Translational Research on Parenting of Adolescents: Linking Theory to Valid Observation Measures for Family-centered Prevention and Treatment.

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Abstract

Parental monitoring and family problem solving are key parenting practices targeted in evidence-based interventions targeting adolescents and families, yet the constructs have yet to be validated across ethnic groups. **Objective:** To promote translational research by evaluating convergent, discriminant, and predictive validity of the two constructs at age 16–17 years through the use of multiple observation indicators and methods and as a function of ethnic status. **Method:** Videotaped parent–adolescent family interactions were coded for monitoring and problem solving in a sample of 714 European American (EA; 59.2%) and African American (AA; 40.8%) males (53.8%) and females (46.2%). **Results:** Structural equation models established convergent and discriminant validity of parental monitoring and problem solving among parent, youth, and observation measures for AA and EA families. Low levels of parent monitoring was highly predictive of antisocial behavior in EA and in AA youths ($p < .001$) and moderately predicted future drug use ($p < .001$) for both groups at age 18-19. Poorer family problem solving was also moderately predictive of antisocial behavior ($p < .001$ for EA; $p < .05$ for AA) and drug use ($p < .01$ for EA; $p < .05$ for AA) at age 18–19. **Conclusions:** These findings suggest that interventions targeting parental monitoring and family problem solving can be reliably evaluated through various measurement methods, and that such interventions are of value in efforts to prevent and treat problem behavior in adolescence. These family processes are readily observable in videotaped family interaction tasks in both EA and AA families.

Key words: parental monitoring, problem solving, problem behaviors, observations/video coding, ethnicity

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Introduction

Interventions that target parenting practices are at the core of evidence-based strategies for treating antisocial or delinquent adolescent problem behaviors (Henggeler & Schaeffer, 2010; Liddle, 2010; Waldron & Brody, 2010). Problem solving and monitoring have emerged as critical parental processes contributing to antisocial behaviors and have become critical domains for both prevention and treatment of adolescence. These evidence-based programs are developed, implemented, and disseminated within the context of translational research, which has been conceptualized as operating across a continuum that originates with the translation of basic science to applied theory [T0] and culminates with translation to global communities and policy change [T5] (Fishbein, Sussman, Ridenour, & Stahl, under review) . One critical component that must be addressed as interventions move from the "bench to the bedside" stage [T1] to the "bedside to practices" stage [T2] is the cross-cultural validation of parenting measures used in interventions that are implemented across diverse populations. Without this validation, implementation is based on the potentially dangerous assumption that an intervention is generalizable across diverse populations. The current study contributes to translational research efforts by examining internal and external validity of observation measures of parental monitoring and problem solving. We first provide definitions of the two parenting constructs of interest and review their associations with youth development and well-being.

Parental Monitoring

Parental monitoring "includes both structuring the child's home, school, and community environments and tracking the child's behavior in those environments" (Dishion & McMahon, 1998, p. 66). Previously termed *parental supervision,* this parenting construct has been central to studying the etiology of delinquent behavior (Loeber & Dishion, 1983). Later, the construct was termed *monitoring* to emphasize the direct and indirect aspects of parents' awareness of the child's behavior and environments (Patterson, 1982; Patterson et al., 1992). One of the most controversial aspects of parental monitoring is the extent to which awareness of the child's behavior and environment is a function of either the parent's tracking or else the child's tendency to disclose his or her daily activities to parents (Kerr & Stattin, 2000). The emphasis on youth disclosure of activities as central to monitoring has heightened awareness of the reciprocal influence process of parenting constructs, suggesting disclosure is integral to parental knowledge (Willoughby & Hamza, 2011) and positive youth outcomes (Keijsers et al., 2010; Willoughby & Hamza, 2011).

However, if one examines the day-to-day reports of parents and youths over time, the data also support that youths who spend more unsupervised time with peers are at high risk for growth in problem behaviors, such as substance use, whereas youth's daily disclosure of activities predicts very little about youths' future behavior (Dishion, Bullock, & Kiesner, 2008), indicating potential limitations in the sole reliance of youth disclosure. Additional support for the importance of parents' involvement in the monitoring process, above and beyond the contribution of adolescents' disclosure, has been provided by back-translational evidence. In fact, Dishion and colleagues (2003) showed that random assignment to the Family Check-Up, a

family-centered intervention targeting parenting skills, led to improvements in observed parental monitoring practices, which mediated reductions in youth substance use (Dishion et al., 2003). While the exact relations between the different aspects of parental monitoring remain to be established, it is clear that parental involvement in the monitoring process is critical to the prevention or reduction of behavior problems in adolescents.

Problem Solving

Problem solving is another aspect of family dynamics that has been established as a reliable predictor of adolescents' healthy development and refers to an ability to clearly define and understand the problem, encourage family members to discuss the problem, generate alternate solutions, and attain resolution or agreement (e.g., Forgatch, 1989; Costigan, Floyd, Harter & McClintock, 1997). Family conflicts combined with deficient strategies to solve them lie at the heart of many forms of psychopathology in childhood and adolescence (Beauchaine & Beach, 2006) including antisocial or delinquent behaviors (Dishion, Forgatch, Van Ryzin, & Winter, 2012; Patterson et al., 1992). Because randomized intervention trials have shown that reductions in family conflict (observed or reported) mediate reductions in youth antisocial behavior (Forgatch & Patterson, 2010; Van Ryzin & Dishion, 2012), investigators have introduced the concept of family problem solving to provide a set of systematic steps to negotiate disagreements in the hope of reducing conflict (Blechman, Taylor, & Schrader, 1981; Forgatch & Patterson, 1989). Family problem solving and parental monitoring are therefore critical domains that can be targeted in interventions and must be accurately represented and understood.

Measurement of Parental Constructs

Methodological approaches can impact the overall understanding of parental processes and thus the development of sound interventions. In fact, the majority of previously described

studies examining parental monitoring and problem solving have been questionnaire-based, relying on adolescent and parent report of their own family dynamics. While questionnaire-based assessments are usually quite popular in real-world settings because they are easier to administer, different types of measurement are necessary to validate the underlying theoretical constructs. Significant efforts have been made to diversify the measurement of parenting processes and to design procedures that can complement self-report questionnaires. For example, the development of coding systems for direct observations of family interaction have successfully provided insights into the family dynamics that can influence the development of children's behaviors (Hops, Tildesley, Lichenstein, Ary, & Sherman, 1990; Patterson, Reid, & Dishion, 1992) and there is evidence that observational measures of parental monitoring and family problem solving are specifically linked to later behavior problems in adolescence.

An observational measure was used to assess parental monitoring in an intervention study and improvements in parental monitoring were found to mediate reductions in substance use (Dishion et al., 2003). This measure was based on videotaped parent–youth conversations during which they discussed the youths' time spent with peers without an adult present. Ratings of this discussion by trained coders yielded a measure of parental monitoring that incorporated the dimensions called out in the definition by Dishion and McMahon (1998). After viewing a videotaped discussion between the adolescent and parent about the youth's unsupervised time spent with peers, coders rated monitoring with respect to tracking, awareness, and communication. Similarly, Forgatch (1989) introduced systematic assessments of family problem solving in videotaped observation tasks by asking youths and parents to discuss "hot topics" and then having them rate the extent to which the conflict was resolved. Longitudinal research has shown that deficits in family problem solving are related to growth in adolescent

problem behavior (Capaldi, Forgatch, & Crosby, 1994; Forgatch & Stoolmiller, 1994). Thus, observation measures of parental monitoring and problem solving have been linked to changes in adolescent problem behavior and require validation given the critical role of these parenting practices in family-based interventions.

