parenting style	.90
Child anger & frustration	.85
Child sadness & distress	.88
Child withdrawal	.88
Child opposition/defiance	.84
Dyad negativity and conflict	.90
Dyad positive affect	.81
Dyad cohesiveness	.83
Dyad focus of problem	.74
Average ICC across items	.87

Note. Our primary study aims utilized the following System for Coding Interactions and Family Functioning (SCIFF) codes: rejection and invalidation, coerciveness, emotional support, negativity and conflict, and cohesiveness.

(Version 7.2; Muthén & Muthén, 2016). To account for the small amounts of missing data, all analyses were conducted using maximum likelihood estimation, which has been shown to be more efficient than listwise deletion and to produce unbiased results with up to 50% missing at random (Enders & Bandalos, 2001).

Results

We present descriptive statistics and bivariate correlations between study variables in Table 2. Suggestive of measurement invariance across race/ethnicity, a series of chi-square tests established that ratings on each of the SCIFF codes were comparable across non-Hispanic African American versus other race/ethnicity groups (see Table 2 in the online supplemental material). In support of cross-sectional convergent validity, there were significant correlations between the SCIFF codes and parent–child reports of parenting at age 15 for measures that assessed the same constructs. First, the SCIFF code for harsh parenting was correlated with parent–child reports of harsh parenting ($r = .34$, $p < .001$). Second, the SCIFF positive parenting code was correlated with parent–child reports of positive parenting ($r = .20$, $p < .01$). Third, the SCIFF code of dyadic conflict was correlated with parent–child reports of dyadic conflict ($r = .36$, $p < .001$). However, the SCIFF dyadic closeness code was not significantly correlated with parent–child reports of dyadic closeness ($r = .12$, *ns*; see Table 2). Moreover, arguing against specificity in the cross-sectional associations, there were significant bivariate correlations between measures that were purportedly assessing different aspects of parenting (e.g., between SCIFF harsh parenting and parent–child reports of positive parenting). Given the intercorrelations between measures within method type (i.e., between SCIFF codes and between parent–child reports; see Table 2), our next step was to explore specificity in the associations of constructs while accounting for method.

Thus, to further explore the specificity of the associations between SCIFF codes and other measures of parenting purported to assess the same constructs, we explored associations within a multivariate framework that modeled both the overlap of predictor and outcome variables to account for method effects (see Table 3; Figure 1). Consistent with our hypothesis that negative forms of directed parenting would show the strongest convergence across methods, we found that SCIFF harsh parenting scores were uniquely related to parent–child reports of harsh parenting ($\beta = .32$, $p < .001$) accounting for correlations between SCIFF codes and parent–child reports of directed and dyadic parenting (see Figure 1). Similarly, SCIFF dyadic conflict scores were uniquely related to parent–child reports of dyadic conflict ($\beta = .24$, $p < .001$). However, we did not find evidence for specificity in the associations between parent–child reports and SCIFF scores for positive parenting or dyadic closeness across methods: higher levels of parent–child-reported harsh parenting were related to lower SCIFF observed positive parenting ($\beta = -.35$, $p < .001$) and lower SCIFF dyadic closeness ($\beta = -.20$, $p < .01$). In addition, lower levels of parent- and child-reported positive parenting were related more SCIFF dyadic conflict ($\beta = -.25$, $p < .001$) but higher SCIFF dyadic closeness scores ($\beta = .17$, $p < .05$; see Table 3 and Figure 1).

Next, we explored prospective convergent validity of the SCIFF. In support of convergent validity, we found a modest bivariate correlation between more observed positive parenting in early childhood and higher SCIFF positive parenting scores in adolescence ($r = .17$, $p < .05$; see Table 2). However, there were also bivariate correlations between higher observed parenting harshness in early childhood and lower positive parenting and dyadic closeness assessed via the SCIFF at age 15 (see Table 2). Higher levels of observed harshness in early childhood were related to lower SCIFF positive parenting scores ($r = -.17$, $p <$

Table 2
Descriptive Statistics and Bivariate Correlations Between Main Study Variables

