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Losing and gaining friends: Does friendship instability compromise academic functioning in middle school?

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ABSTRACT

Extending past research on the academic benefits of having close friends in early adolescence, the study examines how instability of friendships (i.e., losses and gains of friends) is related to academic engagement and performance in middle school. The sample was drawn from a longitudinal study of ethnically diverse youth across 26 middle schools ($N = 5991$). The results demonstrated that over two thirds of friends were either lost or gained during the first year in middle school. When controlling for friendship network size, both friendship losses and gains were concurrently associated with lower academic engagement and performance at spring of sixth grade. Moreover, higher overall instability during the first year in middle school was related to lower academic engagement in seventh grade, which in turn, predicted lower grade point average (GPA) by the end of middle school. The findings suggest that friendship instability captures a disruptive social process that can compromise academic functioning in middle school.

1. Introduction

Establishing friendships is considered a central developmental task of early adolescence (Sullivan, 1953). At a time of increased independence from parents and a growing motivation for intimacy with peers, close relationships with same-aged peers (i.e., friendships) fulfill critical social needs that provide young adolescents with a sense of security, validation, emotional and instrumental support (Hartup, 1989; Vitaro, Boivin, & Bukowski, 2009). As such, friendships help buffer distress following negative social experiences (Hodges, Boivin, Vitaro, & Bukowski, 1999) and also promote positive school attitudes and academic performance (Berndt & Keefe, 1995; Wentzel, Barry, & Caldwell, 2004). Although the evidence supporting the benefits of friends is robust, most studies consider friendships at only one time point. However, friendships are not static. Young adolescents make new friends, while other relationships dissolve over time (Meter & Card, 2017; Poulin & Chan, 2010). In the current study, we focused on dynamic changes in friendships following the transition to middle school. We proposed that much like instability in other close adolescent relationships (e.g., romantic relationships), changes in friendship may be disruptive especially in early adolescence when students are acclimating to a new school environment. Extending past studies that focus on the maintenance of friends over time (Berndt & Keefe, 1995; Ladd, 1990), we examined the effects of friendship instability — that is, changes in friendship due to either dissolution and formation (Chan & Poulin, 2007, 2009) — during the first year of middle school on academic engagement and performance.

A variety of conceptual approaches guide research on friendships and academic functioning. Research examining peer selection and influence processes suggests that adolescents both choose academically similar friends and also become more similar to their friends over time (Kindermann, 2007; Rambaran et al., 2017; Shin & Ryan, 2014). Highly engaged and achieving students befriend other academically-oriented peers who promote academic success, whereas less academically-oriented students tend to seek out

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friends who are similarly disengaged and low achieving, compromising academic functioning over time (Ryan, 2000). In addition, the effects of having friends (regardless of the characteristics of the friend) are robust. Compared to adolescents without friends, those with at least one friend display higher academic achievement (Wentzel et al., 2004). Moreover, friendships characterized by greater emotional support facilitate classroom involvement, whereas highly conflictual friendships exacerbate school adjustment problems in childhood (Ladd, Kochenderfer, & Coleman, 1996) and early adolescence (Berndt & Keefe, 1995). Beyond such effects of friends and friend characteristics, the current study examined how high friendship turnover, or what we call here friendship instability, is related to academic engagement and performance in middle school.

1.1. (In)stability of close relationships

Given that only about half of adolescents' friendships are maintained over a school year (Bowker, 2004; Değirmencioğlu, Urberg, Tolson, & Richard, 1998; Poulin & Chan, 2010), there are many youth for whom friends "come and go," particularly following the transition to middle school (Hardy, Bukowski, & Sippola, 2002). Friends who once spent the entire day together in self-contained elementary school classrooms might have little contact in the new middle school environment where there are increased opportunities to form new friendships based on a much larger pool of peers. Given that high-quality friendships provide important resources to promote academic motivation and engagement (Hosan & Hoglund, 2017) and that changes in close friendships weaken access to friendship provisions (e.g., emotional support and intimacy; Aikins, Bierman, & Parker, 2005; Berndt, Hawkins, & Hoyle, 1986), youth with high levels of friendship instability may therefore lack the necessary support to stay engaged in class and do well academically. That is, without a stable and secure friendship base, youth may participate less and withdraw from classroom activities (Ladd et al., 1996).

Although no studies to date have examined the impact of friendship instability on academic outcomes, mounting evidence suggests that changes in friendship can be disruptive. For example, Chan and Poulin (2009) found that friendship instability, computed as the number friendship losses and gains relative to the size of the friendship network, was related to elevated depressive symptoms in young adolescents. There is also evidence that discontinuity in other types of close relationships (e.g., romantic) places adolescents at risk for psychological and academic problems. For example, the dissolution of romantic relationships is related to emotional and behavioral maladjustment (e.g., depression, lower self-esteem, suicidality; Chen et al., 2009; Price, Hides, Cockshaw, Stanova, & Stoyanov, 2016). Likewise, having a greater number of dating partners takes a toll on emotional health and is related to declining academic performance and motivation between the ages of 12 and 16 (Zimmer-Gembeck, Siebenbruner, & Collins, 2001). It is presumed that the time required interacting with potential and actual partners displaces emotional and motivational resources that could be devoted to schoolwork (Zimmer-Gembeck et al., 2001). Although romantic relationships are fundamentally different in many ways from friendships inasmuch as they involve physical attraction and sexual intimacy (Connolly, Craig, Goldberg, & Pepler, 1999), instability of friends may also contribute to maladjustment. Thus, any changes (due to either dissolution or formation) in friendships are likely to cause disruption that undermines academic functioning.