The analysis of validity of key theoretical constructs requires consideration of multiple factors. As explained in the classic work of Campbell and Fiske (1959), multiple measurement strategies for the same construct are needed to consider patterns of covariation among measurements for the same construct (i.e., convergent validity) and for other constructs (i.e., discriminant validity). While parental monitoring and problem solving might superficially appear to hold discriminant validity, it is important to ensure that targeted parenting practices are empirically distinct and not highly overlapping to inform target components for interventions. Thus the next critical step in translational research about this parenting construct is to ascertain that all measures of parental monitoring and problem solving based on youth report, parent report, and direct observations are coherent and relate to their respective underlying construct. However, in order to establish the validity of measures used in evidence-based interventions, it is paramount to consider the populations on whom these measures are being administered.

Generalizability across Ethnicities

In order to be conceptually and methodologically accurate, these parental constructs must be discussed with respect to potential ethnic or racial differences. The fact that parenting practices are culturally embedded in a set of values, traditions, and learned strategies (Gonzales, Cauce, & Mason, 1996) raises questions about the generalizability of past results from studies showing that parental monitoring and family problem solving have an impact on youth development. In fact, some literature suggests parenting styles may be differentially linked to

youth outcomes as a function of ethnicity (Steinberg, Lamborn, Dornbusch, & Darling, 1992; Steinberg, Dornbusch, & Brown, 1992), with weaker associations between parental authoritativeness and academic achievement compared to Asian-, European-, or Hispanic-American adolescents.

Despite some evidence of ethnic differences in parental styles, it is not clear whether the measurement of these two parenting constructs (monitoring and problem solving) is equivalent in families of diverse ethnicities. Catalano and colleagues (1992) examined mean-level differences between ethnic groups with respect to family management practices and predictive validity of substance use in European American (EA) and African American (AA) youths. Although there were significant mean differences reported in some family management groups, these constructs predicted substance use equally for both groups. Krishnakumar, Buehler, and Barber (2003) examined relations of youth-reported interparental conflict, parenting behaviors and youth behavior outcomes and demonstrated similar patterns among interparental conflict, lower parental monitoring, and youth problem behaviors in both EA and AA families (Krishnakumar, Buehler, & Barber, 2003).

Metzler et al. (1998) recommended that further research be conducted on the construct validity of specific and distinct aspects of parenting, and they especially encouraged research that focuses on understanding method factors (e.g., informant, observation) and cultural variation. They proposed that an alternate way to test the validity of parenting constructs is to evaluate if self-reported items hold equal meaning across informants. To these contentions, we would add that when considering the validity of key parenting constructs across ethnic groups, it is critical to consider how direct observations of parenting converge with the perceptions of family members. Coder perceptions of parenting practices have been influenced by the ethnicity of the

coder and the family (Gonzales, Cauce, & Mason 1996; Yasui & Dishion, 2008). Methodological complexities are thus inherent to studies that involve ethnically diverse populations.

Current Study

The goal of this study was to examine the validity of two important aspects of parenting that are commonly targeted in family-based interventions, parental monitoring and problem solving. In this article, particular attention is paid to possible differences in construct validity for families who identify as EA and as AA. Specifically, we examined**:** (a) the convergent validity of the key constructs when using direct observations, youth reports, and parent reports; (b) the extent to which the two parenting constructs could be discriminated; and (c) whether the two parenting constructs measured at age 16–17 were predictive of substance use and antisocial behavior measured at age 18–19 among EA and AA adolescents. We hypothesized that parental monitoring and family problem solving would demonstrate validity, equivalently, among EA and AA adolescents.

Method

Sample

Participants were 714 adolescents and their families (423 EA families, 227 male; 291 AA families, 157 male) drawn from a longitudinal, family-centered intervention study (Dishion & Kavanagh, 2003). The median gross annual income in this sample was between $50,000 and $59,999 for EA participants and $20,000 and $24,999 for AA participants. Participants were initially recruited in sixth grade from three middle schools in an ethnically diverse urban community, but the data used in this study were obtained from two of the later waves of data collection (age 16–17 and age 18–19 years) given the increasing autonomy and independence-

seeking behaviors present in older adolescence, and consequently, greater likelihood to face situations in which parental monitoring and family problem solving may be particularly critical. All study participants (parents and adolescents) signed a consent form, and they were treated in accordance with the ethical standards of APA and the human subjects review board of [*Institution name masked for review*]. The retention rate for this sample through age 18–19 was 82%.

Procedures

Adolescents age 16–17 and their families were invited to participate in a multimethod family assessment consisting of observation tasks and questionnaires. Questionnaires were administered to mothers, fathers, and youths as part of an assessment battery with questions about substance use, adolescent problem behavior, parental monitoring, and problem solving, among other topics. Parents (i.e. mother or father, or both when possible) and adolescents were prompted to discuss topics relevant to monitoring and problem solving for 5 minutes each. For the observed problem-solving task, participants were asked to discuss an area of conflict (hot topic) for 5 minutes that pertained to the family that had been selected by the parent prior to the discussion. For the observed monitoring task, the youth was prompted to discuss an activity within the past month during which the youth spent unsupervised time with friends, to discuss whom the youth spent time with, where they were, and what they did. Parents were prompted to ask questions after the youth had described this situation. Coder observation ratings of monitoring and problem solving were used, and participants completed corresponding self-report measures about monitoring and problem solving, which resulted in two accounts of the same family management skills.

Coding procedures. The videotapes were coded by a team of 20 undergraduate students

(17 females) who were blind to the study hypotheses. Ethnicity was reported for 19 of the 20 coders; 15 explicitly reported being White or Caucasian, and none reported being African American. Coders were trained to provide macroratings after each family discussion task, which reflect their global impressions of various aspects of the parent–child relationships based on the overall parent–child interaction during the entire task versus microratings, which are based on individual behaviors captured during small intervals of time. Macrorating systems are typically less intensive than microratings and thus easier to implement and sustain in real-world settings. Coder impressions followed an unpublished macrorating coding system developed by Dishion, Peterson, Winter, Jabson, and Hogansen (2007). Examples of items used for the Parental Monitoring and the Family Problem Solving scales are provided in the Measures subsection. Given the purpose of the present study to establish the validity of these observation measures, these measures have not been extensively published. However, the Parental Monitoring scale used in the present study was found to be predicted by lower levels of family conflict and to predict change in later antisocial behavior (Van Ryzin & Dishion, 2012). Coder percent agreement of the macroratings across the entire project was 84%.

Measures

Parental monitoring. Monitoring was measured with four indicators, each representing a different reporting agent (mother, father, adolescent, and coder).

Mother, father, adolescent report. Parents and adolescents were asked to complete the Child and Family Center Parent Questionnaire and the corresponding Child Questionnaire (CFCQP and CFCQC; Child and Family Center, 2001) about parental monitoring. The same four items were used to assess mother, father, and adolescent participants, and a 5-point Likert-type scale was used to elicit responses ranging from 1 (*never or almost never)* to 5 (*always or almost*

always). A high score on this scale indicates higher levels of parental monitoring. Adolescents were asked to respond to the following items: In the past 3 months, how often did at least one of your parents (a) know what you were doing when you were away from home, (b) know where you were after school, (c) know about your plans for the coming day, and (d) have a pretty good idea of your interests and activities? Cronbach's alpha values were as follows: mother report, .89 for the overall sample, .89 for EA, .88 for AA; father report, .89 for the overall sample, .87 for EA, .87 for AA; adolescent report, .84 for the overall sample, .81 for EA, .86 for AA.

Coder ratings. Coders provided behavioral macro ratings on videotaped parent–adolescent interactions, developed by Dishion & Kavanagh (2003). The Parental Monitoring scale includes seven items rated on a 9-point Likert scale anchored at 1 (*not at all*), 5 (*somewhat*), and 9 (*very much*). Coders were asked to respond to items such as, Does it seem that the child spends time away from adult supervision? Does the child indicate being with friends in settings without adult supervision? and Does there seem to be a lack of adult involvement in this child's daily life? An indicator, *lack of monitoring*, was constructed from coder responses, but it was then reverse-coded so that all parental monitoring indicators were coded in the same direction. The Cronbach's alpha value for this scale is .77.

