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Peer Selection and Socialization in Adolescent Depression: The Role of School Transitions

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Abstract

Previous studies have indicated homophily in internalizing distress among adolescent friends, resulting from both peer selection and socialization processes. However, developmental differences and the role of school transitions in these processes have not been elucidated. A sample of 367 adolescents was followed from 6th to 11th grade to investigate prospective relationships between adolescents' and their friends' depressive symptoms in middle school, during transition to high school, and in high school. Results revealed that students selected friends with similar levels of depressive symptoms after each school transition. Additionally, friends appeared to socialize adolescents to become more similar in depressive affect in late middle school years. These findings suggest normative selection effects following school transitions, followed by socialization effects in middle school, but not high school.

Keywords

Depression; friendship; peers; internalizing; school transitions

Adolescence is marked by developmental changes and transitions across multiple areas, including greater independence from parents, increased closeness with peers, and multiple school transitions (Brown, 2004; Collins & Laursen, 2004). A large literature also demonstrates an increase in the incidence of depression during early and mid adolescence (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Kim-Cohen et al., 2003; Saluja et al., 2004) that, in some cohorts, continues into late adolescence (Galambos, Leadbeater, and Barker; Hankin et al., 1998). Several studies have implicated the processes of peer selection and socialization in adolescent depression (Giletta et al., 2011; Haselager et al., 1998; Hogue & Steinberg, 1995; Prinstein, 2007; Stevens & Prinstein, 2005; Van Zalk et al., 2010), but they did not examine developmental changes in these processes. In addition, existing literature has not addressed the role of school transitions in peer selection and socialization processes, despite evidence of substantial impact of school transitions on the peer context and friendships (Cantin & Boivin, 2004; Hardy, Bukowski, & Sippola, 2002). The present

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study examines friendship selection and socialization for depressive symptoms in the context of normative school transitions throughout the developmental periods of early and middle adolescence.

Homophily, Selection and Socialization

Peers become a primary socialization context and an important source of support in adolescence (Bokhorst, Sumter, & Westenberg, 2010; Furman & Burhmester, 1992; Hartup & Stevens, 1997). Friendships, defined as voluntary and mutually reciprocated relationships between equals, become more intimate - that is, marked by self-disclosure, sharing of personal and private thoughts and feelings, and empathy (Berndt, 1982). In turn, shared interests, activities and behaviors become more important for adolescent friendships, leading to greater similarity between friends (i.e., homophily) compared to childhood friendships (Kandel, 1978; Sullivan, 1953). Apart from serving as a basis for intimacy, homophily also helps adolescents establish a sense of personal identity as they explore and receive validation of their beliefs, interests and attitudes (Epstein, 1989). Thus, it is not surprising that adolescents are similar to their friends on a variety of characteristics, such as popularity, peer victimization, prosocial and antisocial behavior, internalizing traits and symptoms, body image, sexual behavior, and alcohol and drug use (Haselager, Hartup, Lieshout, & Riksen-Walraven, 1998; Henry, Schoeny, Deptula, & Slavick, 2007; Hutchinson & Rapee, 2007; Linden-Anderson, Markiewicz, & Doyle, 2009; Jaccard, Blanton, & Dodge, 2005; Kandel, 1978; Mariano & Harton, 2005). Literature thus confirms that friends are similar on many different facets.

Homophily may develop through two different mechanisms, selection and socialization. Selection refers to a process of selecting friends who are similar to oneself. Both theoretical and empirical work has confirmed that friendship selection is highly influenced by similarity and that adolescents become more selective in choosing friends who are more similar to themselves (Newcomb, 1961; Tesser, Campbell, & Smith, 1984; Urberg et al., 1995). By contrast, socialization refers to a process of friends influencing one another, so that they become more similar over time. These processes are not necessarily exclusive or sequential, meaning that homophily among friends could occur through either selection or socialization at different points in a friendship.

Peer Selection and Socialization in Adolescent Depression

Selection and socialization have been extensively studied in relation to externalizing behaviors, with findings typically demonstrating both selection and socialization effects for alcohol, tobacco and drug use (Kandel, 1978), sexual attitudes and behaviors (Henry et al., 2007), and delinquency (Haynie & Osgood, 2005). By contrast, few studies have addressed the roles of selection and socialization in friends' similarity in internalizing behaviors, such as depressive symptoms.

Depression is a particularly relevant facet of adjustment in adolescence. Approximately 15–23% of adolescents meet criteria for Major Depressive Disorder (MDD) at some point during adolescence (Birmaher et al., 1996; Garber, 2000; Lewinsohn & Essau, 2002; Sund, Larsson, & Wichstrom, 2011), with even greater proportion of youth (18–40%) experiencing subclinical symptoms of depression (Olsson, Nordstom, & van Knorring, 1999; Olsson & van Knorring, 1997; Saluja, Iachan, Schedit, Overpeck, Sun, & Giedd, 2004). Multiple studies suggest that the incidence (number of new cases) of depression increases sharply in early and middle adolescence, and then declines (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Kim-Cohen et al., 2003; Saluja et al., 2004). However, some studies found the highest incidence later in adolescence, between the ages of 15–18 (Hankin et al., 1998). These differences may be explained by cohort effects, as suggested by Galambos et al.,

