Published in final edited form as:

J Child Psychol Psychiatry. 2013 February ; 54(2): 157–166. doi:10.1111/j.1469-7610.2012.02574.x.

Early concern and disregard for others as predictors of antisocial behavior

Soo Hyun Rhee, Ph.D.^{1,2}, Naomi P. Friedman, Ph.D.¹, Debra L. Boeldt, M.A.^{1,2}, Robin P. Corley, Ph.D.¹, John. K. Hewitt, Ph.D.^{1,2}, Ariel Knafo, Ph.D.³, Benjamin B. Lahey⁴, JoAnn Robinson, Ph.D.⁵, Carol A. Van Hulle, Ph.D.⁶, Irwin D. Waldman, Ph.D.⁷, Susan E. Young, Ph.D.¹, and Carolyn Zahn-Waxler, Ph.D.⁶

¹Institute for Behavioral Genetics, University of Colorado, Boulder, CO

²Department of Psychology and Neuroscience, University of Colorado, Boulder, CO

³Department of Psychology, The Hebrew University of Jerusalem, Jerusalem, Israel

⁴Department of Health Studies, University of Chicago, Chicago, IL

⁵Department of Human Development and Family Studies, University of Connecticut, Storrs, CT

⁶Department of Psychology, University of Wisconsin, Madison, WI

⁷Department of Psychology, Emory University, Atlanta, GA

Abstract

Background—Prediction of antisocial behavior is important given its adverse impact on both the individuals engaging in antisocial behavior and society. Additional research identifying early predictors of future antisocial behavior, or antisocial propensity, is needed. The present study tested the hypothesis that both concern for others and active disregard for others in distress in toddlers and young children predict antisocial behavior during middle childhood and adolescence.

Methods—A representative sample of same-sex twins (N = 956) recruited in Colorado was examined. Mother-rated and researcher-observed concern and disregard for others assessed at age 14 to 36 months were examined as predictors of parent- (age 4 to 12), teacher- (age 7 to 12), and self-reported (age 17) antisocial behavior.

Results—Observed disregard for others predicted antisocial behavior assessed by three different informants (parents, teachers, and self), including antisocial behavior assessed 14 years later. It also predicted a higher-order antisocial behavior factor ($\beta = .58, p < .01$) after controlling for observed concern for others. Mother-rated disregard for others predicted parent-reported antisocial behavior. Contrary to predictions, neither mother-rated nor observed concern for others inversely predicted antisocial behavior. Results of twin analyses suggested that the covariation between observed disregard for others and antisocial behavior was due to shared environmental influences.

Conclusions—Disregard for others in toddlerhood/early childhood is a strong predictor of antisocial behavior in middle childhood and adolescence. The results suggest the potential need for early assessment of disregard for others and the development of potential interventions.

Keywords

antisocial behavior; empathy; concern for others; disregard for others

Introduction

The adverse impact of antisocial behavior on both the individuals engaging in antisocial behavior and society makes the examination of its etiology extremely important, and additional research identifying very early predictors of antisocial behavior is needed. Although existing research suggests a significant negative relation between empathy and antisocial behavior (e.g., Miller & Eisenberg, 1988), there are few longitudinal studies examining this association or studies examining the differential prediction of separable components of empathy. Therefore, we addressed the following largely unanswered questions: (1) Do concern and disregard for others assessed very early in life (assessed at age 14 to 36 months) predict later antisocial behavior (assessed at age 4 to 17 years)? (2) Is disregard for others a better predictor of antisocial behavior than concern for others? (3) Are there common genetic and environmental influences on the covariance between concern or disregard for others and antisocial behavior?)

Before presenting our hypotheses, it is important to define the terms used in the literature. “Concern for others” is a composite construct encompassing the behavioral, affective, and cognitive factors associated with empathic and prosocial reactions (e.g., Hastings, Zahn-Waxler, Robinson, Usher, & Bridges, 2000), and includes helping the victim, concern for the victim, and hypothesis testing. In contrast, some children display behaviors that are opposite of “concern for others” in response to others’ distress, such as physical attacks, teasing/taunting, or anger (e.g., Klimes-Dougan & Kistner, 1990), and the term “disregard for others” has been used to describe these behaviors (Hastings et al., 2000). In the present study, the operational definition of “disregard for others” is responding to others’ distress with active, negative responses (i.e., showing a disregard of others’ feelings of distress), and includes anger and hostility toward the victim. Zahn-Waxler, Radke-Yarrow, Wagner, and Chapman (1992) demonstrated that both concern and disregard for others in response to others’ distress occurs as early as age 2, and that very young children differentiate between the distress they cause in others and the distress they simply witness in others. Throughout the present study, the terms “concern for others” and “disregard for others” are used when referring to these composite constructs, whereas the term “empathy” is used to when referring to a more limited construct of the affective response to another person’s emotional state or condition (e.g., Eisenberg, 2005), and when discussing the results of specific studies examining “empathy”.

We hypothesize that concern and disregard for others assessed in very young children will predict antisocial behavior assessed later in life. Several lines of research suggest that low empathy should be associated with higher aggression or antisocial behavior. Feshbach and Feshbach (1969) suggested that empathic individuals inhibit their aggressive behavior, as they vicariously experience distress when observing others in distress. Empathy deficits are a hallmark trait of psychopathy (Harpur, Hakstian, & Hare, 1988) and callous-unemotionality (Frick & Dickens, 2006), which are particularly stable (Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005) and heritable (Waldman & Rhee, 2006) forms of antisocial behavior. There is a significant association between callous-unemotionality and antisocial behavior (Dadds & Salmon, 2003), and callous-unemotionality predicts later conduct problems (Moran, Ford, Butler, & Goodman, 2008). Low empathy and high antisocial behavior may have a common deficit of underarousal of the parasympathetic nervous system (e.g., Shirtcliff, Vitacco, Graf, Gostisha, Merz, & Zahn-Waxler, 2009). Also, neuroimaging studies suggest that brain regions implicated in empathy deficits are implicated in antisocial behavior (Sterzer, Stadler, Poustka, & Kleinschmit, 2007), and that antisocial individuals exhibit atypical neural empathic responses to others’ distress (Decety, Michalska, Akitsuki, & Lahey, 2009).

