Published in final edited form as:
J Res Pers. 2007 ; 41(3): 507–523.

Trait Stability and Continuity in Childhood: Relating Sociability and Hostility to the Five-Factor Model of Personality

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Abstract

We investigated the continuity of personality constructs in the Oregon Youth Substance Use Project, a cohort-sequential study encompassing development from early childhood to adolescence with five annual or biennial assessments. Sociability and Hostility, assessed by teachers' ratings of children's behaviors at each assessment, were related to the traits comprising the Five-Factor model assessed by teachers' ratings at the fifth assessment. Confirmatory factor analysis demonstrated that Sociability and Hostility were reliably measured at each assessment, and these constructs were relatively stable over time (mean rank-order stability coefficients over intervals of 1–5 years were .50 and .43, respectively). Sociability was most strongly associated (positively) with Extraversion, and Hostility was most strongly associated (negatively) with Conscientiousness and Emotional Stability. No differences were found for younger versus older children. Implications for measuring childhood personality traits using teachers' reports of early childhood behavior are discussed.

Keywords

Sociability; Hostility; Five-Factor model; children's personality; stability; continuity

A longstanding question in personality psychology is to what extent childhood temperament and personality constructs are comparable to those of adults (Caspi, 1998; Caspi, Roberts, & Shiner, 2005; Shiner & Caspi, 2003). Studies of individual differences in infants and young children typically use different theoretical models and measures from studies of adults, which creates the need for a bridge between childhood and adult personality concepts. The study of the continuity of individual-difference constructs from childhood to adulthood is further complicated by methodological differences such as the use of observer ratings instead of self reports for younger children. Nevertheless, establishing construct continuity is necessary in longitudinal studies of personality development and for evaluating the influence of childhood personality traits on later outcomes.

In this study, we examined two constructs, Sociability and Hostility, derived from factor analysis of teachers' ratings of children's behaviors, and the relation between these two constructs and the traits comprising the Five-Factor (Big Five) model, also assessed by teachers' ratings 1–6 years later. This study was conducted on a community sample of children participating in an ongoing longitudinal study of the predictors of substance use, the Oregon

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Youth Substance Use Project (OYSUP; Andrews, Tildesley, Hops, Duncan, & Severson, 2003). The data are from the first five assessments following children from the 1st through 5th grade until they were in the 6th through 10th grade.

The elementary-school years (middle childhood) comprise a developmental period for individual differences that originates in infant temperament and leads to adolescent personality traits. There is less consensus on the structure of infant temperament than there is on the structure of adult personality (Rothbart & Bates, 1998). However, Ahadi and Rothbart (1994) proposed an influential model of infant temperament with links to adult personality structure. The approach system, manifested through sociability, impulsivity, and activity, underlies positive emotionality and adult Extraversion, whereas the avoidance system, manifested through anxiety and threat avoidance, underlies negative affect and adult Neuroticism. They proposed that a third temperament, effortful control, is superordinate to the approach and avoidance systems and has a moderating effect on both. In a development of this model, Eisenberg et al. (2004) proposed two forms of control involved in self-regulation of children's emotions: effortful control, and the less voluntary reactive control. The system for reactive control was further divided into reactive undercontrol (approach) and reactive overcontrol (avoidance). The modulating effects of these various forms of control or self-regulation complicate the direct one-to-one mapping of temperament onto personality (Ahadi & Rothbart, 1994; Carver, 2005; Caspi, 1998).