(2004). Galambos et al. found a consistent symptom increase from age 12–16 and a consistent decrease in symptoms at ages 20–23 across four different cohorts. However, between the ages of 16 and 20, some cohorts showed increased depressive symptoms while others showed a decrease. Nevertheless, all studies agree that depressive symptoms and diagnoses rise substantially in early to middle adolescence. In turn, adolescent depression has been linked with a number of negative outcomes, such as body dissatisfaction (Presnell, Bearman, & Stice, 2003), substance use (Sihvola et al., 2008), suicidal ideation (Goldston et al., 2009) and school drop-out (Fortin, Marcotte, Potvin, Royer, & Joly, 2006). Considering the heightened prevalence of depression during adolescence and the negative outcomes associated with depression, it is important to understand factors that influence adolescent depression.

As noted earlier, several studies revealed homophily of depressive symptoms in adolescent friendships (Giletta et al., 2011; Haselager et al., 1998; Hogue & Steinberg, 1995; Prinstein, 2007; Stevens & Prinstein, 2005; Van Zalk et al., 2010) that could be the result of selection and/or socialization influences. Several studies examined selection and/or socialization effects for depressive symptoms directly. All of these studies found evidence of socialization effects, with friends' higher depressive symptoms predicting an increase in individual adolescent's depressive symptoms over time (Giletta et al., 2011; Hogue & Steinberg, 1995; Prinstein, 2007; Stevens & Prinstein, 2005; Van Zalk et al., 2010). These socialization effects were demonstrated in both middle school and high school students, and across different definitions of friendships, from single best friends to groups or cliques of up to 10–13 friends. However, two of these studies found evidence of gender differences that were not consistent with each other. Hogue and Steinberg (1995) reported socialization effects in male (but not female) high school students' friendship groups, whereas Giletta et al., (2011) found socialization among female (but not male) friendship dyads in 12–16 year-old students. Only three studies tested selection effects; two reported that both male and female adolescents were more likely to select friendship groups with similar levels of depressive symptoms (Hogue & Steinberg, 1995; Van Zalk et al., 2010), but one found no evidence of selecting a best friend based on similarity in depressive symptoms (Giletta et al., 2011). Thus, although the number of studies is limited, it appears that socialization effects are robust across different definitions of friendships, while selection effects for depressive symptoms only occur when a larger number of friends is considered. However, existing research has not addressed how these selection and socialization effects may vary throughout adolescence as a function of developmental changes and contextual (primarily school) transitions.

Developmental Changes in Peer Selection and Socialization

Both peer selection and socialization processes may be influenced by developmental changes occurring during adolescence. Given the greater emphasis on intimacy and homophily in adolescent friendships, older adolescents may be expected to be more selective in choosing friends similar to themselves. However, little empirical research has addressed this issue. Bryne and Griffitt (1966) compared 4^{th} and 12^{th} grade students' liking of hypothetical peers with similar attitudes to the respondent, finding no age difference in selection effects. Studies examining peer influences on antisocial behavior demonstrated that adolescents were more likely to choose friends with similar levels of antisocial behavior, but only during mid-adolescence (ages 14–15; Monahan, Steinberg, & Cauffman, 2009). Dishion and Owen (2002) showed that youth were more likely to select friends with similar levels of substance use in later compared to earlier adolescence. It is possible that the higher prevalence of substance use and subsequently greater availability of substance using peers in later adolescence, and/or a more prominent role of substance use in the lives of older adolescents, are primarily responsible for these results. These studies suggest that

developmental differences of selection effects occur, but may vary substantially across different behaviors. Clearly, more research is needed to clarify possible developmental changes in the magnitude of peer selection effects during adolescence for different characteristics and behaviors, including depressive symptoms.

Likewise, the evidence for possible developmental changes in peer socialization (or influence) is unclear. Theoretically, younger adolescents may be more susceptible to peer socialization because of their less developed cognitive and executive functioning skills, such as abstract thinking and impulse inhibition (Keating, 2004). In later adolescence, with greater cognitive and behavioral autonomy and more advanced identity development, susceptibility to peer socialization effects may decline. These propositions have been generally supported by studies utilizing adolescent self-report. Using responses to hypothetical “peer pressure” situations, Berndt (1979) found that conformity to peers peaked around 12–15 years of age. Similarly, Steinberg and Monahan (2007) reported an increase in self-reported resistance to peer influences between the ages of 14–18. However, studies that examined developmental differences in the effects of peer behavior on adolescents' own behavior have not confirmed these self-report trends. For instance, one study found no differences in peer influences on adolescent smoking between 6th and 11th grade (Chassin, Presson, Sherman, Montello, & McGrew, 1986). Similarly, comparable socialization effects for antisocial behavior have been reported in middle and late adolescence (ages 15–20; Monahan et al., 2009). Yet another investigation found a stronger effect of the proportion of smoking friends on adolescents' smoking in 11th than in 8th grade, suggesting a stronger, not weaker, peer socialization effect in later adolescence (Urberg, Cheng, & Shyu, 1991). These studies suggest that developmental differences in the susceptibility to peer influence vary with the behavior domain being examined. The present investigation will contribute to better understanding of developmental changes in peer selection and socialization with regards to depressive symptoms.

