



Published in final edited form as:

*Early Child Res Q.* 2008 ; 23(2): 288–298. doi:10.1016/j.ecresq.2007.04.003.

## The relations among young children's peer-reported trustworthiness, inhibitory control, and preschool adjustment

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### Abstract

Sixty-five (38 male and 27 female) preschool children (mean age = 5 years 1 month) completed measures of peers' trustworthiness (promise keeping and secret keeping). Teachers rated the preschool children's inhibitory control, trustworthiness, and preschool adjustment. Structural Equation Modeling (SEM) yielded support for the hypothesized model. The expected positive paths were found from (1) gender to preschool adjustment and inhibitory control, (2) age to peer-reported trustworthiness, (3) peer-reported trustworthiness to preschool adjustment, (4) inhibitory control to peer-reported trustworthiness, and (5) inhibitory control to preschool adjustment. The findings confirmed the hypothesized development of trustworthiness with age and girls' advantage over boys in inhibitory control and preschool adjustment. The findings supported the hypotheses that trustworthiness is associated with preschool adjustment and mediates, in part, the relation between inhibitory control and preschool adjustment.

### Keywords

Young children; Peer-reported trustworthiness; Inhibitory control; Preschool adjustment

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Trustworthiness conventionally involves an individual fulfilling his or her promises (e.g., keeping promises) and maintaining confidentiality of personal information (e.g., keeping secrets). Trustworthiness has been regarded as a self-regulatory social behavior that is required in the classroom (Wentzel, 1991). In support of that hypothesis, some studies have shown that children's trustworthiness is related to peer relationships, school adjustment and self-control during the early and later elementary school years (Betts & Rotenberg, in press-a; Rotenberg, McDougall, et al., 2004; Wentzel, 1991). Trustworthiness in *preschool* children has been neglected in research. The purpose of the current study was to redress this oversight by examining the relations among trustworthiness, school adjustment, and inhibitory control in preschool children.

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## 1. Children's trustworthiness and school adjustment

There have been varying conceptualizations of trustworthiness. The conceptualization that guided the current investigation is Rotenberg and his colleagues' 3 (basis)  $\times$  2 (domain)  $\times$  2 (target dimension) conceptual model of trustworthiness (Rotenberg, Boulton, & Fox, 2005; Rotenberg, Fox, et al., 2005; Rotenberg, MacDonald, & King, 2004; Rotenberg, McDougall, et al., 2004). According to this framework, there are three fundamental bases of trustworthiness: (a) reliability, which refers to the fulfillment of word or promise; (b) emotional, which refers to refraining from causing emotional harm, such as being receptive to disclosures, maintaining confidentiality of them, refraining from criticism and avoiding acts that elicit embarrassment; and (c) honesty, which refers to telling the truth and engaging in behaviors that are guided by benign rather than malicious intent and by genuine rather than manipulative strategies. The three bases of trustworthiness are further differentiated by two domains (cognitive/affective and behavior) and two dimensions of the target (specificity and familiarity). For example, children's trustworthiness elicits both cognitions/affect and behavior from others. Furthermore, those other persons vary from a general category of people to a specific person and from relatively unfamiliar to familiar person(s). According to the framework, trustworthiness is conceptualized as having a strong reciprocal quality, notably within dyadic interactions. The current investigation focused on the reliability and emotional bases of trustworthiness as shown by children's keeping promises and keeping secret behaviors, respectively, toward the moderately general and familiar target—the peer group.

Wentzel (1991, 1996) hypothesized that trustworthiness is a form of self-regulatory social behavior that is related to adjustment to school. According to these formulations, children are expected to fulfill promises made to their peers and teachers (e.g., promise to share resources) and maintain confidentiality of some information (e.g., not to tell embarrassing information about a classmate) during classroom activities. Although Wentzel (1991, 1996) focused on trustworthiness in children during elementary school and early adolescence, her hypothesis bears on preschool in so far as this is a period of socialization that prepares children for formal schooling. In support of Wentzel's hypothesis, investigators have found that trustworthiness is associated with academic achievement (Imber, 1973; Wentzel, 1991), number of peer friendships in school (Rotenberg, McDougall, et al., 2004), and being desired by classmates as a partner on academic activities (Wilson & Carroll, 1991) during later elementary school. Also, Betts and Rotenberg (in press-a) found that peer-reported trustworthiness was concurrently associated with, and predicted changes in, school adjustment across a 1-year period, in 6-year-old children. The longitudinal findings yielded by this study provide support for the hypothesis that trustworthiness is a factor that potentially contributes to school adjustment during the early elementary school years.