Shiner and Caspi (2003) recently proposed a hierarchical framework for children's personality/temperament in middle childhood with four dimensions at the broadest level corresponding to four of the five broad dimensions (Big Five) in the adult Five-Factor model (John & Srivastava, 1999). These are: Extraversion/positive emotionality (related to infant approach and adult Extraversion); Neuroticism/negative emotionality (related to infant avoidance and adult Emotional Stability versus Neuroticism); Conscientiousness/constraint (related to infant effortful control and adult Conscientiousness); and Agreeableness (related to infant effortful control and adult Agreeableness). This taxonomy provides a useful framework for accommodating other developmental researchers' findings on personality traits in middle childhood (Shiner, 1998). These four broad dimensions have been found consistently by several different research groups and cross-nationally (Halverson, Kohnstamm, & Martin, 1994). The fifth adult trait of Intellect/imagination (Goldberg, 1993) or Openness to Experience (McCrae Costa, 1987) has been identified less reliably as an independent dimension in children of this age (Shiner & Caspi, 2003).

Different methodologies have been used to study the personality traits of middle childhood. Some researchers have used parental free descriptions of their children's personalities to define the domains of childhood personality in much the same way that the lexical approach to adult personality taxonomies uses the dictionary (e.g., Kohnstamm, Halverson, Mervielde, & Avilla, 1998; Mervielde & De Fruyt, 2002). Parents and teachers rated children on traits culled from these free descriptions. Others have used items drawn from adult personality measures and other sources (e.g., Digman & Inouye, 1986; Shiner, 2000).

In addition, there is a considerable body of research on measures of children's behaviors. Teachers' ratings of young children are widely used to screen for behavioral problems and several measures have been developed (e.g., Achenbach, 1991; Crick, 1996; Harter, 1985; Spivack & Swift, 1967; Walker & McConnell, 1995). These measures are less widely viewed as indicators of children's trait-related behavior, but potentially could be used for this purpose. For example, Shiner (2000) used experts to identify personality-related items from the Devereux scales (Spivak & Swift, 1967), which are teacher ratings of classroom behaviors. She combined these with items from parental and child interviews to assess personality traits of middle childhood. If these behavior rating scales can be meaningfully related to the Five-

Factor model, they will provide a new source of early childhood data that can be used in studies of childhood predictors of subsequent outcomes. Whether these ratings are sufficiently comprehensive to be regarded as measures of personality traits is open to debate because they are limited to observable behaviors and do not include inferences about thoughts or feelings. However, they may provide an untapped reservoir of information about the behavioral components of children's early personality traits

In a previous study, Hampson, Andrews, Barckley, and Sevenson (in press) developed measures of childhood Sociability and Hostility from exploratory and confirmatory factor analyses of teacher's behavior ratings collected at the first OYSUP assessment. The influence of these childhood constructs on the development of attitudes, subjective norms, and intentions regarding future alcohol use was evaluated using latent growth modeling. Sociability and Hostility, assessed at the first assessment, were related to the growth of all three alcohol-related cognitions. Their influence on the growth of intentions was mediated by their influence on the growth of attitudes and subjective norms. However, that study did not investigate construct continuity or stability of Sociability and Hostility over time or explore the relation of Sociability and Hostility to personality constructs.

The Five-Factor model was developed to describe and measure adult personality structure. However, it has been shown in a number of studies to be appropriate for measuring personality dimensions in young adolescents (e.g., John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994; Lynam et al., 2005) and even younger children (Abe, 2005; Measelle, John, Ablow, Cowan, & Cowan, 2005). At the fifth assessment of the OYSUP sample, teacher ratings were obtained on marker traits for the Big-Five personality dimensions (Goldberg, 1992). These ratings enabled an investigation of the relation between Sociability and Hostility assessed on multiple occasions beginning in early childhood with five broad personality traits assessed in adolescence.

