

Trajectories of Social Withdrawal from Middle Childhood to Early Adolescence

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Abstract Heterogeneity and individual differences in the developmental course of social withdrawal were examined longitudinally in a community sample ($N=392$). General Growth Mixture Modeling (GGMM) was used to identify distinct pathways of social withdrawal, differentiate valid subgroup trajectories, and examine factors that predicted change in trajectories within subgroups. Assessments of individual (social withdrawal), interactive (prosocial behavior), relationship (friendship involvement, stability and quality, best friend's withdrawal and exclusion/victimization) and group- (exclusion/victimization) level characteristics were used to define growth trajectories from the final year of elementary school, across the transition to middle school, and then to the final year of middle school (fifth-to-eighth grades). Three distinct trajectory classes were identified: *low stable*, *increasing*, and *decreasing*. Peer exclusion,

prosocial behavior, and mutual friendship involvement differentiated class membership. Friendlessness, friendship instability, and exclusion were significant predictors of social withdrawal for the *increasing* class, whereas lower levels of peer exclusion predicted a decrease in social withdrawal for the *decreasing* class.

Keywords Social withdrawal · Developmental trajectories · Friendship · Exclusion

The study of developmental psychopathology has characterized maladjustment as comprising two broad forms of difficulties—undercontrol (e.g., aggression) and overcontrol (e.g., social withdrawal; Mash and Barkley 2003). And yet, it remains the case that the developmental course of psychological overcontrol problems has received relatively less conceptual and empirical attention than that of psychological undercontrol problems. One example of such understudied psychological overcontrol difficulties is social withdrawal.

Social withdrawal may be defined as the consistent display of all forms of solitary behavior when encountering familiar and/or unfamiliar peers across situations and over time (Rubin and Asendorpf 1993; Rubin and Coplan 2004). Children characterized as socially withdrawn spend most of their time playing alone and on the periphery of the social scene, often due to shyness or social anxiety. Importantly, social withdrawal has been shown to be moderately stable from early through middle childhood (Hymel et al. 1990; Rubin et al. 1989, 1995) and from late childhood through early adolescence (e.g., Schneider et al. 1998). For example, in the *Waterloo Longitudinal Project*, Rubin and colleagues reported that *observed* social withdrawal (the aggregate of [unoccupied onlooker solitary play] among familiar peers) was stable from ages 5 to 9 years and that peer perceptions of social withdrawal (peer nominations for

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such items as *Someone who is shy* and *Someone who likes to play alone*) were stable between ages 7 years and 10 years (e.g., Hymel et al. 1990; Rubin et al. 1995). Data also revealed that approximately two-thirds of extremely socially withdrawn children maintained their status from ages 5 to 11 years across every 2-year period (Rubin 1993).

Beyond stability, social withdrawal has been identified as a risk factor for psychosocial maladjustment (for a recent review, see Rubin et al. 2003). To begin with, observed and peer- and teacher-reports of social withdrawal are contemporaneously associated with such negative, intrapersonal difficulties as low self-esteem, negative self-perceptions of social competence, and anxiety during middle and late childhood (e.g., Hymel et al. 1993; Rubin et al. 1993). Moreover, researchers have shown that social withdrawal during childhood predicts such internalizing problems in early adolescence as depression and loneliness (e.g., Boivin et al. 1995; Gazelle and Rudolph 2004; Gazelle and Ladd 2003; Rubin et al. 1995). Furthermore, social withdrawal is associated with, and predictive of, such interpersonal difficulties as peer rejection (e.g., Bowker et al. 1998), and victimization (Boivin and Hymel 1997).

Despite these well-documented psychological and peer difficulty correlates and consequences of social withdrawal, researchers have recently demonstrated that not all socially withdrawn children experience psychosocial and emotional difficulties or continue to remain highly socially withdrawn over time. Gazelle and Rudolph (2004), for example, reported that anxious-solitary youth displayed *increased* social approach in the context of *low* peer exclusion, suggesting that peer difficulty or the lack thereof may alter longitudinal trajectories of social withdrawal. Beyond this work, however, few longitudinal studies exist that chart the pathways of social withdrawal in childhood or that address developmental heterogeneity among individuals. Furthermore, most of the studies that do exist are largely focused on the early years (e.g., Gazelle and Ladd 2003) or involve, at best, only two or three assessments during childhood, and use variable-oriented rather than person-oriented approaches (Gazelle and Rudolph 2004; Rubin et al. 1995). The one exception is a recent study by Booth-LaForce and Oxford (2006, submitted), in which distinct trajectory patterns of social withdrawal from early childhood (first grade) to early adolescence (sixth grade) were identified, predicted by early temperament, insensitive parenting styles, and attachment, and related to varying psychosocial and emotional outcomes. Specifically, children whose social withdrawal increased over time (compared with those whose withdrawal decreased or who were never withdrawn) were more lonely, depressed, victimized, and excluded by peers. Because this aforementioned study focused on younger children, it is important to examine the

issue of developmental heterogeneity among older children and adolescents, particularly since the strength of associations between social withdrawal and indices of psychosocial maladjustment increase with age (Rubin et al. 2003).

Hinde (1987) has argued that social development is best considered from a multi-level perspective that includes individual characteristics, social interactions, relationships, and groups. Although it is clear that peer acceptance or rejection at the group level of social complexity can ameliorate or exacerbate difficulties associated with social withdrawal during mid-to-late childhood (e.g., Gazelle and Rudolph 2004; Hymel et al. 1990), few researchers, if any, have targeted the friends of withdrawn children at the relationship-level as a potentially significant developmental force. To address this research gap and to examine the significance of Hinde's (1987) multi-levels of influence on the development of social withdrawal, in the present study we examined distinct pathways of social withdrawal during the transition from elementary-to-middle school and then through the years of middle school; we further investigated the extent to which multi-level covariates of individual, interactional (prosocial behavior), relationship- (friendship), and group-level (peer exclusion/victimization) factors ameliorated or exacerbated the course of social withdrawal. To this end, this set of interactional, friendship and group-level covariates was explored in relation to both the levels of social withdrawal in middle childhood (i.e., the intercept) and the rates of change over time across early adolescence (i.e., the slope).