Researchers have found that the preference for trustworthiness in peer relationships, notably friendships, is evident only by the elementary school years or by early adolescence (Berndt & Perry, 1986; Buhrmester & Furman, 1987; Bukowski, Hoza, & Boivin, 1994; Parker & Asher, 1993; Sharabany, Gershoni, & Hofman, 1981). As evidence for the earliest emergence of such preferences, Furman and Bierman (1984) found that trustworthy behaviors (i.e., secret keeping) were judged as desirable for friendships by 7–8-year-old children. The question addressed by the current investigation is whether trustworthiness is a salient feature of peer relationships in very young children; in this case, as shown by its association with adjustment to preschool.

The extension of Wentzel's (1991, 1996) hypothesis in the current investigation was based on the notion that preschool is period of a socialization during which the socially desired behavior, such as trustworthiness, is being acquired (see Hart, DeWolf, Wozniak, & Burts, 1992). As a derivation of that proposition, the current investigation was guided by the expectation that trustworthiness would be positively correlated with age. This was anticipated because it was

reasonable to expect that preschool teachers and peers in preschool (as well as caregivers) would promote children's acquisition of trustworthy behaviors (e.g., keeping promises) by prompting, reinforcement, modeling, and other forms of socialization practices. Consequently, trustworthiness should likely be more evident in older than in younger children during the preschool period.

## 2. School adjustment, trustworthiness and inhibitory control

Wentzel (1991, 1996) conceptualized trustworthiness as self-regulatory behavior. Consistent with that notion, the current investigation was guided by the expectation that the self-regulation processes of inhibitory control would be associated with children's trustworthiness and also preschool adjustment. Temperamental inhibitory control in young children has been assessed by Rothbart and colleagues (Rothbart, Ahadi, & Evans, 2000) as a subscale of The Child Behavior Questionnaire (CBQ). The inhibitory control scale assessed the "capacity to plan and to suppress inappropriate approach responses under instructions or in novel or uncertain situations" (Rothbart, Ahadi, & Hershey, 1994, p. 29). The potential role of inhibitory control in trustworthiness resides in the notion that keeping a secret *depends* on a child's ability to suppress inappropriate responses under instructions (i.e., not to tell anyone else) or in novel or uncertain situations (e.g., when others ask). Similarly, fulfilling a promise *depends* on a child's ability to plan to behave under instructions (i.e., as asked to by social agents) or in novel or uncertain situations (e.g., when the promise is in conflict with other demands).

There is evidence supporting the conclusion that inhibitory control is associated with various forms of children's adjustment. For example, Lengua (2003) found that inhibitory control was concurrently associated with lower internalizing and externalizing problems and higher social competence in children from grades 3–5, and also predicted lower externalizing problems 2 years later. Similarly, Eisenberg and colleagues (Eisenberg, Fabes, Guthrie, & Reiser, 2000; Eisenberg et al., 1998; Eisenberg et al., 2004) have found that effortful control (a composite of inhibitory control and attentional control) predicted higher levels of social competence, adjustment, and sympathy, both concurrently and across time in children during the early years of school, specifically during kindergarten. Also, Eisenberg et al. (2001) found that low inhibitory control in 4–8-year-old children was associated with externalizing problems. The preschool years are a time of rapid development of effortful control (e.g., Kochanska, Murray, & Harlan, 2000; Reed, Pien, & Rothbart, 1984), and a time in which problematic behaviors such as aggression also are very common (Dodge, Coie, & Lynam, 2006) and, consequently, a likely target of adults' attention.

Guided by the preceding theory and research, two hypotheses were advanced in the current investigation. First, it was expected that inhibitory control would be associated with children's preschool adjustment. Second, as a mediation hypothesis, it was expected that inhibitory control would be associated with trustworthiness that, in turn, would be associated with preschool adjustment. In this sequence, trustworthiness is seen as a partial mediator of the relation between inhibitory control and preschool adjustment. Although mediation cannot be proved with concurrent data, it is possible to test whether the pattern of findings is consistent with mediation. Some specific support for this hypothesis was found by Betts and Rotenberg (in press-a) for the early elementary school years. Using cross-sectional data, it was found that peer-reported trustworthiness mediated the relation between self-control (as assessed by teacher ratings of impulsivity) and teacher-rated school adjustment in 7-year-old children. The question addressed by the current investigation was whether a similar set of relations would be found in preschool children using inhibitory control as the measure of self-regulation.

### 3. Gender differences

Several studies show that girls demonstrate better adjustment to the early years of school than do boys. Birch and Ladd (1997) found that teachers reported that, relative to boys, girls were more co-operative and more able to meet the demands placed upon them by the school environment. Also, it has been found that girls exhibit more prosocial and less antisocial behavior in the classroom during kindergarten than do boys (Birch & Ladd, 1998)—a finding consistent with early gender differences in prosocial and aggressive behavior (Eisenberg & Fabes, 1998). Gender differences were expected in the current study: girls would show greater preschool adjustment than would boys. In addition, meta-analyses show that girls demonstrate higher inhibitory control than do boys (e.g., Else-Quest, Hyde, Goldsmith, & Van, 2006). Those gender differences also were expected in the current study.

