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# Psychometric properties of a youth self-report measure of neglectful behavior by parents☆

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ABSTRACT

**Objective:** This study aimed to empirically assess psychometric properties of a multi-dimensional youth self-report measure of neglectful behavior by parents.
**Method:** Data were gathered from 593 12-year-old youth participating in the Longitudinal Studies of Child Abuse and Neglect (LONGSCAN) consortium; 272 also had data at age 14. Youth responded to a 25-item measure of their experiences of neglect. Expert raters classified items into 4 factors, followed by confirmatory factor analyses. We evaluated cross group measurement equivalence by gender and longitudinal measurement equivalence from age 12 to age 14. Validity was assessed by the relationships between factor scores and (1) neglect reports to child protective services (CPS), (2) quality of parent–child interactions, and (3) parental monitoring.
**Results:** A 3-factor model (Physical Needs, Emotional Support, and Parental Monitoring) of neglect was obtained, with equivalence across gender and longitudinally (age 12–14). The pattern of correlations between the factor scores, CPS reports, and measures of the parent–child relationship offered modest to moderate support for convergent validity.
**Conclusions:** The findings suggest a promising and relatively brief youth self-report measure of neglect to help advance research in this area.


## Introduction

Neglect is by far the most common form of child maltreatment, accounting for approximately two-thirds of reported cases in the US (US DHHS, 2010). In a report by the National Research Council (1993) on the state of research on child maltreatment, particular deficits were noted in the realm of child neglect. To address these deficits, research on neglect requires theoretically defined, reliable, and validated measures of neglect that are not limited to cases known to child protective services (CPS) (Dubowitz et al., 2005).

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Three sources of data have been used to measure neglect: direct observation, archival CPS data, and self-report. The choice of data source is driven by cost, convenience, the conceptualization of neglect, and the purpose of the assessment. Direct observation of children's home environments and family interactions minimize reporting biases of CPS data. However, in addition to the cost and effort, there are problems with the representativeness of the situation and the ability to capture neglect when parents know they are being observed.

CPS data are known to significantly underreport exposure (Sedlak & Broadhurst, 1996) and suffer from other biases (English, 1997; Hampton & Newberger, 1985; Lane, Rubin, Monteith, & Christian, 2002). Even using a more refined coding system based on CPS narratives (Barnett, Manly, & Cicchetti, 1993; English et al., 1997a; Zuravin, 2001) cannot circumvent the problem of relying on what was documented by CPS caseworkers. Another concern is that laws, policies, and practice vary among and within states and within agencies, and over time (Barnett et al., 1993). In addition, the relatively high threshold for reporting to CPS may exclude children with less severe, although potentially harmful, neglect.

Survey measures of neglect include self- and interviewer-administered questions, with data obtained from children/youth and/or caregivers. Directly asking children/youth to report on their experiences has advantages over reports by adults (Widom, Raphael, & DuMont, 2004; Widom, Dutton, Czaja, & DuMont, 2005). Children's perceptions of their own possible neglect are important and may influence outcomes. Obtaining information directly from youth rather than from caregivers may be more accurate (Ceballo, Dahl, Aretakis, & Ramirez, 2001; Fisher et al., 2006), involving a shorter recall period with less bias, and less stigma attached to reporting whether their needs were met. Finally social desirability may be diminished by using self-report with a self-administered computerized approach (Black & Ponirakis, 2000; Turner, Ku, Rogers, Lindberg, & Plec, 1998) and focusing on children's needs, rather than on caregiver behavior.

One self-report measure of neglect is the Multidimensional Neglect Behavior Scale, Form A: Adolescent and Adult Recall Version (MNBS-A) assessing neglectful behavior by parents as recalled by adults, or, as experienced by adolescents (Straus, Kinard, & Williams, 1995). This measure spans the 4 commonly considered domains of neglect: physical, emotional, supervisory, and cognitive. The alpha coefficient of reliability of the full-length scale in a sample of 359 mostly White college US undergraduates was .93 (Straus et al., 1995). The authors found evidence for 2 dimensions (emotional/cognitive and supervision/physical). However, Harrington, Zuravin, DePanfilis, Ting, and Dubowitz (2002) were unable to replicate the 2-factor structure in a sample of primarily African American, low income, urban caregivers of young children. They did find partial support for a 4-factor solution based on a modified set of items.

Building on the above work, a somewhat similar measure of neglect was developed for children and youth—the Multidimensional Neglectful Behavior Scale-Child Report (MNBS-CR; Kantor et al., 2004). The MNBS-CR broadly assesses child neglect across the same core domains. It includes pictorial items, audio computer-assisted testing, and programming by age and gender of the child. The measure was evaluated in a sample of 144 maltreated children, age 6–15 years, and a comparison group of 87 children. The MNBS-CR had high reliability for the overall scale, particularly for older (10–15) children (alpha = .94). Preliminary findings indicate some support for validity. Younger and older neglected children scored significantly higher on the MNBS-CR than community children. Among older children, the MNBS-CR Supervisory scale was significantly associated with the Child Behavior Checklist (CBCL), and total MNBS-CR scores were significantly associated with clinician reports of behavioral disorders. The authors, however, found limited support for a 4-domain structure of neglect. While the MNBS-CR is the more recent measure, it remains unclear which measure, MNBS-A or MNBS-CR is best for assessing neglect.