Social Withdrawal, and Individual Characteristics, Friendship, and Peer Exclusion/Victimization

From a social motivation viewpoint (e.g., Asendorpf 1993), individuals' tendencies to engage in social interaction may be constrained by such internal mechanisms as anxiety, fear or social disinterest. Growing evidence suggests that these social orientations may result in diverging pathways depending on the peer environments that each individual experiences. As noted previously, Gazelle and Rudolph (2004) found that children who were socially anxious and withdrawn developed distinct trajectories of social approach and social avoidance depending on the degree to which they experienced peer exclusion. Specifically, anxious-solitary youth increased social approach, demonstrating more prosocial behavior when they experienced less peer exclusion; when they encountered considerable peer exclusion, social avoidance and the display of helpless behavior resulted. It is also the case that children who display prosocial behavior are regarded by peers, parents, and teachers as more popular, socially competent, and well-adjusted than those who are aggressive and disruptive (see

Rubin et al. 2006a for a recent review). As such, the display of prosocial behaviors may play an important role in determining longitudinal trajectories of social withdrawal. In contrast to the effects of peer exclusion, one might expect *decreasing* withdrawal for those children who exhibit prosocial behavior.

Moving to the relationship level, friendships have long been viewed as significant sources of social support in individual growth and development (e.g., Sullivan 1953). Much of the research supporting this view emanates from studies of friendless children. For instance, friendless children are more likely to be lonely and victimized by peers than those children who have friends (Brendgen et al. 2000; Kochenderfer and Ladd 1996). And Hodges et al. (1999) reported that victimization by peers predicted increases in internalizing and externalizing problems across the school year *only* for those children who lacked a mutual best friendship. Despite the reported relations between friendlessness and peer rejection and victimization, it is certainly the case that not all friendless children experience peer exclusion or victimization (Ladd and Troop-Gordon 2003). Accordingly, it could be that friendlessness and peer rejection or exclusion have markedly different effects on adjustment trajectories.

Approximately 60-to-65% of socially withdrawn 8-to-11 year olds are known to have a mutual best friend (Schneider 1999; Rubin et al. 2006b); this is similar to the prevalence of friendship among non-withdrawn children and young adolescents (Rubin et al. 2006b). Moreover, the social support of a high-quality *stable* friendship has been shown to be helpful for children during times of school transition (e.g., Berndt et al. 1999). Yet, the extent to which the presence of a mutual stable friendship is helpful for withdrawn children is unknown. Thus, in the present study, we examined the significance of friendship involvement and stability as it may affect trajectories of social withdrawal.

When considering the possible influence of friendship on adjustment, it is important to consider the characteristics of friends and similarities between friends (e.g., Haselager et al. 1998). Researchers have shown that there are greater similarities between friends than non-friends in terms of social withdrawal (Rubin et al. 2006b), shyness (Haselager et al. 1998), and shared internalized distress (Hogue and Steinberg 1995). Yet, whether having a friend who shares behavioral characteristics known to be associated with maladaptation serves an ameliorative or exacerbating function is heretofore largely unknown. Drawing from the literature on deviancy training among aggressive youth (e.g., Dishion et al. 1996), keeping company with maladjusted friends may augment rather than ameliorate maladjustment. Withdrawn children and their best friends have

been found to be more victimized than non-withdrawn children and their best friends, suggesting that friendships may not be protective when best friends share maladaptive behavioral similarity (Rubin et al. 2006b). In the present study, the characteristics of the child's best friend were examined with reference to the role of friendship on developmental *trajectories* of social withdrawal for those who had identifiable mutual friendship.

Lastly, it has been suggested that friendships of high quality can buffer, or protect children from negative outcomes (e.g., Parker and Asher 1993). There is evidence, however, that indicating that the friendships of socially withdrawn children are lower in relationship quality than those of non-withdrawn children. For example, Rubin et al. (2006b) found that withdrawn 10-year-old children reported their best friendships as significantly less fun, helpful and intimate than non-withdrawn children; their friendships were perceived as being less likely to lead to the resolution of conflict than those of their non-withdrawn age-mates. Both withdrawn children and their best friends rated their friendships to be lower in overall quality than their non-withdrawn counterparts and the best friends of non-withdrawn children. In light of these findings, it is reasonable to query whether friendship quality can influence or modify individual trajectories of social withdrawal over time. The present study is the first to consider this possibility. It is also the first to examine whether individual variations of social orientation, the demonstration of socially competent behavior, and the experience of peer exclusion and victimization individually and collectively predicted varying developmental trajectories of social withdrawal.

Overview of the Present Study

In summary, the purposes of the present study were threefold. First, we sought to identify trajectories of social withdrawal from elementary school to middle school in a large community sample. Specifically, we followed children as they made a transition from the familiar milieu of their elementary schools into larger, unfamiliar middle schools. Given that accompanying (and defining) characteristics of social withdrawal in mid-to-late childhood are shyness and social anxiety (Rubin et al. 2003), a school transition was posited to be especially stressful for those children who were socially withdrawn as elementary schoolers (Barber and Olsen 2004). We employed General Growth Mixture Modeling (*GGMM*) to examine whether there are distinct trajectory patterns of social withdrawal across this school transition and thereafter, through the middle school years.

Second, we examined a set of covariates to determine whether distinct factors are predictive of class membership and to evaluate the class-specific associations among interactional, relationship, and group-level factors and the development of social withdrawal for different classes. Thus, our goals were to (a) identify those factors that predict distinct trajectory class membership, and (b) examine factors that buffer or exacerbate developmental pathways of social withdrawal (i.e., intercept and slope) *within* class across the transition from elementary-to-middle school.

Third, in a final set of analyses, we focused specifically on children who had a mutual best friendship after the transition from elementary-to-middle school (i.e., fall semester of grade 6). We did so to investigate the extent to which specific individual characteristics of the best friend (the best friend's social withdrawal, peer exclusion and victimization), and the quality of the friendship affected trajectories of social withdrawal.

Given the general lack of research on the developmental trajectories of social withdrawal, we relied on the extant literature to derive our hypotheses. Despite evidence that extremely withdrawn children are likely to remain withdrawn throughout childhood (e.g., Rubin et al. 1995; Schneider et al. 1998), we posited that considerable heterogeneity in the developmental pathways of social withdrawal would be evinced in analyses of intrapersonal change. Booth-LaForce and Oxford (2006, submitted) found three distinct trajectories of social withdrawal (characterized by increasing, decreasing, and low-stable patterns) from first-to-sixth grades in the only other study investigating heterogeneity in developmental patterns of social withdrawal; consequently, we anticipated that we might discover similar patterns in the present study.

