Anxious Solitude and Peer Exclusion:
A Diathesis-Stress Model of Internalizing Trajectories in Childhood

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A diathesis-stress model was proposed in which the joint forces of individual vulnerability (anxious solitude) and interpersonal adversity (peer exclusion) predict depressive symptoms in children over time. Children’s (N = 388; 50% female) social behavior, peer exclusion, and emotional adjustment were assessed at kindergarten entry and every spring thereafter through 4th grade, primarily by teacher report. Results indicated that anxious solitude and peer exclusion co-occur in children soon after kindergarten entry and that anxious solitary children who are excluded early on, in comparison with their nonexcluded anxious solitary counterparts, display greater stability in their subsequent display of anxious solitude. As hypothesized, the joint influence of anxious solitude and exclusion predicted the most elevated depressive symptom trajectories.

Although anxious solitude in the early school years has been linked to depressive symptoms in later childhood on average, it is also recognized that there is a great deal of heterogeneity in the apparent outcomes of anxious solitude (Hymel, Rubin, Rowden, & LeMare, 1990; Ladd & Burgess, 1999; Morison & Masten, 1991; Rubin, Chen, McDougall, Bowker, & McKinnon, 1995; Rubin & Mills, 1988; Strauss, Forehand, Smith, & Frame, 1986). Although some anxious solitary children experience internalizing difficulties, others appear relatively well adjusted. An important challenge in the study of childhood solitude is to develop a framework for determining which anxious solitary children are most or least at risk for emotional difficulties. There is a need for dynamic developmental models of adjustment of solitary children that include interpersonal influences that occur in midcourse (e.g., primary school years), as well as at the outset of development. At present, early interpersonal influences (parent–child attachment quality) have received some noteworthy empirical and theoretical attention as precursors to childhood anxious solitude (e.g., Renken, Egeland, Marvinney, Mangelsdorf, & Sroufe, 1989; see Rubin & Burgess, 2001, for a review), but later peer-related interpersonal influences have received little attention as risk factors that may modify anxious solitary children’s internalizing trajectories over the course of childhood. Interpersonal adversity (peer exclusion) that occurs during the primary school years, as well as individual vulnerability (anxious solitude), and especially the joint influence of these forces may contribute to internalizing difficulties over time. The importance of examining both individual and interpersonal risk factors has been emphasized in diathesis-stress models of risk for psychopathology and in prevention research: “Developmental models should emphasize the complex transactions between individuals and their environments, between systems of influence, and across periods of time” (Coie et al., 1993, p. 1017).

In this study we examined the relationship between individual vulnerability (anxious solitude) and environmental adversity (peer exclusion) over time, as well as the potential joint contribution of these two factors to children’s internalizing trajectories.

The two major forms of solitude that have emerged as associated with risk, anxious solitude (passive anxious withdrawal) and solitude due to...
Co-Occurrence of Anxious Solitude and Peer Exclusion

The current investigation is consistent with previous research in the sense that social anxiety and peer exclusion are conceptualized as key proximal determinants of elevated solitude in children. However, the current investigation differs markedly from past research by conceptualizing anxious solitude (individual vulnerability) and peer exclusion (interpersonal adversity) as forces that often act jointly on children. In previous investigations, anxious solitude and exclusion have consistently been conceptualized as characteristics of two nonoverlapping solitary groups (e.g., Asendorpf, 1990; Harrist et al., 1997). This conceptualization may have led researchers to overlook the co-occurrence of anxious solitude and peer exclusion and resulted in a substantial gap in understanding the potential contribution of peer-related interpersonal adversity to heterogeneity in internalizing outcomes among anxious solitary children.

Furthermore, it is unclear when over the course of development anxious solitude and exclusion may come to co-occur, because past longitudinal studies have investigated exclusion only in nonanxious children. However, there is evidence concerning the onset of peer rejection in anxious solitary children. Peer rejection is not synonymous with peer exclusion. Peer rejection is an attitudinal construct that represents peers' negative appraisals (dislike) of a child on a confidential survey. Therefore, peer rejection is not directly observable to the child who is the object of these sentiments. In contrast, peer exclusion represents peer actions that are overtly communicated to children, often in a concrete manner (e.g., "you can't play"; Boivin & Hymel, 1997). Nevertheless, peer rejection may contribute to peer exclusion of anxious solitary children. In other words, attitudinal rejection may motivate peers to overtly exclude children from play activities (peers may not want to play with children whom they dislike). There is evidence for a positive relationship between peer rejection and peer exclusion (Bowker et al., 1998; Harrist et al., 1997) and for the ability of peer rejection to partially mediate the relationship between socially withdrawn behavior and other forms of overt peer mistreatment (victimization; Boivin & Hymel, 1997). If this partial mediational process is at work, the timing of rejection onset may offer clues about the timing of exclusion onset in anxious solitary children.

Based on the available evidence about rejection of anxious solitary children, two alternative hypotheses about the timing of the anxious solitude–peer exclusion co-occurrence are proposed. The late-onset exclusion hypothesis posits that anxious solitary children are not excluded by peers in early childhood, but may become excluded by late childhood. The early-onset exclusion hypothesis posits that anxious solitary children may experience exclusion from early childhood onward.

Late-onset exclusion hypothesis. One set of evidence suggests that anxious solitary children are not rejected by their peers in early childhood, but become rejected around third grade (Rubin, Chen, & Hymel, 1993). In a similar vein, young children are unreliable informants about anxious solitary behavior but become reasonably reliable around third grade, whereas young children are reliable informants of other behaviors (e.g., aggressive behavior; Younger, Gentile, & Burgess, 1993). Younger and colleagues proposed that the occurrence of late-onset rejection may be due to developmental changes in peer perceptions of anxious solitary children (Younger & Boyko, 1987; Younger, Schwartzman, & Ledingham, 1985, 1986). Anxious solitary behavior may not be as salient to young children as aggressive behavior because it is less concrete and less likely to affect them directly. As children's social-cognitive skills develop, they may perceive increasingly subtle differences among their peers' social behavior, come
to view anxious solitary behavior as deviant, and dislike and subsequently exclude anxious solitary
children. Thus, the co-occurrence of anxious solitude and peer exclusion may emerge in later childhood,
and this increase in interpersonal stress may render anxious solitary children especially vulnerable to
internalizing difficulties at that time.

**Early-onset exclusion hypothesis.** Another possibility is that anxious solitary children may experience
peer exclusion from early childhood. A second set of evidence indicates that reticent solitary behavior
(e.g., onlooking solitary behavior) is associated with peer rejection as early as preschool (Hart et al., 2000;
Rubin & Clark, 1983). Again, if rejection partially mediates the relationship between anxious solitude
and exclusion, anxious solitary children may encounter exclusion as early as preschool. The early co-
ocurrence of anxious solitude and exclusion may make it difficult to determine temporal precedence.
Nevertheless, the early co-occurrence of anxious solitude and peer exclusion may have important
implications for children's adjustment, especially if these two conditions endure over time. Early
exclusion of anxious solitary children may precipitate internalizing difficulties in the early school
years, and the cumulative interpersonal adversity of long-term exclusion may increase risk for internal-
zizing difficulties over the course of childhood.

The importance of determining the onset of exclusion in anxious solitary children stems not only
from an interest in timing per se, but also from additional concerns. Determining the timing of
exclusion onset has the potential to demonstrate that social-emotional development is a dynamic
process that may be substantially affected by experiences in midcourse (e.g., elementary school
years) as well as by those that occur in early childhood. Timing also has implications for causality.
The causal role of anxious solitude in peer exclusion would be supported by findings indicat-
ing that early anxious solitude precedes the onset of exclusion and predicts subsequent exclusion in later
childhood. Yet, more complex temporal ordering of anxious solitude and peer exclusion may raise more
nuanced causal possibilities.