The capacity for empathy and prosocial behavior occurs very early in life, with significant individual differences in this early capacity (e.g., Zahn-Waxler, Robinson, & Emde, 1992). However, Miller and Eisenberg's meta-analysis (1998) found that the inverse association between empathy and antisocial behavior was not significant in studies examining young children. Some researchers suggest that the association between empathy and antisocial behavior in very young children is absent because aggression in preschoolers may reflect children's social interest, maturity level, and aptness to be active rather than hostility (Feshbach & Feshbach, 1969; Murphy, 1937). That is, aggression in preschoolers may be different in meaning and etiology than aggression in older children. Van Beijsterveldt, Bartel, Hudziak, and Boomsma's (2003) longitudinal study of aggression between age 3 and 12 provide evidence consistent with this idea; although aggression was highly stable, significant new genetic influences on aggression emerged between age 3 and 7. Also, Hastings et al. (2000) found no significant association between concern for others and externalizing behavior at age 4–5 years, but greater concern for others at age 4–5 years predicted decreases in the stability and severity of externalizing problems by age 6–7 years. Therefore, we hypothesize that concern and disregard for others assessed in very young children will predict *later* antisocial behavior.

We also hypothesize that disregard for others will be a better predictor of antisocial behavior than concern for others. Several researchers have noted that empathy deficits are not always associated with antisocial behavior. Most notably, although autism spectrum disorders are associated with significant empathy deficits, they are not always associated with antisocial behavior (Rogers, Viding, Blair, Frith, & Happe, 2006), and individuals with psychopathy and autism spectrum disorders may have different types of empathy deficits (e.g., deficits in resonating with others' distress in psychopathy and deficits in cognitive perspective taking in autism spectrum disorders; Jones, Happé, Gilbert, Burnett, & Viding, 2010). Decety and Meyer (2008) suggest that empathy deficits in autism spectrum disorders are "passive" (i.e., characterized by a lack of either interest or capacity for empathy and prosocial behavior), whereas empathy deficits in conduct disorder are "active" (i.e., reactions charged by negative affect and aggressive responses to others' distress marked by anger and amusement). One study has examined both "passive" (i.e., absence of concern for others) and "active" (i.e., presence of disregard for others) deficits as predictors of antisocial behavior (Hastings et al., 2000); here, boys with elevated externalizing behavior did not differ from other children at age 4–5 in their level of concern, but did show higher disregard for others.

Females often show higher levels of concern for others (e.g., Zahn-Waxler, Robinson, & Emde, 1992) and lower levels of antisocial behavior (e.g., Van Hulle et al., 2007) than males. Miller and Eisenberg's (1988) meta-analysis reported a stronger association between empathy and antisocial behavior in males than in females, which disappeared after controlling for sample size. We examined whether any significant association between concern/disregard for others and antisocial behavior remained after controlling for gender, and whether it is similar in magnitude across gender.

The present study included longitudinal data for concern and disregard for others and parent- and teacher- rated externalizing behavior. Concern for others increases with age (e.g., Zahn-Waxler, Robinson, & Emde, 1992), whereas less is known regarding the development of disregard for others. Externalizing behavior typically decreases with age (e.g., Robbers et al., 2010), with significant individual differences in trajectories (e.g., Côté et al., 2006). Given these longitudinal data, we were able to conduct latent growth curve modeling to examine possible associations between change in concern or disregard for others and change in antisocial behavior.

We examined whether significant associations between concern or disregard for others and antisocial behavior are due to genetic or environmental influences. Psychopathy, which is marked by empathy deficits, is an especially heritable form of antisocial behavior (e.g., Waldman & Rhee, 2006), suggesting a possible genetic association. However, this was an exploratory question,

Method

Participants

The participants were twins from the Longitudinal Twin Study (LTS; Rhea, Gross, Haberstick, & Corley, 2006), a sample of same-sex twin pairs recruited through the Colorado Department of Health born between 1986 and 1990. The present study included 956 individuals (including 484 females and 472 males and 261 monozygotic [MZ] and 215 dizygotic [DZ] pairs) for whom there are data for concern and disregard for others during toddlerhood/early childhood and/or antisocial behavior during middle childhood/adolescence (see Appendix 1 for sample sizes at each age). After complete description of the study to the subjects, written informed consent was obtained.

Procedure

Home and laboratory visits occurred at ages 14, 20, 24, and 36 months (Emde & Hewitt, 2001). Concern and disregard for others were measured via observations of reactions to empathy probes and mother interviews.

Empathy probes consisted of the mother or the examiner pretending to hurt herself, vocalizing pain and simulating pained facial expressions for 30 seconds, then gradually subsiding distress during the next 30 seconds. A recording of an infant crying broadcast from a speaker (in a room containing ten toys, including a baby doll) was also used as an empathy probe in the laboratory at 14, 20, and 24 months. Variables from the observational measures included in the present study are “concern for victim”, “helps victim”, “proximity to victim”, “hypothesis testing”, “anger”, “hits offending object”, and “hostility” (see Appendix 2 for details regarding the coding and inter-observer reliabilities, which ranged from .76 to .99).

The mother interview included six items. The first item was “helps” (“Do you ever see ____ spontaneously help ____ (prompt: pick up things, getting dressed, offering toy)?”). Mothers were also asked how their children respond when either the co-twin or mother is distressed, and were asked to answer “yes” or “no” to the possible responses shown by their children. The responses included “approaches”, “comforts”, “hits”, “runs”, and “laughs.”

Codes across empathy probes or situations were averaged to maximize reliability. These average scores were highly skewed, and transformed into ordinal variables with three or four categories for the observed concern for others items, two categories for the observed disregard for others items, four to six categories for the mother-rated concern for others items, and four categories for the mother-rated disregard for others items. The number of categories was chosen to maximize variability while avoiding small cell sizes.

Initial exploratory factor analysis revealed two clear factors underlying both the items from observations and mother interviews at each age. The mother interview items “helps”, “approaches”, and “comforts” loaded on one factor (that we named “concern for others”), and “hits”, “runs”, and “laughs” loaded on another factor (named “disregard for others”). For the observations, “concern for victim”, “helps victim”, “proximity to victim”, and “hypothesis testing” loaded on the “concern for others” factor, and “anger”, “hits offending object”, and “hostility” loaded on the “disregard for others” factor.