Additionally, we predicted that, in general, the presence of a mutual friendship would ameliorate social withdrawal over time. Specifically, the existence of a reciprocal best friendship in sixth grade, the year during which the transition from elementary school occurred, was posited to have a significant impact on the rate of change in social withdrawal over time. Also, it was predicted that for those children whose best friends were also socially withdrawn, their own development of social withdrawal would be exacerbated over time. Moreover, we posited that a supportive friendship would ameliorate social withdrawal during the transition from elementary-to-middle school. Lastly, we hypothesized that if children were viewed by their peers as helpful and prosocial, they would evidence a decrease in social withdrawal; alternately, if the peer group excluded and victimized the child, we hypothesized that there would be an increase in social withdrawal over time. Given evidence that the consequences of social withdrawal are greater for boys than

girls (Rubin and Coplan 2004), sex was included as a control variable in each set of analyses.

Method

Participants

Participants were drawn from a larger longitudinal sample of fifth-grade students ($N=556$ children, 271 girls) from 26 classrooms in eight public elementary schools in the Washington DC Metropolitan Area, for whom written parental permission was received (consent rate=84%). The mean age of the sample at the start of the study (fall, fifth grade) was 10.23 years ($SD=0.48$); males, $M=10.23$ years ($SD=0.45$) and females, $M=10.21$ years ($SD=0.51$). As they moved to middle school (sixth grade), we followed the participants longitudinally and administered the questionnaires described below. Available demographic school information indicated similar county-wide ethnic and racial compositions of the elementary (40% Caucasian, 22% Hispanic/Latino, 22% African American, 15% Asian American) and middle schools (43% Caucasian, 19% Hispanic/Latino, 23% African American, 15% Asian American). Based on mutuality of friendship nominations, pairs of friends in the sixth grade were invited to visit a laboratory at a large public university to complete an additional battery of questionnaires, including those pertaining to friendship quality and support. Of the original 556 participants, 446 children remained in the longitudinal study, participating in at least three waves of in-school assessment (attrition rate: 19%). The final sample for this study comprised 392 children (202 girls) who contributed data for variables after handling missing data with General Growth Mixture Modeling (*GGMM*) which allows partial participation in trajectory variables (i.e., social withdrawal), but not predictor variables. To examine the possibility of attrition biases, the final sample of 392 participants was compared with those who participated in fewer than three time points. Logit analysis, a common method of detecting attrition bias (Miller and Wright 1995), was performed to estimate the probability that the first wave respondents would participate in later waves and remain in the study. Results revealed no significant differences between longitudinal participants and those who dropped out of the study in terms of sex of participant, friendship involvement, friendship stability, prosocial behavior, peer exclusion and victimization in the fall of fifth grade. Additional details with reference to the sample size for each variable are presented below in the “*Statistical Methodology and Data Analytic Plan*” section. A follow-up analysis of the Latent Growth Curve Modeling (LGCM) was conducted for the

subgroup of participants (i.e., *friended* group) who had an identifiable mutual friend after the school transition as well as friendship predictor covariate data ($n=262$).

Procedure

During the fall (November or December) and spring (April or May) semesters of the fifth and sixth grades and during the spring of eighth grade (April or May), participants completed a battery of group-administered questionnaires in their classrooms. The questionnaires identified the children's best friends in the school, and the behavioral characteristics of each participant. In addition, data on perceived friendship support were obtained from the sixth grade participants with mutual best friends during laboratory visits, which typically occurred between the fall and spring school assessments.

School Measures

Friendship Nominations Participants were asked to write the names of their "very best friend" and their "second best friend" at their school (Bukowski et al. 1994). Children could only name same-sex friends in their grade, and only *mutual* (reciprocated) *best* friendships were subsequently considered. Children were considered "best friends" if they were each other's very best or second best friend choice. This procedure was identical to that used in many other studies of best friendship (e.g., Parker and Asher 1993; Rubin et al. 2006b). Although children could nominate any same-sex child in their grade as a best friend, only participating children completed the friendship nominations; it was impossible to determine whether a friendship was reciprocated when a nonparticipating child was identified as a best friend. Therefore, only identifiable mutual friendships were considered herein; the consideration of the "very best" and "second best" friendship choices was necessary to ensure sufficient power for the data analyses. Friendship involvement data (the presence or absence of a mutual best friendship) in the fall of the fifth and sixth grades (after the school transition) were of particular interest. We also examined friendship involvement data in the spring of the fifth grade to determine friendship stability during the fifth grade.

Extended Class Play (ECP) Following completion of the friendship nomination questionnaire, participants completed an extended version of the Revised Class Play (RCP; Masten et al. 1985; Wojslawowicz Bowker et al. 2006). The children were instructed to pretend to be the directors of an imaginary class play and to nominate their classmates for various roles. Similar to the original RCP procedure, grade 5 children were

instructed to nominate one boy and one girl within their classroom for each role. To adjust for an increased number of peers and changes in classroom that occur throughout the day, grade 6 and 8 children could nominate up to three same-sex and three opposite-sex peers across the entire grade for each role. In all grades, only nominations for participating children were considered, and to eliminate possible sex-stereotyping, only same-sex nominations were utilized (Zeller et al. 2003). All item scores were standardized within sex and within classroom (fifth grade) or within grade (sixth, eighth) in order to adjust for the number of nominations received and also the number of nominators.