School Transitions

Apart from general developmental changes, school transitions are also likely to influence both selection and socialization processes in adolescent friendships. In the U.S., most adolescents experience two major school transitions - from elementary to middle school around age 11 (between 5th and 6th grade) and from middle school to high school around age 14 (between 8th and 9th grade). However, in some school districts, transitions may occur from elementary to junior high school around age 13 (between 6th and 7th grade) and from junior high school to high school around age 15 (between 9th and 10th grade). All school transitions typically involve a move to a larger school with a greater student population. This can cause a disruption in established peer groups, as well as provide opportunities to select new friends from a larger and more diverse pool of peers. Indeed, research has demonstrated that previous friendships are often lost and new friendships are formed following school transitions (Cantin & Boivin, 2004; Hardy, Bukowski, & Sippola, 2002). Because of the disruptions in existing friendships and greater opportunities to form new friendships, the effects of selection processes may be more prominent than socialization effects immediately after a school transition. However, once new friendships have formed, it is likely that socialization becomes a more important force responsible for similarity among friends. At this point, the understanding of school transitions and how they influence selection and socialization is speculative and warrants investigation.

In addition to their impact on friendships, school transitions may contribute directly to an increase in depressive symptoms. Although results are somewhat mixed, several studies indicate that school transitions are associated with a decrease in academic performance (Alsapaugh, 1998; Blyth, Simmons & Carlton-Ford, 1983; Seidman, Aber, Allen & French, 1996; Wigfield, Eccles, Mac Iver, Reuman and Midgely, 1991), lower perceived support

from school personnel (Barber and Olsen, 2004; Eccles, 2004), and decreased school satisfaction (Barber & Olsen, 2004; Rudolph, Lambert, Clark, Kurlakowsky, 2001; Seidman et al., 1996). Perhaps as a consequence of these changes, school transitions also are associated with lower self esteem, higher rates of depression and psychological distress, and increased loneliness (Barber & Olsen, 2004; Chung, Elias, & Schneider, 1998; Wigfield et al., 1991). Thus, we would expect a general increase in depressive symptoms following each school transition that could further contribute to a greater magnitude of selection of friends similar to one's level of depressive symptoms.

Gender Differences

The literature also suggests important gender differences in adolescent depression, friendships, selection and socialization processes, and effects of school transitions. In adolescence, gender differences in prevalence rates of depression emerge, with many more females than males suffering from depression (Hankin et al., 1998, Saluia et al., 2004). Gender differences are also evident in adolescent friendships. Generally, females report greater closeness and support in their friendships compared to males (Buhrmester & Furman, 1987; Furman & Buhrmester, 1992), which may be partly due to higher rates of self-disclosure and co-rumination among female friends (Rose, 2002). However, such co-rumination is also associated with increased depression and anxiety (Rose, Carlson & Waller, 2007), and may translate into stronger socialization influences on depressive symptoms among adolescent females. However, females also report greater resistance to peer influence than males, particularly in early to mid-adolescence (Sumter, Bokhorst, Steinberg, & Westenberg, 2009). Thus, it is unclear whether socialization effects for depression would be stronger among adolescent females or males. As noted earlier, existing literature has yielded inconsistent results, with one study showing socialization in males, but not females (Hogue & Steinberg, 1995) and another showing socialization in females, but not males (Giletta et al., 2011). Boys and girls also seem to react differently to the new friendship opportunities presented by school transitions, with girls being more likely to form friendships with previously unfamiliar peers than boys (Hardy et al., 2002). Thus, it is possible that, following school transitions, selection may play a more important role in girls' than boys' friendships. Finally, school transitions influence the emotional health of boys and girls differently, with girls showing more psychological distress than males following a school transition (Chung et al., 1998). In summary, it is clear that gender differences need to be examined when evaluating selection and socialization for depressive symptoms in adolescent friendships.

Present Study

Although existing literature suggests that adolescents select friends with similar levels of depressive symptoms and that friends socialize each other to become more similar in their levels of depression, it is unclear whether and how these processes vary developmentally throughout adolescence, how they are affected by major school transitions, and how they may differ by gender. The present study addresses these questions by systematically examining selection and socialization effects for depressive symptoms occurring year to year between 6^{th} and 11^{th} grade (ages 12–17). We hypothesized that adolescents would associate with friends who are similar in their levels of depressive symptoms and would also influence each other to become more similar in depressive symptoms over time (Giletta et al., 2011; Haselager et al., 1998; Hogue & Steinberg, 1995; Prinstein, 2007; Stevens & Prinstein, 2005; Van Zalk et al., 2010). Second, we predicted that selection effects would be stronger immediately following school transitions (in grades 6 and 9 vs. other grades) due to increased likelihood of new friendships being formed at those times (Cantin & Boivin, 2004; Hardy, Bukowski & Sippola, 2002). Third, after school transitions occur and the peer environment becomes more stable (grades 7, 10, and 11), peer influence was hypothesized

to increase in importance, at least among younger adolescents who may be more susceptible to peer influence (Steinberg & Monahan, 2007). Fourth, because studies have demonstrated stronger selection effects (Dishion & Owen, 2002; Hogue & Steinberg, 1995) in late adolescence, we expected stronger selection effects in later adolescence (grades 9–11) than in early adolescence (grades 6–8). Finally, in regard to gender differences, the selection effects following school transitions were expected to be stronger among females, as females are more likely to make new friends in new schools than males (Hardy et al., 2002). In light of conflicting evidence, no hypotheses were made about gender differences in socialization effects.