We predicted that, both cross-sectionally and longitudinally, Sociability would be most strongly related to Extraversion, and Hostility would be most strongly related to low Agreeableness, low Conscientiousness, and low Emotional Stability (Neuroticism). Sociability – operationalized in the present study as the tendency to seek out and interact with others, and to be active and popular – is a major component of all models of Extraversion and relates to positive emotionality and approach temperament (Depue & Collins, 1999). Therefore, it was expected that a measure of sociable tendencies based on teachers' behavioral observations when the children were younger would relate to teachers' ratings of these children's levels of Extraversion when they were older. Sociability was not expected to relate substantially to any of the other Big Five traits. In contrast, Hostility – operationalized in the present study as both relational and overt aggression – reflects negative emotionality and poor anger regulation (Ahadi & Rothbart, 1994). To get along successfully with others, individuals must learn to regulate their impulses and emotions, and Agreeableness, Conscientiousness, and Emotional Stability are the three Big-Five traits most closely aligned with effortful and reactive control (emotional regulation). For example, in young adolescents, of all the Big Five, Agreeableness in particular was a moderator of interpersonal conflict (Jensen-Campbell & Graziano, 2001; Jensen-Campbell et al., 2002). Together, Agreeableness, Conscientiousness and Emotional Stability form a higher-order pro-social dimension reflecting a concern with getting along with others (Digman, 1997; Saucier & Goldberg, 2003). Therefore, it was expected that hostile behavioral tendencies observed in younger children would relate to teachers' ratings on these three Big Five traits when they were older.

In summary, the purpose of the present study was to evaluate the relation between personality constructs derived from behavior ratings obtained in five successive assessments across middle childhood and early adolescence, and ratings on marker traits for the Five-Factor model

obtained at the fifth assessment. First, we determined whether the constructs of Sociability and Hostility could be reliably measured from teachers' ratings at each of the five assessments. Specifically, the structural continuity of the latent constructs of Sociability and Hostility identified at T1 was examined at each of the subsequent assessments using confirmatory factor analysis. Next, we determined whether these constructs were stable over time. Finally, the relations between Sociability and Hostility and the Big-Five traits were examined cross-sectionally at the fifth assessment, and longitudinally using Sociability and Hostility measured at each of the previous four assessments to predict the Big-Five traits measured at the fifth assessment.

Method

Design

In a cohort-sequential design, five grade cohorts (1st through 5th grades at the first assessment) were assessed annually over four years (T1 – T4), until they were in the 4th through 8th grades. The fifth assessment (T5) took place two years after T4, when participants were in the 6th through 10th grades.

Participants

The OYSUP sample is composed of 1,075 children from 15 elementary schools in one school district in Western Oregon. At T1, an average of 215 students in each of the 1st through 5th grades participated, with equal numbers of boys and girls (50.3% female; $n = 528$), and an average age of 9.0 years ($SD = 1.45$). The sample was 86% Caucasian, 7% Hispanic, 1% Afro-American, and 2% each of Asian/Pacific Islander, American Indian or Alaskan native, and other or mixed race/ethnicity. Approximately 7% of mothers and 11% of fathers had not obtained a high school diploma, and 71% of mothers and 66% of fathers had some form of post-high school education. The schools were located in a predominantly working class community; 40% percent of the sample was eligible for a free or reduced lunch, an indicator of low family income.

Andrews et al. (2003) provide a detailed description of the sampling procedure and the representativeness of the sample. The children were representative of other children in the school district in terms of race/ethnicity and participation in the free or reduced lunch program, but had slightly higher test scores in reading and math. Attrition between assessments was highest between the fourth and fifth assessment (10%), which were separated by two years. Children who participated at T5 were similar to those in the T1 sample who did not participate on demographic variables, including grade, gender, race/ethnicity, and income (as measured by eligibility for free lunch). In attrition analyses for Sociability and Hostility, children who did not participate at T5 were those who dropped out of the study and those who remained in the study but could not be included because no teacher ratings were available for them ($n = 279$ for Sociability and $n = 277$ for Hostility). Children who participated at T5 differed from those who did not participate by having somewhat higher standardized scores at T1 on Sociability ($M = .04$, $SD = .77$ vs. $M = -.11$, $SD = .81$, $t = 2.87$, $df = 1,045$, $p < .05$) and lower scores at T1 on Hostility ($M = -.06$, $SD = .75$ vs. $M = .16$, $SD = .86$, $t = -3.81$, $df = 1,044$, $p < .05$).