Items were added to the original RCP to more fully capture different types of aggression (e.g., *Someone who spreads rumors*), assess peer victimization (e.g., *Someone who is hit/kicked*), and better distinguish between active isolation (e.g., *Someone who is often left out*) and social withdrawal (e.g., *Someone who prefers to be alone*). An exploratory principal components factor analysis with varimax rotation yielded five orthogonal factors (in contrast to the RCP's three broad factors of Aggressive/Disruptive, Sensitive/Isolated, and Sociability/Leadership): Aggression, Withdrawal/Shyness, Exclusion/Victimization, Prosocial Behaviors, and Popularity/Sociability. The standardized item scores were summed to yield five different total factor scores for each participant. Only the subscale scores for the constructs of withdrawal (items "*A person who hardly ever starts up a conversation*", "*Someone who talks quietly or rarely*," "*Someone who is very shy*", and "*Someone who gets nervous about group discussion*") at all five data points, and exclusion/victimization and prosocial behavior in the fall of fifth and sixth grades were used herein. Internal consistency (Cronbach's alphas) for these factors were as follows: Withdrawal/Shyness (4-items): grade 5 fall:.83; grade 5 spring:.87; grade 6 fall:.85; grade 6 spring:.91; grade 8 spring:.90; Exclusion/Victimization (8-items): grade 5 fall:.88, grade 6 fall:.94; and Prosocial Behaviors (6-items): grade 5 fall:.82, grade 6 fall:.88. Detailed psychometric and factor analytic information has been reported elsewhere (Rubin et al. 2006b), along with results from confirmatory factor analyses that supported the five-factor model in the fifth and sixth grades (Wojslawowicz Bowker et al. 2006). For example, teacher-reports of shy and anxious behaviors distinguish between withdrawn and non-withdrawn children who were identified by the ECP measure (Rubin et al. 2006b).

Laboratory Measures (Sixth Grade Only)

Network of Relationship Inventory (NRI) The NRI was used to assess adolescents' perceptions of friendship support

(Furman and Buhrmester 1985). The 30-item Likert-type questionnaire yields 11 subscales that load on four factors: (1) *social support* (companionship, instrumental help, intimacy, nurturance of the other, affection, reliable alliance, enhancement of worth), (2) *satisfaction*, (3) *negativity* (punishment, conflict, relative power), and (4) *relative power* (Furman 1996). Only the social support subscale was used in this study ($\alpha=0.88$). Reliability and validity of this measure has been previously established (see Furman 1996).

Friendship Quality Questionnaire-Revised (FQQ) The *FQQ* was used to assess the young adolescents' perception of the quality of their dyadic-relationship with their best friend (Parker and Asher 1993). The 40-item Likert-type questionnaire yields six subscales in the areas of companionship and recreation, validation and caring, help and guidance, intimate disclosure, conflict and betrayal, and conflict resolution (α s=0.73–0.90); higher scores indicated greater perceived friendship quality or higher levels of conflict. The positive *FQQ* sub-scales were highly correlated (range: $r=0.36$ to $r=0.74$). Thus, in keeping with the procedures recommended by Parker and colleagues (e.g. Parker and Asher 1989), only the total positive *FQQ* score (the total of companionship and recreation, validation and caring, help and guidance, intimate disclosure) was used in this study.

The correlation between the two indices of perceived friendship quality (*NRI* friendship support score and the *FQQ* total positive score) was $r=0.62$, $p<0.001$. Thus, a composite friendship quality score was created to prevent a statistical violation of independence assumptions using the positive *FQQ* and *NRI* social support scores; this centered composite score was included in the *GGMM* model as a covariate.

Statistical Methodology and Data Analytic Plan

A person-oriented approach to data analysis was used in the present study to examine individual differences as well as heterogeneity in development. This approach is useful with longitudinal research designs where data often include heterogeneous subgroups of individuals. A General Growth Mixture Model (*GGMM*) approach was employed to examine the pathways of individual social withdrawal trajectories with the goal of determining optimal class membership and intra-personal growth for each individual by estimating latent variables (i.e., the intercept and slope) based on multiple repeated indicators. *GGMM* also allows investigation of the possibility of heterogeneity; in this case, testing whether the population was constructed of two

or more distinct subgroups that follow similar longitudinal mean pathways of social withdrawal. Data analysis was conducted using *Mplus Version 3.12 and 4.0* (Muthén and Muthén 2004, 2006).

Missing Data In this study, models were estimated using the *Mplus* statistical program which uses a full-information maximum-likelihood (FIML) estimation. This procedure allows partial data on the trajectory variables (i.e., social withdrawal), but not missing data on predictor variables (Muthén and Shedden 1999). Of 446 participants with partial data, complete data on predictor variables were available for 392 children: 17 children (3%), 9 children (2%), and 37 children (8%) were missing data for fifth grade friendship involvement, fifth grade friendship stability, and sixth grade friendship involvement after the school transition, respectively. The *Mplus* software program uses a FIML estimation operating under the assumption that data are missing at random (*MAR*). *MAR* assumes that the reason for missing data is either random or random after incorporating other variables measured in the study (Arbuckle 1996; Little 1995).

Results

The results are presented in two parts. First, we describe varying developmental trajectories of social withdrawal and the predictors of varying class membership. We also describe factors that predicted initial status as well as growth within class (i.e., the predictors of the intercept and slope within each class); specifically, we describe interactive, relationship, and group-level factors. Second, for those participants who had a mutual best friendship when they made the transition from elementary-to-middle school (fall semester, grade 6), we examined the relations between a variety of friendship constructs and the developmental pathways of social withdrawal.

Model testing was used to determine growth patterns of social withdrawal, the number of distinct class trajectories, and the relations with covariates from the fall of fifth grade *for the initial level* and from the fall of sixth grade *for the rate of growth*. To evaluate which model best fit the growth pattern for the whole sample, intercept-only, intercept+linear, and intercept+linear+nonlinear (quadratic) growth models were fit to the data. The intercept+linear growth model was selected as the baseline model given that it appeared to provide the most parsimonious fit to the data. During the estimation of mixture models, 500 different random start values were initiated to ensure that maximum likelihood (ML) estimation searches for a global maximum

solution and prevent local maximized solutions that ML estimation may have when the estimation algorithm searches for an optimum solution.

Based on the intercept+linear growth model, *GGMM* tested whether the entire sample consisted of two or more distinct subgroups that have different patterns of social withdrawal trajectories. We estimated fit indices for one-to-four classes (see Table 1). Models with different numbers of latent classes were compared to evaluate which model provided the best fit to the data. Because models with different numbers of classes are not nested, a model comparison was conducted using a series of fit indices such as the Bayesian Information Criterion (*BIC*; Schwarz 1978), the sample size adjusted *BIC* (*SSA BIC*; Sclove 1987), and the Akaike Information Criterion (*AIC*; Akaike 1987). Lower scores represent better fitting models. Entropy refers to the average classification accuracy in assigning individuals to classes; values range from 0 to 1, with higher scores reflecting a better accuracy in classification of class membership. As shown in Table 1, the model fit improved when more latent classes were included. However, the Lo-Mendell-Rubin (*LMR*) likelihood ratio test of model fit indicated that the increment of estimate from a model with three classes to a model with four classes was not significant ($p=0.1905$). Thus, the three-class model was chosen as optimal in that it best balanced goodness-of-fit and parsimony.