Variable	*n*	*M*	*SD*	Observed, early childhood: Harsh parenting	Observed, early childhood: Positive parenting	Observed, adolescence: Harsh parenting	Observed, adolescence: Positive parenting	Observed, adolescence: Dyadic conflict	Observed, adolescence: Dyadic closeness	Questionnaire, adolescence: Harsh parenting	Questionnaire, adolescence: Positive parenting	Questionnaire, adolescence: Dyadic conflict
Observed parenting in early childhood (HOME)												
Harsh parenting (*M* ages 3 and 5)	179	.36	.65									
Positive parenting (*M* ages 3 and 5)	179	6.72	1.47	−.28***								
Observed parenting and the parent–child relationship at age 15 (SCIFF)												
Harsh parenting	187	1.66	.78	**.11**	**−.03**							
Positive parenting	187	2.75	1.10	**−.17***	**.17***	–.43***						
Dyadic conflict	187	1.60	.92	**.03**	**.06**	.55***	−.37***					
Dyadic closeness	187	3.29	1.18	**−.20***	**.07**	–.34***	.64***	−.49***				
Parent and child reports of parenting and the parent–child relationship at age 15												
Harsh parenting	229	.00	.67	.10	−.09	**.34*****	**−.38*****	**.26*****	**−.25****			
Positive parenting	226	.00	.76	.07	−.02	**−.14†**	**.20****	**−.32*****	**.19****	.16*		
Dyadic conflict	215	.00	.82	.11	−.05	**.20****	**−.23****	**.36*****	**−.22****	.45***	−.34***	
Dyadic closeness	223	−.01	.80	−.10	.03	**−.03**	**.25****	**−.20****	**.12**	−.24***	.51***	−.42***

Note. Values in bold indicate correlations of interest between observed parenting in early childhood and adolescence and between observed parenting and questionnaire reports of parenting in adolescence. HOME = Home Observation for Measurement of the Environment scales; SCIFF = System for Coding Interactions and Family Functioning.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Unique Associations Between Parent–Child Reports of Parenting and the Parent–Child Relationship and the SCIFF Codes in Adolescence and Between Observed Parenting in Early Childhood and the SCIFF Codes in Adolescence

Variable	Harsh parenting		Positive parenting		Dyadic conflict		Dyadic closeness	
	B (*SE*)	β	*B* (*SE*)	β	*B* (*SE*)	β	*B* (*SE*)	β
Model 1: Parent/child reports at age 15								
Harsh parenting	.37 (.08)	.32***	−.57 (.13)	−.35***	.18 (.09)	.13*	−.36 (.13)	−.20**
Positive parenting	−.16 (.09)	−.16†	.15 (.10)	.11	−.30 (.10)	−.25**	.26 (.13)	.17*
Dyadic conflict	.06 (.08)	.06	.04 (.13)	.03	.27 (.09)	.24**	−.12 (.14)	−.08
Dyadic closeness	.14 (.07)	.14*	.17 (.12)	.12	.07 (.09)	.06	−.09 (.13)	−.06
Model 2: Observed parenting in early childhood								
Harsh parenting	.14 (.15)	.12	−.26 (.15)	−.15†	.08 (.17)	.05	−.42 (.16)	−.23*
Positive parenting	.003 (.04)	.01	.10 (.06)	.13	.05 (.05)	.08	.003 (.07)	.004

Note. System for Coding Interactions and Family Functioning (SCIFF) codes were explored in a single multivariate model as correlated dependent variables. Models accounted for the covariance of predictor variables (i.e., intercorrelations of parent–child reports of parenting and the parent–child relationship at age 15 and of Home Observation for Measurement of the Environment scales variables in early childhood) and dependent variables (i.e., intercorrelations of SCIFF codes).
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

.05) and lower SCIFF dyadic closeness scores ($r = -.20, p < .05$), but not harsh parenting at age 15 (see Table 2). To further explore these associations while accounting for method overlap, we examined associations in a multivariate model that accounted for the covariance of predictor and outcome variables (see Table 3 and Figure 2). We identified one significant pathway when explored in a multivariate framework. Specifically, more observed harshness in early childhood was uniquely related to lower dyadic closeness assessed via the SCIFF in adolescence ($\beta = -.23$, $p < .05$; see Table 3 and Figure 2). However, observed harshness in early childhood was not significantly related to observed harshness in adolescence, nor was observed positive parenting in early childhood significantly related to observed positive parenting in adolescence.