Problem solving. Problem solving was measured with four indicators, each of which represented a different reporting agent (mother, father, adolescent, coder).

Mother, father, adolescent report. The problem-solving self-report questionnaire (PROB; Oregon Social Learning Center, 1997) was used to assess parent and adolescent perceptions of the problem-solving task by means of a six-item Likert-type scale. Immediately following the task, mothers, fathers, and adolescents were asked to respond to the following items: (a) How well did you understand what the problem was? (b) How much did you agree on

a solution? (c) Do you think you solved this problem during this discussion? (d) How satisfied are you with this discussion? (e) Did your family decide to take some action as a result of this discussion? and (f) How often does your family have a discussion like this? Responses were anchored at 1 (e.g., *not at all well; not at all satisfied*) and 5 (e.g., *very well; very satisfied*). A high score on this scale indicates higher levels of problem-solving perception. Item analysis revealed that excluding two items from the scale (Item a and Item f) increased the cohesiveness of the construct and were not included in the final scale. Cronbach's alpha values were as follows: for mother report, .87 for the overall sample, .86 for EA, .87 for AA; for father report, .83 for the overall sample, .83 for EA, .75 for AA; for adolescent report, .87 for the overall sample, .86 for EA, .87 for AA.

Coder ratings. Coders completed the Problem Solving macro rating scale to assess their global impressions of family management processes after observing the videotaped problem-solving discussion. This scale, a five-item, 9-point Likert scale anchored at 1 (*not at all*), 5 (*somewhat*), and 9 (*very much*), included items such as, How clearly was the problem specified? Was the problem stated in a neutral or positive tone (e.g., no blaming or criticism)? and Are alternative solutions discussed by the family? The Cronbach's alpha value for this scale is .74.

Adolescent problem behavior: antisocial behavior and substance use. When adolescents were age 18–19, antisocial behavior was measured as a latent variable on the basis of three indicators, including the adolescent and parent reports. The Adult Behavior Checklist (ABCL; Achenbach & Rescorla, 2003), used to assess parent perceptions of adolescent antisocial behavior, consists of a 16-item, 3-point Likert scale. The Adult Self-Report (ASR; Achenbach & Rescorla, 2003) was used to assess adolescent perceptions of their own antisocial behavior. Mothers, fathers, and adolescents were asked to respond to items such as *argues a lot; blames*

others for own problems; cruelty, bullying, or meanness to others; gets along badly with family; gets in many fights; and *physically attacks people.* Responses were anchored at 0 (*not true*), 1 (*somewhat or sometimes true*), and 2 (*very true or often true*). A high score on this scale indicates higher levels of antisocial behavior perception. Cronbach's alpha values were as follows: for mother report, .89 for the overall sample, .89 for EA, .88 for AA; for father report, .90 for the overall sample, .90 for EA, .91 for AA; for adolescent report, .83 for the overall sample, .81 for EA, .84 for AA.

Substance use at age 18–19 was measured by using a latent construct on the basis of three indicators from adolescents' self-report that assessed (a) tobacco frequency, (b) alcohol frequency, and (c) marijuana frequency of use in the past 3 months.

Results

Analytic Plan

All primary analyses were based on structural equation modeling (SEM) using Mplus v.6. We first tested the hypothesis that, for both constructs, youth and parent report have differential convergent validity with coder macrolevel ratings, as a function of ethnicity. The strategy used to test for convergent validity of the parental monitoring and family problem solving constructs consisted in running a first SEM model in which all loadings were constrained to equality across ethnic groups, followed by a second model in which the loading for coders' rating of the construct was free to vary across groups. We could then test whether the second model fit the data significantly better than did the first one.

Then, we tested the discriminant validity of the two constructs, as a function of ethnicity. To establish discriminant validity of the two parenting constructs, we verified whether the correlation between them was within the small to moderate range (Lewis-Beck, Bryman, & Liao,

2004). Last, we tested the hypothesis that the monitoring and problem-solving constructs were prognostic of later antisocial behavior and substance use across ethnic groups. To test predictive validity, we tested a model in which the regression path from parental monitoring to future antisocial behavior was allowed to vary across ethnic groups and a second model that constrained the relationship between monitoring and antisocial behavior to be equal across both ethnic groups. Similar analyses were conducted to test the predictive validity of parental monitoring on later substance use as well as the predictive validity of problem-solving on later antisocial behavior and substance use, separately. Effect sizes for path coefficients were interpreted using Cohen's (1988) guidelines, in which the standardized coefficient value is considered small when it is at .10 or less, medium at approximately .30, and large at .50 or greater. Missing data for the variables used in the SEM analyses were not missing completely at random, as indicated by Little's MCAR test (Little, 1988): $\chi^2(495) = 616.151$, $p < .001$. It is still likely that the missing data are missing at random (MAR). Missing data for all variables were handled using full information maximum likelihood, a technique that allows the use of all available information from participants who provided valid data, even if they had occasional missing values.

Descriptive and Preliminary Analyses

Means and standard deviations as a function of ethnicity and gender for indicators for all constructs in this study (parental monitoring, problem solving, antisocial behavior, drug use) are presented in Table 1. Table 2 shows the correlations among all observed variables. Factorial ANOVAs were run on all indicators to test for gender and ethnic differences and for interactions between these variables. ANOVA results for parental monitoring and problem solving are presented in Table 3, and results relevant to antisocial behavior and drug use are in Table 4.

Parental monitoring. The ANOVA revealed a significant main effect of ethnicity, with higher monitoring among EA youths than among AA youths, according to mother and father reports. A significant main effect of gender was observed for mother and adolescent reports and for coder ratings, indicating higher levels for girls than for boys. There was, however, a significant interaction between ethnicity and gender for coder reports, and post hoc *t*-tests showed that parental monitoring was higher for AA females than for AA males, whereas this gender difference was not significant in the EA sample, $t(205) = 3.31$, $p < .001$.

Problem solving. The ANOVA revealed a significant main effect of ethnicity for family problem solving according to mother, father, and adolescent report, and a trend in the opposite direction based on coder report. Higher levels of problem solving were reported in families of AA participants relative to EA participants, but coders reported marginally lower levels in families of AA participants, compared with EA participants. In addition, there was a significant interaction between ethnicity and gender for adolescent report, and post hoc *t*-tests revealed that the ethnic difference was significant only among males, $t(253) = – 6.06$, $p < .001$.

Antisocial behavior and drug use. No significant main effects or interaction effects involving gender or ethnicity emerged for antisocial behavior, regardless of informant. In contrast, a significant main effect of ethnicity was observed for frequency of tobacco, alcohol, and marijuana use in the past 3 months according to adolescent report, with EA adolescents reporting higher mean levels of use, relative to AA adolescents. Also, a significant main effect of gender was observed for frequency of alcohol and marijuana use, with males reporting higher frequency of use, relative to females. There was a significant interaction between ethnicity and gender, relevant to adolescent report of alcohol and marijuana use. Post hoc *t*-tests showed that EA males used significantly more alcohol, $t(343) = 3.78$, $p < .001$, and marijuana, $t(343) = 4.08$,

$p < .001$, than did EA females, whereas no significant gender differences emerged among AA participants.

Primary Analyses

All the following analyses were based on SEM, and we used Kline's (2005) guidelines to interpret fit indices, starting with the stipulation that a good model fit is characterized by a nonsignificant chi-square value. However, with large data samples, this chi-square criterion is commonly considered overly conservative, because significance is easily achieved with more statistical power (Schermelleh-Engel, Moosbrugger, & Müller, 2003). Other fit indices that are less sensitive to sample size were also considered. When using the comparative fit index (CFI) and the Tucker-Lewis index (TLI), values of .90 or more indicate an adequate model fit. Acceptable model fit is also evidenced by root mean square error of approximation (RMSEA) values of .08 and standardized root mean square residual (SRMR) values of .10 or less.