When examining the 14-, 20-, 24-, and 36-month data simultaneously, there were several cases of bivariate missingness (e.g., no individual with a positive score for “hits offending object” at 14 months and “anger” at 24 months). Therefore, composite variables were created for mother-rated concern and disregard for others and observed concern and disregard for others at each age by summing the items loading on each factor (for individuals with data for all items). These sums, which were significantly skewed, were transformed into ordinal variables with four categories for mother-rated concern for others, observed concern for others, and mother-rated disregard for others, and three categories for observed disregard for others. The percentage of the sample in each category of the ordinal variables is shown in Appendix 3.

At age 4, 5, 7, 9, 10, 11, and 12, the Child Behavior Checklist (CBCL/4–18; Achenbach, 1991a) was mailed to the twins’ parents, and at age 7, 8, 9, 10, 11, and 12, the Teacher’s Report Form (TRF; Achenbach, 1991b) was mailed to the twins’ teachers. We examined the externalizing scale scores, which were skewed, and therefore binned into ordinal variables with four categories, with the number of categories chosen to avoid small cell sizes. The percentage of the sample in each category of the ordinal variables is shown in Appendix 3.

At age 17, conduct disorder symptoms were assessed via the Diagnostic Interview Schedule for Children-IV (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). We examined the presence/absence of conduct problems, using answers to the stem questions for the conduct disorder symptoms occurring over the lifetime, given that in this general population sample, past year conduct disorder symptoms (as defined by the DSM-IV; American Psychiatric Association, 2000) were not common. “Stealing with confrontation” (0.8%) and “forced sex” (0.1%) were dropped from the analyses because of their extremely low prevalence. The range of the percentage of sample with a positive score in the remaining variables ranged from 1.5% (cruelty to animals) and 38.1% (stealing without confrontation).

Analyses

All analyses were conducted in Mplus, version 6 (Muthén & Muthén; 1998–2010). Given that all data were ordinal¹, analyses were conducted using the weighted least squares, mean and variance adjusted (WLSMV) estimation method, with which pairwise deletion is used. In Mplus, data from individuals in the same family can be treated as non-independent, which is taken into account when computing standard errors and model fit using the TYPE=COMPLEX option. The *p*-values are for the ratio of each parameter estimate to its standard error, yielding a *z*-statistic, and were used to determine the parameters’ significance. Alternative fit indices were examined given that the χ^2 is sensitive to sample size, including the Tucker-Lewis index (TLI; Bentler, 1990) and the root mean square error of approximation (RMSEA; Browne & Cudeck, 1993). A TLI greater than .95 and RMSEA less than .06 indicate good model fit (Hu & Bentler, 1998).

Results

Measurement Models

Appendix 4 shows a confirmatory factor analysis model for the relations among mother-rated and observed concern and disregard for others, with each latent factor loading on assessments at each age, $\chi^2(98) = 129.35$, $p = .02$, TLI = .919, RMSEA = .020. Observed concern and disregard for others were significantly negatively correlated, whereas mother-rated concern and disregard for others were significantly positively correlated, suggesting

¹The exception was the bivariate genetic analyses, where plausible values for latent variables and maximum likelihood estimation were used.

possible rater bias in the latter. The correlation between mother-rated and observed concern for others was positive and significant; the correlation between mother-rated and observed disregard for others was positive, but not significant. Therefore, we examined mother-rated and observed data as separate predictors of later antisocial behavior.

Appendix 5 shows a confirmatory factor analysis model with latent parent-report (with loadings on age 4 to age 12 externalizing behavior), teacher-report (with loadings on age 7 to age 12 externalizing behavior), and self-report (with loadings on the individual items) factors, which were significantly correlated, $\chi^2(296) = 420.54$, $p < .01$, TLI = .978, RMSEA = .021. An equivalent model with a higher-order antisocial latent factor with loadings on the parent-, teacher-, and self-report latent factors (which were .53, .78, and .55, respectively and statistically significant at the $p < .01$ level) was also estimated.

Predicting antisocial behavior with concern and disregard for others

Correlational model—Table 1 shows the correlations from a measurement model that incorporated the concern and disregard for others and antisocial behavior latent variables described above, $\chi^2(798) = 964.38$, $p < .01$, TLI = .970, RMSEA = .015. There were no significant correlations between either mother-rated or observed concern for others and antisocial behavior. Mother-rated disregard for others was significantly correlated with parent-reported antisocial behavior, but not with teacher- or self-reported antisocial behavior. In contrast, there were significant correlations between observed disregard for others and parent-, teacher-, and self-reported antisocial behavior. Therefore, all subsequent analyses were limited to examining relations between observed disregard for others and antisocial behavior. A correlational model indicated that the higher-order antisocial behavior factor was significantly correlated with observed disregard for others ($r = .51$, $p < .01$), but not concern for others ($r = -.02$, $p = .85$), $\chi^2(521) = 647.41$, $p < .01$, TLI = .978, RMSEA = .016.

Structural equation model—To examine whether observed disregard for others predicts antisocial behavior even when its shared variance with concern for others is controlled, we tested a structural equation model in which a higher-order antisocial behavior factor was regressed on observed concern and disregard for others, $\chi^2(521) = 647.40$, $p < .01$, TLI = .978, RMSEA = .016 (see Figure 1). Disregard for others significantly predicted antisocial behavior after controlling for concern for others ($\beta = .58$, $p < .01$), whereas concern for others did not ($\beta = .19$, $p = .20$). The regression coefficient was significantly larger for disregard, as indicated by a significant decrement in the fit of the model when they were constrained to be equal, $\chi^2(1) = 9.65$, $p < .01$.