Measures

Teachers' ratings of children's behaviors—Teachers rated their students on several behavior scales. These included the short version of the Walker McConnell test of children's social skills (Walker & McConnell, 1995); the Harter social acceptance subscale of the Self Perception Profile for Children (Harter, 1985); the Achenbach withdrawn subscale of the Teacher Report Form (Achenbach, 1991); and the Crick aggression scales (Crick, 1996).

Hampson et al. (in press) developed scales to measure Sociability and Hostility from these behavior ratings. Exploratory factor analysis of all items from the above scales at T1 yielded a two-factor solution accounting for 52.3% of the variance. To maximize the orthogonality between the scales, the most high-loading, factor-pure marker items for each factor were selected. Confirmatory factor analysis demonstrated acceptable fit for the measurement model, $\chi^2(143, N = 1,049) = 417.97$, CFI = .98, Root Mean Square Error of Approximation (RSMEA) = .043 (90% CI = .038, .048). Sociability was measured by five items from the Walker-McConnell scale (maintaining conversation, initiating conversation, extending play or conversation, gets chosen by other children, and invites other children), one item from the Harter scale assessing number of friends, one OYSUP item assessing popularity, and three items from the Achenbach withdrawn scale (withdrawn, prefers to be alone, and underactive). Hostility was measured by six items for the Crick relational aggression scale (gossips, isolates, excludes, rejects, threatens other children, and tells lies); three items from the Crick overt aggression scale (bullies, hits, fights); and one OYSUP item assessing how often the student exerted a negative influence on friends.

Teacher ratings on these items were obtained at T1 – T5. At T4 and T5, Sociability was measured by eight (not ten) items because students were not rated on two items that were not appropriate for older kids (gets chosen by other children, and invites other children). Children in grades 9 and 10 at T5 were not rated on any of the Hostility items, as these behaviors are less observable by teachers in older students.

Teacher ratings of the Five-Factor Model—Five marker traits for each of the adult Big Five dimensions were selected from markers identified by Goldberg (1992) and Saucier (1994). These were: sociable, energetic, talkative, shy, and reserved for Extraversion; helpful, friendly, kind, aggressive and selfish for Agreeableness; tidy, plans ahead, reliable, lazy and careless for Conscientiousness; well-balanced, calm, self-assured, moody, and anxious for Emotional Stability; and intelligent, creative, curious, unintelligent, and unimaginative for Intellect/Imagination. At T5 only, teachers rated each child on each trait using a 5-point scale: 1 = false, 2 = somewhat false, 3 = neither true nor false, 4 = moderately true, 5 = very true.

Teacher's familiarity with their students—For each child at each assessment, teachers indicated how long (in months) and well they knew them (1 = not well at all, 5 = very well).

Procedures

Teachers' ratings of the children's behavior were made during the second half of the school year (January – May). Teacher ratings on the behavior scales were obtained at each of the five assessments (T1–T5), whereas teacher ratings on the Big-Five traits were only obtained at T5. For grades 1–7, most children were rated by only one teacher because they were taught primarily by a single teacher. For grades 8, 9, and 10, when they were taught by several teachers, many children were rated by two teachers. For T1 – T4, where ratings on Sociability and Hostility items were available from more than one teacher, the one who knew the child best was chosen (using their reports of how long and how well they knew each child). At T5, when the majority of the sample was in grades 8, 9 or 10, 48.5% of children were rated by more than one teacher. Correlations between pairs of teachers' ratings of the same child across the 25 Big Five marker traits revealed a wide range of agreement but no apparent influence of grade (grades 8, 9 and 10 combined, mean $r = .52$, $SD = .34$, $n = 365$; grade 8, mean $r = .50$; grade 9, mean $r = .57$; grade 10, mean $r = .49$). Therefore, where teachers' ratings on the Big Five traits correlated .30 or higher, the mean rating across the two teachers was used for the child's rating on each Big Five trait, and on Sociability and Hostility. Where teachers' ratings correlated less than .30, the one who knew the child best was chosen (using their reports of how long and how well they knew each child). Most children were rated by a different teacher

at each assessment. Teacher identification was not always tracked, but the available data indicated that about 18% of children were rated by the same teacher across one or more assessments.

