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Friends' Knowledge of Youth Internalizing and Externalizing Adjustment: Accuracy, Bias, and the Influences of Gender, Grade, Positive Friendship Quality, and Self-Disclosure

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Abstract

Some evidence suggests that close friends may be knowledgeable of youth's psychological adjustment. However, friends are understudied as reporters of adjustment. The current study examines associations between self- and friend-reports of internalizing and externalizing adjustment in a community sample of fifth-, eighth-, and eleventh-grade youth. The study extends prior work by considering the degree to which friends' reports of youth adjustment are *accurate* (i.e., predicted by youths' actual adjustment) versus *biased* (i.e., predicted by the friend reporters' own adjustment). Findings indicated stronger bias effects than accuracy effects, but the accuracy effects were significant for both internalizing and externalizing adjustment. Additionally, friends who perceived their relationships as high in positive quality, friends in relationships high in disclosure, and girls perceived youths' internalizing symptoms most accurately. Knowledge of externalizing adjustment was not influenced by gender, grade, relationship quality, or self-disclosure. Findings suggest that friends could play an important role in prevention efforts.

Keywords

Friends' knowledge; Friendship quality; Self-disclosure; Gender

Multi-informant approaches to the study of youth emotional and behavior functioning help address problems associated with self-report data (e.g., social desirability biases) and enhance the validity and sensitivity of assessments (Achenbach et al. 1987; Cole et al. 2000; Weiss et al. 2002). Research has demonstrated the utility of parents (e.g., Rice et al. 2007) and teachers (e.g., Youngstrom et al. 2000) as reporters of youth adjustment. However, friends have been understudied and underutilized as reporters. This is surprising given the significant role of friends in the lives of youth (Hartup and Stevens 1997; Rubin et al. 1998). Moreover, it is unfortunate given the role that friends could play in prevention efforts. For example, if youth are knowledgeable about friends' psychological adjustment, programs could be developed that teach youth strategies for encouraging the friends to seek help and for enlisting the assistance of adults if the friends refuse to seek help for themselves.

To date, few studies have considered friends' knowledge of youths' adjustment, and the findings need to be replicated and extended. First, issues of *accuracy* versus *bias* need to be examined. Friend-reports of youth adjustment are likely due to both accuracy (i.e., the friend-reports are predicted by the youth's actual adjustment) and bias (i.e., the friend-reports are predicted by other variables, such as the friend reporters' own symptoms). However, no studies of friends' knowledge of youth adjustment have assessed the degree to which friend-reports are due to accuracy and bias. The current study utilized an analytic approach specifically designed for dyadic data (Actor Partner Interdependence Model; Kashy and Kenny 2000; Kenny and Acitelli 2001) to examine accuracy and bias effects on friend-reported adjustment. Second, although some research suggests that not all friends are equally valid reporters of youth adjustment (e.g., Prinstein and Wang 2005; Swenson and Rose 2003), more information is needed regarding how characteristics of the youth and the relationship impact relations between self- and friend-reports of adjustment. The current study tests whether accuracy and bias effects on friend-reports are moderated by gender, grade, friendship quality, and disclosure between friends.

Close Friends' Knowledge of Youth Adjustment

The concordance between youth self-reports of adjustment and reports from others is typically small to moderate (e.g., Achenbach et al. 1987). Nevertheless, different informants are considered to have valid perspectives (Achenbach 2006; De Los Reyes and Kazdin 2005), in part because they observe behaviors in different contexts (Achenbach et al. 1987; Rice et al. 2007; Youngstrom et al. 2000). For instance, peers may observe behaviors and interactions that are difficult for adults to observe (e.g., Crick and Grotpeter 1995). As examples, peers can observe symptoms related to social contexts, such as withdrawing or exhibiting a lack of pleasure when associating with the peer group. In fact, aggregate peer-report indices of distress based on classmate nominations evidence significant relations with self-reported symptoms (e.g., Lefkowitz and Tesiny 1980; Weiss et al. 2002).

Close friends may be especially knowledgeable of youth distress. Friendships are highly valued relationships (Bukowski et al. 1996; Hartup and Stevens 1997) and are characterized by more extensive interactions (e.g., greater companionship) and more intensive interactions (e.g., greater communication) than other peer relationships (Hartup 1996; Hartup and Stevens 1997; Newcomb and Bagwell 1995). Also, during childhood and adolescence, the amount of time that youth spend with friends increases (Richards et al. 1998). These findings suggest that youths' friends may have unique opportunities to learn of and observe problematic adjustment in a variety of settings.

However, surprisingly little is known about friends' knowledge of youths' psychological adjustment. Only one study was identified that examined friends' reports of youths' internalizing symptoms. In this study of fifth-, seventh-, and ninth-graders (Swenson and Rose 2003), youth completed the Children's Depression Inventory, and friend reports were obtained using a revision of this measure. Findings demonstrated self-friend agreement on two subscales created in the study: affective depressive symptoms and conduct-related depressive symptoms.

Friend-reports of externalizing symptoms have been obtained more frequently, but the purpose of these studies typically has not been to examine self-friend agreement. These studies generally examined similarity between friends or the impact of having deviant friends on youth adjustment (see Thornberry and Krohn 1997). The studies often considered relations between youths' self-reported externalizing behavior and their reports of their friends' externalizing behavior (e.g., Laird et al. 2005; Shoal and Giancola 2003) but not relations between youths' self-reports and reports of the youths' behavior provided by a

friend. However, one study found significant relations between self- and friend-reports of deviant behavior (e.g., stealing, fighting) and health-risk behavior (e.g., drinking, smoking; Prinstein and Wang 2005). Research on substance use also has included friends' reports as collateral-reports to support the validity of self-reported measures (e.g., by demonstrating that self-reports and collateral-reports share similar relations with other variables). A few of these studies reported significant relations between self- and friend-reports of substance use in adolescence (Smith et al. 1995) and young adulthood (e.g., Hagman et al. 2007).

The results of the prior studies suggest the importance of considering friends as reporters of adjustment. The current study extends this work by examining self-friend agreement within a single study that uses measures specifically designed to assess broader indices of internalizing and externalizing symptoms (the Youth Self-Report; Achenbach and Rescorla 2001). Moreover, as described below, the current study also considers the degree to which friend reports are due to accuracy and due to bias and considers a range of moderators of self-friend agreement.

Accuracy versus Bias

As noted, friends' reports of adjustment likely reflect both accuracy and bias. In this context, bias refers to characteristics of the friend reporters that could systematically influence their reports. A bias would be especially problematic if it actually contributed to greater self-friend agreement. This can be the case for the assumed similarity bias (see Kenny and Acitelli 2001). This bias refers to individuals' tendency to assume that others are similar to themselves (Marks and Miller 1987), especially in close relationships (Schul and Vinokur 2000). Interestingly, given that partners in close relationships do tend to be similar, the assumed similarity bias can actually contribute to greater agreement between partner- and self-reports (Kashy and Kenny 2000; Kenny and Acitelli 2001). As such, it is crucial to test accuracy effects (e.g., the effect of youths' actual symptoms on the friends' reports) while controlling for assumed similarity.