Methods

Participants and Procedures

Data were collected from a cohort of youth attending a public school system in a medium-sized northeastern town (Cillessen & Borch, 2008). The present report includes data collected in six successive years (1998–2003) from a cohort of adolescents attending the same grade in the school system as they progressed from 6th to 11th grade (approximate ages 12 to 17). The students attended two middle schools in grades 6–8 and one high school in grades 9–12. In the spring of each year, all students in that grade were invited to participate in the study. The number of students participating in the study ranged from 357 to 551 over the six years (participation rate 72–91%).

Because we were interested in studying peer selection and socialization within the context of normative school transitions (i.e., attendance of the same middle school followed by a transition to and attendance at the same high school), only participants who had complete data for all middle school years (grades 6–8) or all high school years (grades 9–11) were included in the analyses. Students with incomplete data for each school segment were excluded because they may have entered or left the school at non-normative time points and thus experienced peer selection and socialization out of synchrony with other students. Additionally, the stress associated with such non-normative transitions may affect depression levels (Hendershott, 1989) and confound results. However, these excluded students still were included in computations of friends' depressive symptoms. Altogether, 230 participants had complete data for grades 6–8 and 126 for grades 9–11. Students included in at least one of these groups (N=367) did not differ from excluded cases in gender [$\chi^2(1) = 2.00$, *ns*] or race [$\chi^2(1) = 2.52$, *ns*], but they had fewer depressive symptoms [M = 1.35 vs. 1.46, $t(792) = 4.68$, $p = .00$]. The participants included 51% females, 64% White, 20% African American, 12% Latinos and 1% of youth from other ethnic origins. Participating adolescents completed group-administered peer nomination and self-report forms in their classrooms.

Measures

Depressive symptoms—In only the 6th grade, participants completed the Children's Depression Inventory (CDI; Kovacs, 1992). The CDI includes 27 items, but one item assessing suicidality was excluded due to ethical reasons. On each item, children chose one of three statements which best described their mood in the past two weeks. The responses were scored 1–3, with a higher score indicating greater severity of depressive symptoms, and averaged ($\alpha = 0.77$). The CDI is considered an appropriate measure for assessing depressive symptoms in young adolescents (Denault & Poulin, 2009; Saylor, Finch, Spirito, & Bennett, 1984). In 7th to 11th grade, depressive symptoms were measured only with the Beck Depression Inventory Short Form (BDI-SF; Beck & Beck, 1972), a 13-item self-report of depressive symptoms that has been used with individuals age 13 and older (Margolese, Markiewicz, & Doyle, 2005; Verstraeten, Vasey, Raes, & Bijttebier, 2009). As with the

CDI, one item assessing suicidality was excluded for ethical reasons, yielding a 12-item measure. Symptoms were rated on a 4-point scale ranging from 1 (not present) to 4 (severe) and averaged ($\alpha = 0.77 – 0.90$ across grades). The BDI-SF has demonstrated adequate validity and is considered an appropriate measure of depressive symptoms in adolescence (Albert & Beck, 1975; Gould, 1982; Scogin, Beutler, Corbishley, & Hamblin, 1988; Leahy, 1992).

Friends' depressive symptoms—Friendship was determined using school-based sociometric procedure. Children were presented with a roster of peers within the same grade and asked to nominate those they considered their best friends. The participants were allowed to make an unlimited number of nominations. Consistent with existing literature on friendships (e.g., Woelders, Larsen, Scholte, Cillessen, & Engels, 2010), friendship was defined by reciprocal nomination, that is, by mutual friendship nomination of the target child and a peer. Although some studies have defined friends based on both reciprocated and unreciprocated nominations, reciprocated friendships are generally preferred because the friendship choice has been confirmed by both parties and reciprocated friendships have higher friendship quality than unreciprocated ones (Newcomb & Bagwell, 1995). Consistent with previous studies of multiple friendships (Hogue & Steinberg, 1995; Woelders et al., 2010), friends' depressive symptoms were computed as the average of self-reported depression scores across all reciprocal friends of each child.

Results

Descriptive Statistics

Means and standard deviations of individual and friends' depression scores, as well as the number of friends in each grade and the proportion of friends in the network who were stable from the previous year, are presented in Table 1. Changes in individual depressive symptoms and friends' depressive symptoms over time from 7^{th} to 11^{th} grades (depressive symptoms in 6^{th} grade were measured with a different instrument and thus could not be directly compared) were evaluated using repeated measures ANOVA followed by pairwise comparisons with Bonferroni correction for multiple comparisons. Results indicated significant differences over time for both individual depressive symptoms [Wilks' Lambda = .88, $F(4,158) = 5.41$, $p = .00$] and friends' depressive symptoms [Wilks' Lambda = .79, $F(4, 99) = 6.40$, $p = .00$]. For both individual and friends' scores, depressive symptoms in 9^{th} grade were significantly lower compared with 10^{th} and 11^{th} grades. In addition, friends' depressive symptoms in 11^{th} grade were significantly greater compared with 7^{th} grade. Next, gender differences in individual and friends' depressive symptoms within each grade were evaluated using independent samples *t* tests. Females had higher depression scores in 7^{th} [1.33 vs. 1.24, $t(321) = -2.19$, $p = .03$] and 8^{th} grades [1.35 vs. 1.26, $t(350) = -2.02$, $p = .04$]. Females also had higher friends' depression scores than males in 7^{th} grade [1.31 vs. 1.25, $t(296) = -2.37$, $p = .02$]. Correlations among all variables are listed in Table 2.

