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Cover Page Footnote

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with the Agreement among Adolescent and Friend Ratings of Behavior Problems

Abstract

The present study investigated the relative agreement between adolescent self-reports and friend informant reports of behavior problems as well as factors that might be related to this agreement. High school students were placed into friendship dyads based on perceived friendship closeness and rated friendship quality, their own internalizing and externalizing behavior problems, and the behavior problems of their matched friend. Self- and friend ratings demonstrated high levels of agreement across behavior problem presentations. Further, raters' own behavior problems were related inconsistently to rating agreement, whereas friendship quality demonstrated some impact on informants' reports of specific behavior problems. This study provided additional support for the utility of friend informants when ratings of adolescents' internalizing and externalizing behavior problems are needed.

Keywords: cross-informant ratings, adolescents, friendship, behavior ratings

Friendship and Informant Characteristics Associated with the Agreement among Adolescent and Friend Ratings of Behavior Problems

Previous research has suggested that adolescents' internalizing and externalizing behavior problems may be best captured by the reports of several informants used in combination, including self, parents, teachers, and peers. To date, research and clinical practice has focused primarily on parent and teacher informants, despite their low to moderate levels of agreement with endorsements from adolescents who were being rated (Epkins, 1995; Kramer et al., 2004; Salbach-Andrae, Klinkowski, Lenz, & Lehmkuhl, 2009; van Dulmen & Egeland, 2011). Such discrepancies can lead to complications in assessment, diagnosis, and treatment (De Los Reyes & Kazdin, 2005; Hawley & Weisz, 2003; Yeh & Weisz, 2001) as well as negative long-term outcomes (e.g., delinquency, self-harm, behavior problems; De Los Reyes, Goodman, Kliewer, & Reid-Quiñones, 2010; Ferdinand, van der Ende, & Verhulst, 2004).

Thus, it is imperative that researchers and clinicians begin to investigate alternative informants who often are not considered for inclusion in the clinical rating process but who may provide valuable information. Given that adolescents tend to spend more time with their friends across different settings, behavior problems that are not apparent to other informants, such as subtle social skills deficits, may be more salient to peer informants (Johnston & Murray, 2003). Similarly, friends may be more likely to observe behavior problems that only occur within a social context (e.g., withdrawal, anhedonia) because they are given more opportunity to view their peers in these situations (Swenson & Rose, 2003). Friend informants also may be privy to information that is withheld from adults. Such information may allow friends to more accurately judge the behavior problems that are exhibited by their friends (Newcomb, Bukowski, & Pattee, 1993). Finally, friends are more likely to have access to situations in which adults typically are not present (Swenson & Rose, 2003) and often are familiar with age-specific social norms. Overall, limited research investigating ratings provided by friends suggested that friends had knowledge of their

peers' psychological functioning but that agreement was affected by a number of factors, including friendship quality (Swenson & Rose, 2003, 2009; Wrobel, Lachar, & Wrobel, 2005). Thus, the present study sought to further investigate the utility of friend informants and to better understand the factors that may affect the ratings that friend informants provide.

One characteristic of interest when considering the relative agreement of cross informant ratings is the friend informant's familiarity with the target peer and the quality of their interactions. Research regarding the acquaintanceship effect should be considered when conceptualizing the impact of friendship on informant ratings. The acquaintanceship effect refers to the propensity for agreement among self- and other-ratings to increase in tandem with familiarity of the observer with the target. This increased familiarity likely would lead to an increase in opportunities to observe the behavior problems that are being rated and consequently lead to greater agreement (Beer & Watson, 2010; Blackman & Funder, 1998). Thus, adolescents who are considered to be friends with a target adolescent may be more accurate in their ratings based on their closer relationship.

Further, considering the importance of friendship in adolescence (Buhrmester & Furman, 1987), it is likely that friendship quality would be related to friend informant ratings and may serve as a helpful measure of acquaintanceship. High quality friendship typically is characterized by support, loyalty, and intimacy (see Berndt, 2002) and is sustained by a number of methods (i.e., self-disclosure, activities, gossip, and conversation; McNelles & Connolly, 1999). Research to date demonstrated a relationship between friendship quality and friend informant ratings. For example, when friendship was perceived to be higher in quality according to the friend informant, agreement was higher for ratings of all types of behavior problems (Swenson & Rose, 2003, 2009). At least part of this relationship appeared to be driven by increased self-disclosure within the friendship (Swenson & Rose, 2009). Further, lower friendship quality was associated with significantly higher

self-friend discrepancies in the report of deviant and risky health behavior (Prinstein & Wang, 2005).