Kenny and Acitelli (2001; see also Kashy and Kenny 2000) proposed a statistical approach for examining the unique effects of accuracy and bias on partner-reports of adjustment. The model proposed by Kenny and Acitelli (2001) has been adapted to friendships and is presented in Fig. 1. The variables on the left refer to each friend's self-reported adjustment. Past studies indicate homophily between friends in regards to adjustment (e.g., Haselager et al. 1998; Jaccard et al. 2005; Popp et al. 2008), and the bi-directional path between the two variables represents the correlation between the friends' self-reported adjustment. The variables on the right refer to each friend's friend-report, and the horizontal paths (i.e., the actor paths) represent bias effects. These paths indicate the degree to which the friend-reports are predicted from the friend-reporters' own adjustment (e.g., whether youth with greater symptoms produce friend-reports indicating higher symptoms). The diagonal paths (i.e., the partner paths) represent the accuracy effects, or the degree to which the youths' self-reports predicts their friends' reports of their adjustment. Importantly, accuracy paths are estimated while controlling for: (a) the relation between the two friends' self-reported adjustment and (b) the relation between the friend reporters' own adjustment and the friend-report. Controlling for these relations ensures that the accuracy effects are not solely due to friend reporters assuming (correctly) that the youth are similar to themselves.

Notably, no studies have considered accuracy and bias effects on friend-reported adjustment. The Swenson and Rose (2003) study controlled for the friend reporters' depressive symptoms in testing relations between self- and friend-reports. However, the study provided no information about bias effects (i.e., the degree to which the friend reports were due to the friend reporters' own symptoms after controlling for youths' actual symptoms). Moreover,

the Swenson and Rose (2003) study used traditional regressions, which increasingly are understood to be inappropriate for dyadic data (Card et al. 2008). Because friends are nested in dyads, the data violate assumptions of independence for regression analyses. In contrast, the Kenny and Acitelli (2001) model was specifically designed to take into account this non-independence.

Moderating Influences on Self-Friend Agreement

The current study further extends past research by examining a range of moderators of accuracy and bias effects. This was important given that some friends may good reporters of youth adjustment and others relatively oblivious. First, the friend reporters' own symptoms may moderate relations between self- and friend-reports with better-adjusted youth being more accurate reporters. This question was not tested in the prior study of friend-reported depressive symptoms (Swenson and Rose 2003). However, the accuracy of parent and peer-reports has been found to be negatively affected by the internalizing symptoms of the informant (e.g., De Los Reyes and Prinstein 2004; Epkins 1994). In addition, adolescents characterized by greater deviant and health-risk behavior also were poorer reporters of friends' deviant and health-risk behaviors (Prinstein and Wang 2005).

It is important to note that the question of whether youths' symptoms moderate self-friend agreement is somewhat different from the question of whether there are bias effects. The moderator analyses test whether agreement between self- and friend-reports varies as a function of the friend reporters' symptoms. In contrast, bias effects analyses address whether mean-levels of friend-reported symptoms vary as a function of the friend reporters' symptoms (e.g., with friends with more symptoms producing friend-reports indicating greater symptomatology).

Also, characteristics of the relationship, namely friendship quality and disclosure, were considered as moderators. Positive friendship quality is often operationalized as including features such as intimacy, validation, support, and companionship (Berndt 2002; Furman 1996). Because friends with higher positive friendship quality experience greater responsiveness and time together they may be more accurate reporters of friends' adjustment. In past research, greater positive quality was related to friends' being more accurate reporters of depressive symptoms (Swenson and Rose 2003) and deviant behaviors (but not health-risk behaviors, Prinstein and Wang 2005). In the current study, agreement between self- and friend-reports also is expected to be influenced by positive friendship quality.

Moreover, whether friendship quality is assessed from the perspective of the youth providing the self-reports of adjustment or the friends may be important. Friends' perceptions of the relationship are related but not identical (Little et al. 1999; Simpkins et al. 2006). The perceptions of the youth providing the self-reports of adjustment may be especially important because the youth may be more forthcoming about internalizing symptoms and more willing to display externalizing symptoms in a friendship they perceive as high quality. However, it could be that the friend reporters' perceptions are especially important because friends may attend more to subtle symptoms in friendships they feel are especially high quality. In the past studies (Prinstein and Wang 2005; Swenson and Rose 2003), only the friend reporters' perceptions of friendship quality were obtained. The present study extends past work by considering both friends' perceptions of friendship quality.

Although intimate disclosure is often included as a component of aggregate scores of relationship quality (Furman 1996), disclosure is examined individually as well. Self-disclosure involves sharing personal thoughts and feelings, and youth in friendships

characterized by high disclosure may be especially knowledgeable of friends' adjustment. In the current research, each friend's perceptions of disclosure in the friendship are considered. Considering self-disclosure as a moderator is an important extension of the past research.

Last, moderating effects of gender and grade are considered. Girls are expected to be more knowledgeable of friends' symptoms than boys. In fact, greater self-friend agreement was found for girls than boys in the study of friend-reported depressive symptoms (Swenson and Rose 2003). However, given that studies also indicate that girls report greater positive friendship quality and disclosure in friendships than boys (Furman and Buhrmester 1985, 1992), it is possible that moderating effects of gender could be due to moderating effects of positive friendship quality and/or disclosure. That is, girls might demonstrate greater self-friend agreement because their friendships are characterized by greater positive quality and/or disclosure. To test this possibility, moderating effects of gender will be examined with and without controlling for moderating effects of positive friendship quality and disclosure.

Any moderating effects of grade also will be tested with and without controlling for moderating effects of friendship quality and disclosure. Older youth could be more accurate reporters given that positive friendship quality and self-disclosure to friends are found to increase with age, especially for girls (Furman and Buhrmester 1992). However, older youth also may be better reporters because social-cognitive and perspective-taking abilities increase with age (Choudhury et al. 2006; Selman 1977). Developmental differences were not found in relations between self-and friend-reports of depressive symptoms (Swenson and Rose 2003). However, the oldest participants in the past study were ninth-grade youth and the oldest participants in the current study are eleventh-grade youth. One possibility is that friends do not become especially knowledgeable about youths' distress until later adolescence.

Method

Participants

The sample for analyses included 208 youth. These were 62 5th graders (34 females, 28 males), 72 8th graders (50 females, 22 males), and 74 11th graders (40 females, 34 males). The sample was 85% European American, 5% African American, 3% Native American, 1% Hispanic American, and 6% other/multiracial.