### 4. Age differences in preschool adjustment

Murphy, Eisenberg, Fabes, Shepard, and Guthrie (1999) found that age was positively associated with preschool adjustment. The researchers attributed that pattern to the children acquiring the social and cognitive skills required for school as they develop. Consequently, the relation between age and adjustment during preschool was examined.

### 5. Assessing trustworthiness during preschool

Peer reports have been used to assess varying domains of social functioning in children during preschool or and early elementary school (Buhs & Ladd, 2001; Wasik, 1987). Rotenberg and colleagues (Betts & Rotenberg, in press-a; Rotenberg, McDougall, et al., 2004) have used peer reports to assess trustworthiness in 5–7-year-old children, 7–9-year-old children, and adolescents (11–14 years of age). Peer reports are the most viable means of assessing trustworthiness because peers are in the rather unique position of observing naturally occurring incidents of promise-keeping and secret-keeping activities during school (see Rotenberg, McDougall, et al., 2004). Peer reports have the advantage over (a) teachers who have limited access to such peer interactions, notably secret keeping, because these are private activities among children; (b) a peer friend's reports because these are likely biased by the emotional bond of friendship; and (c) any *individual's* reports (teacher or peer friend) because peer reports represent the convergence of *multiple* reports of behavior. For these reasons, peer-reported trustworthiness was the primary measure in the current study.

Similar to previous research (e.g., Betts & Rotenberg, in press-a), peers in the current study were required to judge promise keeping and secret keeping of children as a measure of trustworthiness. These judgments were chosen because they were *observable* behaviors that did not necessitate the peers inferring the target person's intentions. This is particularly desirable when assessing trustworthiness in preschool children because the ability to infer a person's intentions is emerging during that developmental period (Porath, 2003). It is worthwhile to note that peer-reported trustworthiness is modestly stable across a year span in 6-year-old children (Betts, 2005), across an 8-month span for 9–11-year-old children, and across a year-span in adolescents (11–14-year-olds) (Rotenberg, McDougall, et al., 2004).

As support for the validity of the peer-reported trustworthiness measure, researchers have found modest associations between it and teacher-reported trustworthiness for 6-year-old children (Betts, 2005) and for 9–11-year-old children (Rotenberg, McDougall, et al., 2004). The modest strength of the observed association was attributed to teachers' difficulty in observing trustworthy behaviors in children. Teacher-reported trustworthiness was included in the current investigation as a criterion measure and a modest association was expected between it and peer-reported trustworthiness. Because of the purpose of the teacher-reported trustworthiness measure, it was not included in model testing.

## 6. Overview of the study and the hypotheses

In the study, teachers and peers reported the preschool children's trustworthiness. Teachers completed measures of the children's preschool adjustment and inhibitory control. As evidence for convergent validity, it was expected that peer-reported trustworthiness would be positively but modestly correlated with teacher ratings of trustworthiness.

The following paths were hypothesized.

*First*, positive paths were expected between gender and both preschool adjustment and inhibitory control. It was anticipated that girls would demonstrate greater preschool adjustment and inhibitory control than would boys.

*Second*, a positive path was expected between age and peer-reported trustworthiness.

*Third*, a positive path was expected between peer-reported trustworthiness and preschool adjustment.

*Fourth*, positive paths were expected between inhibitory control and both peer-reported trustworthiness and preschool adjustment.

*Fifth*, as outlined in the preceding two hypotheses, the paths were expected to demonstrate that peer-reported trustworthiness mediates, in part, the relation between inhibitory control and preschool adjustment. In that same vein, it was expected that there would be an indirect effect of peer-reported trustworthiness in the relation between inhibitory control and preschool adjustment.

In addition, the study was designed to examine two other issues: (a) whether there was a positive correlation between age and preschool adjustment, and (b) whether there were gender differences in the correlations among the measures.

## 7. Method

### 7.1. Participants

The participants were 65 children (38 males and 27 females) with mean age = 5 years 1 month (S.D. = 5 months) ranging from 4 years to 6 years 2 months. The participants were two cohorts of children who were 4 years of age and older in two preschools located on university campus schools in the United States. One preschool was located in the building housing a Department of Psychology and the other preschool was located in a building on the same campus linked to another related department. In the former preschool, the children were divided into two age groups and those were accommodated in two separate rooms. The current sample was drawn from the older age group. The latter preschool was open concept and consisted primarily of one large room. The racial composition of sample was as follows: 83% White, 5% Afro-American, 3% Native American, 5% other, and 4% unknown. The preschools primarily served middle-class and college-educated families.