Heterogeneity of Trajectory Patterns and Latent Class Membership

Growth patterns of developmental trajectories, characteristics of class membership, and associations between a set of covariates and class trajectories are described in this section. Three distinct trajectory classes of social withdrawal were identified: (1) A *low-stable* social withdrawal trajectory, consisting of 333 children (84.9% of the sample) whose social withdrawal scores started low in the fall of grade 5 and remained low throughout elementary (grade 5 fall and spring) and middle school (grade 6 fall and spring; grade 8 spring); (2) a *decreasing* social withdrawal

trajectory, comprising 30 participants (7.7% of the sample) who exhibited the highest level of social withdrawal in the fall of grade 5 and decreased thereafter through to the eighth grade; and (3) an *increasing* trajectory, comprising 29 participants (7.3% of the sample) whose social withdrawal scores were relatively high in the fall of grade 5 (i.e., higher than the low-stable class and lower than the decreasing class), became increasingly withdrawn through to the eighth grade, and eventually displayed the highest level of social withdrawal in that latter grade. Model-estimated means and mean trajectories for the three-class general growth mixture solution are presented in Fig. 1. The estimated linear mean trajectories fitted mean class trajectories reasonably well. Latent class descriptive statistics of covariates included in the analysis are presented in Table 2.

Of interest was the extent to which factors (a) differentiated class membership and (b) predicted both the initial status and growth of social withdrawal within each class. Thus, the analyses allowed an examination of both ameliorating and exacerbating factors vis-à-vis the development of social withdrawal. Results revealed class-specific predictors for the three distinct patterns of developmental trajectory. We found that some constructs predicted class membership and growth within class, whereas others only predicted growth within a given class.

Predictors of Latent Class Membership

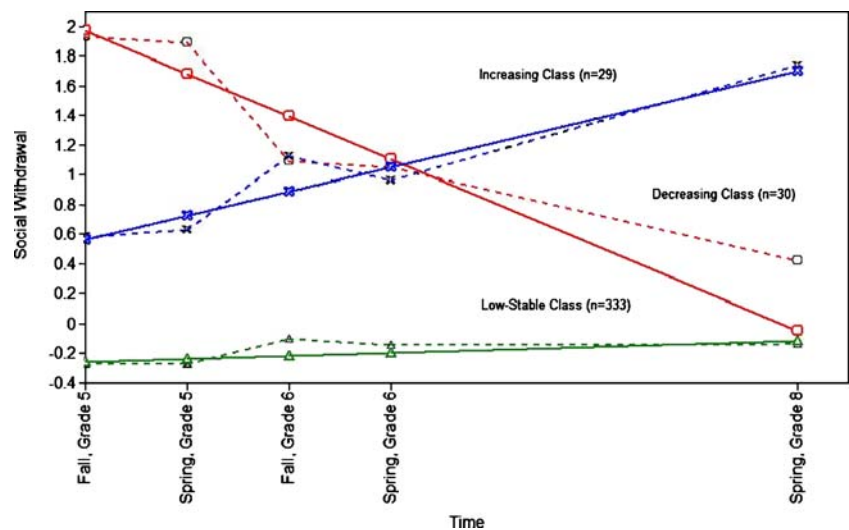
Given our interests in the multi-level complexity of children’s social world, interactive (prosocial behavior in the fall of grades 5 and 6), relationship (friendship involvement in the fall of grades 5 and 6; friendship stability during grade 5) and group-level (peer exclusion/victimization in the fall of grades 5 and 6) factors were included in model-building as a means of improving model fit and accuracy of assignments of individuals to valid classes (Muthén 2003). Because a major goal of the study was to identify factors that related to a transition period wherein children moved from elementary to middle school, we defined the growth function (i.e., slope) with middle school entry (sixth grade,

Table 1 Model comparison

Class	Loglikelihood	#of parameter	BIC	SSA BIC	AIC	Entropy	LRT p-value for k^{-1}
1 (growth model)	-7,861.350	19	15,838.521	15,778.223	15,760.700	–	–
2	-1,657.426	38	3,541.761	3,421.188	3,390.853	0.921	0.0986
3	-1,562.072	57	3,464.507	3,283.648	3,238.145	0.935	0.1291
4	-1,490.388	69	3,392.794	3,173.859	3,118.777	0.974	0.1905

BIC Bayesian information criterion; *SSABIC* sample-size adjusted BIC; *AIC* Akaike information criterion; *LRT* Loglikelihood ration test; *Entropy* classification accuracy in assigning participants to classes

Fig. 1 Mean class trajectories (dashed lines) and fitted mean trajectories (solid lines) for social withdrawal



fall semester) covariates including prosocial behavior, friendship involvement (presence or absence), peer exclusion/victimization as well as the previous school year's (fifth grade) stability of friendship. Sex of child was included in the model as a control variable.

Latent class membership and growth parameters were simultaneously regressed on a set of covariates. Then, multinomial logistic regression analyses were conducted to test which predictors discriminated class membership. This required designating one of the classes as a reference group and predicting the probability of class membership in a given group versus the reference group. To allow for the examination of the associations between the covariates and changes in social withdrawal, the *low-stable* class was chosen as the reference group.

Results revealed that peer nominations of both prosocial behavior and peer exclusion/victimization in grade 5 uniquely discriminated both the decreasing and increasing classes from the *low-stable* class. Relative to the *low-stable* class, children with high initial levels of peer exclusion/victimization (est.=1.260, $SE=0.294$) and prosocial behav-

ior (est.=1.061, $SE=0.289$) in the fall of fifth grade had a greater probability of being in the *decreasing* class, in which the trajectory started out at the highest level of social withdrawal in the fall of grade 5 and gradually decreased over time. These same constructs (exclusion/victimization and prosocial behavior), as assessed in the fall of fifth grade, also predicted a greater likelihood of being in the *increasing* class, relative to the *low-stable* class (est.=1.203, $SE=0.344$; est.=0.875, $SE=0.341$, respectively).