These 208 youth were selected from a larger sample of 610 youth. Initially, all fifth-, eighth-, and eleventh-graders from eight schools in three Midwestern school districts ($n=743$) were invited to participate (with the exception of special education students). Parental consent was obtained for 623 youth. Of these youth, 610 participated (2 youth did not participate due to special needs, 6 moved from the district, and 5 were repeatedly absent).

Analyses were limited to participants who met several criteria. First, youth were included only if they had a reciprocal friend in the study. This reduced the sample from 610 to 459. Second, youth were retained if they had data from a friend who reported on their adjustment. Of the 459 friended youth, 313 were reported on by a reciprocal friend and, therefore, had friend-report adjustment data.¹ Most youth with friends who did not have friend-reported data did not have these data because their friends were assigned to report on a higher-priority friend (see information below regarding friendship priority). Third, youth were included only if they reported on the adjustment of the friend who provided the friend-reported data about them. Given the priority system used to assign friends to report on (see

¹More than one reciprocal friend reported on 97 of these youth. For these youth, the friend-report data from the highest-priority friendship were used. If the reports came from friends of equal priority, the friend-data retained for analyses were chosen at random

below), it was possible for a youth to report on a reciprocal friend (i.e., the youth's highest-priority friendship) but for that friend to report on a different youth (i.e., the friend's highest priority friendship). This criterion reduced the sample from 313 to 248. Finally, youth were excluded if they or the friend skipped more than 20% of the items on the internalizing or externalizing adjustment scales. If they skipped fewer than 20% of the items on a scale, their mean score across the other scale items was used in the place of the missing items (Little and Rubin 1987). This criterion reduced the sample from 248 to 208.

These 208 participants formed 104 mutually exclusive friendship dyads (124 female dyads and 84 male dyads). These 208 youth represent 28% of the 743 youth initially recruited and 34% of the 610 youth who received consent and participated. The consent and participation rates were reasonable, with 82% (610 of 743) of invited youth participating. The steps at which most youth were lost involved excluding youth without reciprocal friends and excluding youth with reciprocal friends who could not be paired in mutually exclusive dyads in which each youth reported on the other, and these steps were necessary given the focus of the study.

Analyses compared the final sample of adolescents ($n=208$) to participants who were excluded from analyses ($n=402$). Girls were more likely to be included than boys (i.e., 39% of girls and 29% of boys were included, $\chi^2 [1]=6.48, p<0.05$). However, included and excluded youth did not differ in terms of grade ($\chi^2 [2]=0.81, p=0.67$), ethnicity (i.e., percentage non-European American; $\chi^2 [1]=0.01, p=0.91$), self-reported internalizing symptoms ($t [589]=0.49, p=0.63 [M=13.36$ included; $M=13.75$ excluded]), or self-reported externalizing symptoms ($t [589]=0.25, p=0.81 [M=12.12$ included; $M=12.29$ excluded]).

Procedure

Questionnaires were group-administered in two 45-minute classroom sessions that were about 2 weeks apart. For one fifth-grade class, a third session was needed. All questionnaires were read aloud. Additional research assistants were available to assist with individual questions. Research staff returned on an additional date to collect data from absent participants.

Measures

Friendship Nominations—A friendship nomination measure (e.g., Parker and Asher 1993; Rose and Asher 1999, 2004) was used to determine the friend about whom each youth would answer questions. Because fifth-graders were in self-contained classrooms, fifth-grade youth circled the names of three best friends on a roster of all classmates with parental consent. Eighth- and eleventh-grade students switched classes during the day and could interact with any grademate. Therefore, they circled the names of three best friends on a roster of all grademates with consent. The method of administering different types of rosters has been used in similar studies (e.g., Rose 2002). Youth starred the name of the friend who was their “very best friend.”

Youth who circled each other's names were considered reciprocal friends. Youth were assigned specific friends to report on for the friend-report measure of internalizing and externalizing symptoms and for the measures assessing friendship quality and disclosure (measures are discussed below). Similar to prior research (e.g., Rose 2002; Rose and Asher 1999, 2004), the specific friend each youth reported on was chosen based on the following priority: (1) youth and friend both “star” each other, (2) youth “stars” friend but friend only circles youth, (3) youth only circles friend but friend “stars” youth, and (4) youth and friend only circle each other. Only same-sex friendships were considered to facilitate comparisons

between girls' and boys' friendships (>95% of reciprocal friendships identified were same-sex).

Self-reported Internalizing and Externalizing Adjustment—Youth responded to the problem items of the Youth Self-Report (YSR; Achenbach and Rescorla 2001). The broadband indices of internalizing and externalizing adjustment were of interest. Youth rated how well each item described them in the prior 6 months on a three-point Likert scale ranging from 0 “*Not True*” to 2 “*Very True/Often True*.” Consistent with some other studies using self-report measures of youth adjustment (e.g., Oldenburg and Kerns 1997; Panak and Garber 1992), one item assessing suicidality was not administered. This reduced the number of internalizing items from 31 to 30. Similarly, due to concerns of school personnel, two items assessing substance abuse and one item pertaining to sexual cognitions were not administered. Thus, the externalizing index included 28 of 31 original items. Youth received scores for internalizing adjustment ($\alpha=0.86$) and externalizing adjustment ($\alpha=0.89$) that were the sum of the relevant items.

Friend-reported Internalizing and Externalizing Adjustment—Friend-reports were obtained with a parallel version of the YSR, modified such that the name of a specific friend was inserted into each item. For example, the original item “I cry a lot” was revised as “[FRIEND] cries a lot.” Participants with reciprocal friends reported on their highest priority friendship. Participants with no reciprocal friends reported on a peer they nominated as a friend, but these data were not used. Similar to the self-report YSR, participants rated each item on a same three-point response scale. Youth received friend-reported internalizing adjustment ($\alpha=0.93$) and externalizing adjustment ($\alpha=0.93$) scores that were the sum of relevant items.

Friendship Quality—Participants completed the Network of Relationships Inventory (NRI; Furman 1996; see Furman and Buhrmester 1985). Twenty-seven items were used to assess positive aspects of friendship quality (i.e., three items each for affection, admiration, companionship, instrumental aid, intimacy, nurturance, reliable alliance, support, and satisfaction). Items were rated on a five-point scale ranging from 1 “*Little or None*” to 5 “*The Most*”. Positive friendship quality scores ($\alpha = 0.97$) were the mean of the 27 items (196 youth had friendship quality data).

Disclosure—Disclosure was assessed with a revision of the Self-Disclosure Questionnaire (Rose 2002; adapted from Parker and Asher 1993). The original measure included five items assessing disclosure with same-sex friends in general. For the current study, the measure was revised to assess disclosure with specific friends and expanded to make items specific to whether the target youth or the friend disclosed. For example, the original item “We tell each other about our problems” was revised as two distinct items: (a) “I tell [FRIEND] private things a lot,” (b) “[FRIEND] tells me private things a lot.” This resulted in a 10-item measure. Each item was rated on a 5-point Likert scale ranging from 1 “*Not at all true*” to 5 “*Really true*.” Disclosure scores were the mean of the ten items ($\alpha =0.97$; 200 youth had disclosure data).