Losing friends may be especially consequential after youth transition to middle school – a transition frequently accompanied by disruptions in social networks and associated with decreased motivation and academic performance (Eccles et al., 1993; Juvonen, Le, Kaganoff, Augustine, & Constant, 2004). At this time of multiple simultaneous changes (e.g., new peers, larger size and different organizational structure of the school), stable friends that serve as a "secure base" may be particularly important. Indeed, the maintenance of a friend across the middle school transition is related to more positive attitudes towards school, higher grades and teacher ratings of involvement (Aikins et al., 2005; Berndt & Keefe, 1995). Among young children, those who are able to maintain more friends following the transition into elementary school (i.e., kindergarten) show greater improvements in school performance and fewer school absences (Ladd, 1990). Accordingly, the lack of friendship maintenance, or the loss of friends, during the first year in middle school is expected to negatively impact academic functioning.

In addition to losing friends, acquiring new friends – although possibly exciting to young adolescents – also contributes to relationship instability. However, the impact of new friendships on academic functioning is less clear. Evidence from childhood suggests that friendship gains promote academic functioning by widening the circle of peers who can offer assistance with school-related tasks (Ladd, 1990). In adolescence, however, the process of developing new friendships may be distracting because recently formed friendships do not yet represent strong bases of intimacy or emotional support. Rather, gaining new friends, just as new romantic relationships (Zimmer-Gembeck et al., 2001), requires explicit effort and attention (Oden & Asher, 1977) that may interfere with academic focus and performance. After all, adolescents with new friends are likely to spend considerable time and effort managing the relationships (e.g., spending time together in school and planning out-of-school activities). Thus, gaining friends — much like losing friends — can then compromise academic engagement and performance.

1.2. Current study

The primary goal of the current study was to investigate whether instability of friends — a relatively normative experience during early adolescence (Meter & Card, 2017; Poulin & Chan, 2010) — is related to lower academic engagement and academic performance (i.e., GPA) across middle school. Whereas past studies have focused on the protective function of friendship maintenance (Aikins et al., 2005; Ladd, 1990; Ladd & Price, 1987), we focused here on the academic risks associated with instability. Friendship instability is defined to reflect not only lack of maintenance (i.e., loss of friends), but also formation of new friendships (Chan & Poulin, 2007, 2009). Moreover, rather than considering the degree to which the number of friends changes over time (e.g., Hardy et al., 2002), we specifically examined whether youth nominate the same or different grade mates as friends at the fall and spring of their first year in

middle school.

Our first goal was to capture the degree to which youth lose and gain friends during their first year in middle school. Second, we investigated the relative impact of friendship losses and gains on concurrent academic engagement and performance. Here we controlled for friendship network size because the same number of changes (e.g., two losses) is likely to differentially impact, for example, a student with two friends compared to a student with seven friends (Chan & Poulin, 2007). Consistent with research on friendship maintenance (and the consequences associated with lack thereof), losses of friends were expected to be negatively related to both academic engagement and performance. However, for friendship gains, there were competing hypotheses. On one hand, the formation of new friendships during the first year in middle school may be positively related to academic functioning, much like in elementary school (Ladd, 1990). On the other hand, because it takes effort to form and maintain a budding friendship, new relationships may also distract youth from academic engagement and possibly compromise their performance. Also, newly formed friendships are unlikely to provide the instrumental or emotional support characteristic of established friendships that foster academic engagement and performance. Thus, to address the competing hypotheses, we first established the independent associations of friendship losses and gains with concurrent academic engagement and performance, while controlling for relevant covariates (e.g., sex, ethnicity, friendship network size). Losses and gains were then combined into a single index to test the overall effect of friendship instability on subsequent academic engagement and performance.

Given that students' academic engagement (e.g., active class participation and timely completion of homework) is a powerful predictor of their achievement outcomes (Skinner, Wellborn, & Connell, 1990; Wentzel, 1993), we presumed that low engagement may help account for lower subsequent GPA among youth experiencing greater friendship instability during the first year of middle school. Thus, we relied on prospective longitudinal data to test whether friendship instability during the first year of middle school is related to lower levels of academic engagement in seventh grade, which, in turn, predicts lower academic performance by the end of middle school (i.e., eighth grade). Providing a rigorous test of our hypothesis, we controlled for baseline academic performance (i.e., GPA at fall of sixth grade), as prior GPA is not only a potent predictor of subsequent GPA, but may also affect friendship choices. Additionally, we took into account critical covariates, including peer rejection, because rejected youth have greater difficulty maintaining friendships (Ellis & Zarbatany, 2007) and are at heightened risk for academic problems (Lopez & Dubois, 2005).

The present study contributes to the existing research in several ways. First, we focused on early adolescence when friendships become more intimate and influential on adjustment (Laursen & Collins, 2009). Specifically, we examined friendship instability during the first year in middle school when students cite "spending time with their friends" as their primary method of adjusting to their new school (Akos & Galassi, 2004). Second, our analyses extended existing research on the consequences associated with lack of friendship maintenance by also investigating the effects of gaining new friendships as another indicator of instability. We proposed that friendship instability (much like peer rejection or victimization) may capture a disruptive social experience that can compromise academic functioning in middle school. Such focus on dynamic relationship processes complements previous approaches that highlight the effects of school transitions (Juvonen et al., 2004) and the impact of school structural changes (e.g., stage-environment fit; Eccles et al., 1993) on declining academic engagement and performance across middle school (Akos, Rose, & Orthner, 2015; Jozsa & Morgan, 2014). Third, we used a rigorous methodological approach that relied on multiple sources of data (peer nominations, teacher-ratings, school records) across three years of middle school and a large ethnically diverse public school sample with presumably generalizable findings across a wide range of demographic groups.