Additional analyses—Higher observed disregard for others assessed at all time points was associated with higher antisocial behavior, with statistically significant associations for observed disregard for others at 14 ($r = .16$, $p = .03$), 20 ($r = .21$, $p = .01$), and 24 months ($r = .20$, $p = .01$), but not at 36 months ($r = .08$, $p = .33$). There was a statistically significant, positive association between each item loading on the observed disregard for others factor and antisocial behavior (anger - $r = .12$, $p = .02$, hits offending object - $r = .09$, $p = .04$, hostility - $r = .17$, $p < .01$). Results of multiple regression analysis showed that the association between observed disregard for others and antisocial behavior assessed at the latest time point (self-report at age 17) remained significant after controlling for parent-reported antisocial behavior assessed between age 4 to 12 (adjusted β for observed disregard for others = .30, $p = .03$). Also, the association between observed disregard for others and the higher-order antisocial behavior factor remained significant after controlling the effects of gender (adjusted β for observed disregard for others = .38, $p = .02$) and socioeconomic status (adjusted β for observed disregard for others = .52, $p = .02$).

Examination of gender differences—Observed disregard and antisocial behavior were significantly correlated in both males ($r = .51, p < .01$) and females ($r = .46, p = .02$). A model constraining these correlations to be equal did not lead to a significant decrement in fit ($\chi^2(1) = .026, p = .87$).

Observed disregard as a predictor of change in antisocial behavior

We conducted latent growth curve models examining variables measured at multiple time points (observed disregard for others and parent- and teacher-reported antisocial behavior; see Appendix 6). These models include a latent Intercept factor, with loadings on all time points constrained to 1.0, reflecting the assumption that the Intercept influences behavior across all time points. The latent Slope factor, with loadings constrained to zero for the first time point, 1.0 for the last time point, and freely estimated for the intermediate time points, represents change from the initial time point.

For observed disregard, the mean of the Slope was significant and negative, suggesting a decrease from 14 to 36 months in this sample. The variance of the Intercept was significant, suggesting significant individual differences in initial observed disregard, but the variance of the Slope was small and not statistically significant. Therefore, subsequent growth models examined a latent observed disregard variable with free loadings at each time point (e.g., see measurement model in Appendix 4). Parent- and teacher-reported antisocial behavior showed a decrease throughout childhood. The variance of the Intercept was statistically significant for both parent- and teacher-reported antisocial behavior, and the variance of the Slope was statistically significant for parent-reported antisocial behavior.

Results of bivariate analyses showed a statistically significant correlation between observed disregard and the Intercept of parent- ($r = .26, p = .03$) and teacher-reported ($r = .37, p < .01$) antisocial behavior. However, the correlations between observed disregard and the Slope of parent- ($r = .06, p = .74$) and teacher-reported ($r = -.24, p = .26$) antisocial behavior were not statistically significant. That is, observed disregard predicts children's initial level of antisocial behavior and the stable individual differences in antisocial behavior over time, but not the individual variations in the slope of decline from the initial time point.

The etiology of the association between observed disregard and antisocial behavior

We examined the magnitude of genetic and environmental influences on the association between observed disregard and antisocial behavior. These analyses required splitting the sample into four groups (i.e., MZ twin 1, MZ twin 2, DZ twin 1, and DZ twin 2), and we encountered a number of bivariate missingness problems, which meant using a latent variable approach was not possible. Therefore, we conducted analyses on plausible values, which are imputed values for latent variables that can be used in a secondary model (Asparouhov & Muthén, 2010)². Twenty imputed datasets of plausible values for latent variables (for observed disregard and parent-reported, teacher-reported, and self-reported antisocial behavior) were generated, then analyses were conducted on the imputed datasets using the TYPE = IMPUTATION command in Mplus.

The phenotypic correlation between observed disregard and the higher-order antisocial behavior factor was .40 ($p = .02$). For antisocial behavior, the MZ correlation ($r = .83, p < .01$) was higher than the DZ correlation ($r = .71, p < .01$), but for observed disregard, the MZ ($r = .73, p < .01$) and DZ ($r = .73, p < .01$) correlations were similar. The cross-trait cross-

²We also conducted the bivariate genetic analyses using factor scores and sums of items that loaded on the latent factors. The overall results were very similar to those using plausible values for latent variables.

twin correlations were also similar for MZ ($r = .41$, $p < .01$) and DZ ($r = .43$, $p < .01$) twin pairs.

We conducted a Cholesky decomposition model examining the variance of antisocial behavior due to genetic (a^2), shared environmental (c^2), and nonshared environmental (e^2) influences shared in common with observed disregard for others and those specific to antisocial behavior (see Figure 2), $\chi^2(65) = 18.20$, $p = 1.00$, TLI = 1.25, RMSEA = .00. The genetic covariation between observed disregard and antisocial behavior was dropped because the heritability of observed disregard was near zero. Almost all of the covariance between observed disregard and antisocial behavior was due to shared environmental influences (covariance due to $a^2 = .00$, $c^2 = .43$, $e^2 = -.03$).

Discussion

Three questions largely unanswered in the literature were addressed in the present study. First, do concern and disregard for others assessed very early in life (assessed from age 14 to 36 months) predict later antisocial behavior assessed via parent- (age 4 to 12 years), teacher- (age 7 to 12 years) and self-report (age 17)? Second, is disregard for others a better predictor of antisocial behavior than concern for others? Third, are there common genetic and environmental influences on the covariance between concern or disregard for others and antisocial behavior?

Disregard for others predicted antisocial behavior, and the results were particularly strong for observed disregard for others, which predicted parent-, teacher-, and self-reported antisocial behavior. These results suggest that antisocial propensity can be measured very early in life (as early as age 14 months), and that antisocial propensity can be predictive across a wide age range (as late as age 17 years). Results of latent growth curve analyses indicated that observed disregard decreased significantly from age 14 to 36 months, but that there weren't significant individual differences in the change in observed disregard. Also, observed disregard for others predicted stable antisocial behavior, but not the decrease in parent- and teach-reported externalizing behavior typically seen for the CBCL and the TRF (e.g., Robbers et al., 2010).

Contrary to predictions and the results from Hastings et al. (2000), concern for others did not predict antisocial behavior. Our results are consistent with suggestions that empathy deficits may not be always associated with antisocial behavior, that children with low empathy do not necessarily have psychopathology, and that empathy deficits can take different forms in different disorders. In particular, our results are consistent with Decety and Meyer's (2008) suggestion that conduct disorder is associated with "active" empathy deficits (i.e., aggressive responses to others' distress) rather than the "passive" empathy deficits (i.e., a lack of either interest or capacity for empathy and prosocial behavior) that characterize autism spectrum disorders.