Additional factors that could potentially impact informant ratings are sex of the informant as well as the interaction between rater sex and friendship quality. Overall, previous research was inconsistent as to whether male or female peer informants were more accurate in their ratings (Peets & Kikas, 2006; Spitzer & Cameron, 1995), but this research suggested that females were more accepting of their peers with behavior problems (Fox, Buchanan-Barrow, & Barrett, 2008; O'Driscoll, Heary, Hennessy, & McKeague, 2012). Research revealed some differences, however, in friendship quality of male and female peers. More specifically, female peers engaged in more self-disclosure than male peers (see Rose & Rudolph, 2006, for review; Swenson & Rose, 2009) and evidenced more intimacy and emotional closeness in their same-sex friendships (Black, 2000; Johnson, 2004). Further, male peers were significantly less likely than female peers to prompt their friends to disclose their problems (Rose, Swenson, & Robert, 2009) but did not necessarily have more negative expectations about engaging in their own self-disclosure (Rose et al., 2012). Thus, although male peers tended to achieve intimacy in their relationships via other intimacy-related activities (McNelles & Connolly, 1999), they may have less information to make accurate judgments regarding behavior problems in their friends. Given this dearth of information, it is not surprising that agreement among male peers' friend ratings was lower relative to that of female peers (Swenson & Rose, 2003). With regard to mixed-sex dyads, friendship quality varied across the sexes, with male peers who identify close female friends reporting higher friendship quality and self-esteem and with female peers who identify close male friends reporting no difference in friendship quality (Kuttler, La Greca, & Prinstein, 1999; Solomon, 2006; Thomas & Daubman, 2001). The agreement among mixed-sex friendship dyads had not yet been investigated.

Additional consideration also should be paid to the relationship between informants' own behavior problems and informant ratings. One relevant source of bias when considering the impact

of informant behavior problems is that of assumed similarity, which involves projection of the informant's traits onto the target (Human & Biesanz, 2011). Research suggested that increased familiarity with the target decreased assumed similarity and increased accuracy (Beer & Watson, 2008). This finding implied that, when the informant was less familiar with the target, he or she used information about the self as a basis for judgments about the target (Human & Biesanz, 2011). Limited research in this population found that higher levels of self-reported behavior problems were related to higher reports of behavior problems in friends and peers (Prinstein & Wang, 2005; Swenson & Rose, 2009). Further, there was some indication that perceived similarity was driving these ratings. For example, Epkins (1994) found that school children who rated themselves more highly on traits such as aggression, anxiety, or depression also rated other children more highly on that same trait. This same pattern was not evident when these children rated other children on different traits. These findings suggested that these children were projecting their own behavior problems onto the children whom they were rating.

In an effort to determine the degree to which perceived similarity biases friend informant ratings of behavior problems, Swenson and Rose (2009) investigated self-friend agreement utilizing the Actor-Dependence Model. This model considered the effects of informant characteristics while also taking into account the effects that each member of the friendship had on each other (Kenny & Acitelli, 2001). Results of this study revealed that, although friend informants were biased strongly by assumed similarity in their ratings of behavior problems, they continued to be rather accurate in their ratings. Such findings provided initial support for examining behavior problems as an important factor in understanding peer informant ratings.

Although biases often are unwanted when studying rating accuracy, researchers suggested that assumed similarity bias actually may increase accuracy because individuals in close relationships tend to be more similar. Thus, if the informant is influenced by assumed similarity, the ratings that they provide may be more accurate, despite being based on their own characteristics,

because these characteristics are similar to those of the person being rated (Kenny & West, 2010). When applying this theory to friend informants, it may be helpful to consider the role of homophily or the tendency to seek out peers with similar traits (Romero & Epkins, 2008). Because both typically developing peers and peers who experience behavior problems tend to seek out others who are similar to them (Goodwin, Mrug, Borch, & Cillessen, 2012; Sijtsema, Lindenberg, & Veenstra, 2010), assumed similarity actually may increase the accuracy of friend informant ratings. Although limited previous research indicated that friends' accuracy was not driven by assumed similarity (Swenson & Rose, 2009), this link was not explored adequately.