Results

Descriptive Analyses

Before conducting primary analyses assessing accuracy and bias effects on friend-reported adjustment, two sets of descriptive analyses were conducted. The first tested mean-level gender and grade differences. The second examined correlations among study variables to allow for comparisons with past studies using correlational analyses.

In order to examine mean-level gender and grade differences, multilevel models were tested with youth nested in the friend dyads using Proc Mixed in SAS. For these analyses, dummy variables for grade were created. Fifth grade was the contrast group. One dummy variable represented the contrast between grades five and eight. The other represented the contrast between grades five and eleven. In each model, gender and the two dummy codes were entered as predictors on the first step. On the second step, the interactions between gender and each dummy code was entered.

Results indicated main effects of gender for five of six study variables. *T* values and means by gender are presented in Table 1. Girls scored higher than boys on self-reported internalizing symptoms, friend-reported internalizing symptoms, positive friendship quality, and disclosure. Boys scored higher on self-reported externalizing symptoms. No gender difference emerged for friend-reported externalizing symptoms. Two main effects for grade emerged. The contrasts between grades five and eleven were significant for self-reported internalizing symptoms, $t(100)=2.90$, $p<0.01$, and disclosure, $t(96)=3.56$, $p<0.001$. For self-reported internalizing symptoms, fifth graders ($m=15.42$, $sd=9.64$) scored higher than eleventh graders ($m=11.29$, $sd=7.03$); for comparison, the scores for eighth graders were $m=13.73$, $sd=8.80$. For disclosure, eleventh graders ($m=3.96$, $sd=0.88$) scored higher than fifth graders ($m=3.23$, $sd=1.28$); for comparison, the scores for eighth graders were $m=3.71$, $sd=1.30$). Also, one interaction was significant. For disclosure, the interaction between gender and the contrast between grades five and eight was significant, $t(94)=2.21$, $p<0.05$. The means for disclosure are presented by gender within each grade (including the eleventh grade for comparison purposes) in Table 1. As can be seen, the gender difference was stronger in grade eight than grade five. However, a significant gender difference favoring girls emerged in all three grades.

Next, correlations among study variables were computed and are presented in Table 2. In these analyses, the individual is the unit of analysis. In regards to homophily between friends, small positive correlations emerged between youths' self-reported adjustment and the self-reported adjustment of their friends for internalizing and externalizing symptoms. However, the relation only reached significance for externalizing symptoms. Significant positive relations also emerged between youths' self-reported adjustment and the reports of their adjustment provided by their friends. These relations were small-to-moderate but significant for both internalizing and externalizing symptoms. Although the correlations suggest that friends' have some knowledge of youths' adjustment, analyses in the following sections provide more information regarding the accuracy and biases of the friends' reports.

Analysis Plan for Assessing Accuracy and Bias Effects

To test the degree to which friends' reports were due to accuracy and bias (and the degree to which these effects were moderated by the friend reporters' own symptoms, friendship quality, disclosure, gender, and grade), the Actor-Partner Interdependence Model (Kenny and Acitelli 2001) was used. As noted, this model was developed for analyses of dyadic data. In the current study, this approach was used to test the paths depicted in Fig. 1 (see Cillessen et al. 2005, for an example of a similar APIM with friend dyads).

The members in same-sex friend dyads are indistinguishable. This can be contrasted with dyads such as heterosexual couples in which the members are distinguishable on variables (e.g., sex) that might systematically affect the paths in the model. Because the members were indistinguishable, the two accuracy paths (i.e., the diagonal paths from Friend 1's self-report to Friend 2's friend-report and from Friend 2's self-report to Friend 1's friend-report) were set to be equal. Also, the two bias paths (i.e., the horizontal paths from Friend 1's self-report to Friend 1's friend-report and from Friend 2's self-report to Friend 2's friend-report) were set to be equal.

The paths in this model can be estimated with either structural equation modeling or multilevel modeling. We used multilevel modeling with Proc Mixed in SAS. In these analyses, the dependent variable (DV) was friend-reported adjustment. There were two independent variables (IVs). The IV included to test the accuracy effect was the self-report from the youth who the friend was reporting on (e.g., when the DV was Friend 2's report regarding Friend 1's adjustment, the IV was Friend 1's self-reported adjustment). The IV included to test the bias effect was the friend reporters' own symptoms (e.g., when the DV was Friend 2's report regarding Friend 1's adjustment, the second IV was Friend 2's own self-reported adjustment).

As noted, an important feature of this approach is that the relation between youths' self-reported symptoms and their friends' reports of their symptoms (the accuracy effect) is tested while statistically controlling for the effect of the friend reporters' own symptoms (the bias effect). Also, unlike traditional regression analyses, the similarity between friends nested in dyads (e.g., the correlation between the friends' self-reported adjustment) is controlled. Testing the accuracy effect while controlling for the similarity between the friends and the bias effect ensures that the accuracy effect is not due to the two friends being similar and to friend reporters providing friend-reports that reflect their own symptomatology (i.e., due to assumed similarity).

Accuracy and Bias in Friend Reports of Internalizing and Externalizing Symptoms

First, the paths in Fig. 1 were tested for internalizing symptoms. For these and all subsequent analyses, all variables were standardized ($M=0$; $SD=1$) so that parameter estimates produced would be standardized and to facilitate tests of interactions in the moderator analyses (Aiken and West 1991). The standardized parameter estimates and their t values are presented in Table 3. The parameter estimates also were added to the model presented in Fig. 1 and the new model is presented in Fig. 2. Results indicated a significant accuracy effect or, in other words, a significant positive effect of youths' self-reported internalizing symptoms on their friends' reports of their symptoms. Although significant, this effect was relatively modest. A larger significant effect emerged for bias, which indicated a significant positive effect of the friends' own symptoms on their friend-reports. Accuracy and bias effects were next evaluated for externalizing symptoms. The results are presented in Table 3 and Fig. 2. Significant effects again emerged for accuracy and bias, with the bias effect again being larger in magnitude.

Moderators of the Accuracy and Bias Effects

Additional multilevel models were tested in Proc Mixed in SAS to determine whether the accuracy and bias effects were moderated by the friend reporters' own symptoms, self-reported or friend-reported positive friendship quality, self-reported or friend-reported disclosure, gender, or grade. Again, friend-reported adjustment was the dependent variable. In terms of independent variables, main effects for self-reported symptoms (the accuracy effect), the friends' own symptoms (the bias effect), and the moderator (e.g., gender) were entered on the first step. On the second step, interactions between self-reported symptoms (the accuracy effect) and the moderator and between friends' own symptoms (the bias effect) and the moderator were entered. The only exception was when the moderator was the friend reporters' own symptoms. Like the other analyses, moderation of the accuracy effect was tested by testing the interaction between youths' self-reported symptoms and the moderator (i.e., the friend reporters' own symptoms). However, it was not possible to test moderation of the bias effect because the variable used to test the bias effect (the friend reporters' own symptoms) was the same as the moderator (the friend reporters' own symptoms). Last, for each moderator analysis, when an interaction was significant, simple slope analyses were conducted and are presented in Table 4.