What accounts for apparently conflicting findings in regard to the timing of peer rejection of anxious
solitary children? Methodological differences are one possibility. The two studies that reported peer
rejection of anxious solitary children in preschool employed continuous concurrent approaches (Hart
et al., 2000; Rubin & Clark, 1983), whereas much of the work that has not found peer rejection of anxious
solitary children until later childhood tended to use a categorical, extreme-group approach. The continu-
ous approach may provide more power for detecting peer rejection than does the categorical
approach, especially because solitary groups tend to be small in sample size. To examine whether links
between anxious solitude and peer difficulties were consistent across analytic approaches, we employed
both continuous and group-oriented analyses. Thus, to test the two alternate exclusion-onset hypotheses,
the ability of early anxious solitude to predict peer exclusion over time will be examined, and anxious
solitude will be framed as a continuous and categorical predictor in two separate versions of this
analysis. Results of analyses should lend support to either the late- or early-onset exclusion hypothesis.

As a second methodological refinement relative to past work, we examined the ability of anxious
solitude to predict exclusion after controlling for externalizing behaviors. Because aggression and
other aversive externalizing behaviors may contribute to peer exclusion (e.g., Asendorpf, 1990; Rubin,
1982), controlling for externalizing behaviors eliminated any potential confound introduced by the
possible co-occurrence of anxious solitude and externalizing behaviors.

An additional important feature of our conceptual and methodological approach was employing a
constant (unvarying) method of assessing solitary behaviors over time. Because solitary behavioral
assessment is frequently accomplished by behavioral observation in early childhood but not in later
childhood, and by peer nomination in later childhood but not in early childhood (see Younger &
Boyko, 1987; Younger et al., 1985, 1986), neither observational nor peer methods appeared to be an
ideal candidate for a constant method of assessment from early to late childhood. Because teachers have
been successfully employed as informants of solitary behaviors from early to late childhood (see Coplan,
2000; Harrist et al., 1997; Rubin & Clark, 1983), we considered teachers the best-available constant
informant over time, but we also planned to validate teacher reports with behavioral observations in
early-middle childhood and peer reports in later childhood.

**Developmental pathways to the co-occurrence of anxious solitude and peer exclusion.** Several develop-
mental scenarios may account for the co-occurrence of anxious solitude and peer exclusion. Perhaps the
most obvious possibility is that anxious solitary children are at risk for becoming excluded by their
peers. Indeed, much of the prior discussion implies this developmental scenario. Anxious solitude may
place children at risk for exclusion by generating
behavior that peers evaluate negatively (e.g., shy, socially awkward behavior) and inhibiting behavior that peers value (e.g., social initiative). These aspects of anxious solitary behavior may contribute to peers’ dislike (attitudinal rejection) of anxious solitary children, which, in turn, may be one source of peers’ motivation to exclude them.

However, we hypothesized that anxious solitude will predict exclusion beyond the extent to which a child is disliked. Additional features of anxious solitary behavior may contribute to risk for exclusion because they signal vulnerability rather than inspire peers’ dislike. For example, anxious solitude is associated with submissive tendencies (Stewart & Rubin, 1995), which may mark a child as an easy target for exclusion. Peers may be motivated to exclude vulnerable children for instrumental reasons, such as enhancing their own social status or reinforcing the boundaries of a friendship group.

Yet, the reverse causal scenario also deserves serious attention, namely, that children who are excluded by peers are at risk for becoming anxious solitary. Children who experience exclusion may worry about having similar experiences in the future. This may occur such that exclusion exacerbates children’s preexisting anxious solitary tendencies, or that anxious solitude emerges in initially non-anxious solitary children. Thus, reverse directionality analyses were also conducted to examine the ability of peer exclusion to predict anxious solitude over time. Furthermore, the emergence or exacerbation of anxious solitude may, in turn, increase risk for further peer exclusion. Thus, bidirectional influences are a possibility. Overall, we expected that the co-occurrence of anxious solitude and peer exclusion would forecast the greatest emotional difficulties over time.

**Diathesis-Stress Model of Anxious Solitude and Peer Exclusion**

The co-occurrence of anxious solitude and peer exclusion can be conceptualized in a diathesis-stress framework; anxious solitude may function as an individual vulnerability or diathesis, and peer exclusion as an interpersonal stressor. When anxious solitary children encounter exclusion their fears of social mistreatment are likely confirmed by their social experiences. In the absence of exclusion, anxious solitary children may worry about how they might be treated by peers. However, in the presence of exclusion, anxious solitary children may not only worry but also feel sure that they will be mistreated by peers and feel hopeless to change their circumstances (Alloy, Kelly, Mineka, & Clements, 1990). Such feelings of hopelessness are linked to depression (Alloy et al., 1990). Thus, anxious solitude is expected to be most likely to lead to depressive symptoms in the presence of peer exclusion (see Joiner, 1997, for a related proposition). We proposed that the joint contribution of individual vulnerability (anxious solitude) and interpersonal adversity (peer exclusion) to children’s depressive symptoms would be greater than the sum of their individual influences, because of these diathesis-stress processes.

This investigation aimed to examine the relationship between individual child (anxious solitude) and interpersonal risk factors (peer exclusion) over time, as well as the potential joint contribution of these two risk factors to children’s depressive symptom trajectories. To this end, our analyses were aimed at testing: (a) two alternate-timing hypotheses predicting the onset and course of peer exclusion from early anxious solitude; (b) the reverse directionality relationship in which exclusion predicts anxious solitude over time—this analysis in combination with the first tested for bidirectionality; and (3) the diathesis-stress hypothesis that the most severe depressive symptom trajectories occur when anxious solitary children experience high levels of peer exclusion.

**Method**

Analyses were conducted using a longitudinal data set spanning 5 years, from kindergarten to fourth grade. All teacher assessments and peer reports of rejection were obtained at six time points: at kindergarten entry in the fall and every spring thereafter through fourth grade. Additionally, to validate teacher assessments with developmentally appropriate assessments from alternate sources at both the outset and endpoint of the study, we obtained behavioral observations of children’s free play for a subsample of participants at kindergarten entry, and we gathered peer behavioral nominations in fourth grade (relevant observer and peer reports were not consistently available at other time points and therefore could not be included in these analyses).

**Participants**

Participating children were drawn from the midwestern United States and were diverse and representative of the region in respect to gender, ethnicity, and socioeconomic status ($N = 388$; 50% female; 77.3% European American, 17.3% African American).
Reliability ranged from .81 to .88 (Profilet, 1996). Mean scores for the original 412 kindergarten participants, longitudinal data for 388 children were available for the current study. Procedures

Teachers completed questionnaires during each assessment period. They received a small honorarium for their time.

From kindergarten through third grade, individual sociometric interviews were administered to target children and their classmates at school, using photos to help children identify classmates following procedures established as reliable with young children (Asher, Singleton, Tinsley, & Hymel, 1979). Consistent with standard practices, a switch from individual- to group-administered sociometrics occurred in fourth grade, in which children circled the names of classmates on a class roster. The fourth-grade assessment also included behavioral nominations relevant to the current study. Children could nominate up to three classmates for each item. At least 80% of children in each classroom provided peer nominations. All peer nominations were calculated by summing the number of classmates who nominated each child and standardizing within classroom to control for variations in classroom size. To maximize the number of peer nominations, we made no distinction between same- and opposite-sex peer nominations.

Additionally, observers made three series of ratings of children’s classroom free-play behaviors for a subsample of children (n = 195) in kindergarten. These behavior ratings were made on 5-point scales following observers’ 10th, 15th, and 20th sets of twenty-seven 2- to 3-second scans of each child’s free-play behavior during the first 10 weeks of the school year (see Ladd & Proﬁlet, 1996). For the behavior ratings employed in the current investigation, alphas ranged from .81 to .90, and interrater reliability ranged from .81 to .88 (M = .85; Ladd & Proﬁlet, 1996).