### 7.2. Measures

**7.2.1. Peer-reported trustworthiness**—Rotenberg and colleagues' (Betts & Rotenberg, in press-a; Rotenberg, Boulton, et al., 2005; Rotenberg, Fox, et al. 2005; Rotenberg, McDougall, et al., 2004) procedure was employed to assess peer-reported trustworthiness, but it was modestly modified for use with the preschool children. Each participant was asked “how often each classmate keeps promises he/she has made” and “how often each classmate keeps secrets he/she has been told.” The procedure was modified for this preschool sample: the

participant was presented a photograph of each classmate in order to assist him/her in making these judgments. The participant rated keeping secrets and rated keeping promises separately on a five-point scale ranging from *Never Ever* (1) to *Always* (5). The procedure was modified for this preschool sample: as a visual aid, the five-point scale was depicted to the participant by a series of columns systematically varying in height, with higher columns depicting greater amounts.

To yield the measure of trustworthiness, the ratings each participant *received* from each classmate for keeping promises and keeping secrets were summed and averaged (per rating) across classmates. These calculations yielded a measure of peer-reported promise keeping trustworthiness and a measure of peer-reported secret keeping trustworthiness for each participant. As expected, peer-reported promise keeping trustworthiness and peer-reported secret keeping trustworthiness were substantially correlated,  $r(63) = .56, p < .001$ , and thus they were combined to yield a measure of peer-reported trustworthiness. High scores on this scale represented high peer-reported trustworthiness.

**7.2.2. Teacher-reported trustworthiness**—Teachers rated each participant on the following four trustworthiness items: (1) “Keeps his or her promises or word,” (2) “Does not do tasks in school that he or she promised to do” (reverse scored), (3) “Reveals secrets told to him or her by classmates” (reversed scored), and (4) “Does not say things in class that will embarrass others.” The teachers reported whether each item *Doesn't apply* (0), *Somewhat applies* (1), and *Certainly applies*. Similar measures of teacher-reported trustworthiness have been utilized in other studies that have included a longitudinal study of 6-year-old children (Betts, 2005) and of 10-year-old children (Rotenberg, McDougall, et al., 2004). In the current study, there was acceptable internal consistency of the teacher-reported trustworthiness scale ( $\alpha = .77$ ). Consistent with the previous research (Betts & Rotenberg, in press-a; Rotenberg, McDougall, et al., 2004), teacher-reported trustworthiness was positively but modestly correlated with peer-reported trustworthiness,  $r(61) = .33, p = .009$ .

**7.2.3. Preschool adjustment**—The 16-item Short-Form Teacher Rating Scale of School Adjustment (Short-Form TRSSA; Betts & Rotenberg, in press-b) was used to assess teacher-rated school adjustment. The Short-Form TRSSA was derived from the TRSSA developed by Ladd and colleagues (Birch & Ladd, 1997; Ladd, Birch, & Buhs, 1999). The Short-Form TRSSA is a three-factor scale composed of (1) on-task classroom involvement (“Is interested in classroom activities” and “Responds to teachers requests promptly”), (2) positive orientation (e.g., “Is cheerful at school” and “Approaches new activities with enthusiasm”), and (3) maturity (e.g., “Seeks challenges” and “Is a mature child”). Teachers completed the items using a three-point scale: *Doesn't apply* (0), *Applies sometimes* (1), and *Certainly applies* (2). In a longitudinal study of 6-year-old children, Betts and Rotenberg (in press-b) found that the total Short-Form TRSSA scale demonstrated acceptable internal consistency ( $\alpha = .89$ ) and stability,  $r(205) = .45, p < .001$ , across a 1-year period. The validity of the Short-Form TRSSA scale was supported by correlations with child-rated measures of school adjustment (i.e., lack of loneliness and school liking) and by correlations with the original TRSSA scale,  $r(265) = .93, p < .001$ . In the current study, acceptable internal consistency was found for the Short-Form TRSSA ( $\alpha = .91$ ).

**7.2.4. Inhibitory control**—The original Inhibitory Control subscale of the Children's Behavior Questionnaire (CBQ) (Rothbart, Ahadi, Hersey, & Fisher, 2001) was composed of 13 items but researchers have developed shorter six-item and shorter four-item forms that have attained acceptable psychometric standards (Putnam & Rothbart, 2006). Five items from the original Inhibitory Control subscale were used in the current investigation with three drawn from the short version of the CBQ and the other two selected to assess the type of behavioral control from the CBQ that was particularly relevant to the preschool environment. The teachers

rated each participant on the five items using seven-point scales, ranging from 1 = *extremely untrue* to 7 = *extremely true* (also not applicable). The items were as follows: “Can lower his/her voice when asked to,” “Is able to resist laughing and smiling when it isn't appropriate,” “Is good at following instructions,” “Can easily stop an activity when she/she is told no,” and “Can wait before entering into a new activities she/he is asked to.” One item from the scale was dropped because it substantively reduced internal consistency that resulted in a four-item scale that was composed of three items from the short form of the CBQ.