2. Method

The current study relied on data from a large, longitudinal study of adolescents recruited from 26 public middle schools in California that varied systematically in ethnic composition ($N = 5991$; 52% female). Based on self-reported ethnicity in the fall of sixth grade, the sample was 32% Latino/a, 20% White, 13% Asian, 12% African American and 23% from other ethnic groups, including biracial or multi-ethnic youth. The proportion of students eligible for free or reduced lunch price (a proxy for school SES) ranged from 18% to 86% ($M = 47.6\%$, $SD = 18.3\%$) across the 26 schools. All participating students made the transition to middle school in the sixth grade school year.

At the end of middle school (i.e., spring of eighth grade), the participation rate was 79% of the original sample, which is comparable to other largely ethnic minority samples in urban school settings (e.g., Gutman & Eccles, 2007). Independent samples *t*-tests were conducted to compare the retained sample of students to those without the eighth grade data necessary for the current study (i.e., GPA). Students without eighth grade data had lower GPA's [$t(1067.46) = 8.02$, $p < 0.001$] and according to teacher reports were less engaged in school [$t(1222.37) = 3.44$, $p = 0.001$] during the sixth grade, suggesting that some of the most vulnerable students were not retained. Yet, because of our analysis method, we were able to include students with even just one wave of data (see Analytic Plan).

2.1. Procedure

The study was approved by the relevant Institutional Review Board and school districts. During sixth grade recruitment all students and families received informed consent and informational letters. Parental consent rates averaged 81% and student assent rates averaged 83% across the schools. Only students who turned in signed parental consent and provided written assent participated. Data collection was conducted in schools. Surveys were read aloud in each classroom by trained researchers, and students received \$5 in the fall and spring of sixth grade, and \$10 in seventh and eighth grade, for completion of the surveys.

For the current study, we considered friendship nominations at the fall and spring of sixth grade to assess friendship instability

across the first year of middle school. In addition to concurrent data in the spring of sixth grade, for the longitudinal analyses we relied on data collected in fall of sixth grade (demographic, baseline academic performance), and spring of sixth (control variables), seventh (academic engagement), and eighth (academic performance) grades.

2.2. Measures

2.2.1. Friendships

Using an unlimited peer nomination procedure, students were asked to list the names of their good friends in their grade at their school during the fall and spring of sixth grade. Based on pilot testing, we used the phrase “good friends” instead of “close friends” because the latter terminology elicited some expectations of romantic involvement. We focus on sixth grade friendships for conceptual (i.e., heightened instability during first year of middle school) and methodological reasons (i.e., fall and spring friendships available only at sixth grade). Consistent with traditional indices of friendship maintenance (e.g., Cairns, Leung, & Cairns, 1995; Chan & Poulin, 2007, 2009), we relied on named friends (i.e., outgoing nominations). Friendship losses were computed as the number of friends nominated in the fall of sixth grade that were no longer nominated in the spring. Friendship gains were computed as the number of nominated friends in spring of sixth grade who were not nominated in the fall. These loss and gain scores were used in the initial analyses to first establish the independent associations of friendship losses and friendship gains with the academic functioning indicators. To capture overall friendship instability (used in the final analyses), the number of friendship losses and gains were summed and divided by the total number of individuals nominated as friends in the fall and spring of sixth grade (cf. Chan & Poulin, 2007, 2009). That is, if a student nominated Cloe, Lupita, and Jessica as friends in the fall and Cloe, Amy, and Mia as friends in the spring, her friendship loss score is 2, gain score is 2, and overall instability is $(2 + 2) / 5 = 0.8$. The instability score reflects the fact that the student retained only one friend across the fall and spring, but named 5 individuals overall. This particular example also illustrates why it is critical to examine who the friends are as opposed to number of friends nominated at each time point, as the student in this example would appear to have high friendship stability based on a simple count method. The instability index varies between 0 and 1, with 0 representing no change in the network (i.e., all friends were nominated in both the fall and spring) and 1 representing complete instability (i.e., no friends were nominated in both the fall and spring; cf. Chan & Poulin, 2007, 2009).

2.2.2. Academic engagement

One teacher completed six items from the Short Form of the Teacher Report of Engagement Questionnaire (TREQ; Connell & Wellborn, 1991) in the spring of Grade 6 and 7 to assess the degree to which students were perceived as engaged, as opposed to disaffected from school activities (e.g., “In my class, this student concentrates on doing his/her schoolwork”). Items were rated on a 4-point scale (1 = *not at all characteristic of this student* to 4 = *very characteristic*), with higher mean values indicating higher levels of academic engagement ($\alpha_{6\text{th grade}} = 0.91$; $\alpha_{7\text{th grade}} = 0.91$).