Internalizing Symptoms—First, the friend reporters' own symptoms were considered as a moderator. The interaction between the self-reported symptoms (the accuracy effect) and the friend reporters' own symptoms was not significant, $t(101)=1.68$. As noted, it was not possible to test whether the friend reporters' own symptoms moderated the bias effect.

Moderating effects next were examined separately for self-reported positive friendship quality and for friend-reported positive friendship quality. Self-reported positive friendship quality did not moderate the effect of self-reported symptoms (the accuracy effect), $t(93)=1.35$, or the effect of the friends' own symptoms (the bias effect), $t(93)=1.03$. However, friend-reported positive friendship quality did moderate the effect of self-reported symptoms, $t(93)=3.31$, $p<0.01$. Simple slope analyses (see Table 4) indicated that there was a significant accuracy effect at high levels (+1 SD) of friend-reported positive friendship quality, but that the accuracy effects were not significant at average (at the M) or low (−1 SD) levels of friend-reported positive friendship quality. Friend-reported positive friendship quality did not moderate the effect of the friends' own symptoms on the friend-reports, $t(93)=1.37$.

Moderating effects for self-reported and friend-reported disclosure were then examined. Self-reported disclosure moderated the effect of self-reported symptoms on the friend-reports, $t(95)=2.53$, $p<0.05$. Simple slope analyses (see Table 4) indicated that the accuracy effect was significant at high levels (+1 SD) of self-reported disclosure but not at average (M) or low (−1 SD) levels. Self-reported disclosure did not moderate the effect of the friends' own symptoms on the friend-reports, $t(95)=1.12$. Parallel results emerged for friend-reported disclosure (see Table 4). Friend-reported disclosure moderated the effect of self-reported symptoms, $t(95)=2.32$, $p<0.05$, but not the effect of the friends' own symptoms, $t(95) = 1.75$. Simple slope analyses indicated that the accuracy effect was significant at high levels (+1 SD) of friend-reported disclosure but not at average (M) or low (−1 SD) levels.

Gender was then tested as a moderator. The interaction between gender and self-reported symptoms was significant, $t(100)=2.28$, $p<0.05$. Simple slope analyses indicated that the accuracy effect was significant for girls but not boys (see Table 4). However, the interaction between gender and the friends' own symptoms was not significant, $t(100)=0.13$.

Given the possibility that the gender effect was due to the moderating effects of friendship quality or disclosure, three additional models were tested. A model was tested for each of the significant moderators: friend-reported positive friendship quality, self-reported disclosure, and friend-reported disclosure. In each case, the model testing gender moderation was performed again, but this time the interaction between self-reported symptoms (accuracy effect) and the friendship quality or disclosure variable was controlled (the main effect of the friendship quality or disclosure variable also was controlled). In each model, the interaction between self-reported adjustment (accuracy effect) and gender became non-significant when the moderating effect of the friendship quality or disclosure variable was controlled (all t 's < 0.75). However, when models were tested examining the moderating effect of friendship quality or disclosure while controlling for the moderating effect of gender, the friendship quality or disclosure variable remained a significant moderator of self-reported adjustment (all t 's > 2.10 , all p 's < 0.05).

Last, the moderating effects of grade were tested. Again, two dummy codes were created to represent the contrasts between the grades. The dummy codes did not interact with self-reported symptoms, $t(98)=0.73$ and 0.87 . Likewise, the dummy codes did not interact with the effects of the friends' own symptoms, $t(98)=0.45$ and 1.56 . Given that there was not

grade moderation, it was not necessary to test whether any grade moderation effects were due to moderating effects of positive friendship quality or self-disclosure.

Externalizing Symptoms—Parallel moderator analyses were then conducted for externalizing symptoms. Friends' own externalizing symptoms did interact with youths' self-reports (the accuracy effect) in predicting the friends' reports of externalizing behavior, $t(101)=2.63, p<0.05$. Simple slope analyses indicated that the accuracy effect was significant for friend reporters' with low (-1 SD) and average (M) symptoms (parameter estimates= 0.37 and $.23$, respectively, $ps<0.001$) However, the accuracy effect was not significant for youth with high symptoms ($+1$ SD, parameter estimate= 0.09). None of the other variables (self- and friend-reported friendship quality, self- and friend-reported disclosure, sex, grade) interacted with the effect of the self-reported symptoms (the accuracy effect) or the effect of the friends' own symptoms (the bias effect).

Discussion

The current study indicated that, on average, friends do have knowledge of youths' adjustment. These findings fit with previous studies finding relations between friend- and self-reports of specific aspects of internalizing or externalizing problems (e.g., Prinstein and Wang 2005; Smith et al. 1995; Swenson and Rose 2003). However, the current study considered broader indices of internalizing and externalizing problems and took the important step of examining accuracy and bias effects on friends' reports. For both internalizing and externalizing adjustment, the bias effects were considerably stronger than the accuracy effects. Notably, this means that the friends' reports seem to be influenced to a greater degree by the friend reporters' own adjustment than by the adjustment of the youth on whom they were actually reporting.

Nevertheless, a benefit of the analytic approach used was that accuracy was tested while controlling for the bias effect and for similarity between friends (Kenny and Acitelli 2001). Although the accuracy effects were not especially strong, they remained significant using this stringent test, which speaks to the potentially important role of friends as reporters of youth adjustment. Conceptually, the results indicate that the accuracy effects were not due to an assumed similarity bias. In other words, relations between friend- and self-reports were not be due to friend reporters assuming correctly that their friends' adjustment was similar to their own. Hopefully, the current study will stimulate future work on partners' reports of youth adjustment that adopts the current analytic approach given that assumed similarity biases could influence perceptions of other important reporters (e.g., parents) as well.

In the current study, it also was unlikely that the accuracy effects were driven by assumed similarity biases because actual similarity between friends was relatively modest (the relation between friends' self-reports was $r=0.11$ for internalizing and $r=0.14$ for externalizing). The effect for internalizing symptoms is generally consistent with other studies that typically indicate relations between friends' reports in the $r=0.10$ to 0.20 range (e.g., Mariano and Harton 2005; Reitz et al. 2006; Stevens and Prinstein 2005; Swenson and Rose 2003). However, the effect for externalizing adjustment was smaller than expected given other studies that generally indicate relations between friends' self-reports of delinquent and/or aggressive behavior in the $r=0.20$ to 0.30 range (e.g., Kandel 1978; Mariano and Harton 2005; Reitz et al. 2006). These studies usually did not test for developmental differences in the similarity between friends' self-reported symptoms and, in one case (Mariano and Harton 2005), did not find developmental differences. However, two studies assessing aggression with peer reports indicated that friends become increasingly similar with age (Mariano and Harton 2005; Rose et al. 2004). Likewise, in the current sample, the relation between self-reported externalizing symptoms for only the seventh-and

ninth-grade adolescents (without the fifth-graders) rose somewhat to $r=0.21$ (the effect for internalizing rose to $r=0.17$). This suggests that accounting for the perceived similarity bias may be especially important in studies with adolescents as compared to earlier in development.