The present study was part of a larger longitudinal study of child maltreatment. In order to directly measure neglect in young adolescents, we modified the MNBS-A. The MNBS-A was utilized as the MNBS-CR was not available at the start of the current longitudinal study. In addition, the MNBS-A has the potential for using the same neglect measure longitudinally, from adolescence through adulthood. The specific objectives in the present study were to: (1) conceptually define, and empirically evaluate, a modification of the MNBS-A for young adolescents; (2) test for equivalence (i.e., same structure) of neglect across genders; (3) evaluate the stability of the multi-factor measure over a 2-year period; and (4) assess convergent validity utilizing CPS records and reports on parental monitoring and parent–youth relationships, by the youth and their caregivers. In addition, we used an Audio-Computer Assisted Self-administered Interview (A-CASI) approach to evaluate the measure.

## Method

### *Sample*

The present study uses data from the Longitudinal Studies of Child Abuse and Neglect (LONGSCAN), a prospective study of the antecedents and consequences of child maltreatment. The consortium of 5 sites across the US has samples that vary by maltreatment risk status from youth who were previously maltreated and placed out-of-home to children at risk for maltreatment (Runyan et al., 1998). Approximately 65% had been reported to CPS by age 12. The participants consisted of LONGSCAN youth with complete data at either age 12 ($n = 593$) or age 14 ($n = 344$); 272 had complete data at both waves. Many of the youth had not yet turned 14 by the time of the study. Half were male, 56% were African American, 28% were non-Hispanic White, and the remainder reported another ethnic identity. The sample was predominantly low income, with

**Table 1**
Distributional properties and exact wording[a] of all 25 items from the modified Multidimensional Neglectful Behavior Scale. Items are grouped based on a theoretically derived factor structure.

| | Loading[c] | Mean | SD | Skew. | Kurt. |
|---|---|---|---|---|---|
| *Physical needs* | | | | | |
| 1. Make sure you bathed regularly? | .48 | .30 | .72 | 2.61 | 6.31 |
| 2. Make sure you saw a doctor when you needed one? | .62 | .18 | .50 | 3.56 | 14.78 |
| **3. Give you enough to eat?**[b] | N/A | .11 | .44 | 5.01 | 26.93 |
| 4. Keep the house clean? | .48 | .18 | .46 | 3.05 | 11.33 |
| **5. Give you enough clothes to keep you warm?** | N/A | .09 | .35 | 4.78 | 27.38 |
| **6. Take care of you when you were sick?** | N/A | .11 | .37 | 4.17 | 21.17 |
| **7. Have something for you to eat when you were hungry?** | N/A | .12 | .40 | 4.40 | 23.60 |
| *Emotional support* | | | | | |
| 8. Do things with you just for fun? | .49 | .75 | .84 | 1.11 | .78 |
| 9. Take an interest in your activities or hobbies? | .56 | .72 | .82 | 1.15 | .97 |
| 10. Comfort you if you were upset? | .70 | .54 | .83 | 1.68 | 2.25 |
| 11. Help you to do your best? | .61 | .25 | .59 | 2.84 | 8.91 |
| 12. Help you when you had problems? | .65 | .38 | .71 | 2.13 | 4.47 |
| 13. Praise you? | .57 | .70 | .93 | 1.30 | .75 |
| 14. Tell you they loved you? | .49 | .23 | .57 | 2.89 | 9.12 |
| *Monitoring/supervision* | | | | | |
| 15. Want to know what you were doing if you were not at home? | .54 | .54 | .87 | 1.70 | 2.07 |
| 16. Care if you got into trouble at school? | .52 | .18 | .57 | 3.78 | 14.72 |
| 17. Take an interest in the kind of friends you had? | .53 | .49 | .76 | 1.74 | 2.84 |
| 18. Care if you did bad things, like shoplifting? | .36 | .16 | .62 | 4.07 | 15.53 |
| 19. Make sure you had somewhere safe to play? | .57 | .26 | .61 | 2.84 | 8.59 |
| 20. *Leave you home alone after dark?* | N/A | 2.21 | 1.01 | −.89 | −.58 |
| 21. *Leave you home alone during the day?* | N/A | 1.72 | 1.08 | −.12 | −1.32 |
| *Educational support* | | | | | |
| 22. *Help you with your homework?* | N/A | .60 | .83 | 1.36 | 1.20 |
| 23. *Make sure you always went to school?* | N/A | .13 | .48 | 4.36 | 20.31 |
| 24. *Help you when you had trouble understanding something?* | N/A | .28 | .63 | 2.71 | 7.72 |
| 25. *Read books to you?* | N/A | 1.47 | 1.14 | .10 | −1.41 |

All items had the following response options: Never (0), Almost Never (1), Sometimes (2), A lot (3). The figures shown reflect reverse coding; higher scores represent more neglect. Descriptive information reported in this table was prior to item transformation.
All descriptives refer to neglect in the past year. Items in italics not used in the final model.

[a] Full item for last year reference begins, "In the last year, how often did your parent(s). . .?" Full item for Elementary School reference begins, "When you were in elementary school, how often did your parent(s). . .?"

[b] Physical Needs items in bold combined to form Physical Needs Index.

[c] All factor loadings presented are for the final three factor model. Although the Physical Needs index is not presented here, its loading (.64) is presented in Fig. 1.

low levels of parental education. The majority of parents (58%) were not employed; 30% had not completed high school or a GED. The youth reported on care by their primary caregiver at the time, mostly the biological mother. There were no demographic differences between the samples at ages 12 and 14.

### *Procedure*

All sites share common protocols for data collection, entry, and management. Data were collected through face-to-face interviews with youth and their caregivers when the youth were approximately 12 and 14 years of age. Trained interviewers administered Audio-Computer Assisted Self Interviews (A-CASI) either at families' homes, children's schools, or at the site's laboratory. Youth heard questions on a head phone and responded privately on a computer. The youth interviews averaged 45 min. Caregivers were reimbursed ($20–$40/interview) and the youth received gift cards for $10–$25. Some variation occurred across sites and over time. Each site followed procedures approved by a human subjects review committee.