Exclusion/victimization after the transition from elementary-to-middle school (i.e., fall, grade 6) marginally differentiated the *increasing* trajectory pattern from that of the *low-stable* reference group, suggesting that peer exclusion and victimization *after* the school transition may be a unique risk factor for being in the *increasing* class membership, relative to the *low-stable* class (est.=0.333, $SE=0.207$). Friendship involvement in the fall of sixth grade (after the middle school transition) differentiated the *increasing* class from both the *low-stable* and *decreasing* classes when the decreasing class was designated as a reference group (est.=2.000, $SE=0.790$; est.=1.827,

Table 2 Descriptive statistics for covariates across three trajectory classes

Covariates	Increasing		Decreasing		Low stable	
	Mean/%	SD	Mean/%	SD	Mean/%	SD
Sex (Female)	62.1%		46.7%		51.1%	
Prosocial Behavior (fall, G5)	0.56	1.04	0.38	0.90	-0.03	0.69
Friendship Involvement (fall, G5)	75.9%		63.3%		65.2%	
Peer Exclusion/Vic (fall, G5)	0.26	0.91	0.44	0.91	-0.13	0.59
Prosocial Behavior (fall, G6)	0.26	0.77	-0.02	0.62	0.11	0.84
Friendship Involvement (fall, G6)	89.7%		66.7%		62.2%	
Friendship Stability (fall to spring, G5)	41.4%		53.3%		39.0%	
Peer Exclusion/Vic (fall, G6)	0.49	1.31	0.13	0.71	0.02	0.84

$SE=0.868$, respectively), indicating that having a reciprocal friend after the school transition predicted a *greater* likelihood of being in the *increasing* class, relative to the low-stable or decreasing classes. This particular finding was further investigated below with regard to the friendship factors.

Predictors of Initial Status and Growth within Class

All of the predictors, with the exception of friendship involvement in the fifth grade, were significantly associated with within-class growth (Table 3).

The Increasing Trajectory Class For children in the *increasing* group, exclusion/victimization predicted the initial level of social withdrawal in the fifth grade (this class trajectory started at a moderately high initial level of social withdrawal relative to the other two groups). An unstable friendship in the fifth grade and the absence of a mutual best friendship in the sixth grade were found to exacerbate this group’s social withdrawal over time. Greater prosocial behavior after the school transition in the fall of grade 6 also predicted increased growth of withdrawal over time.

The Decreasing Trajectory Class Children in the *decreasing* trajectory of social withdrawal actually entered the study at the highest level of withdrawal relative to the children in the other two trajectories. Significantly, if the children in this group experienced less exclusion and victimization *after* the school transition, they were more likely to show a decrease in social withdrawal over time. There was no significant predictor of initial status for this class.

The Low-Stable Trajectory Class As expected, a substantial proportion of the participants (85%) displayed a consistently low level of social withdrawal over time without any notable growth. Yet, in terms of within-class initial status for the *low-stable* class, those who experienced greater peer exclusion/victimization and exhibited more prosocial behavior were more likely to evidence higher initial social withdrawal in the fifth grade. There was no significant predictor for within-class growth for this class.

Friendship Factors as Buffers or Exacerbators of Social Withdrawal

As noted previously, results from analyses predicting latent class membership indicated that children who had a mutual friendship after the transition from elementary-to-middle school were more likely to be in the *increasing* trajectory class, relative to the *low stable* and *decreasing* classes, suggesting that friendship involvement may have a different impact on children’s behavior depending on class membership. To better understand this unexpected finding, we attempted to distinguish between friendships that may serve as buffers and those that serve as exacerbators of maladjustment after the participants made the transition from elementary-to-middle school. To do so, we performed follow-up analyses (Latent Growth Curve Modeling) to examine the trajectory of social withdrawal with an expanded set of relationship-level friendship variables as covariates. The friendship covariates were included to examine the influence of friendship factors on both the initial level of social withdrawal and on changes over time. These analyses focused on those children who had a mutual

Table 3 Parameter estimates for three-class GGMM model with covariates

Parameter	Increasing class		Decreasing class		Low stable class	
	Estimate	SE	Estimate	SE	Estimate	SE
Intercept						
Sex	0.829	0.264	0.709	0.382	-0.071	0.044
Prosocial behavior (G5 fall)	0.208	0.143	0.077	0.124	0.117***	0.031
Friendship involvement (G5 fall)	0.010	0.214	-0.264	0.337	0.004	0.041
Peer exclusion/Vic (G5 fall)	0.371**	0.138	-0.116	0.133	0.163***	0.037
Slope						
Sex	-0.368***	0.058	-0.015	0.088	0.009	0.010
Prosocial behavior (G6 fall)	0.043*	0.022	0.094	0.050	0.002	0.005
Friendship involvement (G6 fall)	-0.621***	0.134	-0.075	0.105	-0.012	0.010
Friendship stability (G5)	-0.247***	0.053	-0.079	0.095	0.006	0.010
Peer exclusion/Vic (G6 fall)	-0.003	0.014	0.292***	0.066	0.009	0.007

* $p=0.05$
 ** $p<0.01$
 *** $p<0.001$

best friendship after the transition from elementary-to-middle school (65% of the sample).

The expanded set of friendship covariates included the reciprocal best friend's own initial level of social withdrawal at the outset of the study (fall, grade 5), the best friend's own level of exclusion/victimization and withdrawal at middle school entry (fall, grade 6), and the target child's perception of friendship quality in the sixth grade. It is important to note that the best friend at middle school entry was not necessarily the focal child's best friend during the fifth grade. Because the index of friendship quality was available for only a subset of the total sample, only those participants who had an identifiable mutual friend and relevant data for the friendship covariates were included in the further analysis; the listwise deletion method was used ($n=262$).

The Friendled Group: Predictors of Initial Status and Growth Over Time To examine why some children start at a higher initial level of social withdrawal (i.e., intercept) and change (i.e., slope) more or less than others, the LGCM was performed. The variances of the intercept and slope were 0.704 ($z=10.209$) and 0.065 ($z=9.414$), respectively; both are significantly different from zero, showing that there were significant individual variations of initial status and growth on social withdrawal. The overall fit indices for the latent growth curve model with the friendship covariates indicated that this model did fit the data relatively well, $\chi^2(29)=95.76$, $p<0.001$; comparative fit index (CFI)=0.909, Tucker-Lewis Index (TLI)=0.891, root mean square error of approximation (RMSEA)=0.094 (with 90% confidence interval of 0.073, 0.115); Akaike (AIC)=5,724.52. This model had a better fit than the interaction model that included the identical friendship covariates *plus* an interaction variable between friend's social withdrawal and perceived friend's support examining the potential interactive effect of friendship quality and the degree of social withdrawal, $\chi^2(33)=106.97$, $p<0.001$; CFI=0.901, TLI=0.880, RMSEA=0.092 (with 90% CI of 0.073, 0.112); AIC=55,872.29.