For all primary analyses, ethnic comparisons were conducted by running multiple-group analyses. We contrasted the fit of models in which coefficients of interest were allowed to differ across EA and AA families with the fit of equivalent models in which these coefficients were constrained to be equal across these groups. A significant difference between models, as revealed by a significant chi-square difference ($\Delta\chi^2$) test, suggests the presence of ethnic differences with regard to the paths of interest. In the figures presenting the model, path coefficients that are significantly different across ethnic groups are italicized. Because group constraints are placed on unstandardized coefficients, small differences may appear in the standardized coefficients shown in the figures, even when they were constrained to equality.

Convergent validity analyses for both constructs were conducted first, followed by discriminant and predictive validity analyses. When convergent analyses revealed that some of

the coefficients should not be constrained to equality across ethnic groups, they were allowed to vary across groups in the subsequent discriminant and predictive validity analyses.

Convergent validity of parental monitoring. We first tested whether coder ratings converged with adolescent- and parent-report measures of a latent parental monitoring construct for both EA and AA participants. The first set of analyses constrained factor loadings of all four indicators to be equal across ethnic groups and showed good model fit, $\chi^2(10) = 15.59$, $p = .11$, SRMR = .06, TLI = .96, CFI = .97, RMSEA = .04. Because we were particularly interested in testing for variations in coders' assessment of parental monitoring in EA versus AA families, the second model maintained the constraints on three indicators (mother, father, and adolescent report of monitoring) across the two groups and allowed the fourth indicator (coder rating) to vary across ethnicity. The less constrained model, $\chi^2(9) = 11.75$, $p = .23$, SRMR = .04, TLI = .98, CFI = .99, RMSEA = .03, fit the data better than did the first model, in which all indicators were set to be equal, $\Delta\chi^2(1) = 3.849$, $p = .05$ (see Figure 1, Panel A). These results suggest that convergent validity between measures of parental monitoring is adequate for both ethnic groups. However, there was some variation in the measurement model of the two groups, perhaps indicating bias of coders who may be less adept at detecting parental monitoring in AA families than in EA families. Specifically, coder ratings of monitoring loaded more strongly for EA families, $\lambda = .45$, $p < .001$, than for AA families, $\lambda = .24$, $p < .01$. Still, effect sizes for both loadings are in the moderate range.

Convergent validity of problem solving. In the first model, we constrained factor loadings so all four indicators were equal across ethnic groups and obtained acceptable fit, $\chi^2(10) = 36.23$, $p < .001$, SRMR = .05, TLI = .94, CFI = .95, RMSEA = .10. Because we were particularly interested in testing variations in coders' assessment of problem solving, the second

model maintained the constraints on three indicators (mother, father, and adolescent report of problem solving) across the two groups and allowed the fourth indicator (coder rating) to vary across ethnicity. The less constrained model, $\chi^2(9) = 18.60$, $p < .05$, SRMR = .07, TLI = .97, CFI = .98, RMSEA = .07, fit the data better than the first model, $\Delta\chi^2(1) = 17.62$, $p < .001$. These results suggest that convergent validity between measures of problem solving is adequate for both ethnic groups, but they also suggest modest variation in the measurement model of the two groups, indicating possible bias resulting from coders' difficulty in assessing family problem solving in AA families relative to EA families. Specifically, coder ratings of problem solving loaded more strongly for EA participating families, $\lambda = .59$, $p < .001$, than for AA families, $\lambda = .15$, $p = .02$ (see Figure 1, Panel B). Although both loadings are significant, the effect size for the EA families' loading was strong, whereas it is only moderate for the AA families' loading.

Discriminant validity of parenting constructs. To establish discriminant validity of the two parenting constructs, we verified whether the correlation between them was within the small to moderate range (Lewis-Beck, Bryman, & Liao, 2004). In the first model, the two latent variables (parental monitoring and family problem solving) were modeled simultaneously, and the correlation between them was allowed to vary across ethnic groups. This model exhibited adequate fit, $\chi^2(48) = 82.12$, $p = .002$, SRMR = .07, TLI = .94, CFI = .95, RMSEA = .05. The second set of analyses constrained the correlation between the two latent constructs to be equal across ethnic groups and similarly exhibited an adequate model fit, $\chi^2(49) = 85.31$, $p = .001$, SRMR = .08, TLI = .94, CFI = .95, RMSEA = .05. The unconstrained model tended to fit the data better than did the constrained model, as evidenced by a marginally significant difference in fit, $\Delta\chi^2(1) = 3.19$, $p = .07$. This suggests a variation in the measurement model of the two groups. Inspection of path coefficients tends to confirm this finding: A moderate relationship between

the constructs of monitoring and problem solving emerged in EA families (r = .33, p < .001), whereas in AA families this correlation was not only small in terms of effect size, but it also failed to reach statistical significance (r = .09, p = .39). Overall, these results suggest that among EA families, the two parenting constructs are only moderately related, and therefore they can still be statistically differentiated. This differentiation pattern was even stronger among AA families, for whom monitoring and problem solving represented two clearly distinct constructs (see Figure 2).

Predictive validity. Predictive validity was examined by first testing a model allowing the regression path from the parenting construct to future child problem behavior to vary. A second model constrained the regression path to be equal across both ethnic groups. All models were found to be equally predictive for both ethnic groups.

Predictive validity of parental monitoring: antisocial behavior. The model including the regression path from parental monitoring to future antisocial behavior exhibited adequate fit, $\chi^2(35) = 56.20$, p = .013, SRMR = .06, TLI = .93, CFI = .94, RMSEA = .04. Higher levels of parental monitoring when youth were 16-17 years old had strong predictive validity for both EA and AA participants at 18-19 years (see Figure 3, Panel A).

Predictive validity of parental monitoring: drug use. The model including the regression path from monitoring to future drug had an acceptable fit, $\chi^2(34) = 66.22$, p < .001, SRMR = .07, TLI = .92, CFI = .94, RMSEA = .06. Higher levels of parental monitoring had moderate predictive validity of future drug use for both EA and in AA families (see Figure 3, Panel B).

Predictive validity of problem solving: antisocial behavior. The model including the regression path from problem solving to antisocial had adequate fit, $\chi^2(35) = 65.97$, p = .001,

SRMR = .09, TLI = .94, CFI = .95, RMSEA = .05. Higher levels of problem solving skills had moderate predictive validity of future antisocial behavior for both AA and EA families (see Figure 4, Panel A).

Predictive validity of problem solving: drug use. The model including the regression path from problem solving to future drug use had an acceptable fit, $\chi^2(34) = 50.99$, $p = .03$, SRMR = .07, TLI = .97, CFI = .98, RMSEA = .04. Higher levels of problem solving skills had moderate predictive ability of future drug use in EA and in AA families (see Figure 4, Panel B).

Discussion

Valid measurement of family management skills is central to the sound evaluation of intervention and prevention programs and therefore to their success, yet, little translational research has been done on the validity of the parental monitoring and family problem solving constructs across ethnic groups incorporating videotaped observations. This limitation of previous research could negatively affect the transferability of intervention effects to minority families and is a critical part of T2 research that must be conducted before moving to the T3, practice-oriented, phase of testing efficacy and effectiveness outcomes in real-world settings. Therefore, the main objective of this study was to validate direct observation measures of parenting practices with mother, father, and adolescent reports in EA and AA families. The inclusion of direct observations allows for a specific, time-limited analysis of family processes from an ‘outsider’ perspective. Specific goals of this study were to expand past research on parent–adolescent interactions in three important ways: (a) by specifically examining the convergent validity of two constructs, parental monitoring and problem solving, as a function of reporting agent (mother, father, adolescent, and coder informants); (b) by examining the discriminant validity of these two constructs by showing to what extent they are independent of each other; and (c) by examining the predictive validity of

these constructs on substance use and antisocial behavior. All these analyses also involved a comparison of results as a function of ethnicity (EA and AA).