2.2.3. Academic performance

Students' grade point average (GPA) was used to assess academic performance. School transcripts were collected at the end of each semester. Grades for all courses from each semester were coded on a 5-point scale (A = 4 and F = 0) and then averaged to create a composite GPA for each student. In the main analyses, we predicted GPA in students' last semester of middle school (i.e., spring of eighth grade), while controlling for GPA at the fall of sixth grade ($M_{\text{fall 6th}} = 3.11$, $SD_{\text{fall 6th}} = 0.78$; $M_{\text{spring 8th}} = 3.01$, $SD_{\text{spring 8th}} = 0.85$).

2.2.4. Covariates

The current analyses included control variables that could account for differences in our academic outcomes or that may function as possible confounds. We controlled for self-reported sex and ethnicity. Students who were not in the four pan-ethnic groups (African American, Asian, Latino, White) were collapsed into a fifth category, “Other,” given the small size of these other ethnic groups (e.g., biracial) and to achieve more parsimonious models. In addition, we controlled for peer rejection, as well as friendship network size. Peer rejection was assessed by asking participants whom they “would not like to hang out with?” at the spring of sixth grade. The number of nominations received from peers was then standardized within schools to account for differences in school size. Friendship network size was calculated as the total number of friends nominated across the fall and spring of sixth grade. This raw score was taken into account as a covariate in the initial regression models, and was included in the computation of the instability index for the mediation model.

2.3. Analytic plan

To provide descriptive information about friendships, we relied on ANOVAs that examined demographic (i.e., sex and ethnic) differences and changes between fall and spring of sixth grade friendship nominations, including losses and gains. To determine whether friendship losses and friendship gains are each independently related to academic engagement and performance, we tested regression models examining their concurrent associations at sixth grade. We then turn to testing our mediation model across middle school. Presuming losses and gains function similarly in the initial regression models (i.e., each are negatively associated with academic indicators), our goal was to test whether friendship instability during first year in middle school predicts academic engagement the following year which, in turn, was expected to predict academic performance by the end of middle school (controlling for baseline academic performance). If losses and gains do not function similarly in the initial regression models two separate models

would be tested: one for friendship losses and the other for friendship gains.

All analyses were conducted in Mplus 7.4 (Muthén & Muthén, 1998–2016) using the Cluster function which accounts for students nested within schools by adjusting standard errors in model estimation. Additionally, we controlled for sex (1 = girl, 0 = boy) and ethnicity (reference group = Latino/a, as the largest ethnic group in the sample) using dummy coded variables, as well as peer rejection and friendship network size. Preliminary models also controlled for the proportion of cross-ethnic friends (as the size of friendship networks may be influenced by the availability of same-ethnic peers; Hamlin, Brown, & Heck, 2005); however, because the proportion of cross-ethnic friends did not predict academic functioning, this variable was excluded from the final models. We controlled for GPA in the fall of sixth grade to be able to take into account differences in academic performance in the beginning of middle school when predicting the indirect effects of friendship changes on eighth grade academic performance. Continuous predictors were grand-mean centered to facilitate interpretation.

Missing data did not exceed 20% and was primarily due to teacher-rated engagement and grades (based on school records) at later time points. There was no specific evidence suggesting that missing data was systematically related to the constructs themselves, thus data were considered to be missing at random (MAR; Enders & Bandalos, 2001). Although there is no empirical method to confirm a MAR mechanism, we addressed the assumptions of MAR through inclusion of covariates related to missing data (e.g., prior grades in school, ethnicity; Widaman, 2006). Missing data was handled using full information maximum likelihood (FIML) estimation with robust standard errors to correct for non-normality. FIML estimation treats all observed predictors as single-item latent variables, allowing each individual to contribute whatever data they have to the likelihood function (i.e., any participant with at least one wave of data was included), and is preferable to listwise deletion (Little, Jorgensen, Lang, & Moore, 2013).

3. Results

The results are divided into three main sections. First, we present descriptive findings about friendships during the first year of middle school, including friendship losses and gains. Second, we present the results of the concurrent analyses to determine whether friendship losses and friendship gains are each independently related to academic engagement and performance. In the last section, we report the findings of our proposed mediational model to determine whether academic engagement at seventh grade accounts for the association between sixth grade friendship instability and eighth grade academic performance.

3.1. Friendships across fall and spring of sixth grade

Examining first the number of outgoing friendship nominations across the first year of middle school, a 3-way 2 (time) \times 2 (sex) \times 5 (ethnicity) mixed repeated measures analysis of variance (ANOVA) revealed a slight increase in the number of friend nominations given in the fall ($M = 3.01$) and the spring ($M = 3.12$) of sixth grade [$F(1, 5919) = 19.85, p < 0.001$]. There was also a significant effect of sex [$F(1, 5919) = 212.63, p < 0.001$], with girls ($M = 3.36, SE = 0.03$) nominating more friends than boys ($M = 2.77, SE = 0.03$), and a significant effect of ethnicity [$F(4, 5919) = 20.45, p < 0.001$]. Post-hoc Tukey HSD tests revealed that Asian and White students nominated more friends than African Americans and Latino students.

The means and standard deviations of variables assessing change in specific friendships are shown in Table 1. On average, students lost 1.75 friends (range: 0–12) across the first year of middle school, while they gained 1.73 friends (range: 0–7), signifying considerable change within the 3 friend average (see above). When considering the proportion of both losses and gains relative to total friendship nominations, the mean friendship instability was 0.68. This suggests that over two-thirds of students' nominated friends were either lost or gained during the sixth grade. Thus, despite the relative stability in the number of friends named across the

Table 1

Means, standard deviations and intercorrelations between variables assessing change in specific friendships, academic functioning and continuous covariates (i.e., peer rejection, friendship network size).