Although friendship quality and the best friends' level of exclusion/victimization were not significant predictors of growth, the reciprocal friends' levels of social withdrawal both in grades 5 and 6 were significantly and positively related to the intercept (grade 5; $est=0.222$, $SE=0.072$) and to the slope (grade 6; $est=0.073$, $SE=0.026$), respectively. Results indicated that the greater the best friend's social withdrawal, the more likely it was that the target child would be highly withdrawn in the fifth grade. It was also revealed that children whose best friends were socially withdrawn in the sixth grade (after the school transition),

were more likely to evidence a pattern of increasing growth in social withdrawal over time.

Discussion

Few researchers have examined long-term developmental trajectories of social withdrawal. Those that have typically report that social withdrawal is relatively stable and that the late childhood and early adolescent outcomes of the phenomenon are by-and-large, negative (see Rubin et al. 2003 for a relevant review). Notably, with the development of complex statistical procedures that allow examination of intraindividual change, there is growing evidence of heterogeneity in behavioral and developmental psychopathology growth trajectories. Significantly, in this study, we discovered three different developmental pathways of social withdrawal from the period beginning with the fall of the "senior" year of elementary school (fifth grade), across the transition into the "freshman" year of middle school (sixth grade), and into early adolescence and the "senior" year of middle school (eighth grade). Using General Growth Mixture Modeling, three latent growth trajectory classes of social withdrawal identified: (a) *increasing*; (b) *decreasing*; and (c) *low-stable* classes.

Given that the participants were drawn from a community sample, as we anticipated, a substantial proportion of the participants (85%) could best be described as maintaining a *low-stable* trajectory of social withdrawal. However, approximately 8% of the sample exhibited a *decreasing* trajectory of social withdrawal from middle childhood through early adolescence, suggesting that not all withdrawn children maintain their risk status. In contrast, approximately 7% of the sample demonstrated an *increasing* pattern of social withdrawal over time. Although small in size, the identification of these two sub-samples is particularly notable because the only other study of trajectories of social withdrawal (from grades 1 to 6) similarly identified these same three patterns—a low-stable (*normative*) group (86% of the sample), a *decreasing* group (5%), and an *increasing* (9%) group (Booth-LaForce and Oxford 2006, submitted).

Predictors of Initial Status, Growth within Class, and Latent Class Membership

Drawing from conceptual models developed by Hinde (1987) and Rubin et al. (2006a), we examined a set of covariates as predictors of initial status, within-class growth, and class membership that characterized *individual* characteristics of the target children and their best friends, the extent to which individuals *interacted* with others in a

prosocial manner, the quality of the target children's best friendships, and the group status that the target children had achieved within their respective schools (in this case, the extent to which they were excluded [rejected] and victimized by the peer group). Significantly, important class-specific predictors were revealed for the three distinct withdrawal trajectories. Some factors predicted initial class membership and growth within each class; others only predicted growth within each class.

The Decreasing Trajectory Children in the *decreasing* trajectory entered the fall of grade 5 with the highest level of withdrawal relative to the children in the other two trajectories. Despite their initially high levels of withdrawal, however, if these children experienced less exclusion and victimization after the transition to middle school, they were more likely to show a decrease in social withdrawal over time. This finding is consistent with those of Gazelle and Rudolph (2004) who reported that when anxious-solitary youth experienced less peer exclusion they displayed an *increase* in social approach. Importantly, our findings along with those of Gazelle and Rudolph (2004) and Salmivalli and Isaacs (2005) suggest that withdrawn children may experience increased motivation to engage others in interaction when the social landscape becomes "kinder" and "gentler." Although bullying and victimization increases in frequency and intensity during the middle school years (Juvonen et al. 2004), perhaps those withdrawn children who experience less peer exclusion and victimization than their classmates gain greater confidence in social interactions, thereby becoming increasingly sociable.

The Increasing Trajectory For the *increasing* class, peer exclusion in the fifth grade predicted initial status, a finding that was not surprising because it is well known that negative peer relationships (exclusion and victimization) place *all* children at risk for social and emotional difficulties (Rubin et al. 2006a). However, the finding that peer exclusion and victimization were significant predictors for both the increasing and decreasing classes is notable because it clearly highlights the central role of peer group adversity (or lack thereof) in the development course of social withdrawal during late childhood and early adolescence. Also newsworthy were the findings that the absence of a mutual friendship and the presence of unstable best friendships further exacerbated social withdrawal for children in the increasing class. Thus, significant risk factors for these children included both the lack of a friendship as they made the transition into middle school and unstable best friendship involvement during their last year of elementary school. When faced with a series of

"unsuccessful," unstable close dyadic relationships, withdrawn children may increasingly remove themselves from social encounters. In this regard, withdrawal may be viewed as a defensive or protective coping strategy. Indeed, there is some evidence to indicate that withdrawn children without mutual best friendships are viewed by their peers as less sociable and popular than withdrawn children with mutual best friendships (Rubin et al. 2006b). Taken together, the findings of the present study strongly suggest that difficulties at the group and relationship levels of social complexity may collide for some withdrawn children, thereby making the transition from elementary to middle school all the more difficult, as was evidenced by increased growth of social withdrawal.

Predictors of Class Membership Exclusion and victimization in the fifth grade uniquely distinguished both the *increasing* and *decreasing* classes from the *low-stable* class. Note that both the increasing and decreasing classes demonstrated a higher initial level of social withdrawal than did the low-stable class. Thus, our results fit nicely with previous research findings demonstrating strong associations between problematic peer relations and social withdrawal during late childhood and early adolescence (e.g., Ollendick et al. 1990).