One possible source of difference between our results and those of Hastings et al. (2000) is the age at which concern for others was assessed (14 to 36 months here vs. 4 to 5 years in Hastings et al., 2000). Maturation changes may lead to some differences in the nature of concern for others as children become increasingly able to decode others' emotional cues, understand others' circumstances, evaluate behavioral options, and develop a larger repertoire of prosocial actions (Eisenberg & Fabes, 1998). This may also explain the results of Miller and Eisenberg (1988), who found stronger contemporaneous associations between empathy and antisocial behavior in older samples, but not in young children.

The prediction of antisocial behavior by observed disregard was robust. Observed disregard for others assessed at each age was positively associated with antisocial behavior, with

statistically significant results for 14, 20, and 24 months. All three items in the latent observed disregard for others factor were significantly and positively associated with antisocial behavior. The association between observed disregard for others and antisocial behavior remained significant after controlling for gender and socioeconomic status, and was similar in magnitude in males and females.

The variance of observed disregard for others and the covariance between observed disregard for others and antisocial behavior was largely due to shared environmental influences. Identification of the specific shared environmental influences on this covariance is an interesting research question. Possibilities include negative parenting, maltreatment, and neighborhood influences. Socioeconomic status, which is significantly associated with antisocial behavior, may not be a good candidate, as our results indicated a lack of association between socioeconomic status and observed disregard for others ($\beta = -.06$, $p = .55$). Another possibility is socialization. Studies have shown a positive association between children's empathy and parental encouragement of empathy, directiveness, and reasoning (e.g., Janssens & Gerris, 1992), even in children in the first 3 years of life (Zahn-Waxler, Radke-Yarrow, & King, 1979). Comparable research examining the association between socialization and disregard for others needs to be conducted.

A strength of the present study is that two methods of assessing concern and disregard for others (mother ratings and observations) and three methods of assessing antisocial behavior (parent-, teacher-, and self-report) were used. These multiple methods allowed us to consider the possibility of context-, method-, or rater-specific associations. For example, it is possible that mother-rated disregard for others is significantly associated with only parent-reported antisocial behavior (and not teacher- or self-reported antisocial behavior) because there is context-specific covariance (i.e., mother-rated disregard for others and parent-reported antisocial behavior both occurring at home). These results also may reflect method covariance. However, these potential context-, method-, or rater-specific associations were not an issue in the assessment of observed disregard for others. Method covariance cannot explain the association between observed disregard for others and antisocial behavior, as observed disregard for others predicted all three types of assessments of antisocial behavior (parent-, teacher-, and self-reported antisocial behavior).

In addition to multiple methods of assessment, there were multiple occasions of assessment for each construct (e.g., concern and disregard for others were assessed at four time points). This repeated measurement allowed us to examine the association between latent concern and disregard for others and antisocial behavior variables at the level of latent variables, which capture the common variance shared across the multiple assessments and are less affected by measurement error. Observed disregard for others was more strongly associated with the higher-order antisocial behavior latent factor ($r = .51$) than parent- ($r = .26$), teacher- ($r = .34$), or self-reported ($r = .36$) antisocial behavior alone, indicating a stronger prediction of the common variance shared across the three informants and multiple assessments.

The availability of longitudinal data for concern and disregard for others and parent- and teacher-reported antisocial behavior allowed us to conduct latent growth curve modeling and examine possible associations between change in concern or disregard for others and change in antisocial behavior. It also allowed us to conclude that disregard for others predicts antisocial behavior across a wide age range (note that observed disregard for others was most strongly associated with self-reported antisocial behavior assessed at age 17).

One possible explanation for these results is that disregard for others was more predictive of antisocial behavior than concern for others because its measurement was more reliable. This

explanation is unlikely, as the correlations for the repeated measurements were stronger for concern for others than for disregard or others (see factor loadings in Appendix 4).

A limitation of the present study is that it is assessed in a general population, so the generalizability of its results to clinical populations remains to be seen. Also, the maximum age in the present study was 17, so it is unclear whether the association between disregard for others and antisocial behavior will persist into early adulthood.

In summary, the present study found that disregard for others in distress assessed during toddlerhood/early childhood, but not concern for others, predicted antisocial behavior assessed via parent-, teacher-, and self-report during middle childhood and adolescence. Previous studies have failed to find significant contemporaneous associations between empathy deficits and antisocial behavior in preschool children. However, the present study's results suggest that individual differences in disregard for others assessed in very young children are predictive of later antisocial behavior, demonstrating its potential as a measure of antisocial propensity. They encourage further examination of hypotheses regarding the nature of the relations between empathy deficits and antisocial behavior (e.g., lack of negative arousal to punishments leading to difficulties in moral socialization, common deficit of underarousal of the parasympathetic nervous system) and suggest the need for examining active disregard for others as well as lack of empathy or concern for others in future studies.

The results also suggest the potential need for early screening of disregard for others and the development of potential interventions. Several researchers have demonstrated an association between children's empathy and parental directiveness (Janssens & Gerris, 1992) and parents' use of induction (i.e., explaining to the child how the victim feels; Hastings, Utendale, & Sullivan, 2007). Although the present study's results do not establish causality, they do suggest that research examining whether similar socialization efforts are effective in decreasing disregard for others, and in turn possibly reducing antisocial behavior, may be worthwhile.

Acknowledgments

This study was supported by the MacArthur Foundation, the Fetzer Foundation, and National Institutes of Health grants MH016880, HD010333, HD050346, and DA011015. We thank the Longitudinal Twin Study investigators, Corinne Wright, Sally Ann Rhea, Akira Miyake, and the LTS participants and research assistants. Preliminary results of this study were presented at the annual meeting of the Society for Research in Child Development on April 2, 2009 in Denver, CO and the annual meeting of the Behavior Genetics Association on June 3, 2010 in Seoul, S. Korea.