Main Analyses

The main analyses were performed using structural equation modeling in Mplus 4.2 (Muthén & Muthén, 2007) with maximum likelihood estimation. Two cross-lagged models were analyzed, one for the middle school years (6^{th}–8^{th} grades) and one for the high school years (9–11^{th}). Although analyzing all grades together would be theoretically preferable, the number of cases who had complete data for both middle school and high school was prohibitively small. Thus, conducting two separate analyses maximized the sample size, power, and generalizability of each analysis. Each model included continuity of individual depressive symptoms and friends' depressive symptoms, respectively, as well as cross-lagged paths linking individual and friends' depressive symptoms over time. Selection

effects were tested by paths linking individual depressive symptoms to friends' depressive symptoms in the next successive grade. A significant path would indicate that individual depressive symptoms in one year predicted the depressive symptoms of reciprocal friends in the next grade. Socialization effects were tested by paths linking friends' depressive symptoms to individual depressive symptoms in the following grade. A significant path would indicate that the average of friends' depressive symptoms predicted individual depressive symptoms in the next grade. Modification indices were examined to identify theoretically meaningful paths that could be included to improve model fit.

The standardized path coefficients for the three cross-lagged models are depicted in Figure 1. Good model fit is indicated by nonsignificant χ^2, CFI > 0.95, RMSEA ≤ 0.06, and SMSR ≤ 0.08 (Hu & Bentler, 1999). The 6–8th grade model had an adequate fit with $\chi^2(5) = 15.71$, $p < .01$; CFI = 0.94; RMSEA = 0.096; and SMSR = 0.04. In the 9–11th grade model, the model fit was poor, $\chi^{2/}(5) = 34.22$, $p < .001$; CFI = 0.54; RMSEA = 0.22; and SMSR = 0.09. Examination of modification indices indicated that allowing depressive symptoms in grades 9 and 11 covary (over and above their indirect association through grade 10 depressive symptoms) would improve model fit. Indeed, allowing this covariance yielded a well-fitting model with $\chi^2(4) = 7.06$, $p = .13$; CFI = 0.95; RMSEA = 0.08; and SMSR = 0.05. Path estimates indicated substantial stability over time in individual depressive symptoms scores in each model. Friends' depressive symptoms were less stable over time, with significant continuity only from 7th to 8th grade and 9th to 10th grade. Several cross-lagged effects reached significance in the middle school model. Individual depressive symptoms in 6th grade positively predicted friends' depressive symptoms in 7th grade, indicating a selection effect. In turn, friends' depressive symptoms in 7th grade positively predicted individual depressive symptoms in 8th grade, indicating a socialization effect. The high school transition model yielded no significant cross-lagged pathways. In the high school model, individual depressive symptoms in 9th grade positively predicted friends' depressive symptoms in the 10th grade, indicating a selection effect.

Finally, possible gender differences in all models were tested with multi-group modeling, comparing a model with path estimates fixed to be equal for both genders to a model where the path estimates were allowed to vary between males and females. Chi-squared difference tests indicated that the middle school model and the high school transition model were invariant across gender [$\Delta\chi^2(8) = 11.75$, *ns*; and $\Delta\chi^2(4) = 6.75$, *ns; respectively*]. The high school model differed by gender [$\Delta\chi^2(8) = 15.76$, $p = .045$]. Follow up tests indicated a significant continuity of depressive symptoms from 10th to 11th grade for girls (β=0.55, p=.00) but not boys (β=0.10, p=.48), but no differences in the cross-lagged paths.

Discussion

Depression increases sharply in early and middle adolescence (Costello et al., 2003; Kim-Cohen et al., 2003; Saluja et al., 2004) and is associated with multiple negative outcomes (Fortin et al., 2006; Goldston et al., 2009; Sihvola et al., 2008). Peer processes have been implicated in adolescent depression as demonstrated by homophily, or similarity, of friends' depressive symptoms (Giletta et al., 2011; Hogue & Steinberg, 1995). The similarity appears to arise from friends influencing each other over time (Giletta et al., 2011; Hogue & Steinberg, 1995; Prinstein, 2007; Stevens & Prinstein, 2005; Van Zalk et al., 2010), as well as choosing friends with similar levels of depressive symptoms (Hogue & Steinberg, 1995; Van Zalk et al., 2010). Although empirical evidence suggests the role of both selection and socialization as contributors to homophily of depressive symptoms, developmental changes in these processes have not been studied. Additionally, existing research has not addressed peer selection and socialization processes in relation to school transitions, despite the important effects that school transitions have on adolescent friendships (Cantin & Boivin,

2004; Hardy et al., 2002). Finally, previous research has yielded mixed evidence regarding gender differences in peer socialization for depressive symptoms, with some studies demonstrating socialization only in males (Hogue & Steinberg, 1995), but others finding socialization effects only in females (Giletta et al., 2011). Therefore, this study investigated prospective relationships between adolescents' and their friends' depressive symptoms during middle and high school. Our investigation of selection and socialization effects across middle and high school years extended previous research by examining homophilic processes developmentally throughout adolescence, and allowed us to focus explicitly on the role of school transitions in peer selection and socialization for depressive symptoms. Additionally, we explored gender differences in the studied relationships.