Interestingly, however, peers' perceptions of the extent to which children were altruistic and prosocial also discriminated the increasing and decreasing trajectory groups from the low-stable class. The extant literature suggests that socially withdrawn children are compliant to the requests of others, unassertive and non-managerial when they approach peers, and generally well-behaved (e.g., Stewart and Rubin 1995). The prosocial behavior construct in the present study comprised such items as *Someone who is polite*, and *Someone who waits his or her turn*. In the social worlds of late-elementary school and middle-school children, within which dominance appears to be associated with perceived popularity (e.g., Rose et al. 2004), it may be that the quiet, unassertive, well-behaved, and submissive child is not viewed as preferable company by peers, thereby leaving her or him disengaged from peer group. Within-class analyses also revealed that greater prosocial behavior after the middle school transition predicted increased growth of withdrawal over time for the *increasing-class*. Thus, despite best efforts to behave in a kind and prosocial fashion (perhaps in an attempt to protect against bullying and peer manipulation), such behaviors may, ironically, work *against* the better interests of the socially withdrawn child.

A somewhat unexpected finding was that friendship involvement in the fall of grade 6, immediately after the

school transition, distinguished the *increasing* class from both the *low-stable* and *decreasing* classes. This finding led us to examine whether the characteristics of the target children's best friend and the quality of the friendship served as buffers or exacerbators of the developmental course of social withdrawal for particular subgroups.

Friended Children: Predictors of Initial Status and Growth

It is well-known that friends are likely to share similar characteristics (Rubin et al. 2006a). And when friends share similarities in maladaptation, friendship appears to be a risk rather than a protective factor (e.g., Dishion et al. 1996; Haselager et al. 1998; Rubin et al. 2006b). Results from the present study certainly support this supposition. In follow-up analyses focused on all children with mutual best friends at the start of middle school, children who had a socially withdrawn friend were more likely to show an initially high level of social withdrawal at the outset of the study (fall, grade 5). More importantly, having a socially withdrawn friend after the school transition (fall, grade 6) appeared to increase children's social withdrawal over time.

What might account for this negative friendship influence? Perhaps when withdrawn children interact with their best friends, they engage in co-ruminative exchanges (Rose 2002). Given that the best friends of many withdrawn children are similarly withdrawn and excluded/victimized, discussions between friends may focus on negative thoughts and feelings about themselves and about the negative aspects of their social experiences in school. In this way, co-ruminative activity may lead to increased withdrawal from the peer group for these children and their friends.

Importantly, the index of friendship quality used in this study did not predict growth in social withdrawal and our hypothesized model had a better model fit than the alternative model that included an interaction effect between the best friend's level of social withdrawal and the quality of the best friendship. Perhaps because socially withdrawn children view their friendships as less helpful and fun than those of non-withdrawn children (see Rubin et al. 2006b), quality may be less influential on their level of social withdrawal than their best friends' behavioral characteristics. Additional research is clearly required to better understand the influence of having a close and positive friendship in the lives of socially withdrawn children.

Nonetheless, the findings highlight the significance of friendship in predicting developmental trajectories of social withdrawal in terms of the characteristics that their friends bring to the relationship. That is, if a child's mutual friend is less socially withdrawn, he or she is less likely to become withdrawn over time; alternatively, if a child's friend is

socially withdrawn, he or she is more likely to show an increase in social withdrawal. These findings add to the growing literature on the protective and risk factors associated with peer exclusion and homophilous relationships (e.g., Gazelle and Rudolph 2004; Salmivalli and Isaacs 2005).

The present study did have a number of limitations. First, friendships were only studied within the school context. It may well be that friendships outside of school affect growth trajectories of social withdrawal. Indeed, outside-of-school friends are generally neglected in the child and adolescent development literatures. The foci of the study included such facets of friendship as reciprocal friendship involvement, stability of friendship, friendship quality and friends' level of social withdrawal. However, we only examined the target child's perceptions of friendship quality; it may be that the friend's perceptions of quality were unlike those of the target. Thus, in subsequent research, researchers might do well to consider the dyadic perspective on the quality of friendship. Furthermore, whilst our focus on friendships in relation to trajectories of social withdrawal was unique, friendships often exist within a larger peer group network, which may also impact socially withdrawn behavior over time. Researchers would do well to consider the importance of these other types of peer relationships in future work to further elucidate the complex linkages between the individual, relationship and group levels of social complexity. Beyond peer relationships, it is important to acknowledge the potential significance of other close relationships in children's lives (e.g., parent-child and sibling relationships). In fact, very little is known of the parenting experiences and parent-child relationships of socially withdrawn middle schoolers and adolescents. Even less is known of the effects of these relationships on the developmental course of withdrawal. This latter emphasis on parenting and family relationships would be a significant avenue of future research.

It is also important to note that the sizes of our *increasing* and *decreasing* trajectory classes were small; this may reflect the characteristics of a community sample. Clearly additional research is needed to replicate our findings and to better understand differences between the *increasing* and *decreasing* trajectory groups. Figure 1 clearly demonstrates that while these two groups did not differ in social withdrawal throughout the sixth grade, differences became striking by the end of middle school (eight grade). It may be the case that certain aspects of the sixth grade masked possible underlying differences in these trajectories. For example, upon entry into middle school, children are faced with both familiar *and* unfamiliar peers. It is possible, therefore, that despite some changes in

behavior, some elementary-school “reputations” persist throughout the first-year of middle school because they are perpetuated by “old” or familiar elementary school classmates. Researchers could consider teacher- and also self-reports of withdrawn behavior to further explore possible differences in behavior among *increasing* and *decreasing* class children in the sixth grade.

Peer exclusion, victimization, and friendlessness have been previously identified as major risk factors for internalizing and externalizing difficulties (see Rubin et al. 2006a); current findings strongly suggest that these factors also exacerbate socially withdrawn trajectories. Given the strong associations between social withdrawal, peer difficulties, and also internalizing difficulties (e.g., Gazelle and Ladd 2003), the next step for researchers is to examine the influence of internalizing difficulties on the developmental course of social withdrawal from childhood to early adolescence.

Despite these limitations, a primary strength of this study of social withdrawal was its use of five waves and four years of longitudinal data for a large community sample of children/young adolescents experiencing the transition from elementary-to-middle school. Additionally, the use of peer assessments derived from multiple “observers” was a clear strength of the study. Using a person-oriented approach, we discovered heterogeneous developmental trajectories of social withdrawal. These trajectories were predicted by multi-level social complexities such as individual characteristics, friendship constructs and characteristics, and peer-group experiences to better understand the nature of developmental pathways of social withdrawal.

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