Convergent and Discriminant Validity

For parental monitoring and family problem solving, the first SEM model revealed that the different measures generally converged, and that convergent validity was satisfactory even when all path coefficients were set to be equivalent in EA and in AA families. The construct of parental monitoring was modestly correlated among mother, father, adolescent, and coder observations, in both ethnic groups, at approximately the same level. The second SEM model, however, did reveal modest variations in the measurement model such that macrolevel coder ratings loaded more strongly for EA families than for AA families, and this was true for both parenting constructs. In other words, coders' perception of parental monitoring and of family problem solving was more consistent with family members' own perceptions for EA families than for AA families. Although these differences in coder ratings may be suggestive of a difficulty for coders to correctly interpret AA families' dynamics, it is important to note that the first model, in which coder ratings were constrained to equality across ethnic groups, presented adequate fit. Therefore, even if model fit improved when we allowed the loading for coder report to differ across ethnic groups, this difference is relatively minor. Nevertheless, it is likely that discrepancies in coder ratings resulted from observable differences in family dynamics between participating families from AA versus EA backgrounds.

One example of differences in family dynamics across ethnic groups resides in AA families' tendency to be more authoritarian in their approach to parenting in general and to monitoring in particular (McLoyd & Steinberg, 1998). It is possible that various coders reacted differently when observing that discussions between AA parents and their youths tended to be

less bidirectional than those occurring in EA families, such that some coders may have rated AA parents as somewhat lower on parental monitoring in these discussions whereas other coders may have rated those parents higher. It is noteworthy, however, that the modest EA and AA differences did not affect the predictive validity of later substance use or antisocial behavior.

With regard to variations in the measurement model for family problem solving, we might suspect some form of ethnic bias from coders' ratings in that descriptive analyses revealed a significant main effect of ethnicity, with AA mothers, fathers, and adolescents all reporting stronger mean-level problem-solving ability than did EA participants, whereas coders tended to perceive EA families as better problem solvers. Work by Darling and Steinberg (1993), who proposed that parenting may be parsed into separate subcomponents (i.e., stylistic or behavioral), may help unravel these disparate findings. One interpretation is that the construct of problem solving may be partitioned into two camps: a stylistic, perhaps even cognitive domain and a more behaviorally prescribed, observable one. Direct observation is focused on behavioral aspects of conflict resolution, whereas family members' reports may instead reflect more inferential qualities (i.e., cognitions or culturally specified styles). Because coders must rate families based on observable behaviors and cannot access participants' cognitions or emotions unless the latter make them explicit through verbal or nonverbal cues, it is expected that macroratings are primarily driven by behavioral manifestation of conflict resolution, and the inferential qualities of problem resolution might be accessible only if coders share the families' cultural background. This could explain why coders' perceptions of the conflict resolution process were somewhat more convergent with EA family members' reports.

Our analyses of discriminant validity revealed that parental monitoring and family problem solving could be discriminated as unique entities. In fact, the medium-sized correlation

between the two constructs among EA families is consistent with the idea that good communication and positive relationships among family members would contribute to efficient parental monitoring and would also facilitate problem solving in the family unit. Yet, the fact that this correlation remained moderate in size corroborates our hypothesis that the two parenting constructs measured here are distinct. The distinction between these constructs is even clearer for AA families, for whom a small and nonsignificant correlation emerged between parental monitoring and family problem solving thus suggesting that those dynamics are not as strongly related to common underlying family dynamics as they are for EA families. This lower, nonsignificant correlation may likewise be a function of ethnic/racial differences in styles of parenting (e.g., authoritative vs authoritarian) such that distinct styles of parenting are associated with differences in relations among family processes.

It is important to note that the problem-solving task focuses on an in-lab discussion of a conflict, whereas the monitoring task reflects discussion of behaviors that have previously occurred in the last month. This difference may influence the degree to which these constructs are directly comparable. However, each family identified a 'hot topic' of relevance, intended to evoke discussion and emotions as occurs in a naturalistic setting.

Predictive Validity of Monitoring and Problem Solving

This study examined the predictive validity of monitoring and problem solving, respectively, on adolescent substance use and antisocial behavior. The construct of parental monitoring was found to be highly predictive of early-adulthood antisocial behavior in EA and in AA families, whereas higher levels of family problem solving were modestly predictive of lower levels of antisocial behavior in early adulthood for EA and AA families. In both ethnic groups, high levels of parental monitoring were moderately related to low levels of drug use in early

adulthood, at age 18–19. So too, high levels of problem solving in both ethnic groups were modestly related to low levels of drug use at age 18–19. This finding is consistent with findings from earlier research that has demonstrated that high levels of monitoring are related to low levels of substance initiation and use (Dishion & McMahon, 1998).

Strengths and Limitations

A key contribution and strength of this study was the use of multiple indicators and methods to measure the latent constructs of parental monitoring and problem solving, and current findings underscore the unique insight provided by observational data into the complex nature of family dynamics. The strengths of observational measures lie in the independent nature of the reporting agent and in the unique opportunity to capture dyadic processes as they unfold in real time. Observational methodologies typically include a macrolevel code as a supplement to the more rigorous and time-intensive microsocial code (Dishion & Granic, 2004). The study findings suggest that monitoring and problem-solving skill are well suited for macrolevel coding analyses, which have obvious benefits in terms of cost effectiveness and labor intensiveness. That is, this study found that these two family management skills can be reliably and validly captured at the macro level. Moreover, the modest correlations between coder and self-report ratings of parental monitoring suggest observational data may provide unique insight into understanding family processes contributing to later antisocial behaviors that would otherwise not be captured. This understanding provides translational researchers with a more precise picture of how evidence-based interventions affect change and has the power to influence policy-level change (T5). Other strengths of this study include its large sample size, which made it possible to compare EA and AA subgroups; its longitudinal design, which was essential to establishing the predictive validity of the constructs under study; and the high retention rate over time.

This study is not without limitations. First, the median household income was higher among EA families, indicating potential socioeconomic influences unrelated to racial or ethnic experience. However, a previous study, using the original sample described in this study, conducted person-oriented analyses and identified a group of families high in resilience and high in family conflict. This group reported higher levels of parental monitoring than an at-risk group. Parental monitoring was measured as a latent construct consisting of the observed measure and adolescent-, mother-, and father-report measures described in the present study. Further post-hoc analyses found that these families in this high resilience, high conflict group were more likely to be African American than European American with no significant differences found on socioeconomic status (Van Ryzin & Dishion, 2012). Moreover, measurement in the present study was characterized by fairly good consistency across ethnic groups in spite of this relatively important difference across subsamples, which suggests robustness of the constructs used. Second, none of the coders identified as AA, which restricts the ability to more concretely attribute the coders' perceptions to ethnic differences between the coders and families versus other culturally relevant cues not specific to ethnicity. Another important consideration is whether families in this sample differ in their endorsement of specific parenting styles and values that have previously been found to differ by ethnicity (e.g., authoritarian, authoritative). Such differences may affect the cultural appropriateness of the video tasks assigned to ethnically diverse families and have implications on the use of a single coding system across ethnicities. However, it is important to emphasize that differences in coder perceptions based on family ethnicity were small.

Implications

Convergent validity among EA and AA families may be a fruitful area of future cross-cultural research to better understand cultural variation in constructs pertaining to conflict

definition and resolution. New knowledge gained through this research will help improve coders' training so they can pay attention to indicators of problem solving in AA families that they might have overlooked in this study. Additionally, the present study focused on measures of parental monitoring and problem solving. Future T1 and T2 studies should develop and evaluate the range of multi-source parenting measures used in family-based interventions. It is important to conduct further research that will identify the most common variations in the interactions happening in families from diverse ethnic backgrounds and to provide coders with additional training to teach them how to correctly interpret these variations across parenting constructs.