Measures

Anxious solitude. Teachers’ assessments of anxious solitude were obtained using items from well-established teacher-report measures (Teacher Report Form [TRF], Achenbach, 1991; Children’s Behavior Scale [CBS], Ladd & Proﬁlet, 1996). Items included: (a) solitary child; (b) self-conscious or easily embarrassed; (c) shy or timid; (d) refuses to talk; (e) too fearful or anxious; (f) is worried, worries about many things; (g) nervous, high-strung, or tense; and (h) tends to be fearful or afraid of new things or situations. All eight items were rated a 3-point scale (0 = not true; 1 = sometimes true; 2 = often true). The anxious solitude scale evidenced acceptable reliability and stability annually from kindergarten to the fourth grade: zs = .75 – .77, rs = .26 – .69, all p < .001 in consecutive years, Ms = 0.22 – 0.34, SDs = 0.30 – 0.35 (contact the first author for a complete table of stability coefficients, zs, Ms, and SDs).

Confirmatory factor analysis (CFA) of the anxious solitude composite at each time point also provided evidence of reliability and invariance in this construct over time, all χ² ns, root mean square residuals (RMRs) = 0.019–0.028, goodness-of-fit indices (GFIs) = 0.99, adjusted goodness-of-fit indices (AGFIs) = 0.96–0.98, and each item loaded significantly on the single anxious solitude factor at all time points. Additionally, the stability of anxious solitude was assessed using an “extreme-group” approach (see Rubin, 1993): There were 29 children (7.5% of the sample, 16 boys and 13 girls) who scored in the top anxious solitude tertile at all time points. Teacher-report anxious solitude was validated by stronger convergence with other informants (teacher-peer “plays alone—wants to play with other kids but is too shy or afraid”: r = .47, p < .001; “doesn’t talk much or talks quietly”: r = .29, p < .001; teacher-observer “anxious, fearful, or uncomfortable in peer situations”: r = .33, p < .001) than between other informants (observer-peer: r = .23, p < .01).

Peer exclusion. Teachers’ assessments of peer exclusion were obtained with the CBS (Ladd & Proﬁlet, 1996). Items included: (a) peers avoid this child, (b) excluded from peers’ activities, (c) peers refuse to let this child play with them, (d) not chosen as a playmate by peers, and (e) ignored by peers. All five items were rated on the same 3-point scale described earlier. The exclusion composite demonstrated high reliability (z = .89–.95) and acceptable stability annually from kindergarten through fourth grade in consecutive years (rs = .29–.66, all ps < .001, Ms = 0.17–0.28, SDs = 0.34–0.50). CFA of exclusion at
each time point also provided evidence of reliability and invariance in this construct over time (all χ² ns, RMRs = 0.003–0.008, GFIIs = 0.99–1.00, AGFIs = 0.96–0.99), and each item loaded significantly on the single exclusion factor at all time points. Teacher-report exclusion was validated by stronger or equal convergence with other informants (teacher-peer “left out”: r = .63, p < .001; teacher-observer “not included/rebuffed by peers”: r = .43, p < .001) than between other informants (observer-peer r = .45, p < .001).

Analyses supported anxious solitude and peer exclusion as two distinguishable factors, though these composites were moderately correlated: .28 fall kindergarten, .29 spring kindergarten, .36 first grade, .36 second grade, .39 third grade, and .50 fourth grade (all ps < .001). Repeated CFA each year indicated an adequate two-factor fit (χ²/dfs = 2.0–3.5, RMRs = 0.055–0.094, GFIIs = 0.94–0.96, AGFIs = 0.90–0.93) and other investigators have reported similar two-factor CFA results with peer reports (Bowker et al., 1998).

Peer rejection. The peer sociometric nomination “someone I do not like to play with” assessed peer rejection. Peer rejection evidenced substantial stability from kindergarten to fourth grade in consecutive years (rs = .52–.68, all ps < .001, Ms = −0.11–0.00, SDs = 0.89–0.98). Good reliability for sociometric nominations is well established (see Ladd & Coleman, 1993; Terry & Coie, 1991).

Externalizing behaviors. Teachers’ assessments of aggressive and hyperactive-distractible behaviors were obtained on the CBS (Ladd & Profilet, 1996). The aggression subscale included: (a) fights; (b) aggressive; (c) kicks, bites, hits; (d) argues; (e) bullies; (f) threatens; and (g) taunts, teases. The hyperactivity-distractibility subscale included: (a) restless, doesn’t keep still; (b) squirming, fidgety; (c) poor concentration, attention span; and (d) inattentive. All items were rated on a 3-point scale (1 = not true; 2 = sometimes true; 3 = often true). Both externalizing behavior subscales evidenced good reliability and stability annually from kindergarten to the fourth grade in consecutive years: aggression α = .89–.91, rs = .56–.71, all p < .001, Ms = 1.22–1.33, SDs = 0.39–0.46; hyperactivity-distractibility α = .86–.91, rs = .54–.83, all p < .001, Ms = 1.43–1.55, SDs = 0.55–0.64. CFA of the aggressive and hyperactive-distractible composites at each time point also provided evidence of reliability and invariance in these constructs over time: (aggression: all χ² ns, RMRs = 0.011–0.019, GFIIs = 0.99–1.00, AGFIs = 0.97–0.98; hyperactivity-distractibility: all χ² ns, RMRs = 0.001–0.006, GFIIs = 1.00, AGFIs = 0.95–1.00), and each item loaded significantly on the appropriate single aggression or hyperactive-distractible factor at all time points. Evidence of convergent validity was obtained by correlating teacher reports of behavior with concurrent observer behavior ratings in kindergarten (aggression: r = .38, p < .001; hyperactivity-distractibility: r = .36, p < .001) and peer behavioral nominations in the fourth grade (aggression composite, α = .82: “talks meanly or argues too much with other kids,” “hits, pushes, or kicks other kids,” “tells other kids they won’t like them or be their friend anymore just to hurt them or to get their own way”: r = .65, p < .001). Also, high correlations between the CBS hyperactive-distractible subscale and the TRF attention problem subscale were obtained at all concurrent time points (all rs ≥ .79, ps < .001). For additional evidence of validity, see Ladd and Profilet (1996). See Table 1 for intercorrelations among early predictor composites (mean scores for kindergarten through second grade).

Depressive symptoms. A measure of depressive symptoms (based on the Child Behavior Checklist Depression Scale [CBCL–D]; Clarke, Lewinsohn, Hops, & Seeley, 1992) was obtained using items from well-established teacher-report scales (TRF,

Table 1
Intercorrelations, Means, and Standard Deviations of Early Predictors

<table>
<thead>
<tr>
<th>Early predictors</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anxious solitude</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.28</td>
<td>0.22</td>
</tr>
<tr>
<td>2. Peer exclusion</td>
<td>0.36***</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.22</td>
<td>0.31</td>
</tr>
<tr>
<td>3. Peer rejection</td>
<td>0.10*</td>
<td>0.61***</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>−0.10</td>
<td>0.75</td>
</tr>
<tr>
<td>4. Aggression</td>
<td>−0.06</td>
<td>0.54***</td>
<td>0.65***</td>
<td>—</td>
<td>—</td>
<td>1.27</td>
<td>0.34</td>
</tr>
<tr>
<td>5. Hyperactivity-distractibility</td>
<td>0.13*</td>
<td>0.58***</td>
<td>0.63***</td>
<td>0.62***</td>
<td>—</td>
<td>1.49</td>
<td>0.52</td>
</tr>
</tbody>
</table>

*p < .05.
**p < .01.
***p < .001.
Achenbach, 1991; CBS, Ladd & Profilet, 1996). Items included: (a) unhappy, sad, or depressed; (b) appears miserable, unhappy, tearful, or distressed; (c) sulks a lot; (d) feels worthless or inferior; (e) apathetic or unmotivated; and (f) underactive, slow moving, or lacks energy. Ratings were made on the same 3-point scale described earlier for anxious solitude. This six-item composite demonstrated acceptable reliability and stability annually ($\alpha = .72-.84$; $rs = .27-.73$, all $ps < .001$ in consecutive years, $Ms = 0.17-.24$, $SDs = 0.28-.39$). CFA of the composite at each time point also provided evidence of reliability and invariance in this construct over time (all $\chi^2$ ns, RMRRs = 0.010–0.018, GFRs = 0.99–1.00, AGFRs = 0.97–0.99), and each item loaded significantly on the single depressive symptom factor at all time points.