### *Measures*

*Demographic* variables such as gender and race of child, caregiver's education level, family income, and marital status were collected from caregivers.

*Child neglect* was measured at age 12 and age 14 using a modified version of the MNBS-A (Straus et al., 1995). The MNBS-A was modified to be appropriate for younger youth. The primary modifications were: (1) response scale was reduced from 7 to 4 options, (2) all but 2 items were reworded into a positive direction (e.g., change "Did not praise me," to "How often did your parents praise you?") so as not to be confusing and to minimize possible reluctance to "blame" parents, and (3) 5 items were added (items 6, 7, 19, 20, and 21 in Table 1) as potential indicators of neglect in early adolescence that were not included in the original scale. The self-report scale consists of 25 items that measure the youth's perception of their interactions with parents or primary caregivers. Youth indicated how often (0 = Never, 3 = A lot) their parent(s) performed

the behavior (see Table 1) during, "*The last year*" and "*When you were in elementary school*." In this paper, results pertain to self-reported neglect in the last year.

*Quality of parent–child relationship.* Youth and their caregivers responded to 8 questions at the 12- and 14-year interviews to assess the quality of the parent–child relationship. The questions were adapted from the National Longitudinal Study of Adolescent Health (Resnick et al., 1997), with responses on a 5-point Likert scale ranging from 1 (Never or Not at all) to 5 (Always). Mean scores were calculated separately for youth and caregiver reports at ages 12 and 14 ($\alpha$s = .63 and .67) for youth reports at ages 12 and 14 respectively, and .59 and .66 for caregiver reports at ages 12 and 14 respectively. Correlations within the same reporter over time were moderate to strong across the 2 time points (*r*s = .44 and .51 for youth and caregiver reports respectively). Youth and caregiver reports had significant and small to moderate correlations at each time point (*r*s = .24 and .33 at ages 12 and 14 respectively). An example of a youth item is "How much do you think s/he cares about you?" An example of a caregiver item is "How close do you feel to [child]?"

*Parental monitoring.* At ages 12 and 14, youth and their caregivers were asked 5 questions adapted for youth respondents from Stouthamer-Loeber's (1984) measure of parental monitoring (i.e., "How much do your parent(s) REALLY know about where you are at night?") and for parents (i.e., "How much do you REALLY know who [child]'s friends are?"). Responses were scored on a 3-point Likert-type scale (0 = "do not know" to 2 = "know a lot"). Mean scores were calculated separately for youth and caregiver reports at ages 12 and 14 ($\alpha$s = .69 and .68) for youth reports at ages 12 and 14, respectively, and .63 and .77 for caregiver reports at ages 12 and 14 respectively. Correlations within the same reporter over time were moderate (*r*s = .34 and .39 for youth and caregiver reports respectively), and, youth and caregiver reports had significant and small to moderate correlations at each time point (*r*s = .21 and .23 at ages 12 and 14 respectively).

*Official CPS allegations of neglect.* Each of the LONGSCAN sites systematically reviewed CPS records to identify reports of alleged maltreatment, and coded the narratives using a modification of the Maltreatment Classification System (Barnett et al., 1993; English & the LONGSCAN Investigators, 1997a). LONGSCAN coders across sites were trained to 90% agreement with a gold standard coder prior to field entry. Subsequent reliability assessment on a random subsample of approximately 5% of reports ($n$ = 129) indicated good overall agreement on coding of type: all kappas > .70 with the 2 types of neglect, Failure to Provide and Lack of Supervision at .88 and .77, respectively. Trained research assistants applied the MMCS coding criteria to CPS narratives documenting the allegation of maltreatment. If a CPS neglect report did not meet the criteria for a given MMCS neglect subtype, that subtype was coded 0. For the present study, allegations of Failure to Provide and Lack of Supervision during the 2 time periods (i.e., ages 10–12 and 12–14) were considered to be dichotomous (i.e., 0 = no allegations and one = at least one allegation). Between ages 10 and 12, 5.8% and 4.9% of youth had allegations of Failure to Provide and Lack of Supervision, respectively. Between ages 12 and 14, 2.6% and 4.4% of youth had allegations of Failure to Provide and Lack of Supervision, respectively.

### *Data analyses*

Data analyses proceeded in 4 phases. First, 12 child maltreatment experts (including the paper co-authors) from 5 disciplines (pediatrics, social work, developmental psychology, child clinical psychology, and sociology) were presented with 25 index cards, each containing a scale item (analogous to a Q-Sort). Raters grouped the items into similar sets and labeled the sets (i.e., "free sort" the items into factors). Raters were not instructed regarding the nature or number of underlying factors. Based on the initial ratings, 4 factors were identified. Then raters grouped the items a second time, constraining their clusters to the defined factors.

In the second phase, we examined the distributional properties and bivariate correlations of the 25 items with the goal of possibly omitting items that did not correlate with the majority of other items. A confirmatory factor analysis (CFA) was conducted based on the defined factors using the age 12 data regarding past year experiences. To reduce potential confounding due to site differences, pooled covariance matrices (across site) were used. Model fit was evaluated using chi-square, measures of model fit (e.g., CFI, RMSEA; Bentler, 1995), and examination of individual factor loadings. Adjustments to the measurement model, if necessary, were based on the examination of modification indices (LaGrange multipliers), factor correlations, and the reproduced correlation matrix (e.g., Byrne, 1994).