In addition, evidence of potential ethnic bias in coders' perceptions of parental problem solving and monitoring may not be confined to observational methodology. Mental health practitioners may be prey to making similar observations in real-world settings, suggesting a need to establish safeguards to ensure these findings do not negatively affect mental health outcomes in clinical settings. Accuracy may be increased through culturally informed training and culturally matching therapists with families, when possible. These efforts may help protect against potential biases, which in turn could affect family engagement and responsiveness to treatment, key parameters investigated in T3 research.

Conclusions

Understanding the role of parental monitoring and problem solving in family-based interventions requires that interpretations of these results be discussed in relation to (a) conceptual equivalence, that is, whether the concepts of parental monitoring and problem solving have equivalent meaning across participants, and (b) functional equivalence, that is, whether parental monitoring and problem solving serve the same role or are associated with the same processes across ethnicity. Either interpretation has a direct bearing on construct formation. From

a methodological standpoint, one could argue that elements of the instruments used to study problem solving and monitoring may lack conceptual equivalence for AA families because of measurement variance showing differences in what coders captured and rated as monitoring and problem solving when compared with what participants self-reported. Notwithstanding a possible lack of conceptual equivalence, it is noted that key aspects of monitoring and problem solving are being captured in spite of possible conceptual gaps. Collectively, these findings suggest that monitoring and problem solving have adequate convergent and predictive validity in this subset of AA and EA participants. These findings also address previous concerns in the literature regarding method factors, in that they include different informants and different assessment types. Although self-reported items may not hold equal meaning across informants and vary in how they are executed in real-time interactions, these constructs hold validity and may be powerful components of clinical interventions targeting adolescent substance use and antisocial behavior in AA and in EA ethnic groups.

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Table 1.

Means and Standard Deviations of Indicators as a Function of Ethnicity, Gender, and Reporting Agent

Indicators	European American				African American			
	Males		Females		Males		Females	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Parental monitoring								
Mother	4.02	.94	4.25	.87	3.71	1.03	3.94	.93
Father	3.93	.86	4.02	.95	3.50	1.12	3.76	.96
Adolescent	2.60	.89	3.00	.90	2.64	.99	2.76	1.13
Coder rating	6.11	1.00	6.13	1.10	5.92	1.08	6.38	.91
Family problem solving								
Mother	12.86	3.76	13.50	3.36	14.99	3.95	14.97	3.11
Father	12.70	3.00	13.05	3.87	15.82	3.37	14.50	2.76
Adolescent	13.00	3.40	14.27	3.80	15.61	3.31	14.98	3.40
Coder rating	4.87	1.17	5.02	1.29	4.73	1.27	4.74	1.36
Antisocial behavior								
Mother report on adolescent	53.95	5.66	53.67	4.59	53.21	5.71	54.46	4.98
Father report on adolescent	53.49	5.11	53.85	5.48	54.50	6.18	53.90	5.05
Adolescent self-report	54.44	5.53	54.54	5.29	54.95	6.05	55.42	5.74
Drug use–adolescent report								
Alcohol frequency	2.68	2.04	1.91	1.74	1.04	1.58	.93	1.31
Tobacco frequency	1.88	2.56	1.55	2.37	.95	1.96	1.00	2.01
Marijuana frequency	1.53	2.19	.74	1.26	.89	1.80	.77	1.60

Table 2.

Correlations Among All Study Variables

			Parental Monitoring				Problem Solving				Antisocial Behavior			Drug Use		
	Gender	Ethn	ParMon-M	ParMon-F	ParMon-A	ParMon-C	ProbSol-M	ProbSol-F	ProbSol-A	ProbSol-C	AB-M	AB-F	AB-A	Tob	Alc	Mari
Gender	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ethn	.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
ParMon-M	.07	-.16**	—	—	—	—	—	—	—	—	—	—	—	—	—	—
ParMon-F	.04	-.15*	.46**	—	—	—	—	—	—	—	—	—	—	—	—	—
ParMon-A	.12**	-.04	.35**	.37**	—	—	—	—	—	—	—	—	—	—	—	—
ParMon-C	.09*	.01	.19**	.23**	.18**	—	—	—	—	—	—	—	—	—	—	—
ProbSol-M	.06	.24**	.09*	.10	.09*	.05	—	—	—	—	—	—	—	—	—	—
ProbSol-F	.01	.28**	.07	.10	.08	.00	.68**	—	—	—	—	—	—	—	—	—
ProbSol-A	.06	.23**	.06	.06	.19**	.02	.62**	.62**	—	—	—	—	—	—	—	—
ProbSol-C	.04	-.08	.13**	.20**	.09*	.08*	.37**	.32**	.31**	—	—	—	—	—	—	—
AB-M	.04	.00	-.25**	-.14*	-.13**	-.09*	-.14**	-.12	-.16**	-.17**	—	—	—	—	—	—
AB-F	.06	.05	-.29**	-.29**	-.17**	-.16*	-.05	-.09	-.11	-.16*	.54**	—	—	—	—	—
AB-A	.05	.06	-.13**	-.15**	-.25**	-.08	-.12**	-.08	-.12**	-.08	.26**	.36**	—	—	—	—
Tob	.01	-.16**	-.19**	-.23**	-.12**	-.19**	-.09*	-.12*	-.14**	-.04	.18**	.26**	.18**	—	—	—
Alc	-.13**	-.35**	-.08	-.01	-.13**	-.13**	-.16**	-.14*	-.23**	-.02	.10*	.17**	.13**	.36**	—	—
Mari	-.11**	-.09*	-.12**	-.14*	-.14**	-.15**	-.10*	-.13*	-.15**	-.10*	.15**	.20**	.14**	.28**	.50**	—

Note. Ethn = Ethnicity; ParMon-M = Parental monitoring, mother report; ParMon-F = Parental monitoring, father report; ParMon-A = Parental monitoring, adolescent report; ParMon-C = Parental monitoring, coder report; ProbSol-M = Problem solving, mother report; ProbSol-F = Problem solving, father report; ProbSol-A = Problem solving, adolescent report; ProbSol-C = Problem solving, coder report; AB-M = Antisocial behavior, mother report ; AB-F = Antisocial behavior, father report ; AB-A = Antisocial behavior, adolescent Report ; Tob = Tobacco Use ; Alc = Alcohol Use ; Mari = Marijuana use.

Table 3.

Analysis of Variance of Between Subjects Effects for Mean Levels of Parental Monitoring and Family Problem Solving Indicators

Indicators	Sums of squares	*df*	Mean square	*F*	*p*
Parental Monitoring					
Mother report					
Ethnicity	11.36	1	11.36	12.85	.00
Gender	6.39	1	6.39	7.23	.01
Ethnicity × Gender	.00	1	.00	.00	.99
Error	434.73	492	.88		
Father report					
Ethnicity	5.33	1	5.30	6.10	.01
Gender	1.30	1	1.30	1.50	.22
Ethnicity × Gender	.33	1	.33	.38	.54
Error	231.33	266	.87		
Adolescent report					
Ethnicity	1.39	1	1.39	1.48	.22
Gender	9.41	1	9.41	10.06	.00
Ethnicity × Gender	2.84	1	2.84	3.03	.08
Error	540.52	578	.94		
Coder report (lack of monitoring)					
Ethnicity	.11	1	.11	.10	.75
Gender	6.90	1	6.90	6.56	.01
Ethnicity × Gender	5.83	1	5.83	5.56	.02
Error	520.69	495	1.05		
Family Problem Solving					
Mother report					
Ethnicity	363.86	1	363.86	28.65	.00
Gender	10.93	1	10.93	.86	.35
Ethnicity × Gender	12.40	1	12.40	.98	.32
Error	5892.92	464	12.70		
Father report					
Ethnicity	196.39	1	196.39	17.40	.00
Gender	8.80	1	8.80	.78	.38
Ethnicity × Gender	26.33	1	26.33	2.33	.13
Error	2697.34	239	11.29		
Adolescent report					
Ethnicity	330.45	1	330.45	26.95	.00
Gender	11.86	1	11.86	.97	.33
Ethnicity × Gender	108.37	1	108.37	8.84	.00
Error	6031.82	492	12.26		
Coder report					
Ethnicity	5.14	1	5.14	3.22	.07
Gender	.79	1	.79	.49	.48
Ethnicity × Gender	.59	1	.59	.37	.54
Error	790.73	496	1.59		