Results were consistent with the interpretation that indices of anxious solitude and depressive symptoms were distinguishable but moderately correlated factors. .48 fall kindergarten, .53 spring kindergarten, .53 first, .54 second, .49 third, and .65 fourth grade (all $ps < .001$). Anxious solitude and depression appeared to become more strongly related over time, and this result was consistent with past evidence indicating that anxiety predicts increased depressive symptoms in children over time (Cole, Peeke, Martin, Truglio, & Seroczynski, 1998).

Results

Unconditional Growth Curve Models

Before testing the hypothesized trajectories (i.e., testing “conditional models” in which predictor variables are specified), unconditional growth curve models using hierarchical linear modeling (HLM; Bryk & Raudenbush, 1992) were tested for exclusion, anxious solitude, and depressive symptoms. Unconditional models contain no Level 2 predictor variables, and their purpose is to test whether there is enough individual variation in trajectories relative to the “mean” (overall trajectory of all children in the sample) to warrant proceeding to specify Level 2 predictor variables in conditional models. Unconditional analyses indicated that there was significant individual variation relative to the mean in exclusion, anxious solitude, and depressive symptom trajectories (see random effects in Table 2). Each unconditional model indicated significant variation to be accounted for both in the intercept (fall kindergarten) and in two slopes indicating change over time (linear and either quadratic or cubic slopes).

Overview of Conditional Growth Curve Analyses

In HLM growth curve analyses, all time points of the outcome variable can be employed in a single analysis (e.g., exclusion scores kindergarten–fourth grade are strung together in a chronological trajectory for each child), but continuous predictor variables are not strung together in a similar fashion. Continuous predictor variables can be formed in different ways depending on the time points one wishes to capture. The simplest approach is to use one time point, such as kindergarten entry. In such an analysis, the predictor characteristic at one time point (e.g., anxious solitude in fall kindergarten) is used to predict the longitudinal trajectory of the outcome variable (e.g., exclusion kindergarten–fourth grade). Another option is to create a predictor composite of multiple time points. This may be desirable if one wishes to weight the stability as well as the severity of a predictor characteristic. In the present study, it was expected that children who displayed relatively stable anxious solitude over the early school years (1 standard deviation or above on kindergarten–second grade composite) would be at risk for elevated peer exclusion trajectories. Thus, an early anxious solitude composite (kindergarten–second grade) was computed to predict exclusion trajectories, but the same analysis was also performed using anxious solitude at each early time point to obtain a more detailed picture of the timing of the onset of exclusion. Early composites (kindergarten–second grade) were also computed for all other predictor variables (intercorrelations, means, and standard deviations are reported in Table 1). The mean of the two time points available in kindergarten (fall and spring) was used to compute early composites (representing the mean of indicators from kindergarten to second grade) so that each year (kindergarten, first, and second grades) would be weighted equally.

In addition to these two approaches to growth curve modeling using continuous variables, groups can also be used to predict growth curves. Both a continuous and a group version of each growth curve model were performed. HLM output yielded parameters for groups significantly different from the mean trajectory. Significant differences among groups were tested with the formula:

$$t = \beta_1 - \beta_2 / \sqrt{SE_1^2 + SE_2^2}.$$
Table 2
Unconditional Growth Curve Models

<table>
<thead>
<tr>
<th>Fixed effect</th>
<th>Peer exclusion</th>
<th>Anxious solitude</th>
<th>Depressive symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model for initial status, $\pi_{0i}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean initial status, $\beta_{00}$</td>
<td>0.24</td>
<td>-0.02</td>
<td>25.64***</td>
</tr>
<tr>
<td>Model for linear change, $\pi_{1i}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean change rate, $\beta_{10}$</td>
<td>-0.02</td>
<td>0.01</td>
<td>-4.04***</td>
</tr>
<tr>
<td>Model for cubic change, $\pi_{2i}$</td>
<td>0.001</td>
<td>0.00</td>
<td>3.33***</td>
</tr>
<tr>
<td>Mean change rate, $\beta_{20}$</td>
<td>0.001</td>
<td>0.003</td>
<td>1.58</td>
</tr>
</tbody>
</table>

| Random effect                                  |                |                  |                     |
| Initial status, $\tau_{0i}$                    | 0.28           | 0.08             | 2301.81***          |
| Linear growth rate, $\tau_{1i}$                | 0.15           | 0.02             | 636.33***           |
| Cubic growth rate, $\tau_{2i}$                 | 0.005          | 0.0003           | 519.27***           |
| Level 1 error, $\epsilon_{1i}$                 | 0.31           | 0.10             | 546.81***           |

*A quadratic (not cubic) term is reported for the anxious solitude model.

*p < .05.

**p < .01.

***p < .001.
It was expected that the continuous and group versions of each model would be consistent with each other overall and complement each other in several ways: (a) similar findings from continuous and group approaches should reinforce confidence in findings, especially confidence in analyses involving groups of relatively modest size; (b) group analysis represents a person-oriented approach by identifying subtypes of children and illustrating combinations of characteristics in children; and (c) continuous analysis permits the evaluation of interactions and the unique predictive power of each variable after accounting for other variables, especially the ability of anxious solitude to predict overt exclusion beyond the effects of attitudinal rejection. Thus, exclusion trajectories were predicted three ways to examine the timing of exclusion onset (early- vs. late-onset hypotheses): continuous prediction by each early time point, continuous prediction using early composites, and group prediction. Anxious solitude and depressive symptom trajectories were predicted two ways: continuous prediction using early composites and group prediction. Prediction of anxious solitude was aimed at examining reverse directionality in the anxious solitude–exclusion relationship, and prediction of depressive symptom trajectories was aimed at examination of the diathesis-stress hypothesis. All conditional analyses were conducted by systematically entering each main predictor (e.g., anxious solitude, exclusion) and additional control variables (e.g., rejection, aggression, hyperactivity-distractibility, sex) at each level of the model (e.g., intercept, linear, and quadratic slopes), and then removing nonsignificant predictors.

Predicting Exclusion Trajectories

The first central aim of this investigation was to predict children’s peer exclusion trajectories from early anxious solitude. It was expected that the shape of the resulting growth-curve trajectories would support either the late-onset or the early-onset exclusion hypothesis. If the late-onset exclusion hypothesis was supported, it would be expected that anxious solitude would predict an exclusion intercept (fall kindergarten) that would not be significantly different from the mean, maintenance of low exclusion in the first years of school, and increased (upward slope) exclusion around third grade. If the early-onset exclusion hypothesis was supported, it would be expected that anxious solitude would predict significantly elevated levels of exclusion at school entry (intercept) or soon after (e.g., spring kindergarten, first grade), and maintenance (no slope) or increase (upward slope) of elevated exclusion over time.

Predicting exclusion from anxious solitude at each early time point. Before using the early anxious solitude composite to predict exclusion trajectories, a preliminary form of this analysis was performed with the anxious solitude predictor at each early time point to permit a detailed examination of the timing of exclusion onset. Exclusion trajectories were predicted from anxious solitude in fall kindergarten, spring kindergarten, first grade, and second grade in separate equations. In this series of two-level HLM growth-curve analyses, time was the Level 1 predictor of exclusion, and anxious solitude at one of the four early assessment occasions was the Level 2 predictor of exclusion over time. Results indicated that anxious solitude at each of the four early assessment occasions predicted a significantly elevated concurrent exclusion intercept (computed intercept coefficients at 1 SD above the mean of anxious solitude: .36 fall kindergarten, .30 spring kindergarten, .30 first grade, .49 second grade, all ps < .01 or better), supporting the early-onset exclusion hypothesis. Therefore, the early anxious solitude composite was employed in subsequent analyses.