Additionally, although associations between friend and self reports were significant for the full sample, it is important to highlight that all friends were not similarly accurate reporters. Findings indicated that taking characteristics of the relationship into account was important. For internalizing symptoms, friends who perceived their relationships as high in positive quality and friends in relationships high in disclosure (according to either self- or friend-report) were the most accurate reporters. Perceiving a relationship as high quality may increase friends' motivation to attend to youths' thoughts, feelings, and behaviors. Additionally, given the internal nature of distressing thoughts and feelings, it makes sense that friends in relationships high in disclosure would be especially accurate reporters of internalizing adjustment. Previous research has not considered the moderating impact of disclosure on friends' knowledge of youth adjustment and doing so was an important extension of the current study.

The current research further indicated that girls were more accurate reporters of friends' internalizing adjustment than boys. Past research found that girls were more accurate reporters of friends' depressive symptoms (Swenson and Rose 2003) but provided no insight into why girls may be advantaged. Importantly, the moderating effects of gender became non-significant when controlling for the moderating effects of positive friendship quality or disclosure. These findings suggest that girls are more knowledgeable reporters due to the higher levels of positive friendship quality and disclosure in their friendships. Although identifying demographic variables that moderate the agreement between self- and friend-reports of adjustment is a good first step, the current findings speak to the feasibility and importance of considering relationship variables that may help to explain these effects.

Notably, the findings mean that boys, friends who perceive their relationships to be low in positive quality, and friends in relationships low in disclosure are less aware of youths' emotional functioning. In fact, accuracy effects for these youth were near zero. Consider the implications for youth with internalizing symptoms with friends who are oblivious to their distress. An important component of friendship is the provision of instrumental and emotional support (Malecki and Demaray 2003; Rose and Asher 2004). Friends who are aware of youths' emotional distress may respond with appropriate social support efforts. However, friends who lack awareness likely are unable to effectively provide support.

In this light, consider that youths' own reports of positive friendship quality did not moderate the relation between friend- and self-reports of internalizing adjustment. When friends perceived the relationships as higher in quality, they seemed to attend more to youths' internalizing symptoms. However, youth themselves perceiving their friendships to be high quality did not have the same effect. For youth who perceive that their friendships are high quality, having a friend who is not attuned to their distress may be especially hurtful. These findings provide an important extension of the previous study of friends' knowledge of depressive symptoms in that the study only considered the friend reporters' perceptions of friendship quality (Swenson and Rose 2003). The findings also fit with the broader multi-informant literature indicating that the degree to which relationship variables moderate agreement between parents and their children depends on whose perception of the relationships are considered (e.g., Treutler and Epkins 2003; see De Los Reyes and Kazdin 2005).

In contrast, friend reporters' own symptoms and grade were not significant moderators for internalizing symptoms. The bias effects meant that friend reporters with greater symptoms produced friend-reports indicating greater symptomatology. However, the degree of agreement between self- and friend-reports was not influenced by the friend reporters' symptoms. This was somewhat surprising given that other studies suggest that reporters with greater internalizing symptoms are less accurate (e.g., Najman et al. 2001; Youngstrom et al. 2000). One possible explanation involves characteristics of the community sample. Although there certainly were youth with elevated and presumably distressing levels of internalizing symptoms, it may be that relatively few youth had cognitive internalizing symptoms extreme enough to impair their perceptions of friends' symptoms relative to other youth.

The fact that grade did not moderate self-friend agreement for internalizing symptoms also did not fit with the hypothesis that older youth would be more knowledgeable. However, the finding is consistent with the past research indicating that fifth- through ninth-grade youth did not differ in their awareness of friends' depressive symptoms (Swenson and Rose 2003). Although youth spend more time with friends with age, older adolescents also become more invested in relations with romantic partners (Collins 2003; Richards et al. 1998). Older adolescents' divided focus among relationship partners may interfere with attention to friends' well-being. Moreover, younger youth may be especially attuned to friendships given the centrality of same-sex friendships in youths' social networks during later childhood and early adolescence (Bukowski et al. 1996; Richards et al. 1998).

Notably, despite the moderator effects for internalizing adjustment, only one moderator was significant for externalizing problems. Namely, friends who were high in externalizing symptoms were poorer reporters of youths' externalizing symptoms than were friends lower in externalizing symptoms. These findings fit with results from Prinstein and Wang (2005) indicating that friends with greater deviant and health risk behaviors were poorer reporters because they overestimated deviant and health risk behaviors in the youth with whom they were friends. In regards to the other non-significant effects, given the more blatant nature of externalizing behaviors, one possibility is that knowledge of friends' externalizing symptoms is more straightforward and less influenced by personal and relationship characteristics than internalizing symptoms. However, another possibility is that the moderators selected for the current study (e.g., self-disclosure) generally were more appropriate for internalizing symptoms. For example, the degree to which the friends spend time together that is not supervised by adults might be an important moderator of self-friend agreement for externalizing problems given that this is a context in which such behavior likely takes place.

Although the moderator effects generally were not significant for externalizing symptoms, recall that the accuracy effect for the entire sample was significant for externalizing symptoms. This finding suggests that most friends (other than those with high levels of externalizing symptoms themselves) did demonstrate knowledge of youths' externalizing symptoms. For internalizing adjustment, it was suggested that friends' knowledge could benefit youth if friends heighten social support efforts in response to youths' distress. However, awareness of a friends' externalizing problems could be problematic. Consider youth with average and lower externalizing symptoms themselves who were found to be aware of friends' externalizing symptoms. This awareness might open the door to the friends engaging in interpersonal interactions similar to those involved in deviancy training (Dishion and Spracklen 1996; Piehler and Dishion 2007) that may elicit greater externalizing behavior in the youth with fewer symptoms and exacerbate externalizing behavior in the friend with greater symptoms. Accordingly, although it is possible that friends might help move youth away from externalizing behaviors, it certainly is not clear

that knowledge of friends' externalizing problems will lead to better adjustment for either friend.

Last, no moderating effects were found for the bias effects for internalizing or externalizing adjustment. This meant that even the friends whose friend-reports were more strongly related to the youths' actual adjustment produced friend-reports that were strongly influenced by their own symptoms. It would be interesting to learn whether the strong bias effects are due, at least in part, to adolescent egocentrism and whether they would weaken with age as individuals develop a more nuanced understanding of others' perspectives and experiences.