References

- Achenbach, TM. Manual for the Child Behavior Checklist/4–18 and 1991 profile. Burlington, VT: University of Vermont Department of Psychiatry; 1991a.
- Achenbach, TM. Manual for the Teacher's Report Form and 1991 profile. Burlington, VT: University of Vermont Department of Psychiatry; 1991b.
- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4. Washington, DC: American Psychiatric Association; 2000. Text Revised
- Asparouhov T, Muthén B. Plausible values for latent variables using Mplus. Technical report. 2010
- Bentler PM. Comparative fit indexes in structural models. *Psychological Bulletin*. 1990; 107:238–246. [PubMed: 2320703]
- Browne, MW.; Cudeck, R. Alternative ways of assessing model fit. In: Bollen, KA.; Long, JS., editors. *Testing structural equation models*. Newbury Park, CA: Sage Publications, Inc; 1993. p. 136-162.
- Côté SM, Vaillancourt T, LeBlanc JC, Nagin DS, Tremblay RE. The development of physical aggression from toddlerhood to pre-adolescence: a nation wide longitudinal study of Canadian

- children. *Journal of Abnormal Child Psychology*. 2006; 34:71–85.10.1007/s10802-005-9001-z [PubMed: 16565888]
- Dadds MR, Salmon K. Punishment insensitivity and parenting: Temperament and learning as interacting risks for antisocial behavior. *Clinical Child and Family Psychology Review*. 2003; 6:69–86. 096-4037/03/0600-0069/0. [PubMed: 12836578]
- Decety J, Meyer M. From emotion resonance to empathic understanding: a social developmental neuroscience account. *Development and Psychopathology*. 2008; 20:1053–1080.10.1017/S0954579408000503 [PubMed: 18838031]
- Decety J, Michalska KJ, Akitsuki Y, Lahey BB. Atypical empathic responses in adolescents with aggressive conduct disorder: a functional MRI investigation. *Biological Psychology*. 80:203–211.10.1016/j.biopsycho.2008.09.004 [PubMed: 18940230]
- Eisenberg, N. The development of empathy-related responding. In: Carlo, G.; Pope, C., editors. *Moral motivation through the life span*. Lincoln, NE: University of Nebraska Press; 2005. p. 73-117.
- Eisenberg, N.; Fabes, R. Prosocial development. In: Damon, W.; Eisenberg, N., editors. *Handbook of child psychology: Vol. 3. Social, emotional, and personality development*. Vol. 5. New York: Wiley; 1998. p. 701-778.
- Emde, RN.; Hewitt, JK. *Infancy to early childhood: Genetic and environmental influences on developmental change*. New York: Oxford University Press; 2001.
- Feshbach ND, Feshbach S. The relationship between empathy and aggression in two age groups. *Developmental Psychology*. 1969; 1:102–107.
- Frick PJ, Dickens C. Current perspectives on conduct disorder. *Current Psychiatry Reports*. 2006; 8:59–72. [PubMed: 16513044]
- Frick PJ, Stickle TR, Dandreaux DM, Farrell JM, Kimonis ER. Callous-unemotional traits in predicting the severity and stability of conduct problems and delinquency. *Journal of Abnormal Child Psychology*. 2005; 33:471–487.10.1007/s10648-005-5728-9 [PubMed: 16118993]
- Harpur TJ, Hare RD, Hakstian AR. Two-factor conceptualization of psychopathy: Construct validity and assessment implications. *Psychological Assessment*. 1989; 1:6–17.
- Hastings, P.; Utendale, W.; Sullivan, C. The socialization of prosocial development. In: Grusec, J.; Hastings, P., editors. *Handbook of socialization: Theory and research*. New York: Guilford Press; 2007. p. 636-664.
- Hastings PD, Zahn-Waxler C, Robinson J, Usher B, Bridges D. The development of concern for others in children with behavior problems. *Developmental Psychology*. 2000; 36:531–546.10.1037//0012-1649.36.5.531 [PubMed: 10976595]
- Hu L, Bentler PM. Fit indices in covariance structure modeling: sensitivity to underparameterized model misspecification. *Psychological Methods*. 1998; 3:424–453.
- Janssens, JMAM.; Gerris, JRM. Childrearing, empathy and prosocial behavior. In: Janssens, JMAM.; Gerris, JRM., editors. *Child rearing: Influence on prosocial and moral development*. Amsterdam: Swets; 1992. p. 57-75.
- Jones AP, Happé FG, Gilbert F, Burnett S, Viding E. Feeling, caring, knowing: different types of empathy deficit in boys with psychopathic tendencies and autism spectrum disorders. *Journal of Child Psychology and Psychiatry*. 2010; 51:1188–1197.10.1111/j.1469-7610.2010.02280.x [PubMed: 20633070]
- Klimes-Dougan B, Kistner J. Physically abused preschoolers' responses to peers' distress. *Developmental Psychology*. 1990; 26:599–602.
- Miller PA, Eisenberg N. The relation of empathy to aggressive and externalizing/antisocial behavior. *Psychological Bulletin*. 1988; 103:324–344. [PubMed: 3289071]
- Moran P, Ford T, Butler G, Goodman R. Callous and unemotional in children and adolescents living in Great Britain. *British Journal of Psychiatry*. 2008; 192:65–66.10.1192/bjp.bp.106.034876 [PubMed: 18174513]
- Murphy, LB. *Social behavior and child personality: An exploratory study of some roots of sympathy*. New York: Columbia University Press; 1937.
- Muthén, LK.; Muthén, BO. *Mplus User's Guide*. 6. Los Angeles, CA: Muthén & Muthén; 1998–2010.
- Rhea SA, Gross AA, Haberstick BC, Corley RP. Colorado Twin Registry. *Twin Research and Human Genetics*. 2006; 9:941–949. [PubMed: 17254434]