Variable	1	2	3	4	5	6	7	8	9
1. Friendship losses	1								
2. Friendship gains	0.19**	1							
3. Friendship instability	0.53**	0.50**	1						
4. Friendship network size	0.67**	0.65**	0.20**	1					
5. Peer rejection	0.06**	0.05**	0.08**	0.04*	1				
6. Academic engagement Gr 6	−0.02	0.01**	−0.13**	0.09**	−0.21**	1			
7. Academic engagement Gr 7	−0.02	−0.01*	−0.09**	0.05**	−0.16**	0.49**	1		
8. GPA Gr 6	0.01	0.03	−0.14**	0.16**	−0.21**	0.66**	0.53**	1	
9. GPA Gr 8	0.00	0.03	−0.13**	0.13**	−0.17**	0.56**	0.53**	0.75**	1
<i>M</i>	1.75	1.73	−0.68	4.68	0.00	2.70	2.76	3.06	3.01
<i>SD</i>	1.37	1.42	−0.26	2.31	1.00	0.76	0.76	0.85	0.85

Note. Friendship losses = friends nominated at fall, but not spring, of 6th grade; Friendship gains = friends nominated at spring, but not fall, of 6th grade; Friendship instability = proportion of losses and gains relative to friendship network size at 6th grade; Friendship network size = number of nominated friends across fall and spring of 6th grade.

* $p < 0.01$.

** $p < 0.001$.

Table 2

Concurrent effects of friendship losses and friendship gains on academic functioning outcomes at spring of sixth grade.

	Academic engagement	academic performance (standardized coefficients and S.E.s)
Sex		
Female	0.22 (0.02)**	0.15 (0.01)**
Ethnicity		
African American	-0.05 (0.02)*	-0.08 (0.03)*
Asian	0.17 (0.02)**	0.27 (0.03)**
White	0.17 (0.03)**	0.29 (0.04)**
Other	0.08 (0.02)**	0.17 (0.03)**
Peer rejection	-0.21 (0.01)**	-0.20 (0.01)**
Friendship network size	0.21 (0.03)**	0.33 (0.04)**
Friendship losses	-0.14 (0.02)**	-0.18 (0.02)**
Friendship gains	-0.12 (0.02)**	-0.16 (0.03)**

Note. Sex reference group = boys; Ethnicity reference group = Latino/a; Friendship network size = number of nominated friends across fall and spring of 6th grade.

* $p < 0.01$.

** $p < 0.001$.

fall and spring of sixth grade, there was substantial instability in whom was considered as a friend. To further illustrate the instability, examining the proportion of participants who experienced at least one change revealed that 96% of students underwent at least one friendship loss or gain during sixth grade. As shown in Table 1, losses and gains in friendship (as well as overall instability) were positively associated with peer rejection.

To examine sex and ethnic differences in friendship changes (i.e., friendship losses, gains and friendship instability), three 2 (sex) \times 5 (ethnicity) ANOVAs were conducted. Although girls experienced significantly more friendship losses [$F(1,5919) = 48.44$, $p < 0.001$] and gains [$F(1,5919) = 55.97$, $p < 0.001$] than boys, when taking into account that girls nominated more friends than boys (see above), the relative proportion of losses and gains (i.e., instability) was comparable across sexes [$F(1,5805) = 3.73$, $p = 0.054$]. In addition, although there were no ethnic differences for friendship gains, Asian students had significantly more friendship losses than White students [$F(4,5919) = 2.83$, $p = 0.023$]. For friendship instability [$F(4,5805) = 21.77$, $p < 0.001$], post-hoc Tukey HSD tests indicated that African American and Latino students experienced significantly more instability in their friendships compared to White and Asian students. For all outcomes, the Sex \times Ethnicity interaction terms were non-significant and therefore excluded from the subsequent regression models.

3.2. Are friendship losses and gains related to academic functioning at sixth grade?

To examine the independent associations of friendship losses and gains on academic engagement and performance at the end of sixth grade, two concurrent regressions were conducted, while controlling for friendship network size (i.e., total number of friends nominated across sixth grade). Examining the results simultaneously across the indicators of academic functioning based on Table 2, girls exhibited higher levels of academic engagement and performance. Additionally, compared to Latino students, Asian and White students as well as youth from other ethnic groups (e.g., biracial) were rated by teachers as more engaged and received higher grades, while African American students were rated as less engaged. Consistent with past research, friendship network size in sixth grade was positively associated with academic functioning: the more friends students nominated, the more engaged they were and the higher grades they obtained. Students who were more rejected by their peers were less engaged and had lower grades. Finally, both friendship losses and gains were each uniquely associated with lower academic engagement and performance when friendship network size was taken into account. That is, although losses and gain by themselves (see bivariate correlations in Table 1) were unrelated to academic functioning, once we accounted for the fact that students with larger friendship networks experience more changes, relationships losses as well as gains were each negatively related to academic engagement and performance. Because both friendships losses and gains functioned similarly, we therefore relied on the overall friendship instability indicator (i.e., proportion of losses and gains relative to friendship network size) to test our longitudinal model.¹ That is, we examined whether the overall instability of friendships during the first year in middle school predicts seventh grade academic engagement and how engagement in turn predicts eighth grade performance (i.e., GPA).