Table 4.
Analysis of Variance of Between Subjects Effects for Mean Levels of Antisocial Behavior and Adolescent Drug Use Indicators

Indicators	Sums of squares	*df*	Mean square	*F*	*p*
Antisocial Behavior					
Mother report					
Ethnicity	0.10	1	.10	.00	.95
Gender	26.66	1	26.66	.96	.33
Ethnicity × Gender	67.11	1	67.11	2.43	.12
Error	12775.83	462	27.65		
Father report					
Ethnicity	10.38	1	10.38	.36	.55
Gender	.53	1	.53	.02	.89
Ethnicity × Gender	8.52	1	8.52	.29	.59
Error	6475.99	224	28.91		
Adolescent report					
Ethnicity	68.04	1	68.04	2.16	.14
Gender	11.05	1	11.05	.35	.55
Ethnicity × Gender	4.83	1	4.83	.15	.70
Error	18341.78	581	31.57		
Drug Use					
Alcohol frequency					
Ethnicity	241.84	1	241.84	80.48	.00
Gender	27.76	1	27.76	9.24	.00
Ethnicity × Gender	15.56	1	15.56	5.18	.02
Error	1745.93	581	3.01		
Tobacco frequency					
Ethnicity	74.88	1	74.88	14.36	.00
Gender	2.19	1	2.19	.42	.52
Ethnicity × Gender	5.85	1	5.85	1.12	.29
Error	3025.27	580	5.22		
Marijuana frequency					
Ethnicity	13.08	1	13.08	4.19	.04
Gender	30.12	1	30.12	9.65	.00
Ethnicity × Gender	15.71	1	15.71	5.03	.03
Error	1810.08	580	3.12		

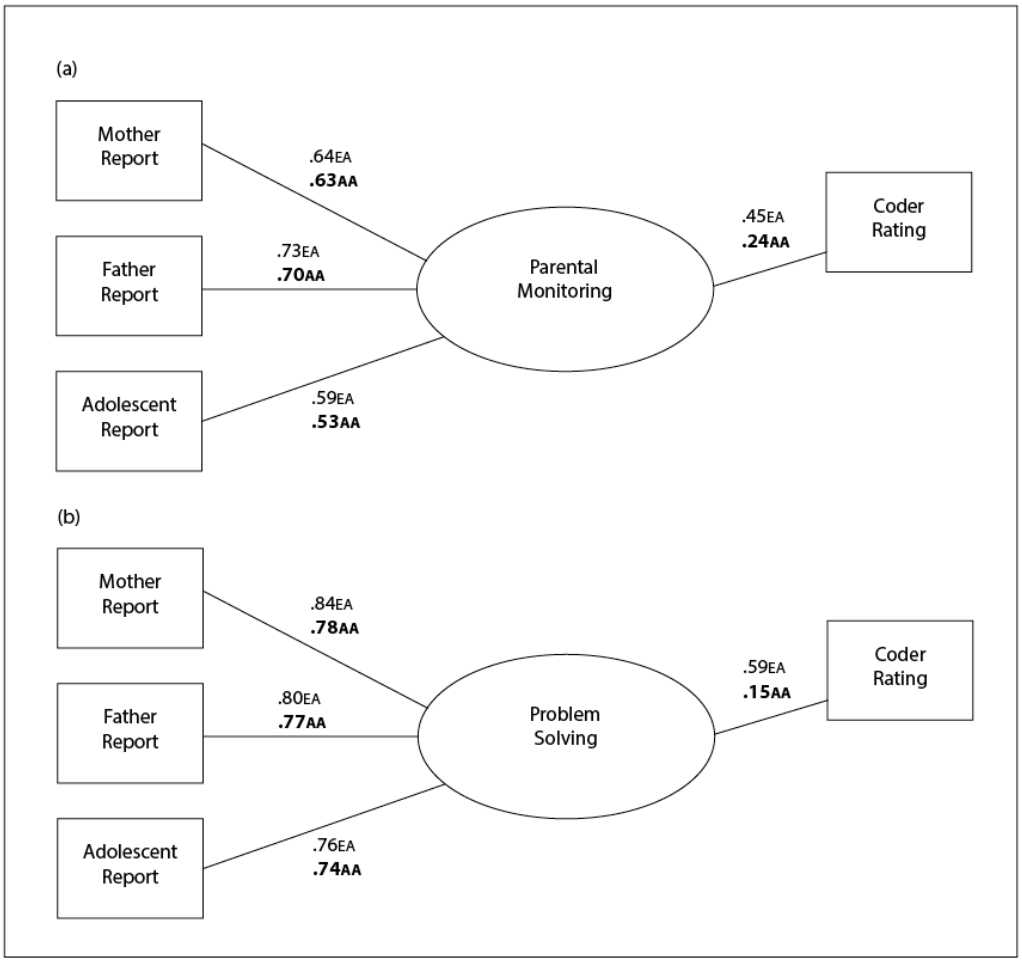

Figure 1. Convergent validity of parental monitoring (Panel A) and problem solving (Panel B) as a function of reporting agent and ethnicity. Italicized path coefficients differ significantly across ethnic groups. Standardized values are reported. In Panel A (parental monitoring), all paths are significant at $p < .001$ except Parental Monitoring→Coder Rating for AA ($p < .01$). In Panel B (problem solving), all paths are significant at $p < .001$ except Problem Solving→Coder Rating for AA ($p < .05$). EA = loadings for European American participants; AA = loadings for African American participants.

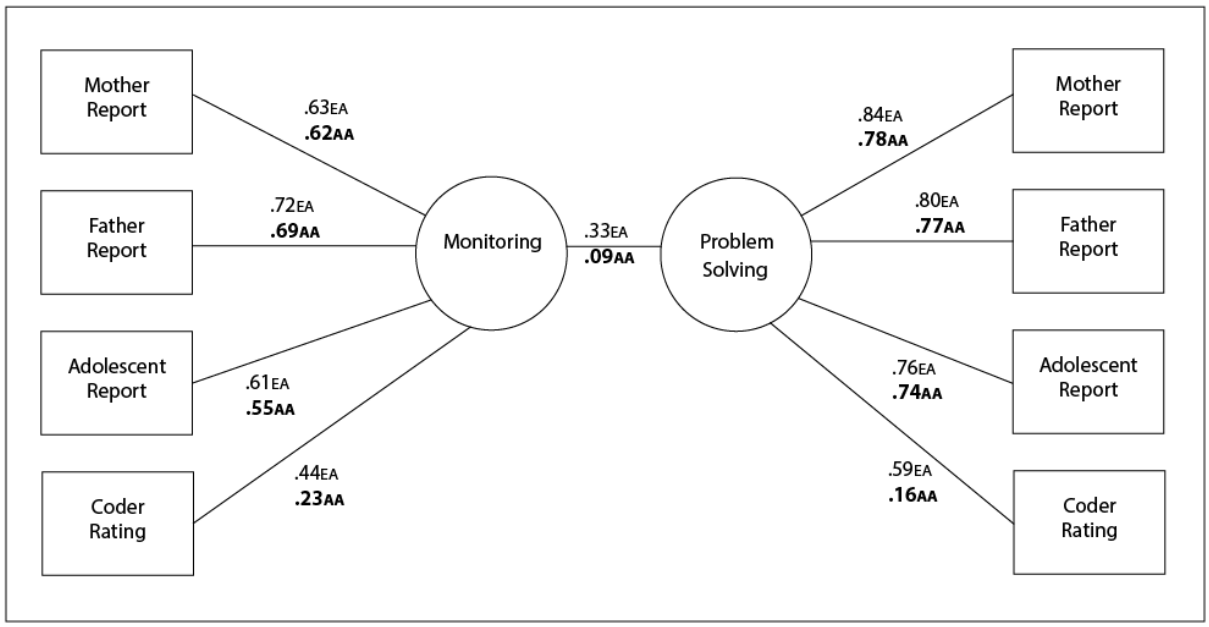

Figure 2. Discriminant validity of parental monitoring and problem solving as a function of reporting agent and ethnicity. Standardized values are reported. All paths are significant at $p < .001$ except Problem Solving→Coder Rating for AA ($p < .05$), Monitoring→Coder Rating for AA ($p < .01$), and Monitoring↔Problem Solving for AA (*ns*). Italicized path coefficients differ significantly across ethnic groups. EA = loadings for European American participants; AA = loadings for African American participants.