- Robbers SC, Bartels M, van Oort FV, van Beijsterveldt CE, van der Ende J, Verhulst FC, Boomsma DI, Huizink AC. A twin-singleton comparison of developmental trajectories of externalizing and internalizing problems in 6- to 12-year-old children. *Twin Research and Human Genetics*. 2010; 13:79–87. [PubMed: 20158310]
- Rogers J, Viding E, Blair RJ, Frith U, Happé F. Autism spectrum disorder and psychopathy: shared cognitive underpinnings or double hit? *Psychological Medicine*. 2006; 36:1789–1798.10.1017/S0033291706008853 [PubMed: 17018169]
- Shaffer D, Fisher P, Lucas CP, Dulcan MK, Schwab-Stone ME. NIMH Diagnostic Interview Schedule for Children Version IV (NIMH DISC-IV): description, differences from previous versions, and reliability of some common diagnoses. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2000; 39:28–38. 0890-8567/00/3901-0028. [PubMed: 10638065]
- Shirtcliff EA, Vitacco MJ, Graf AR, Gostisha AJ, Merz JL, Zahn-Waxler C. Neurobiology of empathy and callousness: implications for the development of antisocial behavior. *Behavioral Sciences and the Law*. 2009; 27:137–171.10.1002/bsl.862 [PubMed: 19319834]
- Sterzer P, Stadler C, Poustka F, Kleinschmidt A. A structural neural deficit in adolescents with conduct disorder and its association with lack of empathy. *Neuroimage*. 2007; 37:335–342.10.1016/j.neuroimage.2007.04.043 [PubMed: 17553706]
- Van Beijsterveldt CE, Bartels M, Hudziak JJ, Boomsma DI. Causes of stability of aggression from early childhood to adolescence: A longitudinal genetic analysis in Dutch twins. *Behavior Genetics*. 2003; 33:591–605. 0001-8244/03/0900-0591/0. [PubMed: 14574135]
- Van Hulle CA, Rodgers JL, D’Onofrio BM, Waldman ID, Lahey BB. Sex differences in the causes of self-reported adolescent delinquency. *Journal of Abnormal Psychology*. 2007; 116:236–248.10.1037/0021-843X.116.2.236 [PubMed: 17516757]
- Waldman, ID.; Rhee, SH. Genetic and environmental influences on psychopathy and antisocial behavior. In: Patrick, CJ., editor. *Handbook of psychopathy*. New York: Guilford; 2006. p. 205-228.
- Zahn-Waxler C, Radke-Yarrow M, King RA. Child rearing and children’s prosocial initiations toward victims of distress. *Child Development*. 1979; 50:319–330. [PubMed: 487876]
- Zahn-Waxler C, Radke-Yarrow M, Wagner E, Chapman M. Development of concern for others. *Developmental Psychology*. 1992; 28:126–136.
- Zahn-Waxler C, Robinson JL, Emde R. The development of empathy in twins. *Developmental Psychology*. 1992; 28:1038–1047.

Key Points

- Existing research suggests a significant negative relation between empathy and antisocial behavior.
- We addressed the following largely unanswered questions: (1) Do concern and disregard for others assessed very early in life (assessed at age 14 to 36 months) predict later antisocial behavior (assessed at age 4 to 17 years)? (2) Is disregard for others a better predictor of antisocial behavior than concern for others? (3) Are there common genetic and environmental influences on the covariance between concern or disregard for others and antisocial behavior?)
- Contrary to predictions, concern for others did not inversely predict antisocial behavior.
- Disregard for others in toddlerhood/early childhood was a strong predictor of antisocial behavior in middle childhood and adolescence.
- The association between disregard for others and antisocial behavior was due to common shared environmental influences.
- The results suggest the potential need for early assessment of disregard for others and the development of potential interventions.

Figure 1.

Structural equation model with observed concern and disregard for others regressed on higher-order antisocial behavior. Individual items on which the latent variables load are not depicted for clarity. Standardized values are shown. ASB = antisocial behavior; $^+ p < .10$, $^* p < .05$, $^{**} p < .01$.

Figure 2.

Bivariate genetic model. Observed Disregard, Parent-Rated ASB, Teacher-Rated ASB, and Self-Rated ASB were plausible latent values. The measurement portion of the model is shown in gray font. Dashed line indicates a path dropped from the model. Standardized values are shown. The squares of the standardized values do not add up to 100% because results are averaged across multiple imputed datasets. A_1 , C_1 , and E_1 = genetic, shared environmental, and nonshared environmental influences shared in common between observed disregard and ASB; A_2 , C_2 , and E_2 = genetic, shared environmental, and nonshared environmental influences specific to ASB; A_{PRA} , A_{TRA} , A_{SRA} , C_{PRA} , C_{TRA} , C_{SRA} , E_{PRA} , E_{TRA} , and E_{SRA} = genetic, shared environmental, and nonshared environmental influences specific to parent-, teacher-, and self-reported ASB; ASB = antisocial behavior; + $p < .10$, * $p < .05$, ** $p < .01$.

Appendix 4.

Confirmatory factor analysis model of the relations among mother-rated and observed concern and disregard for others assessed at 14, 20, 24, and 36 months. Standardized values are shown. 14 mo = 14 months; 20 mo = 20 months; 24 mo = 24 months; 36 mo = 36 months; + $p < .10$, * $p < .05$, ** $p < .01$.

Appendix 5.

Confirmatory factor analysis model of the relations among parent-, teacher-, and self-reported antisocial behavior. Standardized values are shown. ASB = Antisocial Behavior; Bully = bullies, threatens, or intimidates; Fight = initiates physical fights; Weapon = use of weapons; CruelP = cruelty to people; CruelA = cruelty to animals; Fire = fire setting; Property = destroying property; Break = breaking and entering; Lie = lies to obtain goods or favors or to avoid obligations; Steal = stolen items of nontrivial value without confrontation; Stay Out = stays out late; Run = run away from home; Truant = truant from school or work; ⁺ $p < .10$, * $p < .05$, ** $p < .01$.

Appendix 6.

Latent growth curve models for observed disregard, parent-reported antisocial behavior, and teacher-reported antisocial behavior. Unstandardized values are shown, except for the correlation between intercept and slope. ⁺ $p < .10$, * $p < .05$, ** $p < .01$.

\$watermark-text

\$watermark-text

\$watermark-text

Table 1
Zero-order Correlations Between Concern and Disregard for Others and Antisocial Behavior Latent Variables

	Parent Report Age 4–12	Teacher Report Age 7–12	Self Report Age 17
Mother-rated Concern for Others	-.01	-.06	-.01
Observed Concern for Others	-.05	.07	-.07
Mother-rated Disregard for Others	.30**	.08	-.02
Observed Disregard for Others	.26*	.34*	.36**

Note.

+ p < .10.

* p < .05.