Finally, the nature of the behaviors that are being rated by the friend informant, namely internalizing versus externalizing behavior problems, is an important factor. Internalizing behavior problems (e.g., depression, anxiety, social withdrawal) tend to be more difficult to rate accurately due to their covert nature (Achenbach, 2011) and to result in lower levels of agreement between informants (Cai, Kaiser, & Hancock, 2004; Kramer et al., 2004; Moreno, Silverman, Saavedra, & Phares, 2008). Although externalizing behavior problems (e.g., aggression, hyperactivity, impulsivity) tended to prompt greater agreement among informants, likely due to their overt nature (Achenbach, 2011; Penney & Skilling, 2012; Salbach-Andrae et al., 2009; Stokes, Pogge, Wecksell, & Zaccario, 2011), there was some evidence that this agreement decreased as peers increased in age (Barker, Bornstein, Putnick, Hendricks, & Suwalsky, 2007; Carlston & Ogles, 2009; Salbach-Andrae et al., 2009). Encouragingly, research has suggested that peers were able to detect both internalizing and externalizing behavior problems (Lauer & Renk, 2013; Verduin & Kendall, 2008). Further, friend informants also demonstrated accuracy in rating peer internalizing and externalizing behavior problems (Swenson & Rose, 2003).

The Present Study

Given the impact of cross-informant disagreement on long-term outcomes, clinical assessment, and treatment selection, it was important to investigate potential alternative

informants that could augment the assessment process. As a result, the present study focused on friends as potential informants and the factors that may influence friends' judgments of behavior problems. In examining cross-informant correspondence between adolescents' self-ratings and those provided by their friends, it was expected that overall agreement in these ratings would be higher for externalizing behavior problems than for internalizing behavior problems.

Further, it was expected that both individual and relationship characteristics would be related to the agreement that was noted between adolescent self-ratings and those provided by their friends. In particular, it was expected that increased friendship quality, closeness, and informant female sex would be associated with increased agreement among adolescent self-ratings and the ratings of friend informants. In contrast, it was expected that informant behavior problems would be associated with decreased agreement. Further, it was expected that each of these individual and relationship variables would provide predictive value in understanding the correspondence between adolescent self-ratings and those provided by their friends.

Method

Participants

A subset of 124 adolescents were selected from a larger data set based on their reciprocated friendship match with another member of the dataset. The larger dataset was collected from adolescents from two public high schools. The subset sample was composed of 34 male and 90 female adolescents with a mean age of 16.46-years ($SD = 0.96$ years). Approximately 36 percent of participants were Caucasian (non-Hispanic), with the remaining participants endorsing a number of other racial and ethnic backgrounds (i.e., 31.5% were Black/non-Hispanic, 12.9% were Hispanic, 8.9% were Biracial, 4.0% were Black Hispanic, 4.0% were Asian, 0.8% were Middle Eastern, 0.8% were Indian, 0.8% were Native American, and 0.8% identified themselves as belonging to some other racial background). Participants were sampled across three grades, with 43.5% from the Tenth Grade, 30.6% from the Eleventh Grade, and 25.8% from the Twelfth Grade.

Measures Related to Adolescent Informants' Ratings of their Friends

Attribution of Friends' Behavior Problems. Despite research support for the utility of friend informant ratings of adolescents in clinical evaluations, there are currently no rating scale measures for friend informants that resemble those that are used with other informants (e.g., Behavior Assessment Scale for Children, Child Behavior Checklist, Conners' Rating Scales). Rather than developing a new measure, it appeared to be more prudent to use an already existing and well-validated measure. As a result, the Teacher's Report Form (TRF; Achenbach & Rescorla, 2001) was adapted for use in this study. This 113-item scale is used widely to assess the emotional and behavioral functioning of school-age youth and thus may be particularly well-suited for use in the friend and peer informant population. Although this measure was designed for teachers and school staff, the content of the items pertains to school behavior and may be appropriate for other individuals who view behavior in this setting (e.g., peers, friends).

Thus, using the TRF, adolescents rated how well each item described their target friend on a Likert-type scale, range from 0 (*Not true of them*) to 2 (*Very true of them*). Scores for internalizing behavior problems and externalizing behavior problems were obtained by summing respective TRF items from these scales that corresponded with similar items on the *Youth Self-Report* (YSR; Achenbach & Rescorla, 2001; for the purposes of ensuring concordance of items). The intact TRF had adequate reliability and validity in assessing the presence of internalizing and externalizing behavior problems in youth from the perspectives of teachers and other informants (Achenbach & Rescorla, 2001). In the present sample, the internalizing behavior problems ($\alpha=.89$) and externalizing behavior problems ($\alpha=.91$) scales demonstrated adequate internal consistency.