Finally, we explored whether gender or poverty moderated associations between our different measures of parenting (see

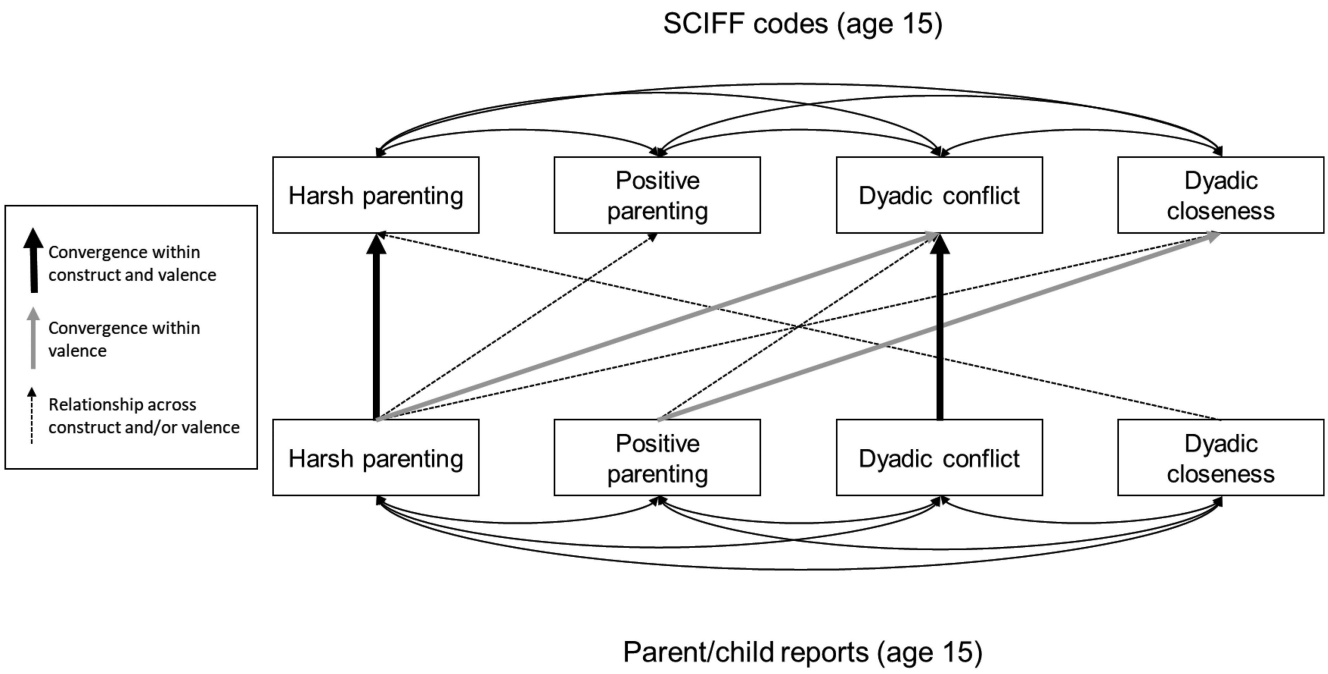

Figure 1. Summary of findings from multivariate model exploring specificity of associations between constructs assessed via the System for Coding Interactions and Family Functioning (SCIFF) codes and parent–child reports for directed versus dyadic parenting and negative versus positive forms of parenting at age 15. Only significant pathways are shown. The model accounted for correlations among all SCIFF codes (range = r = .27–.50, $p < .001$) and among all parent–child reports of parenting (range = r = .16–.41, $p < .05$).