Statistical Analyses

The structure of Hostility and Sociability was confirmed for each assessment using confirmatory factor analysis (Mplus version 3; Muthén & Muthén, 2004). Pearson correlation coefficients were used to assess the rank-order stability of Sociability and Hostility across assessments. We used structural equation modeling (using Mplus) to assess the relation between Hostility and Sociability and the Big Five. Full maximum likelihood methods were used to estimate missing data (Enders, 2001). Errors were allowed to correlate within and between indicators of Sociability and Hostility, and within and between each of the Big Five. However, errors were not allowed to correlate between indicators of Sociability or Hostility and any of the Big Five. The effects of grade (2nd and 3rd grade versus 4th and 5th grade at T1) on the structural parameters between Hostility and Sociability and the Big Five were examined using multiple-sample analysis. In these analyses, the measurement model was constrained to be equal for each grade group. Structural paths between Sociability and Hostility and the Big Five factors were initially constrained to be equal across grade groups and successively freed. The difference in fit between the models was evaluated using a χ^2 difference test. Sample sizes differed across analyses depending on the availability of teacher ratings, and are given in Table 1 and the figure captions. Sample sizes are smaller for the structural equation modeling because to be included children had to have teacher personality ratings at T5 and teacher behavior ratings at T1, T2, T3, T4, or T5. For all analyses, the significance level was set at $p < .05$.

Results

Sociability and Hostility

Measurement model—The 20 items identified previously to assess Sociability and Hostility for the sample at T1 (see Methods section) were used here as indicators of latent constructs at each time of assessment. For T1 – T3, both Sociability and Hostility each had 10 indicators. For T4 and T5, Sociability had only 8 indicators. For T5, the measurement model was evaluated only for those students in grades 6, 7 and 8, since indicators loading on Hostility were not assessed in grades 9 and 10. The fit of the measurement models was good at each time of assessment (see Table 1). At each assessment except T5, there was a small but significant negative correlation between Sociability and Hostility: T1 = $-.09$, T2 = $-.18$, T3 = $-.14$, T4 = $-.10$, $p < .01$; T5 = $-.02$.

Stability of Sociability and Hostility—Children's scores on the Sociability and Hostility scales (means of item ratings converted to z scores) were used to determine rank-order stability over all possible time intervals by correlating each time of assessment with every other (see Table 2). These correlations (all significant) indicate considerable rank-order stability, with higher correlations across shorter intervals, and the correlations for Sociability tending to be slightly higher than those for Hostility.

The Five-Factor Model at T5

The measurement model—Exploratory factor analyses for the entire sample at T5 indicated that the best five-factor orthogonal solution (accounting for 75% of the variance) was achieved after dropping seven traits that loaded highly on more than one factor. Confirmatory factor analyses were conducted to test the fit of the measurement model based on the remaining 18 traits in which the five latent constructs were: Extraversion (sociable, talkative, shy, reserved); Agreeableness (kind, helpful, friendly); Conscientiousness (tidy, planful, reliable, lazy, careless); Emotional Stability (mood, anxious); and Intellect (original, intelligent, no

imagination, unintelligent). The fit of the model for the entire sample at T5 was adequate, $\chi^2(98, N = 783) = 503.50, p < .001, CFI = .961, RMSEA = .073$ (90% CI = .066 – .079). The standardized (and unstandardized) path coefficients for each indicator of the latent traits are shown in Figure 1. For clarity, the correlations between the five latent constructs are not included in this figure (or subsequent ones) but are provided in Table 3, and show that the factors were moderately related.