Researchers have had teachers rate children on the Inhibitory Control subscale of CBQ in previous studies with considerable success. The Inhibitory Control subscale of CBQ completed by teachers has been found to have acceptable internal consistency ( $\alpha = .88$ ) attesting to an aspect of its reliability. In support of the validity of the Inhibitory Control subscale of CBQ completed by teachers, researchers have found that it is significantly correlated with parents' reports on the same subscale,  $r(190) = .50, p < .001$ , and with observed behavioral control (e.g., sitting still) (Eisenberg et al., 2001, 2004). The Inhibitory Control subscale completed by teachers had acceptable internal consistency in the current study ( $\alpha = .92$ ).

### 7.3. Procedure

Following peer-report testing practices for young children (e.g., Buhs & Ladd, 2001; Wasik, 1987), the target behaviors of promise keeping and secret keeping were defined and described for the participant. The tester stated “a promise is when someone says that they will do something” and then gave an example of it as “when someone in your preschool says that you can share some crayons then he or she has made a promise.” The participant was then asked whether or not he or she agreed with the sentence that “Some people say that a promise is saying that they will do something.” All the participants agreed with the statement except one girl who said that she was not sure. A similar definition and example procedure was followed for secrets. The tester stated that “a secret is something that you tell someone else and that you don't want the person you have told to tell anyone” and gave an example of it as “when you tell someone in your preschool class that you are scared of the dark and you don't want them to tell the rest of the class.” The participant was asked whether or not he or she agreed with the sentence that “Some people say that a secret is something you tell someone else that you don't want the person to tell anyone.” All participants agreed, with the exception of one participant—the same as for promises—who stated that she was not sure. (Because of failure to confirm the definition/description, this participant's data were excluded from the analyses.) The participant was then required to complete the peer report task (keeping secrets and keeping promises) as outlined in Section 7.2. The participant was shown a photograph of each classmate when judging him or her.

Standardized instructions encouraged the participant to give honest answers by highlighting that his or her answers were confidential, that the questions were not a test and there were no right or wrong answers. Later in the school year, the preschool teachers completed the Short-Form TRSSA and the Inhibitory Control scale for each participant and rated his or her trustworthiness on the scale outlined. The teachers completed the scales and ratings approximately 1 month after the participants were tested, with the mean time span = 28 days (S.D. = 9.6 days).

## 8. Results

### 8.1. Correlations among the measures

The correlations among the measures (with means and standard deviations) are shown in Table 1. Peer-reported trustworthiness was positively correlated with preschool adjustment and

inhibitory control and the latter two variables were positively correlated. Age was positively correlated with peer-reported trustworthiness.

In order to examine gender differences in the associations among the variables, separate sets of correlations were calculated for girls and boys (shown in Table 1). Inhibitory control was positively correlated with preschool adjustment for both boys and girls. Although the correlation between peer-reported trustworthiness and inhibitory control was positive for boys and girls separately (as in all participants), the correlations did not attain statistical significance. Peer-reported trustworthiness was positively correlated with age for boys but not for girls. Peer-reported trustworthiness was positively correlated with preschool adjustment for boys but not for girls. Finally, age was positively correlated with peer-reported trustworthiness for boys but not for girls. Despite the variation in correlations for boys and girls, comparisons showed that there were no significant differences in correlations for the two genders. Also, the sample sizes were different by gender, with a smaller sample of girls.

## 8.2. Testing the model

Structural Equation Modeling (SEM) was carried out using AMOS to examine the hypothesized model. Gender was coded as 1 for boys and 2 for girls in the analyses. The model is shown in Fig. 1. The model was a good fit of the data: the chi-square was nonsignificant,  $\chi^2(4) = 1.000, p = .910$ , the Root Mean Square Error of Approximation was less than .05 (RMSEA < .001), and the Comparative Fit Index exceeded .95 (CFI = 1.00) (see Bentler, 1990). All the paths attained significance (see Fig. 1) and all are positive. As hypothesized, there were paths between gender and both preschool adjustment and inhibitory control. As anticipated, girls demonstrated greater preschool adjustment than did boys ( $M_s = 25.04$  and  $19.40$ , respectively) and greater inhibitory control than did boys ( $M_s = 30.08$  and  $25.08$ , respectively). Also, as hypothesized, there was a positive path between age and peer-reported trustworthiness.