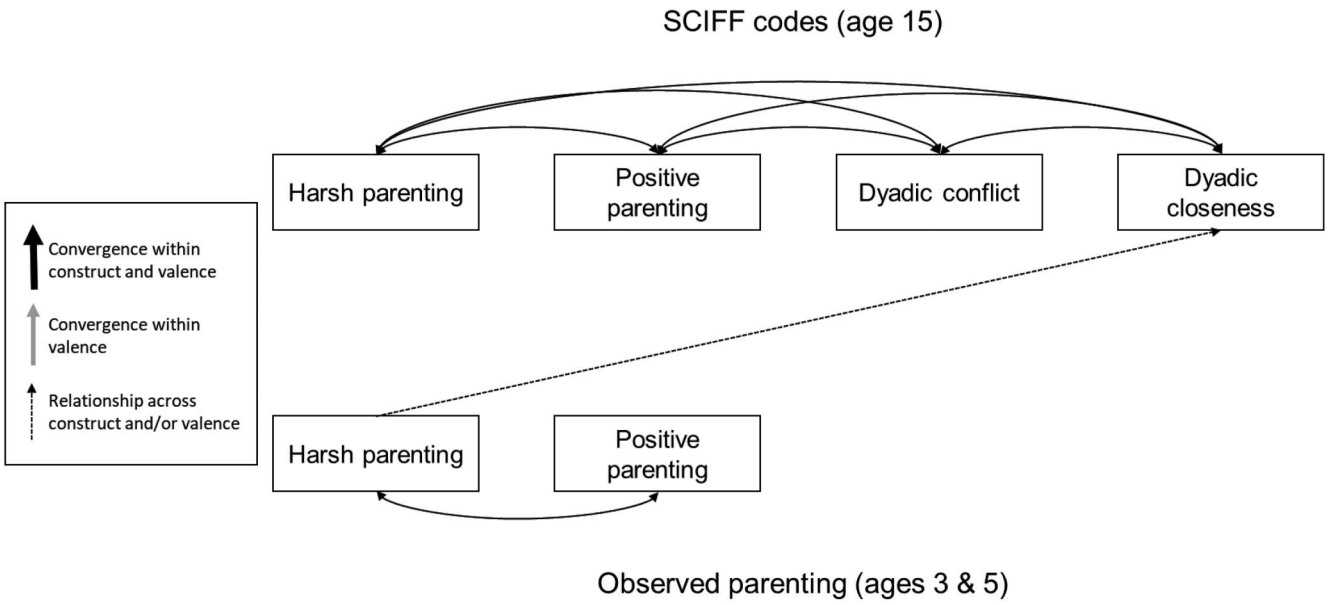

Figure 2. Summary of findings from multivariate model exploring specificity of associations between constructs assessed via the System for Coding Interactions and Family Functioning (SCIFF) codes at age 15 and observed parenting in the home at ages 3 and 5. Only significant pathways are shown. The model accounted for correlations between all SCIFF codes (range = $r = .27$–$.50$, $p < .001$) and between observed harsh and positive parenting at ages 3 and 5 ($r = -.28$, $p < .01$).

Tables 3 and 4 in the online supplemental material). Broadly, multigroup analyses argued against moderation of the cross-sectional associations between parent–child reports of parenting or between earlier observations of parenting and SCIFF codes by gender or living below 200% of the poverty line, with one exception: Parent–child reports of harsh parenting were significantly related to lower observed SCIFF dyadic closeness specifically in boys ($B = -.57$, $SE = .16$, $\beta = -.27$, $p = .001$), but not girls ($B = -.24$, $SE = .16$, $\beta = -.15$, $p = .12$; see Table 3 in the online supplemental material). However, the results overwhelmingly suggest that the convergence of observed parenting measures across time and the association between parent–child reports of parenting and SCIFF codes was equal across boys and girls and among families living above and below 200% of the poverty line (see Tables 3 and 4 in the online supplemental material).