In the third phase, the factor model developed in the second phase was evaluated for the measurement equivalence in several domains using multiple group modeling techniques (Muthén & Muthén, 1998). Specifically, 5 levels of equivalence were evaluated across gender and time (age 12 and age 14) (Pitts, West, & Tein, 1996). The levels examined include: *configural equivalence*, *metric equivalence*, *tau-equivalence*, *intercept equivalence*, and *parallel measures* (Bollen, 1989; Jöreskog & Sörbom, 1996; Muthén & Muthén, 1998). These differing levels are sequentially nested and can be estimated through imposing restrictions on the measurement model. CFA is preferred over Principal Components Analysis (PCA) or Exploratory Factor Analysis (EFA) because the appropriateness of these restrictions can be empirically tested at each step to determine whether the higher level of measurement equivalence is appropriate. We began with the most basic level of equivalence (configural) and tested increasingly stringent models.

*Configural* equivalence describes a scale in which the same factor structure and loading patterns are observed across groups or time. In other words, configural equivalence demonstrates that the same parameters (e.g., factors and paths) exist across groups or time and establishes the baseline model for subsequent tests of measurement equivalence.

*Metric equivalence* is established through restriction of the factor loadings of the same items from the configurally equivalent measure to equivalence across the groups (or over time). Factor variances, covariances, item intercepts (item means),

and error variances are freely estimated across the groups. This is the most basic level of measurement equivalence, necessary for subsequent comparisons between groups or over time (Jöreskog & Sörbom, 1996; Pitts et al., 1996). While configural equivalence establishes that the same parameters exist (e.g., the same items are related to the same factors across groups), metric equivalence actually concerns the equivalence of the strengths of those relationships.

*Tau-equivalence* is demonstrated when factors have the same variances and covariances in the two groups (or over time) while enforcing metric equivalence. Tau-equivalence implies that the items have the same true-score variance in the groups, a very stringent test of measurement equivalence (Cheung & Rensvold, 1999; Meade & Lautenschlager, 2004).

*Intercept equivalence* concerns whether the item means are equal across the groups, or over time. This criterion might not be expected in all instances if, for example, there are differences associated with adolescent development.

Finally, *parallel measures* are the most stringent form of equivalence and exists when, in addition to being tau-equivalent, the error variances of the items are equivalent across the groups (or over time). This is a level of equivalence often observed for "standardized" tests.

In the fourth phase, evidence of the scale's psychometric properties was examined. Internal consistency (alpha) reliability coefficients were calculated to provide psychometric information on the factor models. Finally, convergent validity was tested by examining the pattern of relationships with measures of Parental Monitoring, Quality of the Parent-Child Relationship, and CPS neglect reports.

## Results

### *Phase I: Expert sorting*

In the "sorting" task, raters identified 4 or 5 factors. All raters identified: (1) a Provision of Physical Needs/Basic Needs factor and (2) an Emotional Support/Nurturance factor. Most identified a Parental Monitoring/Supervision factor. Over half identified an Educational Support/Cognitive Stimulation factor. Remaining identified factors included Healthcare, Parental Support, Problem Solving, Truancy, Permissiveness, Nutrition, and Moral Guidance.

Three raters determined the 4 most frequently identified factors: Provision of Physical Needs, Emotional Support/Nurturance, Monitoring/Supervision & Safety, and Educational/Cognitive Support. The remaining 9 raters re-clustered the 25 items into 1 of these 4 factors. Table 1 lists the items by cluster.

### *Phase II: Description and confirmatory factor analysis*

Table 1 also lists descriptive statistics (mean, SD, skewness, and kurtosis) for each item, reverse coded, where necessary. Many of the items showed moderate to severe non-normality, especially items measuring Physical Needs. Four items (3, 5, 6, and 7) had over 90% responses as "A lot" (i.e., positive). These 4 items were recoded ("A lot" = 0 versus any of the other 3 responses = 1) and summed to create a "Basic Physical Needs" Index (the index was in the same direction and scaled to range from 0 to 3 as was the case with the other variables).

While still non-normally distributed (skew = 2.59, kurtosis = 6.13), non-normality for the Needs Index was not as pronounced as the original items. As moderate to severe non-normality can impede estimates from CFA (West, Finch, & Curran, 1995), and based on recommendations by Tabachnick and Fidell (2007), all variables were log-transformed prior to analysis. Because the response option of zero does not have a defined log, a small constant (.01) was added to all variables prior to transformation.

The zero-order correlations among the 25 variables at age 12 for the past-year time frame were small/moderate to large (*r*s ranging from .24 to .69) for the 7 Provision of Physical Needs items, moderate to large (*r*s ranging from .27 to .49) for the 7 Emotional Support/Nurturance items, small to large (*r*s ranging from −.07 to .59) for the 7 Monitoring/Supervision and Safety items, and small to large (*r*s ranging from .09 to .48) for the 4 Education/Cognitive Support Items. Whereas the 2 "Left Home Alone" variables were highly correlated with each other ($r = .59$), they were poorly correlated with all other variables (*r*s ranging from .00 to .15). These 2 variables were excluded from all remaining analyses. Given that 4 of the Physical Needs items (3, 5, 6, and 7 in Table 1) were pooled to construct the Basic Needs composite, 20 variables were retained for the factor analyses.

CFA models were estimated using the 20 Last-Year items collected at age 12. For all models, several estimates were evaluated to assess how well the model fit the data, including $\chi^2$, CFI (Comparative Fit Index), and RMSEA (Root Mean Square Error of Approximation) (Hu & Bentler, 1995). CFI is an example of a relative fit index and represents the comparison between the worst fitting model (i.e., the baseline or independence model), which assumes no relationships, and the target model. Values less than .90 were considered a poor fit, .90–.95 an adequate fit, greater than .95 a good fit (Hu & Bentler, 1995). Meanwhile, RMSEA is adjusted for model parsimony (i.e., penalizes models that estimate too many parameters) and is sensitive to changes in restrictiveness of models. Values greater than .08 were considered a poor fit, .05–.08 an adequate fit, and less than .05 a good fit (Browne & Cudeck, 1993). To isolate areas within the multiple factor model not adequately measured, residual correlations and modification indices (MI) for non-specified relations were evaluated for all models (Byrne, 1994).