Predicting exclusion from the early anxious solitude composite. The primary continuous approach to prediction of children’s exclusion trajectories was performed using the early anxious solitude composite (kindergarten–second grade mean), while controlling for rejection, aggression, and hyperactivity-distractibility. Consistent with previous analyses, high early anxious solitude predicted elevated exclusion at school entry (see Table 3), lending strong support to the early-onset exclusion hypothesis. Furthermore, high anxious solitude predicted increasing exclusion over time, parallel to the mean trajectory. Though high anxious solitude predicted elevated exclusion trajectories for children of both sexes, anxious solitary boys’ exclusion trajectories were significantly more elevated than anxious solitary girls’, as indicated by a significant Anxious Solitude × Sex interaction (boys = 1, girls = −1; Table 3, Figure 1). In Figure 1 and all subsequent figures illustrating continuous results, each trajectory was plotted at 1 SD above the mean of the predictor. In the interest of clarity in graphical representation of complex results, two simplifications were made to figures representing continuous results: (a) predictors are plotted only at high (1 SD above) but not low (1 SD below) levels (this renders continuous graphs more comparable to correspond-

As expected, early anxious solitude predicted elevated exclusion trajectories beyond early peer rejection (Table 3 and Figure 1 show unique behavioral predictors after accounting for peer rejection). These findings lend empirical support to the contention that (a) anxious solitude renders children vulnerable to exclusion beyond the extent to which they are disliked by peers and (b) attitudinal peer rejection is distinguishable from overt peer exclusion. Nevertheless, results indicated that peer rejection may be a partial mediator of the relationship between anxious solitude and peer exclusion (Baron & Kenny, 1986). First, both early anxious solitude and early peer rejection were significant predictors of exclusion trajectories (Table 3). Second, supplementary regression analysis indicated that early anxious solitude was a significant predictor of early rejection ($b = .25$, $t = 2.06, p < .05$). Third, the anxious solitude coefficient was reduced (coefficient decreased from .42 to .37) after rejection was added to the exclusion growth-curve model. Overall, analyses suggested that rejection played a small but significant role in mediating the relationship between anxious solitude and exclusion, but that anxious solitude predicted exclusion trajectories after accounting for rejection.

Early anxious solitude also predicted elevated exclusion after controlling for hyperactivity-distractibility and aggression, supporting the contention that anxious solitude contributes to risk for exclusion.

### Table 3

**Conditional Peer Exclusion Model: Continuous and Group Analyses**

<table>
<thead>
<tr>
<th>Level of model</th>
<th>Coefficient</th>
<th>SE</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Continuous approach</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model for initial status, $π_0$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean initial status, $β_{00}$</td>
<td>$-0.10$</td>
<td>$0.06$</td>
<td>$-1.54$</td>
</tr>
<tr>
<td>Anxious solitude, $β_{01}$</td>
<td>$0.37$</td>
<td>$0.05$</td>
<td>$7.74^{***}$</td>
</tr>
<tr>
<td>Sex*Anxious solitude, $β_{02}$</td>
<td>$0.14$</td>
<td>$0.05$</td>
<td>$2.87^{**}$</td>
</tr>
<tr>
<td>Hyperactivity-distractibility, $β_{03}$</td>
<td>$0.13$</td>
<td>$0.03$</td>
<td>$3.94^{***}$</td>
</tr>
<tr>
<td>Aggression, $β_{04}$</td>
<td>$0.13$</td>
<td>$0.05$</td>
<td>$2.42^*$</td>
</tr>
<tr>
<td>Rejection, $β_{05}$</td>
<td>$0.19$</td>
<td>$0.03$</td>
<td>$7.73^{***}$</td>
</tr>
<tr>
<td>Sex, $β_{06}$</td>
<td>$-0.04$</td>
<td>$0.01$</td>
<td>$-3.84^{***}$</td>
</tr>
<tr>
<td>Model for linear change, $π_{1i}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean change rate, $β_{10}$</td>
<td>$0.08$</td>
<td>$0.04$</td>
<td>$2.31^*$</td>
</tr>
<tr>
<td>Aggression, $β_{11}$</td>
<td>$-0.08$</td>
<td>$0.03$</td>
<td>$-3.10^{**}$</td>
</tr>
<tr>
<td>Rejection, $β_{12}$</td>
<td>$0.05$</td>
<td>$0.01$</td>
<td>$3.67^{***}$</td>
</tr>
<tr>
<td>Model for cubic change, $π_{2i}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean change rate, $β_{20}$</td>
<td>$0.001$</td>
<td>$0.001$</td>
<td>$2.70^{**}$</td>
</tr>
<tr>
<td><strong>Group approach</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model for initial status, $π_0$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean initial status, $β_{00}$</td>
<td>$0.22$</td>
<td>$0.01$</td>
<td>$16.09^{***}$</td>
</tr>
<tr>
<td>Anxious solitary externalizing group, $β_{01}$</td>
<td>$0.47$</td>
<td>$0.10$</td>
<td>$4.81^{***}$</td>
</tr>
<tr>
<td>Stable anxious solitary boys’ group, $β_{02}$</td>
<td>$0.42$</td>
<td>$0.07$</td>
<td>$6.03^{***}$</td>
</tr>
<tr>
<td>Variable anxious solitary group, $β_{03}$</td>
<td>$0.08$</td>
<td>$0.04$</td>
<td>$2.09^*$</td>
</tr>
<tr>
<td>Externalizing group, $β_{04}$</td>
<td>$0.22$</td>
<td>$0.07$</td>
<td>$3.01^{**}$</td>
</tr>
<tr>
<td>Rejection, $β_{05}$</td>
<td>$0.22$</td>
<td>$0.02$</td>
<td>$10.19^{***}$</td>
</tr>
<tr>
<td>Model for linear change, $π_{1i}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean change rate, $β_{10}$</td>
<td>$-0.02$</td>
<td>$0.01$</td>
<td>$-1.79$</td>
</tr>
<tr>
<td>Rejection, $β_{11}$</td>
<td>$0.02$</td>
<td>$0.01$</td>
<td>$2.08^*$</td>
</tr>
<tr>
<td>Model for cubic change, $π_{2i}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean change rate, $β_{20}$</td>
<td>$0.002$</td>
<td>$0.001$</td>
<td>$2.75^{**}$</td>
</tr>
<tr>
<td>Offset anxious solitary group, $β_{21}$</td>
<td>$-0.001$</td>
<td>$0.001$</td>
<td>$-2.18^*$</td>
</tr>
</tbody>
</table>

**Note:** Italics emphasize variables or groups of primary interest.

* $p < .05$

** $p < .01$

*** $p < .001$. 

By generating extreme-group graphs, and (b) the effects of each predictor are plotted separately (rather than plotting the additive effects of multiple continuous predictors; however, subsequent group graphs illustrate the trajectories of children identified on multiple characteristics).
beyond any relationship with externalizing behaviors. Hyperactivity-distractibility and aggression predicted elevated exclusion intercepts. However, aggression also predicted a decreasing exclusion trajectory after school entry. This descending slope is representative of nonrejected aggressive children because it only emerged as significant after rejection had been accounted for in the model.

Predicting exclusion from anxious solitary groups. To take a group approach to the prediction of exclusion trajectories, we distinguished anxious solitary groups from one another based on the stability of anxious solitude over time and presence of externalizing behaviors. Stable, variable, and offset anxious solitary groups; an anxious solitary externalizing group; and an externalizing group were identified (see Table 4 for mutually exclusive grouping criteria). Two thirds of the children in the anxious solitary externalizing group (the majority of whom were boys) also demonstrated relatively stable anxious solitude (top tertile at all times). The overall trajectory of all children in the sample is shown as the mean trajectory. No normative group was used as a predictor so that these children could fully contribute to the estimation of the mean trajectory against which all other groups were compared. Peer rejection (a continuous variable) was included in the group analysis of exclusion trajectories to examine the ability of group behavioral status to predict exclusion trajectories beyond the effects of rejection (this also made continuous and group exclusion analyses more comparable).