Discussion

We examined the use of the SCIFF, a brief coding scheme designed to assess both directed parenting behaviors (harsh and positive parenting) and dyadic parenting (conflict and closeness), among a low-income sample of adolescents and their parents in a research setting. Our results established the interrater reliability and convergent validity of five of the SCIFF codes, particularly those codes assessing negative aspects of parenting and the parent–child relationship. Specifically, parent–child reports of harsh parenting and dyadic conflict were uniquely related to the SCIFF codes of harsh parenting and dyadic conflict, after accounting for overlap with measures of positive parenting. This specificity in the associations helps to support the convergent validity of the SCIFF codes by showing convergence across methods. The magnitude of these effects was larger than those reported in a recent meta-analysis that explored associations between parent reports and observations of parenting (Hendriks et al., 2018). We also found a unique association between observations of parental harshness in the home during early childhood and lower levels of observed dyadic closeness in adolescence, which highlights the importance of considering early parenting for understanding later parent–child relationships into adolescence. Finally, moderation analyses largely argued against moderation of any associations, cross-sectional or longitudinal, by sex or income. Thus, the convergence between parenting across different methods and across time was equal for boys versus girls and children living below or above 200% of the poverty line.

First, we found robust evidence for convergence between our modified SCIFF-based coding of parental harshness (i.e., combining rejection, coerciveness, and invalidation) and the combined parent and child reports of harsh parenting (corporal punishment, inconsistent discipline), albeit with small effect sizes in some cases. In addition, the SCIFF dyadic conflict code was uniquely related to dyadic conflict reported by parents and children. These findings are consistent with a recent meta-analysis, which found that parent-reported parenting and observed parenting were more strongly related when assessing negative aspects of parenting (Hendriks et al., 2018). Moreover, intergenerational parenting is also more consistent for negative aspects of parenting, including anger and hostility, than for positive parenting (Belsky, Conger, & Capaldi, 2009). In the current study, we may have found particularly robust effects because we separated directed parenting (i.e., parenting behaviors directed from the parent to the adolescent) from dyadic parenting (i.e., interactive behaviors indexing parent–

child relationship). Our study provides support for using the SCIFF with low-income, urban, mixed-gender, and predominantly African American families of adolescents in a research setting, particularly for assessing negative aspects of parenting and the parent–child relationship, which are commonly targets of family centered interventions for reducing child problem behaviors (Chiapa et al., 2016; Forgatch & Stoolmiller, 1994). Importantly, the SCIFF coding scheme has the potential to be adapted for use both in younger samples and using alternative structured tasks, including play with previously restricted or challenging toys or clean-up tasks that assess intrusiveness and negative regard/hostility (Berlin, Brady-Smith, & Brooks-Gunn, 2002; Thompson, Zalewski, Kiff, & Lengua, 2018).

Second, we found less evidence for specific convergence between our SCIFF codes and the combined parent–child reports for positive parenting and dyadic closeness, except for a unique pathway from positive parenting and higher SCIFF dyadic closeness scores. However, while we found significant bivariate correlations between positive aspects of parent–child reports of parenting with observed positive parenting and dyadic closeness, these associations did not remain significant within multivariate models that accounted for harsh parenting and dyadic conflict. One explanation for these findings is that the task we used to elicit arousal within the parent–child dyad (i.e., the hot topics task; Hetherington, 1992) is more explicitly focused on conflict and problems in the relationship. Thus, one future avenue for research focused on better understanding positive aspects of parenting and the parent–child relationship would be to include discussion tasks with a positive emotional focus (e.g., "a fun experience you had as a family, what made it fun, what you would do again to make it even more fun"; cf. Hauser et al., 1984). Nevertheless, the unique associations we found between higher levels of parent–child-reported harsh parenting and lower observed positive parenting and dyadic closeness speak to the effectiveness of the SCIFF coding for identifying parent–child dyads whose interactions are may also be characterized by a lack of warmth, emotional reciprocity, togetherness, and unity. Indeed, parent–child reports of parental harshness were significantly related to all the SCIFF codes, even within the multivariate framework that accounted for method overlap.