The goal of the analysis was to determine whether the theoretically defined factor structure was consistent with the data. Thus, we initially estimated the 4-factor solution in which each variable was specified to load on the factor as defined in

**Table 2**
Test of gender equivalence of age 12 last year reporting period.

| Model | Description/test | $\chi^2$ (df), $p$ | RMSEA | CFI ($\Delta$CFI) | $\Delta\chi^2$ (df), $p$ |
|---|---|---|---|---|---|
| 1. Configural equivalence | Three-factor model. Baseline model. | 423.14 (202), $p < .001$ | .061* | .900* | n/a |
| 2. Metric equivalence | Loadings forced to equivalence across gender. Compare to Model 1. | 444.52 (215), $p < .001$ | .060* | .897 (.003) | 21.38 (13), $p = .066$ |
| 3. Tau-equivalence | Factor variance/covariance estimates forced to equivalence across gender. Compare to Model 2. | 456.49 (221), $p < .001$ | .060* | .894 (.003) | 11.97 (6), $p = .063$ |
| 4. Intercept equivalence | Item intercepts forced to equivalence across gender. Compare to Model 3. | 487.41 (237), $p < .001$ | .060* | .889 (.005) | 30.92 (16), $p = .014$ |
| 5. Parallel measures | Item error variances forced to equivalence across gender. Compare to Model 3. | 510.73 (237), $p < .001$ | .063* | .877 (.012) | 54.24 (16), $p < .001$ |

* Adequate fit.

Table 1. A second, more restricted, factor model specifying only a single factor was also estimated. As the single factor model is nested within the 4-factor model, these models can be directly compared in terms of model fit by examining the change in chi-squared values (Bentler & Bonett, 1980). A statistically significant test suggests that the 4-factor model provides a better fit than the 1-factor model. Recently, researchers have also suggested examining the change in CFI values for nested models to directly compare model fit, with values of .01 or greater indicating superior fit (e.g., $\Delta$CFI values less than .01 indicating no change in fit or equivalence; Cheung & Rensvold, 2002; Meade, Johnson, & Braddy, 2008).

*Test of the 4-factor model.* Neither the 1 nor the 4-factor model provided an adequate fit to the data; $\chi^2$ (170, $N = 593$) = 577.83, $p < .001$, CFI = .86, RMSEA = .064, and $\chi^2$ (164, $N = 593$) = 520.02, $p < .001$, CFI = .88, RMSEA = .061, $\Delta\chi^2(6) = 57.81$, $p < .001$, respectively. Moreover, examination of the individual estimates from the solution revealed that correlations involving the Educational Support/Cognitive Stimulation factor were high (greater than .90). Two variables of this factor ("Made sure you went to school" and "Read books to you") had pronounced cross-loadings on the other factors. Rather than collapsing the Educational Support items into 1 of the 3 factors, we dropped the 4 items hypothesized to represent this factor because (1) collapsing would result in factors not theoretically defined a priori and (2) it is not clear which factor(s) represent these items theoretically. As a result of the poor fit among the initial models, the ensuing analyses did not test a priori specified models. Thus, these analyses could not be considered confirmatory as they relied on model modification parameters to identify the best fitting models.

*Test of the 3-factor model.* The 1- and 3-factor models for the 16 remaining items were estimated. As with the full 20 items, the 1-factor model displayed poor-to-adequate fit [$\chi^2$ (104, $N = 593$) = 381.52, $p < .001$, CFI = .88, RMSEA = .067]. The 3-factor model had adequate fit with a significant improvement in $\chi^2$ and CFI [$\chi^2$ (101, $N = 593$) = 328.97, $p < .001$, CFI = .90, RMSEA = .062, $\Delta\chi^2(3) = 52.55$, $p < .001$] over the 1-factor model. Residual correlations and MIs did not reveal systematic patterns of model misfit. Fig. 1 shows the standardized solution for the 3-factor model with most factor loadings exceeding .50 (strong). In sum, the 3-factor model provided adequate fit to the data, adequately representing 3 distinct, though correlated, factors of neglect.

### *Phase III: Measurement equivalence*

*Across gender.* Configural equivalence between female and male models was supported; the 3-factor model provided better fit to the data than the corresponding 1-factor model for both females [$\Delta\chi^2$ (3, $N = 298$) = 34.68, $p < .001$] and males [$\Delta\chi^2$ (3, $N = 295$) = 18.95, $p < .001$]. Neither gender showed evidences of either pronounced cross-loadings or correlated errors between variables of differing factors. Thus, the 3-factor model shown in Fig. 1 (estimated separately for females and males) served as the baseline model for subsequent tests of measurement equivalence. Table 2 summarizes the model results for the test of each level of measurement equivalence. The 3-factor model displays tau-equivalence across gender, though not intercept equivalence or parallel measures according to the change in chi-squared test. It also displays intercept equivalence, though not parallel measures according to the change in CFI.

Given the established measurement equivalence across gender, the following observed differences in item means can be attributed to gender. Specifically, girls were more likely to report higher mean levels for the following items: "Comfort you when upset," "Asked what you were doing when you went out," and "Took an interest in the kinds of friends you had."