Relating Sociability and Hostility to the Five-Factor Model at T5

The latent constructs of Sociability and Hostility at T1 – T5 were related to the T5 Big Five traits using structural equation modeling. The model for each assessment is shown in Figures 1 – 5, which include standardized path coefficients, so that the relative strength of paths within each model may be compared, as well as unstandardized coefficients (in parentheses). The fit indices for each model are provided in the figure captions. In these analyses, the path coefficients for the indicators for the latent constructs were fixed to be the same as those established in the measurement models for each time of assessment. The correlations between Sociability and Hostility constructs, the correlations among the Big Five constructs, and correlated errors between indicators are not shown in these figures for the sake of simplicity. For Sociability and Hostility, the number of correlated errors ranged from a low of 14 for the T4 model (Figure 2) to a high of 20 for the T2 model (Figure 4), and correlated errors only occurred between Sociability indicators or Hostility indicators, never across constructs. For the Big Five, the same correlated errors occurred in all models. There were 27 correlated errors among indicators of the Big Five, including ones within the same Big Five construct and ones between different Big Five constructs.

The model at T5 (Figure 1) used data for students in grades 6, 7, and 8 only ($N = 480$) because those in grades 9 and 10 were not rated on Hostility items, and the ratings of indicators of Hostility and Sociability were made by the same teacher (or combination of teachers) as the ratings of the Big Five. At T5, all the paths between Sociability and Hostility to all the Big Five traits were significant. However, the pattern of association differed markedly between Sociability and Hostility. The largest associations for Sociability were with Extraversion (.92), followed by Agreeableness (.57), whereas the largest association for Hostility was with Emotional Stability (–.61) followed by Agreeableness (–.47) and Conscientiousness (–.47). Hostility was the least strongly associated with Extraversion (.14).

The remaining models (Figures 2–5) used all available participants from all grades and the T4 – T1 measures of Sociability and Hostility, respectively, and represent increasing prospective intervals between the measurement of these two traits and the measurement of the Big Five. The same pattern of associations between Sociability and the Big Five traits was clearly apparent across the cross-sectional model (Figure 1) and all four prospective models (Figures 2–5). Sociability was always most strongly positively related to Extraversion, and about equally moderately positively associated with the remaining traits. In all the models, Hostility was most strongly related (negatively) to Conscientiousness and Emotional Stability, and was about equally and moderately negatively associated with Agreeableness and Intellect. In three models, the path coefficient between Hostility and Extraversion was not significant, therefore this path is included in the respective figures (Figures 2, 3, and 5). Possible age effects for the models shown in Figures 2–5 were examined by multiple-sample analysis but model fit was not significantly improved by freeing any of the structural paths between Sociability and Hostility and the Big Five factors for younger versus older participants.

Discussion

The constructs of Sociability and Hostility, measured by teachers' ratings of children's classroom behaviors demonstrated structural continuity across five successive assessments

over a six-year period. Moreover, these constructs also demonstrated rank-order stability, despite the majority of students being rated by different teachers at each assessment. Sociability and Hostility demonstrated the same pattern of relations to the Five-Factor model in both cross-sectional and prospective analyses. These findings are discussed in terms of the continuity and stability of children's personality traits, the validity of teachers' ratings, and the implications for early intervention.

The present findings contribute to the evidence for moderate stability of childhood individual differences (Roberts & DelVecchio, 2000). In their meta-analysis, Roberts and DelVecchio (2000) estimated stability coefficients for personality traits of .45 for children aged 6 to 12 years. In the present study, the mean (uncorrected) stability correlations for Sociability (.50) and Hostility (.43) across all time intervals combined were of the same order of magnitude as Roberts and DelVecchio's (2000) estimate.