Results of the group analysis indicated that all anxious solitary groups (except the offset anxious solitary group) were significantly more excluded than the mean at school entry and became more excluded over time parallel to the mean trajectory, similar to the results obtained using continuous variables (see Table 3 and Figure 2). Furthermore, stable anxious solitary boys and anxious solitary externalizing children evidenced significantly more elevated exclusion than variable anxious solitary children ($t = 3.80, p < .001; t = 4.40, p < .001$), but they were not significantly different from each other ($t = 0.44, ns$). In contrast, the offset anxious solitary group did not differ from the mean at school entry and was the only group that did not show a substantial increase in exclusion over time. These results suggest that anxious solitary children who are excluded from school entry evidence more stability in their subsequent manifestation of anxious solitude, whereas initially anxious solitary children who do not become excluded in the early school years may be able to subsequently overcome their anxious solitude.

Similar to continuous analyses, in the group analysis of exclusion trajectories, anxious solitude predicted more elevated exclusion trajectories for boys than girls. Stable anxious solitary boys, but not stable anxious solitary girls, evidenced significantly
Table 4
Grouping Criteria, Group N, and Sex

<table>
<thead>
<tr>
<th>Group</th>
<th>Stability of anxious solitude</th>
<th>Early composites</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Anxious solitude</td>
</tr>
<tr>
<td>Anxious solitary externalizing&lt;sup&gt;b&lt;/sup&gt;</td>
<td>–</td>
<td>≥ 1 SD</td>
</tr>
<tr>
<td>Stable anxious solitary</td>
<td>Top quartile at all times</td>
<td>≥ 1 SD</td>
</tr>
<tr>
<td>Variable anxious solitary</td>
<td>Variable quartiles</td>
<td>≥ 1 SD</td>
</tr>
<tr>
<td>Offset anxious solitary</td>
<td>Top tertile K, bottom tertile 2nd–4th</td>
<td>&lt; 1 SD</td>
</tr>
<tr>
<td>Externalizing&lt;sup&gt;c&lt;/sup&gt;</td>
<td>–</td>
<td>&lt; 1 SD</td>
</tr>
</tbody>
</table>

Excluded groups used to predict anxious solitude trajectories

<table>
<thead>
<tr>
<th>Group</th>
<th>Stability of anxious solitude</th>
<th>Early composites</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Anxious solitude</td>
</tr>
<tr>
<td>Anxious solitary high exclusion externalizing&lt;sup&gt;b&lt;/sup&gt;</td>
<td>–</td>
<td>≥ 1 SD</td>
</tr>
<tr>
<td>Anxious solitary high exclusion&lt;sup&gt;b&lt;/sup&gt;</td>
<td>–</td>
<td>≥ 1 SD</td>
</tr>
<tr>
<td>Anxious solitary low exclusion&lt;sup&gt;b&lt;/sup&gt;</td>
<td>–</td>
<td>≥ 1 SD</td>
</tr>
<tr>
<td>Offset anxious solitary (low exclusion)</td>
<td>Top tertile K, bottom tertile 2nd–4th</td>
<td>&lt; 1 SD</td>
</tr>
</tbody>
</table>

<sup>a</sup> ≥ 1 SD aggression and/or ≥ 1 SD hyperactivity-distractibility.
<sup>b</sup>No distinction was made between stable and variable solitude to conserve sample size.
<sup>c</sup> ≥ 1 SD aggression and ≥ 1 SD hyperactivity-distractibility (aggressive-only and hyperactive-distractible-only groups were not listed because they were nonsignificant predictors after accounting for peer rejection).
elevated exclusion (the analysis was also performed with the stable anxious solitary group combined by sex, which also resulted in a significantly elevated intercept, but a lower intercept coefficient of .26 instead of .42). Though the size of the stable anxious solitary group was small after being broken down by sex, the reliability of sex differences in group analyses was supported by their similarity to the sex differences found in continuous analyses employing the whole sample (Anxious Solitude × Sex interaction). Although the risk for interpersonal difficulties may be more severe for anxious solitary boys than for girls, anxious solitary girls may also be at risk, albeit more moderate risk. Indeed, highly excluded groups counted girls among their members, and continuous analyses indicated mildly elevated exclusion trajectories for girls.

Results also indicated that the externalizing (aggressive and hyperactive-distractible) group demonstrated significantly elevated exclusion from school entry, but groups that were aggressive or hyperactive-distractible only did not differ significantly from the mean after rejection was accounted for.

Reverse Directionality: Predicting Anxious Solitude Trajectories

Predicting anxious solitude from the early exclusion composite. All three approaches to the prediction of exclusion trajectories from anxious solitude supported the early co-occurrence of anxious solitude and peer exclusion. Next, a test of reverse directionality was planned. Particularly because anxious solitude and peer exclusion appears to co-occur frequently from school entry, it is unclear whether anxious solitude contributes to peer exclusion over time, peer exclusion contributes to anxious solitude over time, or both processes occur in a bidirectional manner.

Because the preceding growth curve analyses predicted exclusion trajectories from anxious solitude, direction of effect was examined by reversing the position of the predictor and outcome variables in growth curve analyses. Thus, a continuous growth curve analysis was performed in which early exclusion predicted anxious solitude over time (controlling for rejection, aggression, and hyperactivity-distractibility to parallel the original model). Results indicated that high early exclusion predicted elevated anxious solitude at school entry and relative maintenance of elevated anxious solitude with a slight decrease parallel to the mean over time (see Table 5 and Figure 3). Also, high early exclusion predicted higher levels of anxious solitude for boys than for girls, as indicated by the Exclusion × Sex interaction (boys = 1, girls = −1).

Rejection was also entered in the analysis of anxious solitude trajectories, and results demonstrated the ability of peer exclusion to predict anxious solitude beyond peer rejection. Early rejection did not predict an elevated anxious solitude intercept at school entry, but did predict a small increase in anxious solitude over time. Externalizing
behaviors were also entered as predictors of anxious solitude to parallel the procedures employed for prediction of exclusion trajectories. Results indicated that high aggression predicted significantly less anxious solitude than the mean at school entry and the maintenance of low anxious solitude over time. These results are consistent with common findings indicating that the majority of aggressive children do not display anxious solitude. Hyperactivity-distractibility did not predict an anxious solitude intercept significantly different from the mean, but did predict a small linear increase in anxious solitude over time (coefficient = .03). Also, after the hyperactivity-distractibility linear term was entered, the linear slope predicted by rejection became nonsignificant. For this reason, the final model reported in Table 5 and Figure 3 was computed without hyperactivity-distractibility because it was more conceptually important to control for peer rejection.

**Predicting anxious solitude from excluded groups.** To perform a group analysis of anxious solitude trajectories, we formed four groups: high exclusion boys and girls and low exclusion boys and girls (see Table 4 for grouping criteria). Results indicated that both high-exclusion boys and girls demonstrated elevated anxious solitude at school entry (See Table 5 and Figure 4), in support of the early co-occurrence of anxious solitude and exclusion. These groups also demonstrated a small increase in anxious solitude parallel to the mean over time. It may be that anxious solitude increases over time only at extreme levels of exclusion (e.g., extreme levels in excluded groups) but that anxious solitude does not increase over time along a continuum of exclusion (as indicated by the continuous analysis). Similar to sex differences in the continuous analysis, group analysis indicated that high exclusion boys were significantly more anxious solitary than high exclusion girls (t = 2.60, p < .01). Rejection did not predict a significant anxious solitary trajectory after the high- and low-exclusion groups were modeled.