Consistent with the first hypothesis of stronger selection effects following a school transition, depressive symptoms in the first year after a school transition (i.e., grades 6 and 9) predicted friends' depressive symptoms a year later. These results indicate that, within the first two years in a new school, children choose friends who have similar levels of depressive symptoms to themselves. Previous literature has shown that students are likely to form new friendships following school transitions (Hardy et al., 2002) and that adolescent friendships are likely to be formed with friends who are similar to oneself (Epstein, 1983). Together with previous findings of selection effects for depressive symptoms in high school students friendship groups (Hogue & Steinberg, 1995; Van Zalk et al., 2010), our results suggest that similarity in depressive symptoms contributes to the friendship selection process after a transition to a middle and high school. We also hypothesized that the selection effect would be stronger in high school than middle school due to the greater importance of homophily among older adolescents. Although the coefficients were in the expected direction (=.20 vs. .15), they were not significantly different from each other (*t*=. 35, *ns*), indicating similar magnitude of selection effects across the two developmental periods.

Next, we hypothesized that socialization for depressive symptoms will occur more than a year after a school transition (i.e., grades 7, 10, and 11), and that these socialization effects will be more prominent in earlier vs. later adolescence (i.e., in middle than high school). The results were partly consistent with these predictions, indicating a significant socialization effect in grade 7 only. Specifically, friends' depressive symptoms in grade 7 predicted individual depressive symptoms in grade 8, suggesting that friends influenced each other over the one year period to become more similar to each other in their depressive symptoms. In line with self-report data on the higher susceptibility to peer influences in early adolescence (Berndt, 1979; Steinberg & Monahan, 2007) and previous findings of socialization effects for depression among middle school students (Stevens & Prinstein, 2005), the period between 7^{th} and 8^{th} grade in middle school appears a high-risk time for peer contagion of depressive symptoms. The lack of socialization effects in high school (grades 9–11) may reflect the instability of friendships in high school suggested in previous literature (Berndt & Hoyle 1985; Chan & Poulin, 2007) and observed in the present study. Alternatively, it may reflect decreased susceptibility to peer influence as adolescents grow more mature (Berndt, 1979; Steinberg & Monahan, 2007). Consistent with the lack of socialization effects and a paucity of selection effects during high school, the fit of the hypothesized model to the data was poor.

Contrary to our hypotheses, no gender differences in selection and socialization effects emerged. Specifically, given that girls are more likely to form new friendships in new schools than boys (Hardy et al., 2002), we expected stronger selection effects for depressive symptoms among girls than boys immediately following school transitions. However, the absence of these gender differences is consistent with previous literature indicating comparable selection effects between male and female high school students (Hogue &

Steinberg, 1995; Van Zalk et al., 2010). Additionally, no evidence of gender differences in socialization effects in the present study corroborates a similar report of no gender differences in socialization effects for internalized distress among males and females in middle school (Stevens & Prinstein, 2005). It is possible that gender differences in peer selection and socialization for internalizing problems exist, but are too small to be detected by studies with relatively small sample sizes (e.g., several hundred). Indeed, studies that reported a statistically significant difference in peer socialization for internalizing problems had a sample size of about 850 (Van Zalk et al., 2010) and 6,000 (Hogue & Steinberg, 1995), much larger than the present study. Therefore, future studies that explore gender differences in selection and socialization processes would benefit from a large sample size.

In addition to the main analyses, we also investigated gender, racial/ethnic and developmental differences in depressive symptoms over time. The results for gender differences in depressive symptoms were not consistent with previous studies indicating higher depressive symptoms in females as compared to males beginning between the ages of 13 and 15 (Hankin et al., 1998). This may be due to multiple factors, including smaller numbers of participants in later adolescence and generally smaller gender differences in our study (effect sizes 0.02 to 0.12) compared to others (effect sizes 0.12 to 0.67; Hankin et al., 1998; Hogue and Steinberg, 1995; Holsen, Kraft and Vittersø, 2000) Differential attrition, with more depressed individuals being less likely to be included in the analyses, likely contributed to both overall lower levels of depressive symptoms in the sample and diminished gender differences in depressive symptoms.

Implications

Several implications arise from these results. First, the selection of friends similar to oneself in depressive symptoms (and likely other characteristics) shows a normative increase in the year after a transition to a middle and high school. Thus, this may be the best time for parents, other adults, or formal intervention programs to influence adolescents' choice of friends to maximize positive and minimize negative peer influences in the time that will follow. For instance, parents or other adults may like to engage youth in conversations about peers at school and emerging friendships, and use these conversations to subtly guide the adolescent to make good friendship decisions and/or more directly structure opportunities to promote friendships with specific peers. Over time, good choice of friends may provide more positive influence, including reinforcement of healthy behaviors rather than negative and potentially harmful behaviors, such as depression.