Critical to the model, the following paths were found: (1) a path between peer-reported trustworthiness and preschool adjustment, (2) a path between inhibitory control and peer-reported trustworthiness, and (3) a path between inhibitory control and preschool adjustment. These paths support the hypothesis that peer-reported trustworthiness mediates, in part, the relation between inhibitory control and preschool adjustment. The statistical significance of the indirect effect of peer-reported trustworthiness on the relation between inhibitory control and preschool adjustment was tested by the bootstrapping method required for small samples (Preacher & Hayes, 2004). With number of bootstrap resamples = 1000, the mean indirect effect = .0590 and that fell within the lower limit (.0021) and the upper limit (.1466) of the confidence 95% level— $p < .05$ . The indirect effect was statistically significant.<sup>1</sup>

<sup>1</sup>Other statistical tests showed that peer-reported trustworthiness mediated or tended to serve as a mediator, in part, of the relation between inhibitory control and preschool adjustment. MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) required two outcomes from two regression analyses to show mediation. *First*, as required for mediation, one regression analysis of the current data showed that inhibitory control (the Independent Variable) predicted peer-reported trustworthiness (the Mediator),  $\beta = .329, p = .01$ . *Second*, as required for mediation, a second regression analysis showed that peer-reported trustworthiness (the Mediator) predicted preschool adjustment (the Dependent Variable),  $\beta = .203, p = .045$ , when inhibitory control (the Independent Variable) was included as a predictor. In the latter analysis, inhibitory control (the Independent Variable) predicted preschool adjustment,  $\beta = .588, p < .001$ , showing that only partial mediation was obtained. Finally, the Sobel test showed that peer-reported trustworthiness tended to serve, in part, as a mediator of the relation between temperamental inhibitory control and preschool adjustment,  $z = 1.75, p = .08$ . The path ( $\beta$ ) between inhibitory control and preschool adjustment modestly decreased from  $.55, p < .001$ , to  $.49, p < .001$  (shown in Fig. 1) when peer-reported trustworthiness was included in the Structural Equation Model. Because of the sample size in the current study, the bootstrapping statistical procedure reported is the most appropriate analysis of the data. Nevertheless, the other analyses yielded a complementary pattern of findings.



## 9. Discussion

The majority of the hypotheses received support. As evidence for convergent validity, it was found that peer-reported trustworthiness was positively correlated with teacher-reported trustworthiness. The hypothesized paths and corresponding model were confirmed. As expected (first hypothesis), positive paths were found between gender and both preschool adjustment and inhibitory control. As anticipated, girls demonstrated greater preschool adjustment and inhibitory control than did boys. As expected (second hypothesis), a positive path was found between age and peer-reported trustworthiness. As expected (third hypothesis), a positive path was found between peer-reported trustworthiness and preschool adjustment. As anticipated (fourth hypothesis), positive paths were found between inhibitory control and both peer-reported trustworthiness and preschool adjustment. Finally, (fifth hypothesis), peer-reported trustworthiness was found to mediate, in part, the relation between inhibitory control and preschool adjustment. A significant indirect effect was found for peer-reported trustworthiness in the relation between inhibitory control and preschool adjustment.

Some variation was found between boys and girls in the correlations among the measures. Nevertheless, the correlations for boys and girls were not statistically significant. Also, statistical comparison between the genders is limited by the fact that the sample of girls was appreciably smaller than the sample of boys.

The observed gender differences in preschool adjustment are consistent with the observation that girls demonstrate better adjustment to school in the early years than do boys (e.g., Birch & Ladd, 1997, 1998). This finding is most compatible with Birch and Ladd (1998) who found that teachers reported that girls exhibited more prosocial and less antisocial behavior in the classroom during the early years of school than do boys.

The observed positive path between peer-reported trustworthiness and preschool adjustment is consistent with Wentzel's (1991) hypothesis that trustworthiness is a self-regulatory social behavior in children that is associated with school adjustment. These findings are consistent with the notion that children are *expected* to fulfill promises made to their peers and teachers and maintain confidentiality of personal information during classroom activities in the preschool and thus engaging in those behaviors promote preschool adjustment. The findings complement those obtained in other research showing that peer-reported trustworthiness of children is associated with their academic adjustment during early elementary school (Betts & Rotenberg, in press-b) and with academic achievement (Imber, 1973; Wentzel, 1991) and number of peer friendships in school (Rotenberg, McDougall, et al., 2004) during the later elementary school years.

The observed relation between age and peer-reported trustworthiness is consistent with the notion that preschool teachers and peers (as well as caregivers) promote trustworthiness in young children and consequently it increases with age. It is also reasonable to consider the possibility that increases with age in children's regulatory skills and in their understanding of the effects of their untrustworthiness on social relations may contribute to an increase in trustworthiness with age. In the future, researchers should examine the extent to which socialization and/or changes in socio-cognitive and regulatory skills are responsible for age differences and the specific socialization mechanisms (i.e., prompting, reinforcement, modeling) or skills involved. In contrast to that pattern, a relation between age and preschool adjustment was not found in the current study. These findings are not consistent with those obtained by Murphy et al. (1999) but their measures of preschool adjustment were different from those used in the current investigation.