*Longitudinal measurement equivalence.* Examination of measurement equivalence across reports at ages 12 and 14 showed support for configural equivalence and the improved fit of the 3-factor over 1-factor model at both ages [Age 12: $\Delta\chi^2$ (3, $N = 272$) = 26.10, $p < .001$]; [Age 14: $\Delta\chi^2$ (3, $N = 272$) = 49.36, $p < .001$]. Thus, the 3-factor model served as the baseline for tests of longitudinal equivalence. As observed in Table 3, the scale demonstrates the most stringent level of longitudinal measurement equivalence, parallel measures. Differences in intercepts for items from the Emotional Support/Nurturance and Monitoring/Supervision factors were observed, however, suggesting that participants' endorsement of these items was changing over time. Specifically, we found that there were consistent and expected changes observed over time with youth reporting increasing self-sufficiency (e.g., 14-year-olds reported their parents were less likely to, "Provide a safe place to play" than 12-year-olds) as well as increased levels of parental monitoring (e.g., 14-year-olds reported their parents were more likely to have, "Asked what you were doing when you went out?")

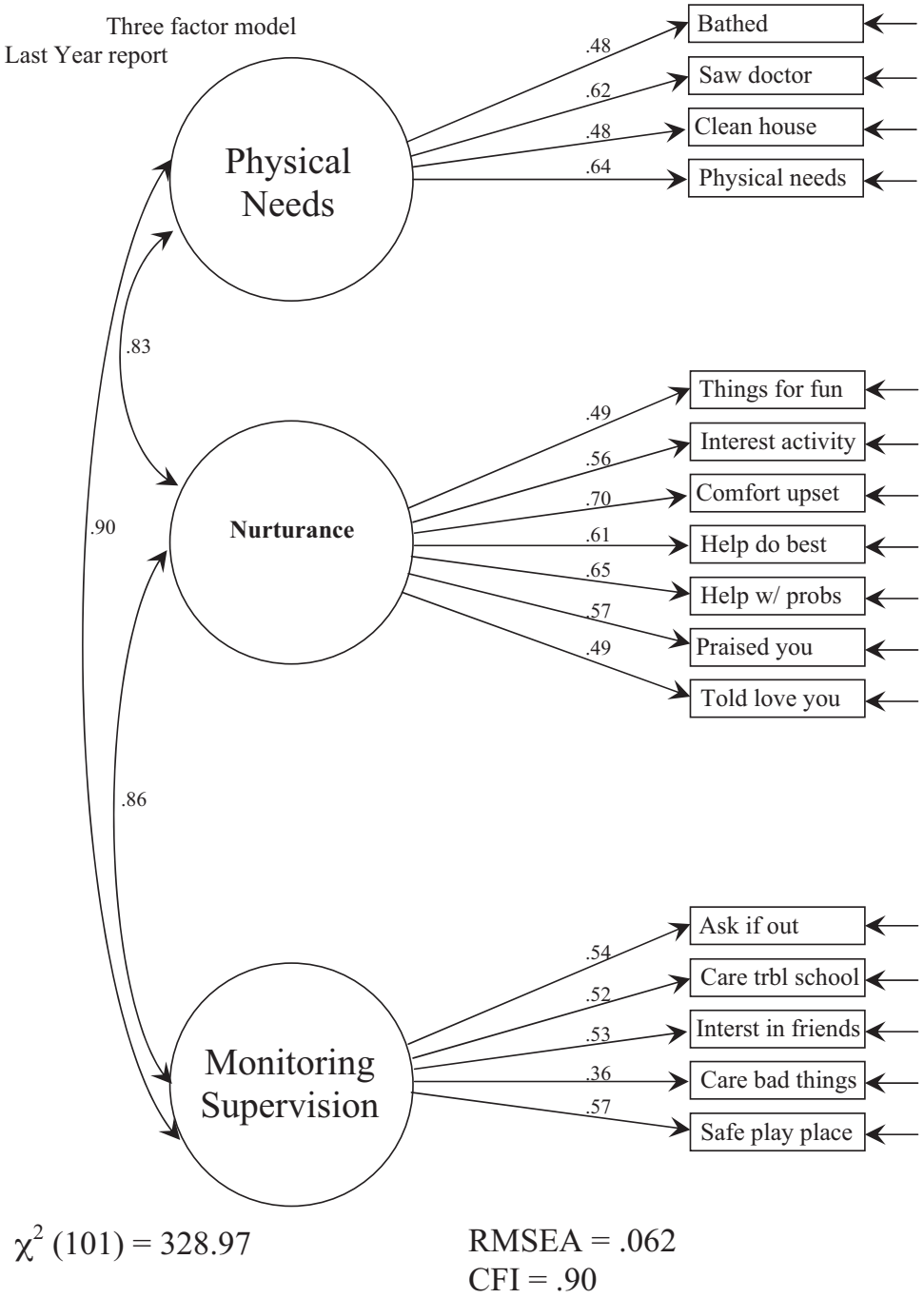


**Fig. 1.** Three factor model.

We conducted tests of measurement equivalence between participants with data at both ages 12 and 14 ($N = 272$) and those who had data only at age 12 ($N = 321$). An overall test of all estimates (factor loadings, factor variances and covariances, intercepts, and error variances) supported the assumption that it is the same measure in the 2 groups [$\Delta\chi^2$ (51) = 63.19, $p = .118$]. Thus, incomplete data did not affect tests of longitudinal equivalence.