Second, the present findings identify the time between 7^{th} and 8^{th} grade as a high risk developmental period for peer contagion of depressive symptoms. Although early recognition and treatment of depression are important at all ages, they may be especially critical during the late middle school years when peer influence in this domain is most likely to occur. School-based programs for adolescents focusing destigmatizing depression, recognizing its symptoms, increasing knowledge about available treatments and related resources, and providing guidance on what to do when suspecting depression in oneself or others, may be particularly important in the middle school. In addition, providing psychoeducation about depression to parents and school staff may help adults recognize symptoms of depression in adolescents and ensure early treatment. Early detection of depressive symptoms may be especially important given the well-documented increase in depressive symptoms across adolescence (Hankin et al., 1998). Identifying depressive symptoms early will aid in decreasing peer contagion of depressive symptoms, as well as provide early intervention that may allow amelioration of depressive symptoms and associated negative outcomes.

Although the specific mechanisms of peer influence have not been addressed in this study, it is possible that the observed effect of friends' depressive symptoms on individual depression was due to co-rumination. Co-rumination refers to excessive discussion of personal problems in the context of close dyadic relationships, is associated with increased depression and anxiety (Rose, 2007) and has recently been demonstrated to contribute to the development of depression during adolescence (Stone, Hankin, Gibb, & Abela, 2011). Co-rumination likely functions as a specific mechanism of peer contagion for internalizing problems, such as depression and anxiety (Rose, 2007). Interventions, as well as parents and other influential individuals, can utilize this knowledge to minimize contagion of internalizing problems in adolescent friendships, for instance by educating youth about the importance of positive talk and the detrimental effects of excessively discussing negative personal problems with friends, or by encouraging activities inconsistent with co-rumination, such as active engagement in enjoyable activities (e.g., after school activities or sports). Thus, co-rumination may be an important mechanism to target for lessening the contagion of depressive symptoms among friends.

Limitations and Future Directions

This study had several limitations that should be addressed in future research. First, it is important to acknowledge that we did not explicitly examine the actual processes of peer selection and socialization for depressive symptoms. Next, only participants with complete data were included in the analyses. This decision was conceptually justified to ensure that all studied adolescents were present through the duration of each analytic time frame (e.g., middle school, high school) and thus experienced the normative school transitions at the same time. However, this approach led to the exclusion of students who may have transferred to or from a different school at non-normative times, dropped out of school, been absent on days in which data was collected, declined to participate in the study, or had no mutual friends. Thus, the results may not generalize to such students. We also did not identify adolescents who were new to the school system in 6^{th} or 9^{th} grade, thus experiencing a non-normative transition in which they would be selecting friends from a new pool of peers. The pattern of selection and socialization may differ for these students and should be addressed in future research. A related limitation includes examining only school-based friendships to the exclusion of friendships outside of the school. This seems especially important as one study demonstrated stronger selection and socialization effects for friends outside of school, although it is important to note that selection and socialization effects for school friends were also present (Van Zalk et al., 2010). Further, participants in this study were only able to nominate friends in their grade. This may have eliminated possible friendships with peers from different grades, particularly in high school where such friendships may be more likely due to increased contact in mixed-age classes. Thus, our results may not generalize to mixed-grade friends. However, research indicates that adolescents often choose friends who are the same age (Hartup, 1993) and are more likely to have a mutual same-grade friend than a mutual mixed-grade friend (Bowker & Spencer, 2010). Thus, the bias from excluding mixed-age friends may have been relatively small. In addition, this study collected data only once a year, and thus was not able to detect more short-term changes in depressive symptoms, friendships, and selection and socialization processes. Another limitation was the use of the CDI as a measure of depressive symptoms in the sixth grade and the BDI in the later grades. This may have influenced some of the results. However, the BDI and the CDI are highly correlated (r=.96; Kimmel et al., 1996), suggesting that they measure the same construct and yield similar patterns of scores. The inclusionary criteria and methods used in this study may reduce generalizability of the results to some students, but the findings should be applicable to the majority of adolescents who experience normative school transitions and whose same-grade friends are representative of their friends defined more broadly.

Another group of limitations involves not examining potentially important aspects of friendships, such as the number of reciprocal friends, stability, or friendship quality. The number of reciprocal friends may have especially important implications for socialization. For instance, previous literature demonstrated that conformity to peers increases with group size in curvilinear fashion and then levels off (Asch 1952; Rosenberg, 1961). Therefore, stronger socialization effects might occur in larger friendship groups. Although this was not one of the research questions addressed by the present study, we did explore possible differences in peer selection and socialization across students with few vs. many friends (defined by median split). The results revealed no differences in the SEM models across the two groups. Future studies should assess the size of friendship groups in relation to peer group processes in a more refined manner. Similarly, the stability of friendships may influence selection and socialization. Typically, researchers speculate that more stable friendships are more influential, but this has not been confirmed by empirical evidence (Urberg et al., 1997). To examine this issue, we compared the SEM models across students with low vs. high stability of friendships (defined by median split) via multi-group modeling. We also explored friendship stability as a predictor of depressive symptoms. The results indicated that low friendship stability predicted depressive symptoms, but, consistent with Urberg et al. (1997), it did not moderate peer selection or influence. Finally, the quality of friendship may also influences selection and socialization regarding the level of depressive symptoms in adolescents and their friends. For instance, higher friendship quality or closeness have been associated with greater susceptibility to peer influences on substance use (Morgan & Grube, 1991; Urberg et al., 1997; Urberg, Luo, Pilgrim & Degirmenicioglu, 2003) and may increase susceptibility to peer influences on depressive symptoms as well. Future studies should address the role of friendship quality in peer socialization effects on internalizing problems.