Limitations and Future Directions

Despite contributions of the research, limitations and future directions should be noted. First, the sample was significantly reduced because friend reports of youth adjustment were not available for many youth or because youth could not be paired in mutually exclusive dyads. Importantly, the representativeness analyses indicated that included participants did not differ from excluded participants in terms of self-reported internalizing or externalizing adjustment. Nevertheless, future research incorporating reports from friends from other contexts (e.g., neighborhoods, places of worship) likely could retain a greater proportion of youth for analyses.

Moreover, future research should include a more diverse sample. The current sample was primarily European-American, and it is possible that different results would emerge for different ethnicities. A more diverse sample also would allow for the study of cross-ethnic friendships. On one hand, friends from different ethnic backgrounds may be less accurate reporters if there are greater differences between friends in communication or emotional expression styles. However, it also could be that cross-ethnic friends assume less similarity and work harder to learn about their friends, which increases accuracy. The latter possibility might be especially true in schools with lower diversity in which the uniqueness of cross-ethnic friendships is accentuated. These same possibilities should be examined in same-versus cross-sex friendships as well.

An additional limitation is that self-reports were the only criterion to which friend-reports were compared. Using more objective indices of adjustment (e.g., treatment utilization, arrest records) or other assessments (e.g., diagnostic interviews, parent reports of adjustment or peer reports of behavior) could provide additional information regarding the sensitivity and specificity of friend reports. Notably, using assessments other than self-reports also would circumvent potential problems related to youth completing the same measure to report on their own and their friends' adjustment. Completing the measure twice could either increase similarity in the reports (e.g., if youth are motivated to perceive themselves as similar to friends) or decrease similarity in the reports (e.g., if youth use themselves as benchmarks and rate their friends as having greater or fewer symptoms). Additionally, in the current study, youth completed the self-report before the friend-report, and counterbalancing these assessments in future studies would be useful.

Last, the current findings could be extended by using a longitudinal design and including an assessment of social support processes to test how possessing knowledge impacts the relationship and each friend. For example, friends who are aware of youths' adjustment problems could increase the support they give, which could reduce the youths' symptomatology. Moreover, the friends might feel closer as a result of the social support processes. However, knowledge of symptomatology could have more negative effects. For instance, knowledge of a youth's psychiatric symptoms could lead friends to terminate the relationship, possibly exacerbating youths' adjustment problems. Moreover, friends'

knowledge could negatively impact the friends' own adjustment. As noted, deviancy training processes could increase the friends' externalizing behaviors. Also, depression contagion has been observed between friends (Stevens and Prinstein 2005), and friends who are aware of youths' internalizing symptoms may be especially susceptible. Clearly, considering pathways through which friends' knowledge could impact the relationship and each friend is an important direction for future research.

Applied Implications

The applied implications of the current findings will become increasingly clear as future research considers the possible adaptive and maladaptive outcomes of friends' knowledge. These include implications related to research ethics. Reporting on friends' symptoms for research projects could increase the salience of these perceptions, which either could have beneficial effects (e.g., through increased social support processes) or detrimental effects (e.g., through deviancy training and/or contagion). Future work also should consider whether youth have negative feelings, such as feeling self-conscious, about their friends reporting on their symptoms.

Moreover, the possible role of friends in prevention and treatment programs should be considered. Although incorporating diagnostic information from friends could facilitate treatment outcomes (e.g., by providing information that is consistent with child- or parent-reported information or by providing a unique perspective on youth functioning), pragmatic concerns likely limit the utility of friend reports in individual treatment contexts. These include concerns related to obtaining consent from the families of the client and friend and regarding increasing the number of people who are aware of the client's treatment status.

Nevertheless, friends may play an important role in school-based prevention and intervention. Youth primarily receive professional assistance after being identified by others, largely parents and teachers (Clarizio 1994). However, friends may be privy to symptoms that are not shared with adults (Cole et al. 1997; Windle et al. 1991). It is unlikely that a program that required friends to routinely report youths' maladjustment to adults would be successful because parents may react negatively to their children being identified as at risk based on peers' reports and because youth may feel it is disloyal to inform adults of friends' symptoms. However, parents and youth may be more receptive to programs that teach youth strategies for encouraging friends to seek help and teach youth about warning signs (e.g., suicidal ideation) that should not be kept secret. The current study supports the utility of developing such programs to promote well-being among youth.

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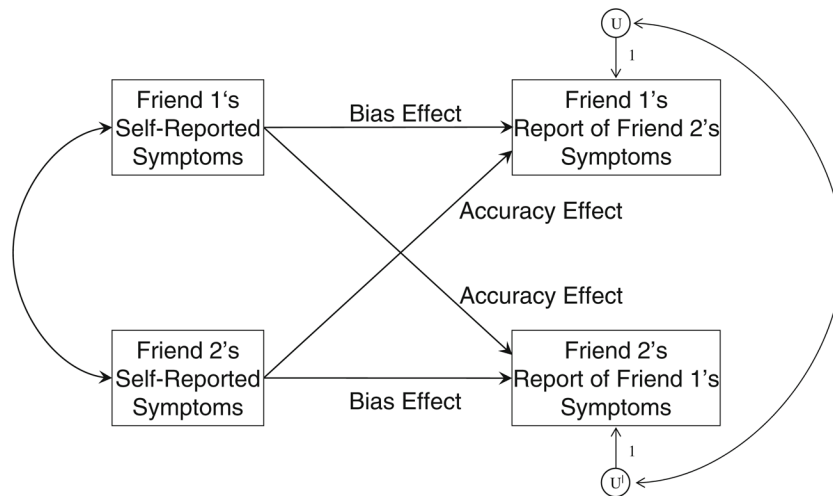


Fig. 1. The Actor-Partner Interdependence Model (Kenny and Acitelli 2001; see also Cillessen et al. 2005) used to examine accuracy and bias effects on friends' reports of youth adjustment. U and U^1 = residuals