As predicted, Sociability was most strongly related (positively) to Extraversion, both cross-sectionally and in each of the prospective models, even over the longest time period (T1 to T5). This finding supports the propositions that sociability derives from the approach system (Ahadi & Rothbart, 1994) and positive-affect temperament (Caspi, 1998). One of the items for Sociability assessed activity level, which is also expected to relate to Extraversion (Caspi, 1998). Providing partial support for our initial prediction, Hostility was most strongly related (negatively) to Conscientiousness and Emotional Stability in all five models but less strongly with Agreeableness. Indeed, compared to Hostility, Sociability was always more strongly associated (positively) with Agreeableness. The items assessing Agreeableness (kind, helpful, friendly) were all desirable characteristics that corresponded quite closely to the items measuring Sociability, indicating that teachers' ratings on a more comprehensive measure of the Big Five traits would have been preferable.

The significant associations between Sociability and all of the Big Five traits, and between Hostility and four (all five in two of the models) of the Big Five traits, was unexpected. However, a probable explanation is that teachers' ratings of the Big Five traits for these children were considerably more complex (i.e., less clear differentiation between the Big Five) than typical observers' personality ratings of adults. Exploratory factor analysis indicated that many of the items loaded on more than one of the Big Five and, even after excluding seven items with particularly large cross loadings, the final measurement model was only marginally adequate, and the factors were quite highly correlated. A similar degree of complexity of personality structure as revealed by teachers' trait ratings of children and early adolescents was observed by Hampson and Goldberg (in press) in a very different multiethnic sample of schoolchildren, suggesting that the Big Five may not be as clearly delineated in children of this age as they are in adults. The unexpected finding in two of the models of a modest but positive association between Hostility and Extraversion, in addition to associations with the other four traits, may have been the result of this complexity in the Big Five ratings. Alternatively, it may result from the lack of inhibition related to both Hostility (e.g., overt aggression) and Extraversion (e.g., sociable and energetic), (Ahadi & Rothbart, 1994).

In a previous study of OYSUP data, Hampson et al. (in press) demonstrated that the measures Sociability and Hostility at T1 predicted developmental change in children's alcohol intentions, and that this influence was mediated by developing attitudes and subjective norms regarding alcohol. For both boys and girls, Sociability predicted increasing intentions to use alcohol, and this influence was mediated by growth in favorable attitudes towards alcohol (social images of kids who drink alcohol). Hostility predicted initial levels of these intentions, mediated by initial levels of subjective norms (i.e., beliefs about levels of alcohol use by peers). These findings were consistent with hypothesized influences of Sociability and Hostility viewed as childhood personality traits on children's exposure to alcohol use and other problem behaviors.

The present study positions the constructs of Sociability and Hostility in relation to the well-established, broader trait dimensions of the Five-Factor model. These findings suggest that the constructs of Sociability and Hostility assessed here by teachers' ratings of children's classroom behaviors could be viewed as two of the precursors of the Big Five personality traits. Elementary school is an important source of environmental influences on genetically based temperament (Wachs, 1994), therefore teachers' ratings of children's behavior at school represents an opportunity to evaluate the transition from temperament to temperament-modulated personality traits. In conjunction with the findings of Hampson et al. (in press), these two constructs, whether viewed as traits or trait-related behaviors, are now embedded in a network of relations with other traits and cognitions related to problem behavior that serves to confirm their validity and usefulness (John et al., 1994).

The behavior-rating scales from which the constructs of Sociability and Hostility were derived were developed independently from the Big-Five scales used to assess the Five-Factor model of personality. Teacher ratings of children's problem behaviors have proved useful for screening purposes to identify children at risk for later adjustment and behavioral problems. The findings from the present study indicate the validity of regarding at least some of these teacher rating scales as measures of trait-related behavior. This conclusion suggests two intriguing implications. First, there may be a large and untapped source of data on young children in the form of these teachers' behavior ratings that could be used by personality researchers in longitudinal studies of personality development and studies of the influences of early temperament or personality traits on later outcomes. Second, these teacher ratings are used to identify children who would benefit from prevention programs to modify behavior and/or prevent later problem behavior from developing (e.g., Severson, Andrews, & Walker, 2003). As more research accumulates to suggest that childhood personality influences consequential adult outcomes (Ozer & Benet-Martínez, 2005), it is exciting to speculate that we may already have a body of evidence to show that it is possible to modify the effects of early childhood trait-related behaviors, and thus to increase children's chances of attaining a wide range of positive life outcomes.