Perhaps most intriguing, low exclusion boys and girls did not differ significantly from the mean intercept at school entry and displayed decreased anxious solitude over time (the negative boys’ and girls’ slopes did not differ from each other significantly, t = .26, ns). Taken together with earlier analyses, results suggest that anxious solitary children who experience early exclusion may subsequently demonstrate greater stability in anxious solitude over time, whereas children who do not experience early exclusion may become less anxious solitary over time.

**Predicting Internalizing Trajectories**

The final central aim of this investigation was to predict children’s internalizing trajectories from early indicators of individual vulnerability (e.g., anxious solitude), interpersonal adversity (peer exclusion), and especially the joint effects of these two risk factors. In two-level HLM growth curve analyses, time was the Level 1 predictor of depressive symptoms, and variations in joint levels of anxious solitude and peer exclusion were Level 2 predictors of depressive symptoms over time. Based on the diathesis-stress hypothesis, it was expected that high anxious solitude in the context of high exclusion would predict the most elevated depressive symptom trajectories.

**Predicting depressive symptoms from early anxious solitude at high and low levels of exclusion.** As expected, in the continuous approach to this analysis, high early anxious solitude predicted more elevated depressive symptoms at kindergarten entry in the context of high exclusion rather than low levels of exclusion.
exclusion (see Anxious Solitude x Exclusion interaction intercept coefficient in Table 6 and Figure 5), lending support to the diathesis-stress model. High anxious solitude in the context of high exclusion predicted highly elevated depressive symptoms at kindergarten entry, whereas high anxious solitude in the context of low exclusion predicted only mildly elevated depressive symptoms at kindergarten entry. Both trajectories demonstrated a parallel increase in depressive symptoms throughout middle childhood. Boys, in comparison to girls, had a slightly higher depressive symptom intercept in kindergarten (because this sex difference was slight, the graph of these results in Figure 5 is not done by sex). An alternate version of this model can also be obtained, which demonstrates the main effect of exclusion and
a similar anxious solitude by exclusion interaction. In both the model shown and in this alternate model, children high in both anxious solitude and exclusion exhibited the most elevated depressive symptoms, whereas children who were high in either anxious solitude or exclusion but not both risk factors showed mild elevation in depressive symptoms.

**Predicting depressive symptoms from anxious solitary and excluded groups.** To perform an analogous group analysis of depressive symptom trajectories, we formed excluded and nonexcluded anxious solitary groups. An anxious solitary high exclusion group, anxious solitary high exclusion externalizing group, and anxious solitary low exclusion group were identified (see Table 4 for grouping criteria). No children in the offset anxious solitary group were excluded, so this group was not modified.

Consistent with the continuous analysis, the group analysis indicated that excluded anxious solitary children (both externalizing and nonexternalizing) displayed significantly more depressive symptoms than did nonexcluded anxious solitary children (both anxious solitary and offset anxious solitary children) at kindergarten entry (See Table 6 and Figure 6). The two anxious solitary excluded groups (externalizing and nonexternalizing) did not differ from each other significantly in depressive symptoms ($t = 1.22$, $ns$). Furthermore, the excluded anxious solitary groups maintained their high level of depressive symptoms over time, whereas both the nonexcluded anxious solitary groups displayed decreasing depressive symptoms over time. Neither of the nonexcluded anxious solitary groups was significantly different from the mean at school entry, and both decreased below the mean trajectory thereafter. Thus, both the continuous and group approaches to predicting depressive symptom trajectories support the diathesis-stress hypothesis that anxious solitude (individual vulnerability) predicts greater depressive symptoms in the context of high rather than low exclusion (interpersonal stress).

**Discussion**

The current study contributes to the existing literature on childhood social withdrawal by provid-
ing evidence that peer exclusion often occurs as early as kindergarten in anxious solitary children and may influence the stability of anxious solitude and risk for depressive symptoms over the course of middle childhood. Emphasis on the joint influence of anxious solitude (individual vulnerability) and peer exclusion (interpersonal adversity) yielded greater understanding of the interpersonal circumstances under which anxious solitary children either fare most poorly or improve over time.

**Early Onset of Exclusion**

Results of the current investigation indicated that peer exclusion not only occurred in anxious solitary
children, but also occurred earlier than would have been expected based on the majority of previous evidence. Results support the early co-occurrence of anxious solitude and peer exclusion in children at the first assessment, in the fall of kindergarten. These findings are consistent with the early-onset exclusion hypothesis that children who display anxious solitude at school entry may become excluded by peers rapidly thereafter. Furthermore, the early onset of exclusion suggests that early intervention may be particularly important, as the marginalized position of excluded children may become increasingly entrenched in peer-affiliation patterns and harder to modify with passing time.

Analyses indicated not only that anxious solitude predicted elevated exclusion at school entry, but also that this exclusion trajectory increased over time (parallel to the mean trajectory). Consequently, it may become increasingly easy to detect exclusion and related forms of interpersonal adversity as anxious solitary children progress through childhood. This may explain why negative peer evaluations (rejection) of solitary children have often been detected in the later years of middle childhood but not often found in younger solitary children (for exceptions, see Hart et al., 2000; Rubin & Clark, 1983).

Yet, based on the present results in which anxious solitude and exclusion co-occur at the first time point in the fall of kindergarten, it is difficult to make a definitive statement about direction of effect in regard to the initial manifestation of anxious solitude and peer exclusion in kindergarten. Previous evidence indicated that the quality of early parent–child relationships and early childhood temperament are related to subsequent anxious solitude among peers (see Renken et al., 1989; Rubin & Burgess, 2001), suggesting that anxious behavioral tendencies may precede the onset of exclusion at school entry. It may be that a “microgenetic,” sequential design in which frequent assessments are made during children’s first weeks of school entry would reveal that there is a more complex temporal pattern to the initial co-occurrence of anxious solitude and peer exclusion in the school setting. Assessment of anxious solitude and exclusion before kindergarten entry (e.g., preschool) may also be important in establishing temporal precedence. Though further investigation will be required to determine the initial anxious solitude–exclusion direction of effect at school entry, present results suggest that exclusion during the early school years influences whether children who display early anxious solitude continue in this pattern or overcome these tendencies over the course of elementary school.

**Diathesis Stress and Stability of Anxious Solitude**

Findings regarding the influence of early exclusion on the stability of anxious solitude can be conceptualized in a diathesis-stress framework summarized by the two following formulas: (a) individual diathesis (anxious solitude) + interpersonal adversity (peer exclusion) = continued individual diathesis over time (anxious solitude) and (b) individual diathesis (anxious solitude) — interpersonal adversity (peer exclusion) = diminished individual diathesis over time (anxious solitude). Anxious solitary children who experienced the greatest peer exclusion soon after school entry displayed the most stable anxious solitude from kindergarten through the fourth grade. Conversely, anxious solitary children who did not experience significant peer exclusion soon after school entry displayed decreased anxious solitude over time.

Taken together, these results suggest that the early exclusion of anxious solitary children may influence the subsequent stability of anxious solitude they exhibit. Anxious solitary children who do not encounter peer exclusion may be able to overcome their social fears because these fears have not been confirmed by their social experiences, allowing these children to gradually learn that they do not have cause to be fearful. On the other hand, anxious solitary children who encounter peer exclusion likely experience confirmation, persistence, and perhaps intensification of their social fears. Overall, these findings support the importance of peer treatment during the school years in determining whether children establish a stable trajectory of anxious solitude or overcome these tendencies over time. Furthermore, present findings suggest that developmental models of adjustment in anxious solitary children must include peer-related interpersonal stress and support during the school years as a major component, in addition to other components (temperament, attachment) and developmental periods (infancy, early childhood) that have received greater attention.

Results suggest that children who experienced the joint forces of anxious solitude and exclusion experienced the intensification of these difficulties over time, though results did not provide direct evidence of mutually exacerbating transactions. Children who displayed early anxious solitude, on average, became increasingly excluded over time, and there was evidence of modest increase in anxious solitude in extremely excluded groups of children. Moreover, results suggest that the joint
influence of anxious solitude and peer exclusion may contribute to risk for depressive symptoms.