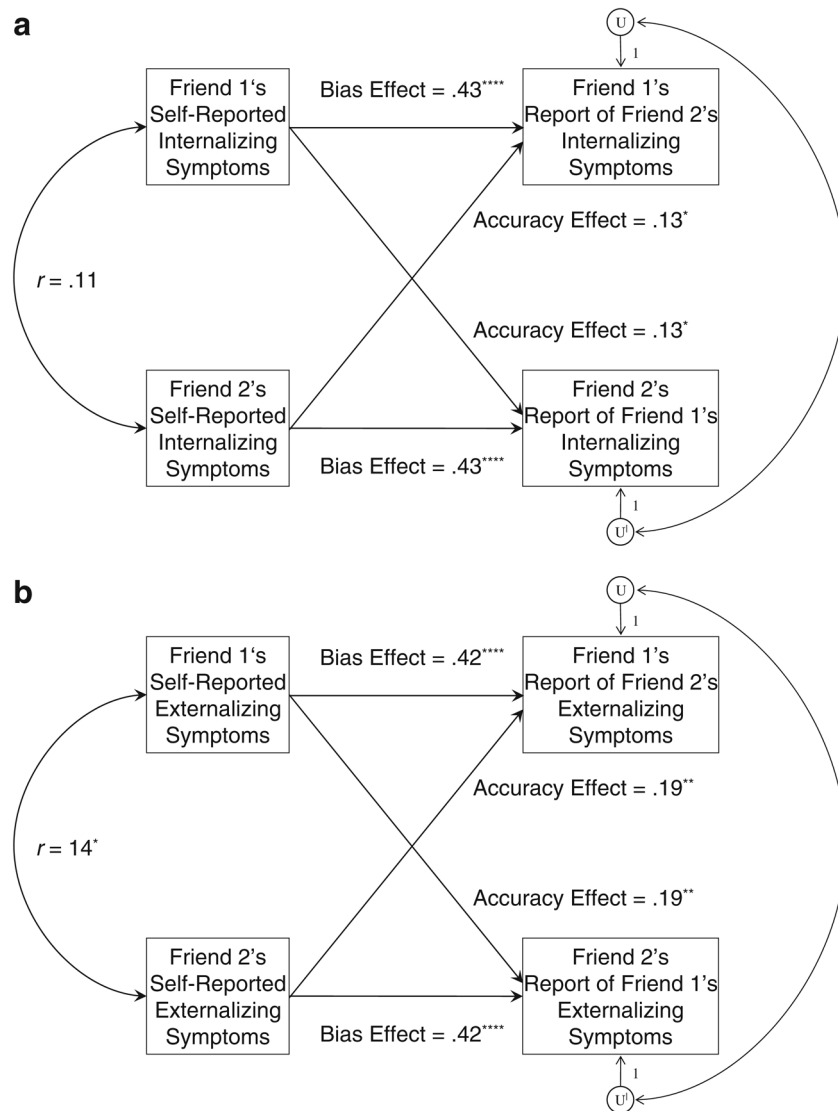


Fig. 2. Panel 1. Results from the multi-level modeling analyses testing the degree to which friends' reports of youths' internalizing symptoms were due to accuracy and bias effects. * $p < 0.05$. **** $p < 0.0001$. Panel 2. Results from the multi-level modeling analyses testing the degree to which friends' reports of youths' externalizing symptoms were due to accuracy and bias effects. * $p < 0.05$. ** $p < 0.01$. **** $p < 0.0001$

Table 1

Mean Scores for Self- and Friend-Reported Internalizing and Externalizing Adjustment and for Positive Friendship Quality and Self-Disclosure for the Entire Sample and by Gender

	Total sample <i>M (SD)</i>	Girls <i>M (SD)</i>	Boys <i>M (SD)</i>	<i>t</i> value
Self-reported internalizing	13.36 (8.62)	15.36 (9.10)	10.42 (6.89)	4.22 ***
Self-reported externalizing	12.12 (7.68)	10.78 (6.76)	14.08 (8.52)	2.05 *
Friend-reported internalizing	8.80 (8.21)	9.91 (7.64)	7.15 (8.78)	3.19 **
Friend-reported externalizing	10.74 (9.18)	10.24 (7.81)	11.48 (10.90)	0.97
Positive friendship quality	3.60 (0.94)	3.85 (0.84)	3.20 (0.96)	3.96 ***
Self-disclosure (whole sample)	3.65 (1.20)	4.16 (0.90)	2.90 (1.19)	7.22 ***
Grade 5	3.23 (1.28)	3.68 (1.17)	2.64 (1.20)	2.60 *
Grade 8	3.71 (1.30)	4.34 (0.74)	2.35 (1.21)	6.69 ***
Grade 11	3.96 (0.88)	4.36 (0.64)	3.49 (0.91)	4.47 ***

*
 $p < 0.05$,

**
 $p < 0.01$,

 $p < 0.0001$

Table 2
Correlations Among Self- and Friend-Reported Internalizing and Externalizing Adjustment, Positive Friendship Quality and Self-Disclosure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Self-reported internalizing									
(2) Self-reported externalizing	0.34 [#]								
(3) Friends' own internalizing	0.11	-0.19 ^{**}							
(4) Friends' own externalizing	-0.19 ^{**}	0.14 [*]	0.34 [#]						
(5) Friend-reported internalizing	0.18 ^{**}	-0.05	0.45 [#]	0.24 ^{***}					
(6) Friend-reported externalizing	-0.04	0.25 ^{***}	0.21 ^{**}	0.45 [#]	0.56 [#]				
(7) Self-reported positive friendship quality	0.08	-0.15 [*]	0.13	-0.15 [*]	0.03	-0.04			
(8) Friend-reported positive friendship quality	0.13	-0.15 [*]	0.08	-0.15 [*]	-0.10	-0.22 ^{**}	0.62 [#]		
(9) Self-reported self-disclosure	0.12	-0.10	0.14	-0.12	0.08	0.02	0.77 [#]	0.61 [#]	
(10) Friend-reported self-disclosure	0.14 [*]	-0.12	0.12	-0.10	0.06	-0.03	0.61 [#]	0.77 [#]	0.67 [#]

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$,

[#] $p < 0.0001$

Table 3

Standardized Parameter Estimates from Multilevel Models Examining the Effect of Self-Reported Adjustment on Friends' Reports of Adjustment (Accuracy Effects) and Examining the Effect of Friends' Own Adjustment on Friends' Reports of Adjustment (Bias Effects)

	Accuracy effects		Bias effects	
	Standardized parameter estimate	<i>t</i> value	Standardized parameter estimate	<i>t</i> value
Internalizing symptoms	0.13	2.15*	0.43	6.98***
Externalizing symptoms	0.19	3.18**	0.42	6.96***

*
 $p < 0.05$,

**
 $p < 0.01$,

 $p < 0.0001$

Table 4

Standardized Parameter Estimates from Multilevel Models Examining the Effect of Self-Reported Internalizing Adjustment on Friends' Reports of Internalizing Adjustment (Accuracy Effects) at Each Level of the Moderators

	Standardized parameter estimate	<i>t</i> value
Friend-reported positive friendship quality		
High (+1 <i>SD</i>)	0.27	3.34 **
Average (<i>M</i>)	0.06	1.00
Low (-1 <i>SD</i>)	-0.15	1.63
Self-reported self-disclosure		
High (+1 <i>SD</i>)	0.25	2.93 **
Average (<i>M</i>)	0.08	1.30
Low (-1 <i>SD</i>)	-0.09	1.06
Friend-reported self-disclosure		
High (+1 <i>SD</i>)	0.23	2.80 **
Average (<i>M</i>)	0.07	1.11
Low (-1 <i>SD</i>)	-0.09	1.03
Gender (without controlling for friendship quality or self-disclosure)		
Girls	0.22	2.95 **
Boys	-0.11	0.88

**
p<0.01.