*Phase IV: Psychometric properties of subscales*

Internal consistency (alpha) reliabilities were examined for each subscale as well as the overall measure for the prior year at ages 12 and 14 (see Table 4). To facilitate the accurate comparison of the Cronbach's alpha reliability coefficients for

**Table 3**
Test of longitudinal equivalence of last year reporting period variables over time ($N = 272$).

| Model | Description/test | $\chi^2$ (df), $p$ | RMSEA | CFI ($\Delta$CFI) | $\Delta\chi^2$ (df), $p$ |
|---|---|---|---|---|---|
| 1. Configural equivalence | Baseline model. Three factor model. All factors and error terms of "like" items allowed to freely correlate. | 685.78 (433), $p < .001$ | .046** | .887 | n/a |
| 2. Metric equivalence | Loadings forced to equivalence over time. Compare to Model 1. | 706.33 (446), $p < .001$ | .046** | .883 (.004) | 20.55 (13), $p = .089$ |
| 3. Tau-equivalence | Force factor variance and covariance estimates to equivalence over time. Compare to Model 2. | 714.91 (452), $p < .001$ | .046** | .882 (.001) | 8.58 (6), $p = .198$ |
| 4. Intercept equivalence | Force item intercepts to equivalence over time. Compare to Model 3. | 783.57 (468), $p < .001$ | .050* | .858 (.024) | 68.66 (16), $p < .001$ |
| 4a. Partial intercept equivalence. | Force item intercepts for Physical Needs factor items only to equivalence over time. Compare to Model 3. | 716.49 (456), $p < .001$ | .046** | .883 (.001) | 1.58 (4), $p = .812$ |
| 5a. Parallel measures | Force item error variances to equivalence over time. Compare to Model 4a. | 736.70 (472), $p < .001$ | .046** | .881 (.002) | 20.21 (16), $p = .210$ |

* Adequate fit.
** Good fit.

the individual subscales with 1 another and with the overall measure, the Spearman–Brown Prophecy Formula was used to estimate the internal consistency (alpha) of each subscale, if they included the same number of items as the overall measure (Nunnally & Bernstein, 1994). The Spearman–Brown Prophecy Formula is:

$$rxx_c = \frac{nr_{xx}}{[1 + (n-1)r_{xx}]}$$

where $rxx_c$ is the corrected or predicted reliability, $r_{xx}$ is the original or observed reliability before correction, and $n$ is the factor by which the test length is changed. The corrected alpha coefficients are generally higher (see Table 4 for corrected alpha coefficients) than the observed alpha coefficients for the overall scale at both ages ($\alpha$s = .86 at ages 12 and $\alpha$ = .86 at 4), with the exception of the monitoring/supervision subscale.

To examine the continuity of individuals' responses across the 2 time points, within-reporter correlations were calculated for the 3 subscales and the overall scale. Correlations between age 12 and age 14 reports for Physical Needs, Emotional Support, and Monitoring/Supervision subscales were moderate ($r$s = .30, .40, and .28, respectively, $p$s < .001). Moreover, although high correlations were reported between factors measured at the same time ($r$s ranging from .83 to .90), these represent the correlations between latent variables after being corrected for unreliability. The correlations between the manifest and observed subscales were substantially lower, but still relatively large ($r$s ranging from .57 to .61 at age 12 and from .55 to .63 at age 14).

Evidence of convergent validity was provided by examining the patterns of relationships between each of the 3 subscales and youth and caregiver reports of parental monitoring and quality of parent–child relationship as well as CPS reports for 2 types of neglect: Failure to Provide and Lack of Supervision. As shown in Table 4, youth and caregiver reports of parental monitoring and quality of parent–child relationship generally provided evidence of convergent validity for the 3 subscales. Although youth and caregiver reports each generally yielded significant correlations at each age, youth reports yielded moderate to strong correlations, while caregiver reports yielded weak to moderate correlations. Also, it appeared that youth reports of quality of parent–child relationship were generally most strongly associated with Emotional Support. However, the types of CPS reports for neglect provided no evidence of convergent or cross-informant validity for the subscales.

## Discussion

Overall, the findings of the present study support a theoretically defined, empirically validated 3-factor measure of youth self-report of neglectful behavior by parents: Provision of Physical Needs, Emotional Support, and Parental Monitoring. Further research is needed to understand the role of the fourth factor, Educational Support, in neglect concerning young adolescents. The findings fit generally with those of prior studies. Straus et al. (1995), using a sample of college students found 2 factors: emotional/cognitive and supervision/physical. Harrington et al. (2002) found 4 factors in a low income sample of mothers: emotional, supervisory, physical, and cognitive. Aside from the last factor, this mirrors the findings of the present study. Preliminary findings from the MNBS-CR, however, in a study of maltreated and comparison children found limited supported for the same 4 core domains, particularly for 10–15 year olds (Kantor et al., 2004).

Findings from the measurement equivalence assessments are promising. The measure displayed measurement equivalence across females and males, indicating that gender differences can be meaningfully interpreted and are not merely due to differences in the measurement of neglect among females and males. More specifically, the finding that preadolescent females report more parental monitoring and emotional support than preadolescent males is supported by prior studies (e.g., Richards, Miller, O'Donnell, Wasserman, & Colder, 2004).

The measure of neglect displayed measurement equivalence from age 12 to age 14. To our knowledge, this is the first study to empirically evaluate measurement equivalence of a multi-dimensional measure of neglect, a critical feature in longitudinal