Future studies also should address generalizability of the present results to different populations, including the types of youth who were excluded from the present study. Additionally, it would be valuable to address the actual processes involved in selection and socialization for depressive symptoms in adolescent friendships and how these processes evolve over time, in relation to school transitions and developmental changes, while incorporating information on friendship stability and other potentially related variables, such as friendship quality or friends' status. Elucidating the specific types of peer interactions that underlie selection and socialization for depressive symptoms across adolescence, and in different populations, would be an important contribution to the literature. Together with a description of friendships characteristics that may facilitate these processes, such investigations would provide crucial information for intervention research aiming to use friendships to decrease depressive affect in adolescence.

Despite these limitations, this study makes novel contributions to the literature by examining the relationships between depressive symptoms of adolescents and their friends over a five-year period, explicitly investigating the role of school transitions in peer selection and influence of depressive symptoms, and systematic examination of gender differences. The results revealed prominent peer selection effects for depressive symptoms after each school transition, peer socialization for depressive symptoms in late middle school years, and no substantial gender differences in these effects. These findings indicate that school transitions are an important contextual factor that affects peer processes, and as such should be explicitly incorporated into the analyses and/or interpretations of developmental studies of peer relationships. Additionally, the results contribute to existing evidence of heightened susceptibility to negative peer influences in early adolescence, and indicate a need for continued investigation of the mechanisms underlying peer selection and socialization for internalizing problems.

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Biography

Natalie Goodwin, M.A., is a doctoral student in the Medical/Clinical Psychology program at the University of Alabama, Birmingham. Her areas of interest are in eating disorders, depression, suicide, friendship and spirituality.

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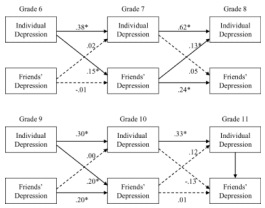

Figure 1.

Cross-lagged model of individual and friends' depression for grades 6–11. *Note.* Numbers are standardized path estimates. A dashed line indicates a non-significant pathway. A solid line indicates a significant pathway. * $p<.05$ or lower.

Table 1

Descriptive Statistics on Depressive Symptoms and Reciprocal Friends

	Depressive Symptoms		Number of reciprocal friends		Stability of friendships	
	Individual	Friends				
Grade	***M (SD)***	***M (SD)***	***M (SD)***	**Range**	***M (SD)***	**Range**
6th grade[a]	1.48 (0.25)	1.48 (0.16)	4.99 (2.95)	1–18		
7th grade	1.29 (0.35)	1.28 (0.24)	3.73 (2.34)	1–15	44.65 (31.87)	0–100
8th grade	1.31 (0.42)	1.33 (0.30)	3.89 (2.48)	1–17	49.00 (33.53)	0–100
9th grade	1.28 (0.37)	1.28 (0.27)	3.05 (1.64)	1–10	39.95 (27.63)	0–100
10th grade	1.38 (0.45)	1.34 (0.26)	3.03 (1.58)	1–8	40.04 (31.77)	0–100
11th grade	1.36 (0.38)	1.40 (0.30)	3.07 (1.70)	1–10		

Note. *N* ranges from 183 to 352

[a]Possible range for depressive symptoms is 1–3 in 6th grade and 1–4 in all other grades

Table 2

Correlations

Variable		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1.	Depression 6	--	.44*	.37*	.13*	.25*	.14*	.38*	.07	.04	.00	−.02	−.09	−.02	.02
2.	Depression 7		--	.47*	.30*	.31*	.20*	.22*	.16*	.05	.09	.14*	−.04	.02	.13*
3.	Depression 8			--	.30*	.21*	.16*	.16*	.09	.11*	.03	.06	.02	.05	.04
4.	Depression 9				--	.40*	.38*	.08	.20*	.12*	.16*	.19*	.09	.01	.06
5.	Depression 10					--	.37*	.04	.21*	.04	.08	.00	−.02	−.05	−.03
6.	Depression 11						--	.01	.05	−.06	.15*	.12	−.01	.04	.02
7.	Friends Depression 6							--	.06	.05	.07	.00	−.08	.00	.00
8.	Friends' Depression 7								--	.24*	.05	.13*	−.02	.13*	.12*
9.	Friends' Depression 8									--	.10	.08	−.05	.12*	−.02
10.	Friends' Depression 9										--	.04	−.03	.04	.02
11.	Friends' Depression10											--	−.06	.04	.00
12.	Friends' Depression 11												--	−.03	.06
13.	Female gender													--	.01
14.	Racial/ethnic minority														--

Note. Depression 6–11 is depressive symptoms in grades 6–11. Friends' Depression 6–11 is the average of depressive symptoms of friends in grade 6–11.

* $p<.05$.