Third, we found that observations of parental harshness in early childhood were related to lower observed dyadic closeness in adolescence. Although we did not find evidence for specificity within construct between the observations of directed parenting across time and methods, this longitudinal finding across more than 10 years is a striking example of how early parenting can set the stage for the later parent–child relationships and how the SCIFF coding in adolescence converged with coder impressions from the widely used HOME inventory in early childhood. In particular, our findings are consistent with coercion theory (Patterson, 1982), which describes a cycle of mutually and escalating negative interactions between parent and child (e.g., anger, hostility) that can stabilize throughout development and shape expectations for social interactions in other contexts and later in development. Thus, our findings suggest that harsh parenting in early childhood may set in motion the processes described in coercion theory to ultimately undermine the closeness, unity, and togetherness of the dyad by adolescence (Dallaire & Weinraub, 2005; Hendriks et al., 2018; Trentacosta et al., 2011; Van Heel et al., 2017). This interpretation is partially supported by the finding of a unique association between lower levels of parent–child-reported positive parenting and more SCIFF dyadic conflict within multivariate models. That is, despite the lack of convergence with SCIFF positive parenting, parent–child reports of parents being less likely to hug, kiss, praise, compliment, or reward the child were nonetheless indicative of parent–child dyads observed to be characterized by tension, anger, irritation, hostility, even over and above parent–child reports of harsh parenting.

Finally, we found significant bivariate correlations between observed parenting in early childhood and SCIFF codes in adolescence, but no significant associations between observed parenting in early childhood and parent–child reports of parenting in adolescence (see Table 2). Although a comparison of these estimates was not a focus of the current study, it may be that the SCIFF codes may have provided a better index of the continuity of parenting across a 10-year follow-up than did parent–child reports. At the same time, the lack of associations between observed harshness in early childhood and adolescence and between positive parenting in early childhood and adolescence (i.e., within construct) is important to consider. These nonsignificant effects could have arisen from methodological differences (i.e., difference in observational coding strategies over time) or could reflect substantive and age-appropriate differences in harsh versus positive parenting in early childhood versus adolescence (Bornstein, 2005; Steinberg, 2001).

There were several strengths to the current study, including that the sample was drawn from a larger study of children representative born in large cities in the United States, use of prospective longitudinal and multimethod data, and thorough exploration of moderation by gender and poverty within stringent multivariate models. However, our study findings should be considered alongside several limitations. First, although we had a multiethnic coding team, the sample size and the number of coders from different racial–ethnic groups did not lend itself to being able to explore moderation of SCIFF coding based on the race–ethnicity of coders. Nevertheless, prior studies have shown that the race/ethnicity of coders and race–ethnicity of family members can contribute to biases in observer ratings of family interaction processes (Harvey, Fischer, Weieneth, Hurwitz, & Sayer, 2013; Harvey et al., 2009; Melby, Hoyt, & Bryant, 2003). Accordingly, future studies of the SCIFF should explore moderation of scoring by the race–ethnicity of the coders or whether there was a match between the race/ethnicity of the coder and family. Moreover, future studies are needed to establish the measurement equivalence of SCIFF codes based on race–ethnicity of families. Second, though we examined convergence of directed parenting behaviors in early childhood and adolescence, we did not have observed measures of dyadic parenting in early childhood. Finally, though the sample was representative of urban families from large cities with an oversampling of nonmarital births, we did not use sampling weights meaning that the estimates are not truly representative, but rather, are reflective of an impoverished sample. Accordingly, our findings may not generalize to more rural or suburban settings, different family structures, or families with higher incomes. Moreover, consistent with U.S. national trends (U.S. Census Bureau, 2018), there was a significant association between non-Hispanic African American race–ethnicity grouping ($\chi^2 = 11.78$, $df = 1$, $p = .001$) and living below 200% of the poverty line. Thus, our results cannot speak directly to whether the SCIFF

shows convergent validity among our predominantly African American sample of adolescents or, more broadly, among adolescents growing up in families living in poverty.

In sum, we established reliability and both cross-sectional and longitudinal convergent validity of five of the 13 SCIFF codes for assessing both negative and positive aspects of parenting, with the most robust effects for a modified harsh parenting code and dyadic conflict. Moreover, associations across time and methods were similar across different genders, races, and families living in different socioeconomic contexts. Thus, the SCIFF provides a valid, meaningful, and objective way to briefly and cost-effectively code parenting and the parent–child relationship within research settings, particularly when focused on vulnerable, low-income, and urban groups.

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