**Table 4**
Convergent validity and alpha reliability coefficients for neglect subscales.

| | Physical needs age 12 ($\alpha$ = .630[.872]) | Physical needs age 14 ($\alpha$ = .620[.867]) | Emotional support age 12 ($\alpha$ = .795[.899]) | Emotional support age 14 ($\alpha$ = .802[.903]) | Monitoring/supervision age 12 ($\alpha$ = .643[.852]) | Monitoring/supervision age 14 ($\alpha$ = .612[.835]) | Mean (SD) |
|---|---|---|---|---|---|---|---|
| Relationship with mother age 12 – youth report | −.31** | – | −.43** | – | −.31** | – | 4.07 (.52) |
| Relationship with youth age 12 – parent report | −.09* | – | −.12* | – | −.09* | – | 4.21 (.44) |
| Relationship with mother age 14 – youth report | – | −.28** | – | −.52** | – | −.33** | 3.94 (.55) |
| Relationship with youth age 14 – parent report | – | −.09* | – | −.22** | – | −.15** | 4.15 (.49) |
| Parental monitoring youth report age 12 | −.29** | – | −.35** | – | −.38** | – | 1.61 (.40) |
| Parental monitoring parent report age 12 | −.08* | – | −.14** | – | −.08* | – | 1.83 (.24) |
| Parental monitoring youth report age 14 | – | −.34** | – | −.44** | – | −.43** | 1.64 (.37) |
| Parental monitoring parent report age 14 | – | −.01 | – | −.10* | – | −.08* | 1.78 (.30) |
| CPS failure to provide allegations 10–12 | .06 | – | .03 | – | .03 | – | |
| CPS lack of supervision allegations 10–12 | .06 | – | .07 | – | .05 | – | |
| CPS failure to provide allegations 12–14 | – | .03 | – | .07 | – | .04 | |
| CPS lack of supervision allegations 12–14 | – | .00 | – | .03 | – | .02 | |

Each of the neglect subscales is coded such that higher scores indicate more neglectful parenting.
Cronbach's α's presented in brackets have been adjusted using the Spearman–Brown Prophecy formula in order to reflect a scale length of 16 items.
* $p < .05$.
** $p < .001$.

research. Specifically, to evaluate change in a construct over time, the same construct must be measured at multiple time points. Having established measurement equivalence for the age 12 and 14 self-reports ensures that longitudinal changes in the observed means can be meaningfully interpreted and attributed to developmental level rather than differences in measuring the constructs across these 2 time periods. However, this factor structure should be validated with youth of different ages in order to ensure its validity during different developmental periods. For example, items such as "Make sure you had somewhere safe to play?" will be less relevant to older adolescents than to younger children. This is an unavoidable challenge to measuring neglect given the developmental changes during childhood.

The scales demonstrated adequate internal consistency and convergent validity, and expected continuity over time. Generally higher internal consistency and temporal continuity among the subscales relative to a single scale score further supports the use of the 3-factor model of the Neglect Scale. Although self-reported neglect within the past year was more strongly related to other self-reported data in general, similar evidence for convergent validity was found with caregiver reports.

Support for validity of the subscales was provided by the specific patterns of relationships. Several relationships between the Emotional Support subscale and particularly the youth reports of Quality of Parent–Child Relationship were moderately sized. Parental reports of their relationships were only modestly associated with the subscales. These patterns of relationships were generally consistent across time points, suggesting adequate measurement invariance over time. It is important to note, however, that several of the observed internal consistency coefficients for youth and caregiver reports of parental monitoring and quality of parent–child relationships were slightly below the typically recommended cutoff for an adequate scale, although the alphas in the high .6 range likely did not compromise the observed correlations between these measures and the neglect factors. There is other evidence supporting the validity of the MSNB (Straus, 2006). Using an Adult Recall short form version of the measure with a convenience sample of 7,179 students, those who reported neglectful behavior as a child were more likely than other students to have physically assaulted a dating partner in the previous 12 months.

The 3-factor measure of neglect offers a number of potential advantages for research and interventions. Based on youth self-report of recent neglect, it ensures that the experiences are understood from the youth's perspective. Concerns regarding bias, social desirability, and recall errors are somewhat ameliorated when compared to parent/caseworker report or retrospective self-report.

The measure includes several items that would not meet criteria for a CPS report; hence, it should be more effective at capturing neglect more broadly defined than cases usually referred to CPS. This lower threshold of concern in the MSNB helps explain why there was little relation to CPS reports. Finally, there is less risk of variability in the measurement of neglect than arises through use of archival data (e.g., reporting criteria may vary over time, across state, or even within agencies).

There are limitations of the current study. Foremost, although theoretically identified, the Educational Support factor was not empirically supported. A larger pool of items may have been useful, although the earlier work on the MNBS-A began with 63 items. Caution should also be exercised with respect to the generalizability of the findings. In addition to the specific age range (age 12–14), the sample was at high-risk for maltreatment. Another issue concerns the interest in having cut scores for determining "neglect." One problem is what "gold standard" to use. Clearly, CPS data do not offer this. This measure of neglect includes many items that would not meet criteria for CPS involvement. Establishing cut scores is an important area for future research. Finally, there is a need to acknowledge the potential limitations of any self-reported data. Youth may have been reluctant to criticize their parents, they may have had a need to view their parents positively, and they may have lacked insight into their circumstances.

Several aspects of the current study suggest areas for further research, such as probing the role of Educational Support. Although this factor was theoretically identified in the current study, and has been posited by other researchers (Zuravin, 1999), empirical support for the factor was not found. Specifically, given the high correlations of this factor with the other 3 factors, the factor was not uniquely measured. Attention should be directed to finding items to assess educational neglect during adolescence. Finally, evaluation of the measure in a more normative sample (with respect to risk) and at differing ages would help evaluate its generalizability.

In sum, our findings constitute a promising step in the development of a multi-dimensional youth self-report measure of neglect. Methodological rigor resulted in a 3-factor, 20-item measure of neglect whose measurement structure was stable across females and males, and over time. The measure is easy to administer, allows detection of less severe neglect than CPS reports, and assesses caregiving behavior associated with neglect from the youth's perspective. Aside from being administered via computer, the measure may also be useful as a paper and pencil questionnaire or as part of an interview. As with any new measure, additional research is warranted, particularly regarding its validity.

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