** p < .01.

Appendix 1

Number of Participants with Data for Concern and Disregard for Others and Antisocial Behavior

	Mothers-Rated Concern	Mother-Rated Disregard	Observed Concern	Observed Disregard	Parent-Reported ASB	Teacher-Reported ASB	Self-Reported ASB
At least one time point	802	802	822	822	869	794	741
14 months	746	746	789	789			
20 months	694	696	708	708			
24 months	680	661	714	714			
36 months	660	660	687	687			
4 years					581		
5 years					491		
7 years					599	574	
8 years						533	
9 years					638	509	
10 years					578	511	
11 years					492	501	
12 years					652	438	
17 years							741

Note. ASB = antisocial behavior.

Appendix 2

Coding of observational measure of concern and disregard for others.

Variable	Coding	Inter-observer Reliability
Concern for victim	1 Absent	.87
	2 Fleeting or slight change of expression that includes brow furrow	
	3 Some concern expressed in face or voice plus verbal content	
	4 Moderate concern, prolonged furrow of brows or vocalizations expressing dismay, different than score of 3 mostly on duration	
	5 Great concern, sadness clearly expressed, sympathetic face	
Helps victim	1 Absent	.98
	2 Present - child performs an action to relieve distress ("I will put a band-aid on"), suggests actions to relieve distress ("You need a band-aid" or "Do you want a band-aid?"), child attempts to soothe, patting victim, code also when actions appear prosocial but unclear.	
Proximity to victim	1 Avoids victim, turns away, attempts to leave the room (even if the victim must be passed in order to do so)	.76
	2 Withdraws from victim, backs away, recoils (but does not turn away)	
	3 Stationary, child neither approaches or withdraws, simple gaze aversion without physically turning away is scored a 3	
	4 Approaches victim with at least one step toward, or child touches victim. If seated, child leans toward the victim.	
Hypothesis testing	1 None	.79
	2 Brief, non-verbal gestures, touches on own body parts analogous to victim, looks back and forth from victim's face to hurt part or other adult, looking very intently (head does not need to move)	
	3 Same as above but prolonged OR one or more moderate non-verbal attempts. Looking plus at least one clear verbal attempt.	
	4 Repeated and/or relatively intense/sophisticated attempts to understand the distress, both verbal, e.g., "Owie?" "Hurt?" "Okay?" and non-verbal attempts such as looking at another person in the room, intent looking at own or victim's injured body part, etc.	
Anger	1 Does not occur	.88
	2 Child has tight lips, may also bang or throw toy	
Hits offending object	1 Absent	.99
	2 Present - defensive action or verbalization toward clipboard or chair (e.g., hits clipboard or says "bad chair")	
Hostility	1 Does not occur	.94
	2 Child hits nearby object, throws something on the floor intentionally, a callous laugh (not just embarrassed giggling)	
	3 Child is judgmental or hostile, may hit victim, say "You shouldn't have done that" or "That was stupid"	

Appendix 3

Descriptive statistics (Percentage of sample in each category of the ordinal variables)

	Mothers-Rated Concern	Mother-Rated Disregard	Observed Concern	Observed Disregard	Parent-Reported ASB	Teacher-Reported ASB	Self-Reported ASB
14 months	0 – 35.5%	0 – 43.7%	0 – 30.4%	0 – 78.5%			
	1 – 29.9%	1 – 23.5%	1 – 41.1%	1 – 15.5%			
	2 – 24.5%	2 – 17.3%	2 – 19.8%	2 – 6.1%			
	3 – 10.1%	3 – 15.5%	3 – 8.7%				
20 months	0 – 7.2%	0 – 35.2%	0 – 13.8%	0 – 87.9%			
	1 – 24.6%	1 – 33.9%	1 – 36.3%	1 – 9.7%			
	2 – 44.4%	2 – 18.5%	2 – 27.0%	2 – 2.4%			
	3 – 23.8%	3 – 12.4%	3 – 22.9%				
24 months	0 – 5.4%	0 – 35.1%	0 – 8.4%	0 – 88.5%			
	1 – 16.0%	1 – 36.0%	1 – 26.3%	1 – 8.8%			
	2 – 42.1%	2 – 17.7%	2 – 27.6%	2 – 2.7%			
	3 – 36.5%	3 – 11.2%	3 – 37.7%				
36 months	0 – 2.1%	0 – 37.4%	0 – 10.3%	0 – 84.4%			
	1 – 13.8%	1 – 36.7%	1 – 19.8%	1 – 11.9%			
	2 – 47.1%	2 – 15.2%	2 – 25.8%	2 – 3.6%			
	3 – 37.0%	3 – 10.8%	3 – 44.1%				
4 years					0 – 22.0%		
					1 – 22.9%		
					2 – 26.5%		
					3 – 28.6%		
5 years					0 – 21.2%		
					1 – 27.1%		
					2 – 25.3%		
					3 – 26.5%		
7 years					0 – 32.1%	0 – 35.3%	
					1 – 25.2%	1 – 26.3%	
					2 – 20.2%	2 – 20.4%	
					3 – 22.5%	3 – 17.8%	
8 years						0 – 34.1%	

	Mothers-Rated Concern	Mother-Rated Disregard	Observed Concern	Observed Disregard	Parent-Reported ASB	Teacher-Reported ASB	Self-Reported ASB
9 years						1 – 29.1% 2 – 19.3% 3 – 17.4%	
10 years					0 – 36.1% 1 – 24.9% 2 – 20.1% 3 – 19.0% 0 – 42.0% 1 – 23.4%	0 – 39.9% 1 – 23.2% 2 – 18.7% 3 – 18.3% 0 – 36.6% 1 – 29.4%	
11 years					2 – 18.0% 3 – 16.6% 0 – 45.5% 1 – 19.9%	2 – 17.8% 3 – 16.2% 0 – 37.9% 1 – 28.5%	
12 years					2 – 20.1% 3 – 14.4% 0 – 40.3% 1 – 25.9%	2 – 18.6% 3 – 15.0% 0 – 41.6% 1 – 31.1%	
17 years					2 – 17.6% 3 – 16.1%	2 – 16.2% 3 – 11.2%	0 – 61.9% to 98.5% 1 – 1.5% to 38.1%

Note. ASB = antisocial behavior.