**Diathesis Stress and Depressive Symptoms**

Findings regarding the joint influence of anxious solitude and peer exclusion on depressive symptom trajectories can be conceptualized in a diathesis-stress framework summarized by the two following formulas: (a) individual diathesis (anxious solitude) + interpersonal adversity (peer exclusion) = elevated internalizing difficulties over time (depressive symptoms) and (b) individual diathesis (anxious solitude) – interpersonal adversity (peer exclusion) = diminished internalizing difficulties over time (depressive symptoms). Anxious solitary children who experienced high levels of early peer exclusion demonstrated elevated depressive symptoms at the initial kindergarten assessment, and the maintenance or slight increase of these elevated levels from kindergarten through the fourth grade. This early onset of depressive symptoms in anxious solitary excluded children is novel in the existing literature, which typically has not found evidence of depressive symptoms until about the third grade (Hymel et al., 1990; Morison & Masten, 1991; Rubin & Mills, 1988; Straus et al., 1986). Conversely, anxious solitary children who did not experience early peer exclusion demonstrated no more depressive symptoms than other children soon after kindergarten entry and declining levels of depressive symptoms from kindergarten through the fourth grade. These findings support the importance of assessing risk for internalizing problems in solitary children on the basis of both individual (anxious solitude) and interpersonal or environmental factors (peer exclusion), and the findings illustrate the usefulness of the diathesis-stress model for conceptualizing the joint influence of these factors.

What mechanisms might be responsible for elevated depressive symptoms when anxious solitude and peer exclusion co-occur? Alloy et al. (1990) proposed a helplessness-hopelessness model suggesting that anxiety may contribute to later depression. In this model anxious individuals feel helpless: They worry that negative events will happen to them and doubt they will be able to cope with these events, but they are not sure that negative events will happen. Anxious solitary children may have worries such as “I don’t know if they’ll let me play. I don’t know what I’ll do if they say no.” In contrast, depressed individuals feel hopeless: They are sure that negative events will happen and doubt they will be able to cope effectively with these events. Anxious solitary children’s feelings of helplessness may transition into feelings of hopelessness when their worries are confirmed by peer exclusion as a concrete form of negative peer treatment (“The other kids never let me play. I don’t know what I’ll do when they say no.”). Thus, when peer exclusion confirms anxious solitary children’s social fears, it may engender modes of thinking and feeling that are linked to depression.

**Risk for Exclusion**

Given the apparent influence of exclusion on subsequent adjustment, what do the present findings suggest about which anxious solitary children are most at risk for peer exclusion? One approach to this question is to consider child characteristics, including child social behavioral characteristics and child sex. It has often been suggested in previous investigations that aggressive and active or immature solitary behaviors (e.g., Asendorpf, 1990; Rubin & Mills, 1988) may lead to peer exclusion, and present results indicating that hyperactivity-distractibility predicts moderate elevation in exclusion are compatible with this idea. Yet, present results also lend strong support to the contention that it is not just children who display acting-out behaviors who are at risk for peer exclusion. Both externalizing and nonexternalizing anxious solitary excluded children were identified as excluded across analyses, and both types of excluded children demonstrated more maladjustment than did their nonexcluded counterparts.

Moreover, early anxious solitude predicted elevated exclusion trajectories after accounting for rejection, as well as externalizing behaviors. Findings were consistent with the premise that attitudinal rejection partially mediates the relationship between anxious solitude and overt peer exclusion, but that anxious solitude contributes to risk for exclusion beyond its linkages with attitudinal peer rejection. These findings suggest that anxious solitary behaviors (shyness, verbal inhibition, elevated solitary behavior) contribute to risk for peer mistreatment because they signal vulnerability, as well as inspire peer dislike. There may be two parallel mediatitional processes at work in the relationship between anxious solitude and peer mistreatment: both vulnerability and rejection processes. Though it is often assumed that rejection is the primary motivation for peer exclusion and other forms of peer mistreatment, instrumental motivation to exclude others (such as enhancing one’s own status or reinforcing the boundaries of a friendship group) may be equally important in motivating peer
exclusion. The most opportune targets of instrumental peer maltreatment would appear to be vulnerable children.

Consistent with several other recent studies, the current findings suggest that there may be greater consequences of anxious solitude for boys than for girls, particularly in the interpersonal domain (e.g., Caspi, Elder, & Bem, 1988; Coplan, Gavinski-Molina, Lagace-Seguin, & Wichmann, 2001; Morison & Masten, 1991; Rubin et al., 1993). A number of factors may account for sex differences in apparent interpersonal outcomes of anxious solitude. Peers (as well as adults) may view social anxiety in boys as a violation of the male gender role that emphasizes self-assertion, self-defense, and interpersonal dominance. Additionally, social anxiety may interfere to a greater extent with patterns of male affiliation. The large peer group context typical of boys’ play may be especially difficult for anxious boys to tolerate. In contrast, anxious girls may be better able to tolerate the less threatening dyadic interactions typical of girls’ play (e.g., Maccoby, 1995). Nevertheless, it is important to note that anxious solitude was also predictive of elevated exclusion trajectories for girls, though to a lesser extent than for boys. Although current results suggest that interpersonal risk is less severe for girls than for boys, they also contradict the notion that anxious solitude poses no interpersonal risk for girls.

Another approach to understanding risk for peer exclusion is to consider characteristics of the environment. Because peer exclusion describes the orientation of the peer environment toward a child, characteristics of the child, though important, may be insufficient to fully explain exclusion. Rather, characteristics of the environment may also need to be considered to gain a more complete understanding of risk for exclusion. For instance, some classrooms may be relatively tolerant of peer exclusion, whereas others have explicit rules prohibiting exclusion, such as “you can’t say you can’t play” (Paley, 1992).

Limitations

The limitation of shared-method variance between early predictor and later criterion measures is lessened because information did not come from the same person (trajectories represent reports by five teachers over time), only someone in the same role (teacher). Nonetheless, certain biases may be associated with the role of teacher, and it will be important to replicate findings with different informants, such as peers, in future investigations. Similarly, teachers reported both anxious solitude and exclusion predictors. Different information must be contained in these indices for them to function as differential or contingent predictors of depressive symptom trajectories, but here again, multi-informant information will be important in the future. Additionally, although results involving groups of small sample size should be interpreted with caution, concordant findings from both continuous and group analyses lend confidence to the pattern of results, and group results are particularly valuable in presenting a person-oriented perspective. Finally, the depressive symptom scale was designed to capture symptoms of clinical depression (see Clarke et al., 1992), but it cannot be equated with clinical diagnosis.

In conclusion, the present findings indicated not only that there is a substantial co-occurrence of anxious solitude and peer exclusion, but that this co-occurrence occurs rapidly upon school entry and is significantly predictive of the stability of anxious solitude and severity of depressive symptom trajectories throughout middle childhood. In light of these findings, it is surprising that the co-occurrence of anxious solitude and peer exclusion has been overlooked for so long. Researchers have long called for methods for distinguishing solitary children at greater risk for serious interpersonal and internalizing problems from those at lesser risk, but this search has been impeded by the almost universal conceptualization of anxious solitude and peer exclusion as characteristics of two nonoverlapping types of solitary children. This state of affairs perhaps explains why so little attention has been given to the contribution of peer treatment to the social and emotional adjustment trajectories of anxious solitary children in middle childhood. Evidence from the present study demonstrated the potential of conceptual models that encompass the joint influence of individual vulnerability and interpersonal adversity in predicting longitudinal patterns of emotional difficulty in solitary children. Furthermore, results emphasized the importance of conceptualizing and measuring influences on emotional adjustment from a dynamic perspective—anxious solitary children’s emotional adjustment appears to be substantially affected by interpersonal influences that occur during the primary school years, as well as the early childhood years.

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