¹ Supplementary analyses were conducted to examine whether the academic consequences of high instability might vary based on whether students mainly lost or mainly gained friends during their first year of middle school. Among students with high instability scores (+1SD; $n = 1237$), difference scores in engagement (i.e., 6th–7th grade) and GPA (i.e., 6th–8th grade) were compared between students whose instability was due to mostly friendship losses (+1SD losses, -1SD gains; $n = 124$) versus gains (-1SD losses, +1SD gains; $n = 229$). The results revealed that both groups showed similar declines in engagement [$t(258) = 0.01$, $p = 0.994$] and GPA [$t(269) = -0.81$, $p = 0.419$] over time.

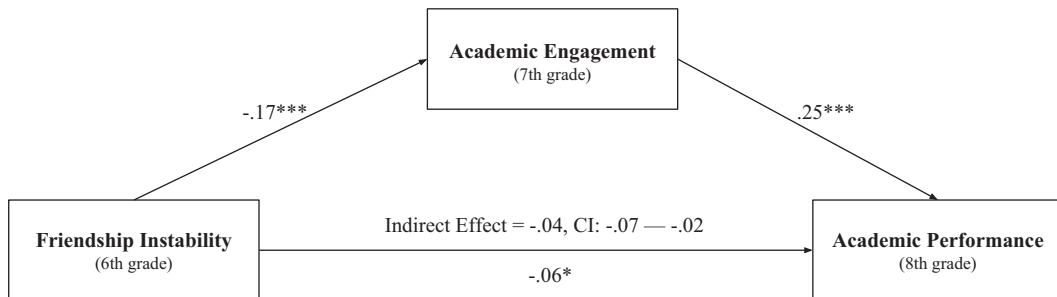


Fig. 1. Unstandardized coefficients for model of friendship instability and academic engagement on academic performance (i.e., GPA). Covariates included sex, ethnicity, peer rejection and baseline academic performance.

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

3.3. Indirect effects of friendship instability

The mediation model (friendship instability → engagement → academic performance) based on longitudinal data was tested using bias-corrected bootstrapping procedures (10,000 bootstraps) and corresponding 95% confidence intervals (Preacher & Hayes, 2008), in which confidence intervals that do not include zero were considered statistically significant. Specifically, we estimated the indirect effects of friendship instability (i.e., proportion of losses and gains relative to friendship network size) at sixth grade on eighth grade academic performance through classroom engagement at seventh grade, while accounting for all aforementioned control variables (i.e., sex, ethnicity, peer rejection, baseline GPA). Aside from ethnicity, in which Asian and White students showed significant increases in grades compared to Latino students, no other covariates significantly predicted changes in GPA. Moreover, although academic engagement and academic performance are highly correlated when assessed concurrently (see Table 1), in our longitudinal model, teacher-rated academic engagement (seventh grade) and academic performance (eighth grade) were correlated at $r = 0.53$ ($p < 0.01$), suggesting that they are related but distinct constructs.

Consistent with our main hypothesis, as shown in Fig. 1, when accounting for academic performance (i.e., GPA) at baseline, greater friendship instability during the first year of middle school predicted lower levels of academic engagement ($b = -0.17$, $SE = 0.04$, $p < 0.001$); and, lower academic engagement, in turn, predicted lower academic performance at the end of eighth grade ($b = 0.25$, $SE = 0.03$, $p < 0.001$). Moreover, the negative association between friendship instability and academic performance (total effect: $b = -0.10$, $SE = 0.02$, $p < 0.001$) was reduced when accounting for academic engagement (direct effect: $b = -0.06$, $SE = 0.03$, $p = 0.013$), indicating support for partial mediation. The estimate of the indirect effect was statistically significant as indicated by its confidence interval that did not include zero ($ab = -0.04$, 95% CI [-0.07– -0.02]), suggesting that the association between friendship instability and lower grades from sixth to eighth grade can be accounted for, in part, by lower levels of classroom engagement.²

Taken together, our results demonstrate significant instability in adolescent friendships following the transition to middle school. When accounting for friendship network size, both losses and gains in friendships were concurrently associated with lower academic functioning. Moreover, overall instability due to friendship losses and gains during the first year in middle school was related to lower academic engagement in seventh grade, which in turn, predicted lower academic performance by the end of middle school.

4. Discussion

Close friendships are considered developmental necessities (Sullivan, 1953). Compared to youth without friends, those with at least one friend tend to do better academically starting in elementary school (Ladd, 1990). The goal of the current study was to shed light on the relatively understudied topic of friendship instability that captures both dissolution of old ties and formation of new ones. By relying on prospective longitudinal data at a time of heightened social change (i.e., first year in middle school), we show how instability of friends is associated with lower academic engagement and lower academic performance by the end of middle school. Thus, complementing the large body of work on problematic peer relations (e.g., peer rejection and victimization) and school-related difficulties, friendship instability appears to capture yet another disruptive social process that can compromise academic functioning in middle school. As such, the current evidence also supports the assumption that continuity — rather than change — promotes adjustment (Juvonen, 2007).