The observed positive path between inhibitory control and preschool adjustment complement other research demonstrating that inhibitory control is associated with psychosocial adjustment

in children (Eisenberg et al., 2000; Lengua, 2003). The observed paths showing that peer-reported trustworthiness mediated the relation between inhibitory control and preschool adjustment complement those obtained by Betts and Rotenberg (in press-a). These researchers found that peer-reported trustworthiness mediated the relationship between self-control (as assessed by teacher ratings of impulsivity) and teacher-rated school adjustment in 7-year-old children. Parallel sets of paths have been found with different age groups and with different measures of self-regulation. It is worthwhile to note that the current findings are qualified by the fact that preschool teachers provided the ratings of inhibitory control and thus may reflect inhibitory control shown in the preschool. Also, the findings are limited by the fact that teachers rated both inhibitory control and preschool adjustment and thus the relation may be affected by common method variance (see Lindell & Whitney, 2001).

The aforementioned path is consistent with the notion that inhibitory control contributes to children's trustworthiness. There are two mechanisms that potentially account for this relation. *First*, a child's proclivity to keep secrets, and hence his or her emotional trustworthiness, depends on his or her ability to suppress inappropriate responses—a facet of inhibitory control. *Second*, a child's proclivity to fulfill a promise, and hence, his or her, reliability trustworthiness, depends on the ability of the child to plan to behave—a facet of inhibitory control. The observed gender differences in inhibitory control are similar to those obtained in other studies (see Else-Quest et al., 2006).

The findings yielded by the current study attest to the utility of Rotenberg and his colleagues'  $3 \times 2 \times 2$  conceptual model of trust and trustworthiness (Rotenberg, Boulton, et al., 2005; Rotenberg, Fox, et al., 2005; Rotenberg, MacDonald, et al., 2004; Rotenberg, McDougall, et al., 2004). Similar to previous research, trustworthiness was assessed by peer reports. In support of the validity of that measure, there was a correlation between it and teacher-reported trustworthiness. Consistent with expectation, the correlation was modest in strength. This was anticipated because of teachers' limited access to children's trustworthiness, notably secret keeping. Additional evidence for the validity of the peer-reported trustworthiness measure arises from the supplemental analyses showing that teacher-reported trustworthiness was positively correlated with preschool adjustment,  $r(61) = .49, p < .001$ , and inhibitory control,  $r(61) = .61, p < .001$ . The pattern of correlations with peer-reported trustworthiness was replicated, in part, when trustworthiness was reported by teachers.

As reported, the pattern of correlations with trustworthiness was similar when reported by teachers and reported by peers. Additional confidence in the peer-reported trustworthiness measures and, in the findings in general, arises from the fact that peer-reported trustworthiness was correlated with measures derived from *other* sources/views (i.e., preschool adjustment and inhibitory control). Therefore, the pattern cannot be reasonably attributed to common method variance.

As argued by Rotenberg and colleagues (Rotenberg, McDougall, et al., 2004), peer-reported trustworthiness may be the most viable means of assessing trustworthiness because of the unique position of peers as observers of the relevant naturally occurring behavior, lack of a strong emotional bond with the target, and the multiple nature of the reports. For those same reasons, it is difficult to assess the validity of peer-reported trustworthiness. Nevertheless, it may be possible to observe some types of trustworthy behaviors in the preschool, such as promise keeping. This could serve as a criterion for assessing the validity of peer-reported trustworthiness. Also, although peer reports may be accurate to some extent, it is possible that these reports include peers' beliefs about the trustworthiness of individual children and those beliefs could affect those children's adjustment to preschool through social interaction. For example, peers' *beliefs* that a child is trustworthy may increase the peers' tendency to engage

in positive interactions with the child and consequently foster the child's adjustment to preschool. Researchers should address these issues in the future.

The findings yielded by the current study have implications for preschool education. Specifically, based on the findings, strategies could be implemented by teachers, teaching assistants, or as part of Social Skills Training programs (Elliott & Gresham, 1993; McConnell, Sisson, Cort, & Strain, 1991) to encourage children to engage in trustworthy behavior during preschool activities. These could include prompting appropriate behavior (e.g., prompting the child to fulfill his or her promises at the appropriate time), praise for displaying the appropriate behavior, modeling the desired behavior (e.g., the teacher overtly stating his or her intention not revealing personal information and behaving accordingly) and cognitive-behavioral strategies (e.g., the children could be encouraged to select promise-keeping and secret-keeping behavioral options in vignettes and enact these in social contexts). In this context, preschool teachers should emphasize that there are conditions under which it is not desirable to keep secrets, such as those that bear on a person's safety (e.g., sexual abuse).