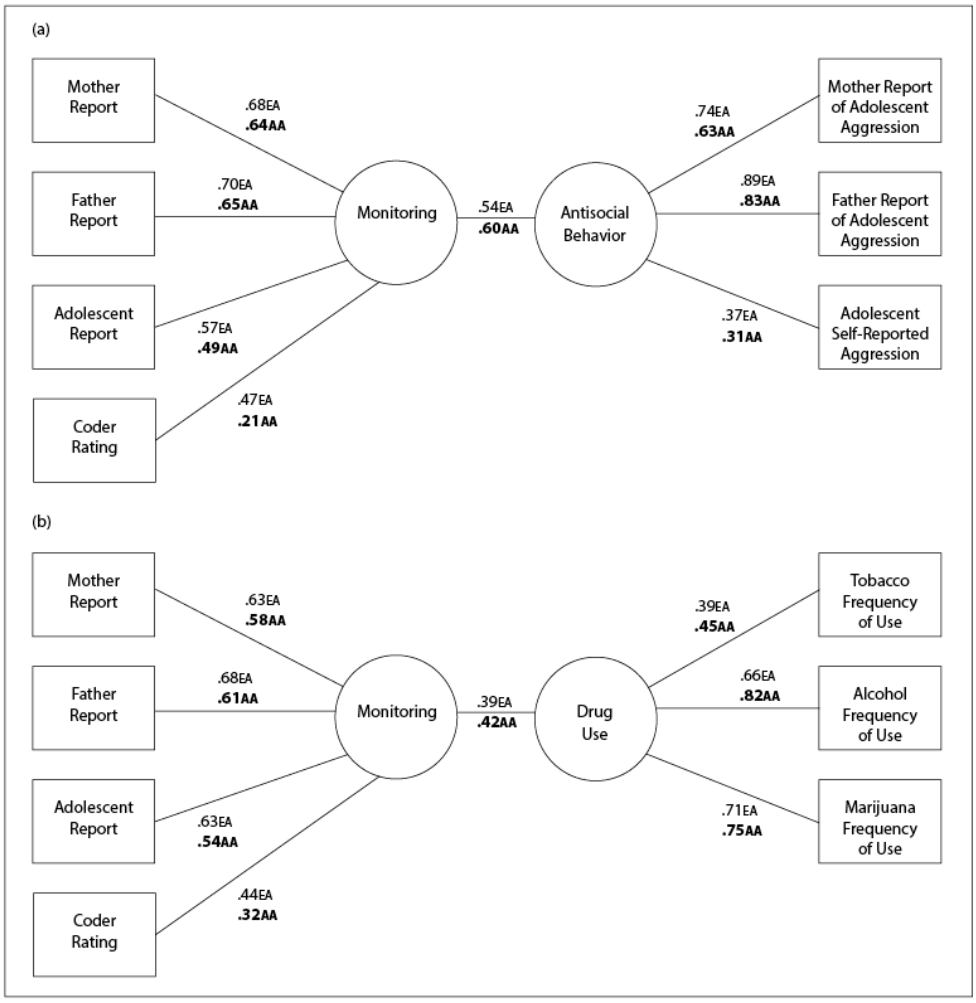

Figure 3. Predictive validity of parental monitoring using future antisocial behavior (Panel A) and future adolescent drug use (Panel B) as a criterion. Standardized values are reported. All paths are significant at $p < .001$ except Monitoring→Coder Rating for AA ($p < .05$; see Panel A). Italicized path coefficients differ significantly across ethnic groups. EA = loadings for European American participants; AA = loadings for African American participants. Confidence intervals for the coefficient from Monitoring to Antisocial behavior (Panel A): –.61 to –-.47 (EA) and –.69 to –.52 (AA). Confidence intervals for the coefficient from Monitoring to Drug use (Panel B): –.46 to –-.33 (EA) and –.49 to –.35 (AA).

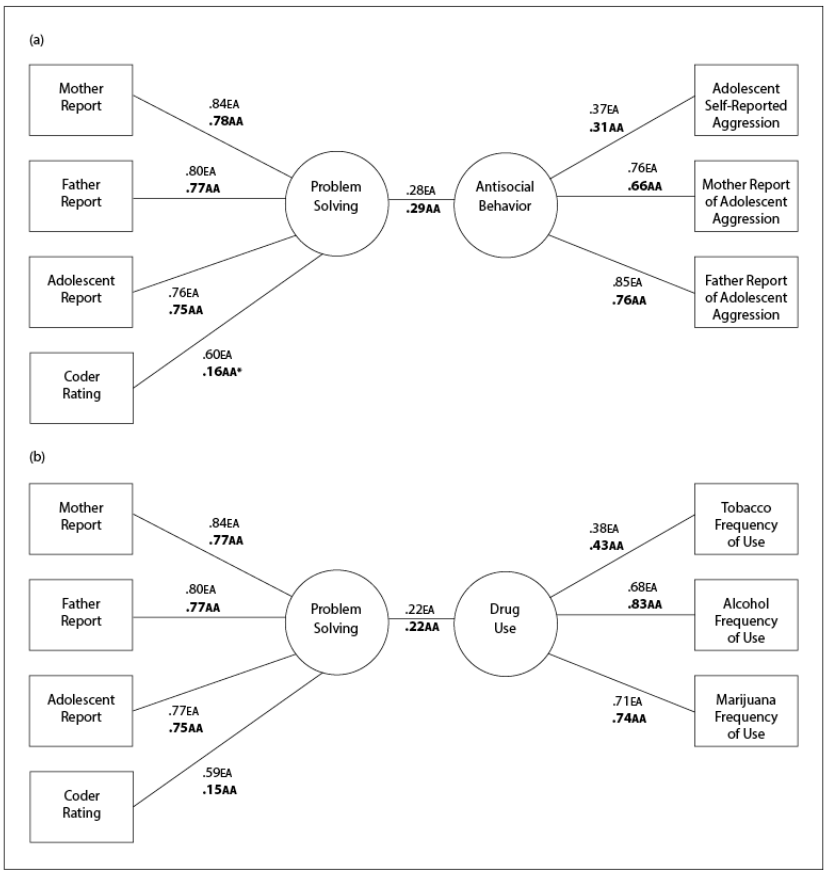

Figure 4. Predictive validity of problem solving using future antisocial behavior (Panel A) and future drug use (Panel B) as a criterion. Standardized values are reported. Most paths are significant at $p < .001$. Some were significant at $p < .05$. In Panel A, these included Problem Solving→Antisocial Behavior (AA) and Problem Solving→Coder Rating (AA). In Panel B, these included Problem Solving→Coder Rating (AA), Problem Solving→Drug Use (AA). In Panel B, Problem Solving→Drug Use for EA was significant at $p < .01$ Italicized path coefficients differ significantly across ethnic groups. EA = loadings for European American participants; AA = loadings for African American participants. Confidence intervals for the coefficient from Problem solving to Antisocial behavior (Panel A): –.35 to –-.22 (EA) and –.36 to –.22 (AA). Confidence intervals for the coefficient from Problem solving to Drug use (Panel B): –.28 to –-.16 (EA and AA).