The current findings underscore that friendships are dynamic relationships. Whereas the number of friends remained relatively

² Supplementary analyses testing the final mediation model separately for gains and losses were conducted to provide additional support for considering cumulative changes (i.e., losses + gains) in the instability index. Over and above covariates, greater instability due to friendship gains during the first year of middle school predicted lower eighth grade GPA ($b = -0.08$, $SE = 0.02$, $p < 0.001$) and this association was accounted for, in part, by lower academic engagement at seventh grade ($ab = -0.03$, 95% CI [-0.06– -0.01]; a path: $b = -0.13$, $SE = 0.05$, $p = 0.005$; b path: $b = 0.25$, $SE = 0.03$, $p < 0.001$). Similarly, instability due to friendship losses was negatively related to eighth grade GPA ($b = -0.08$, $SE = 0.02$, $p < 0.001$) due to lower seventh grade engagement ($ab = -0.04$, 95% CI [-0.06– -0.02]; a path: $b = -0.17$, $SE = 0.04$, $p < 0.001$; b path: $b = 0.25$, $SE = 0.03$, $p < 0.001$). The similar pattern of results suggests that the process whereby changes in friendship interfere with academic functioning unfolds similarly regardless of whether the changes are due to losing friends, gaining friends, or both.

stable (with a slight increase by spring), taking into account whom adolescents nominated as their friends depicted substantial volatility. About two thirds of youth reported some changes in their friends across the sixth grade, while almost all (96%) lost or gained one friend during their first year of middle school. In comparison to past studies documenting that approximately 50% of friends are stable (see Meter & Card, 2017), our findings reveal greater instability (see Hartl, Laursen, & Cillessen, 2015 for exception). Yet, previous investigations have often taken into account only a limited number of friendships (e.g., best friendships; Bowker, Rubin, Burgess, Booth-LaForce, & Rose-Krasnor, 2006) and the duration has been investigated in contexts that promote stability (e.g., non-transition times, shorter time lapse between measurements; Chan & Poulin, 2007; Parker & Seal, 1996). In contrast, we focused on an academic school year following a transition to a new school environment capturing a time period of heightened volatility in peer relations (Değirmencioğlu et al., 1998; Hardy et al., 2002). With an increased availability of peers (i.e., possible friends) in a much larger school environment, students may have less motivation to work at maintaining existing friendships and instead spend time “shopping around” for the right group of friends. Our estimates of instability may also reflect in part the selection criteria in the fall when youth do not yet know one another well. For example, while friendship selection at the beginning of sixth grade may be based on observable attributes, such as familiarity (e.g., attending the same elementary school, classroom seating), factors known to promote friendship longevity (e.g., similarity on preferences and attitudes) may require more time to recognize. Nevertheless, our results suggest that youth who more efficiently find compatible pals are better off academically than those who take longer to secure lasting relationships.

Although having different friends across the first year in middle school is normative, such changes are nevertheless disruptive. Consistent with findings regarding breakup of romantic relationships (e.g., Chen et al., 2009; Price et al., 2016), the current findings suggest that friendship changes can interfere with adaptive functioning. Whereas students with stable ties may be able to rely on their friends as a resource for emotional support, advice and assistance with schoolwork (e.g., Wentzel, 1993), those who lose friends or gain new ones cannot reliably count on such resources. Thus, youth with high levels of friendship instability are likely to lack the necessary instrumental (e.g., homework help, study buddy) and emotional (e.g., mitigate academic worries) support to stay engaged in the classroom and excel academically. Moreover, the explicit attention and effort involved in friendship transitions (Aikins et al., 2005) may consume resources that could otherwise be directed towards schoolwork.

Our initial correlational findings corroborated past research documenting that having more friends is positively related to academic engagement and performance (Berndt & Keefe, 1995; Ladd, 1990; Ladd & Price, 1987). Moreover, it does not appear to be inherently problematic to form new friendships or leave behind old ones: The bivariate correlations (Table 1) showed that the number of friends lost and gained was unrelated to the academic outcomes examined. However, when taking into account the total friendship network size in sixth grade (which was positively related to academic functioning), a greater number of new friends, much like lost friends, was related to lower academic engagement and GPA during sixth grade. These concurrent regression findings are important because they imply that while a greater number of friends is associated with better academic functioning, greater turnover (and even mere formation) of such relationships has the opposite relation to academic engagement and performance. Although new friendships promote improvements in school performance among young children (Ladd, 1990), developmental differences in friendship may account for the differential impact of friendship gain during early adolescence. While in childhood friendships are based on proximity and participation in common activities, early adolescence is marked by cognitive and social changes that increase the importance of emotional intimacy, loyalty, and self-disclosure (Berndt, 2004; McDougall & Hymel, 2007; Parkhurst & Hopmeyer, 1999). Thus, for adolescents, new friendships may involve more active effort (e.g., coordinating schedules, as well as sharing possible worries; Berndt & Perry, 1986) and serve as weaker bases of support, which may then take a toll on schoolwork. It is possible that adolescents' heightened orientation towards peers (Fuligni, Eccles, Barber, & Clements, 2001) and desire to impress potential friends could also increase motivation not to appear “nerdy” or studious (Juvonen & Murdock, 1995), particularly if desired friends do not appear to value hard work or academic success.

Corroborating past research, our initial descriptive results also show that peer rejection is related to academic difficulties in early adolescence (Lopez & Dubois, 2005). Youth who are rejected by their schoolmates may have fewer opportunities to engage in peer interactions that support academic endeavors (e.g., homework assistance). Indeed, peer rejection may inhibit friendship maintenance. While peer acceptance increases opportunities to form friendships (Nangle, Erdley, Newman, Mason, & Carpenter, 2003), rejected students may have difficulty making and keeping friends. With fewer friendship opportunities, rather than building a friendship based on similarity which facilitates relationship longevity (Hartl et al., 2015; Poulin & Chan, 2010), rejected students may become friends with anyone who is available and willing. In addition, if their rejection is associated with aggressive behavior, poor social skills or behavioral dysregulation, rejected youth may offer few benefits to new or existing friends, in turn promoting dissolution. Moreover, if social skills develop concomitantly with stable friendship, socially marginalized youth may be at heightened risk for long-term relationships difficulties as well as academic disadvantage. Cross-lagged models testing directionality of the association between peer rejection and friendship instability may provide new insights that extend our understanding of peer rejection and academic difficulties.