Acknowledgements

The research was supported by Grant DA10767 from the National Institute of Drug Abuse. We gratefully acknowledge the assistance of Martha Hardwick and the assessment staff for helping with data collection, and Christine Lorenz for manuscript preparation.

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Figure 1.

Structural Equation Model of the Associations Between Sociability and Hostility Measured at T5 with the Big Five Traits Measured at T5 ($\chi^2 = 1,473.74$, $df = 527$, $N = 480$, $CFI = .940$, $RMSEA = .061$, 90% CI = .057–.065, $N = 480$).

Figure 2. Structural Equation Model of the Associations Between Sociability and Hostility Measured at T4 with the Big Five Traits Measured at T5 ($\chi^2 = 1,355.01$, $df = 532$, $N = 731$, $CFI = .961$, $RMSEA = .046$, 90% CI = .043–.049, $N = 731$).

Figure 3. Structural Equation Model of the Associations Between Sociability and Hostility Measured at T3 with the Big Five Traits Measured at T5 ($\chi^2 = 1,602.03$, $df = 602$, $N = 748$, $CFI = .956$, $RMSEA = .047$, 90% CI = .044–.050, $N = 748$).

Figure 4. Structural Equation Model of the Associations Between Sociability and Hostility Measured at T2 with the Big Five Traits Measured at T5, ($\chi^2 = 1,515.29$, $df = 597$, $N = 753$, $CFI = .961$, $RMSEA = .045$, 90% CI = .042–.048, $N = 753$).

Figure 5. Structural Equation Model of the Associations Between Sociability and Hostility Measured at T1 with the Big Five Traits Measured at T5 ($\chi^2 = 1,512.23$, $df = 599$, $N = 769$, $CFI = .961$, $RMSEA = .045$, 90% $CI = .042-.047$, $N = 769$).

Table 1
Fit Indices for Measurement of Sociability and Hostility at Each Time of Assessment (T1–T5)

	χ^2	N	df	CFI	RMSEA	90% CI
T1 (Grades 1–5)	530.34	1,048	151	.978	.049	.044 – .054
T2 (Grades 2–6)	468.23	998	149	.982	.046	.042 – .051
T3 (Grades 3–7)	554.24	966	154	.975	.052	.047 – .057
T4 (Grades 4–8)	401.70	941	120	.980	.050	.045 – .055
T5 (Grades 6–8) ^a	310.81	482	121	.974	.057	.049 – .065

^aNo Hostility ratings available for grades 9 and 10

Table 2
Correlations for the Entire Sample Between Assessments (T1–T5) for Sociability¹ (Above the Diagonal) and Hostility² (Below the Diagonal)

	T1	T2	T3	T4	T5
T1					
T2	.50				
T3	.47	.57			
T4	.42	.50	.50		
T5	.37	.41	.46	.47	
		.35	.33	.49	.44
				.50	.48
					.49
					.46

¹ Sociability assessed by the 8-item scale

² At T5, only students in grades 6, 7, and 8 had scores on Hostility

Table 3
Correlations Among the Big Five Latent Constructs at T5

	E	A	C	ES
A	.55			
C	.35	.76		
ES	-.34	-.61	-.62	
I	.42	.63	.71	-.48

Note: E = Extraversion, A = Agreeableness

C = Conscientiousness, ES = Emotional Stability

I = Intellect/Imagination