In the future, researchers could examine whether there are groups of children who receive mixed nominations of trustworthiness and untrustworthiness. Potentially, some children may behave in a trustworthy fashion to some peers and an untrustworthy fashion toward other peers. This group would be similar to the “controversial” group of children identified by peer report measures (see Newcomb, Bukowski, & Pattee, 1993). Similar to this category of children, controversial trustworthy children may make up a small proportion of the population. Examining this group may require testing a relatively large sample of children. Finally, the current study yielded paths within a cross-sectional design. Consequently, considerable caution must be exercised in drawing conclusions about the causal relations among the variables. In the future, researchers should undertake longitudinal investigations to examine the hypothesized causal links. Also, with sufficient samples of boys and girls, researchers could use Structural Equation Modeling to examine whether the hypothesized paths were moderated by the gender of the children.

In summary, the current study showed that trustworthiness, as reported by peers, is associated with preschool adjustment. Also, it was found that inhibitory control is associated with peer-reported trustworthiness and preschool adjustment. Finally, the study yielded evidence that peer-reported trustworthiness mediates, in part, the relation between inhibitory control and preschool adjustment.

## Acknowledgement

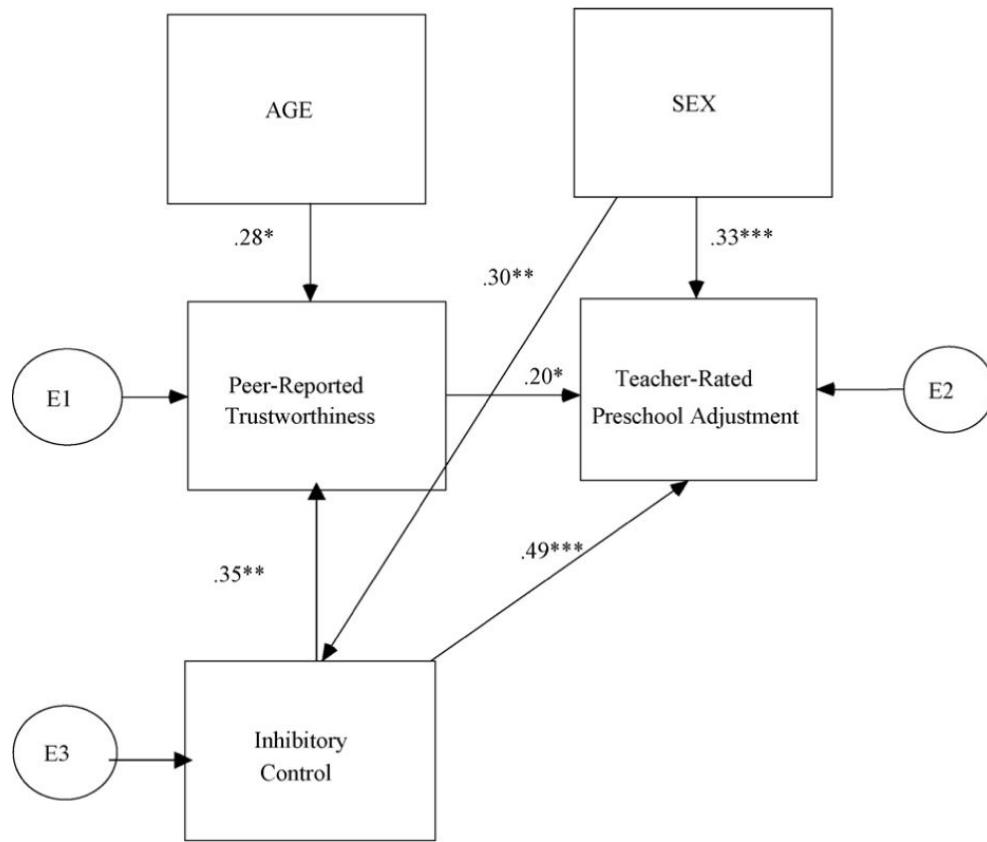
This research was supported, in part, by a grant from the Russell Sage Foundation to the first author and by a grant from the National Institute of Mental Health to the third author.

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**Fig. 1.**  
The final model and observed paths among the measures.

**Table 1**  
The means, standard deviations, and correlations among the measures for all participants and by gender

Measures	Mean	S.D.	Preadj	Inhcon	Age
All participants					
Peer-reported trustworthiness	6.32	1.30	.40***	.33**	.29*
Preschool adjustment (Preadj)	21.69	5.59		.65***	.02
Inhibitory control (Inhcon)	27.67	6.41			-.04
Age (in months)	60.38	5.01			
Boys					
Peer-reported trustworthiness	6.31	1.31	.43**	.30	.34*
Preschool adjustment (Preadj)	19.40	5.62		.63***	-.09
Inhibitory control (Inhcon)	20.11	6.79			-.09
Age (in months)	60.18	5.17			
Girls					
Peer-reported trustworthiness	6.51	1.30	.35	.35	.11
Preschool adjustment (Preadj)	25.04	3.52		.55***	.03
Inhibitory control (Inhcon)	23.96	5.12			-.13
Age (in months)	60.65	4.86			

Note. d.f.s = 62 for all participants, 36 for boys, and 24 for girls

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$  (two tailed).