Our results also shed light on how demographic characteristics (i.e., sex and ethnicity) contribute to changes in adolescent friendships. Girls' friendships appear to be more volatile than boys. However, when differences in network size were controlled for in our index of instability, we found no differences in the friendship instability of girls and boys. Thus, consistent with a recent meta-analysis documenting no sex differences in friendship stability (Meter & Card, 2017), patterns of friendship maintenance and change appear to be similar for girls and boys. We did, however, find significant ethnic differences in friendship instability. Specifically, African American and Latino students experienced greater instability in their friendships compared to their White and Asian peers. Given the similarity in friendship losses or gains, we presume higher instability is related to African American and Latino students' fewer friendship nominations (see also Vaquera & Kao, 2008; Way, Gingold, Rotenberg, & Kuriakose, 2005). That is, with smaller,

more intimate friendship networks, the relative impact of friendship change is more substantial. Given that the schools in the current sample all included at least moderate levels of ethnic diversity, it would also be important to examine ethnic differences in other school contexts. While the school ethnic composition may not influence the closeness of established friendships (Vaquera & Kao, 2008), it may play a role in the formation of friendships particularly when a racial/ethnic group lacks a critical mass and is at risk for isolation or marginalization.

There are several limitations to this study. First, friendship instability was assessed based on outgoing (i.e., given) nominations which do not distinguish between desired and actual friends (Echols & Graham, 2016). Although recent evidence suggests that reciprocity, or lack thereof, does not affect friendship stability (Meter & Card, 2017), future studies using alternative measurements of friendship (e.g., reciprocation) are needed to replicate the current findings. Second, friendship instability was assessed at two time points during the school year. Although we presume that such assessment provides a general indication of the friendship changes occurring during the first year of middle school, adolescents' friendship networks are likely to change within shorter time frames (e.g., Chan & Poulin, 2007, 2009). In future research, capturing friendship losses and gains across weekly or monthly intervals would shed light on the frequency and proximal impact of such changes. Additionally, longitudinal mediation models (e.g., autoregressive, latent-growth models) which model all variables at all time points would provide insight as to whether the academic consequences of friendship instability are stable across time. Third, our index of instability does not depict the heterogeneity in social experiences for groups of students who may share the same instability score (e.g., mostly losing friends versus mostly gaining friends across the school year). However, our supplementary analyses suggest that indeed it is the proportion of change, rather than the nature of changes that is related to academic functioning. Regardless, it is important to recognize that gains in friendships may occur for many reasons (e.g., proximity, similarity, etc.) and emotional reactions to friendship losses may vary depending on how the relationship ended. Thus, future research is needed to shed light on how the emotions and reasons associated with different patterns of instability are related to a wide range of adjustment indicators.

The current study recognizes the need to further understand both the characteristics of individuals with high friendship instability and the characteristics of their friends. It would be important to know whether youth with high levels of instability during their first year in middle school already had, and continued to have, great amounts of friendship turnover. It remains unknown whether friendship instability represents a persistent individual difference as opposed to lack of person-environment fit (Eccles et al., 1993). Also, we did not examine the effects of specific characteristics of (lost and gained) friends, nor did we model relationship quality. It is possible that the academic orientation or the quality of specific friendships may moderate the academic consequences of instability. Whereas the loss of a disengaged friend may serve youth well, the gain of a highly motivated friend should have positive academic effects. Similarly, the loss of a desirable or highly supportive friendship may be especially distracting, while the loss of a relationship that requires extensive attention might enable youth to focus more on schoolwork. These questions were beyond the scope of the current investigation focusing on the effects of instability of relationships, but may be a fruitful avenue for future research.

4.1. Implications

The current study contributes to the literature on negative peer experiences by demonstrating that friendship instability during the first year in middle school is related to lower academic engagement and performance. As attention continues to focus on the protective benefits of friendship (e.g., buffer of stress), our results suggest that it is also important to understand the consequences associated with instability of friends during early adolescence. Indeed, adjusting to the social aspects of a school transition may be as important as adjusting to its academic demands. Despite the recognized impact of peer relationships in academic success (Way et al., 2005), most schools offer few opportunities for interaction among students during class time (Osterman, 2000). In contrast, there may be explicit efforts to separate friends into different classrooms (Zajac & Hartup, 1997). Based on the current findings, schools might instead want to capitalize on stabilizing friendships. For example, friendship nominations can be a tool that allows teachers to decide in some cases which students might benefit from continuing to attend the same classes.

Schools might be able to engineer more continuity in friendships also through relationship skill-building. High levels of friendship instability may be an indicator of deficits in social skills (Parker & Seal, 1996). Just as in the context of romantic relationships, friendship maintenance requires effort and skills - skills that have been recognized as needing explicit instruction and practice ("Making Caring Common," 2017). Supportiveness and conflict resolution are skills for a lifetime that can benefit all youth, but especially those who have trouble maintaining friends.

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