Friendship Quality. In order to assess friendship quality among adolescents and the friends whom they were rating, the *Network of Relationships-Relationship Quality Version* (NRI-RQV; Buhrmester & Furman, 2009) scale was used. This 30-item scale measures positive and negative relationship qualities across several types of relationships, including parents, friends,

boyfriends/girlfriends, and siblings. Adolescents were asked to rate the frequency with which each item occurred on a 5-point Likert type scale ranging from 1 (*Never or hardly at all*) to 5 (*Always or extremely much*). Several subscale scores can be derived from the measure (i.e., Companionship, Intimate Disclosure, Pressure, Satisfaction, Conflict, Emotional Support, Criticism, Approval, Dominance, and Exclusion), with each subscale being composed of three items. In addition, two more general factor scales, Closeness and Discord, can be computed by obtaining the mean of several subscales. The current study utilized the Closeness factor score as an indication of positive friendship quality. This measure demonstrated adequate reliability in previous studies (Buhrmester & Furman, 2009). The internal reliability of the Closeness scale also was adequate for the present study ($\alpha=.93$).

Measures Relevant to Adolescent Informants' Self-Ratings

Adolescent Behavior Problems. In order to assess the level and type of behavior problems present in the adolescent informants themselves via their own self-report, the *Youth Self-Report* (YSR; Achenbach & Rescorla, 2001) was utilized. This 120-item scale assesses the social and behavioral development of adolescents aged 11- to 18-years. Adolescents rated how well each item described them on a Likert-type scale that ranged from 0 (*Not true of them*) to 2 (*Very true of them*). Scores for internalizing, externalizing, and total behavior problems as well as narrow-band and *DSM*-oriented scale scores can be derived from this measure. As with the TRF, scores for internalizing behavior problems and externalizing behavior problems were obtained by summing respective YSR items that corresponded to similar items on the TRF based on the Achenbach scoring system. The intact YSR has adequate reliability and validity in assessing a broad range of behavior problems in adolescents and is one of the most widely used measures of adolescents' internalizing behavior problems and externalizing behavior problems (Achenbach & Rescorla, 2001). In the present sample, the internalizing behavior problems ($\alpha= .86$) and externalizing behavior problems ($\alpha= .82$) scales demonstrated adequate internal reliability.

Adolescent Demographics. A demographics questionnaire inquired about adolescent informants' demographic characteristics, including age, sex, race/ethnicity, and other characteristics relevant to SES.

Procedure

This study was approved by the Institutional Review Board at the University of Central Florida and by the schools that agreed to participate. Informed consent was obtained from the parents or legal guardians of all adolescent participants included in this study. Following receipt of consent, data collection took place on two separate days. On the first day, the research team provided information about the purpose of the project, and each adolescent was asked to provide their assent to participate. Once assent had been attained, an initial packet of questionnaires was distributed to the adolescents. As part of this packet, each adolescent completed the *Demographics Questionnaire* and *YSR* as well as a *Friend Identification* form. Adolescents were asked to provide the names of five friends who attended school with them and to rate that friend on a Likert-type scale that ranged from 1 (*Not close to all*) to 5 (*Extremely close/best friends*). Adolescents then were matched based on peer nomination procedures that have been used in previous research (Parker & Asher, 1993; Swenson & Rose, 2009). Specifically, adolescents were paired according to their rated closeness with respective peers, with priority given in the following order: pairs where each friend selected the other as their closest friend, pairs where one friend indicated a very close friendship and the other friend a less close friendship, or pairs where each friend indicated a friendship that is less close. The sample in this study represented adolescents who were placed successfully into a reciprocated dyad, resulting in 41 dyads composed of female friends, 11 composed of male friends, and 10 composed of mixed-sex friends. On the second day of data collection, adolescents completed a second packet of questions including the *TRF* and the *NRI-RQV* about the friend with whom they were paired.

Results

Means and standard deviations are provided in Table 1 so that findings could be put into context. Overall, participants' mean internalizing behavior problems and externalizing behavior problems scores on the YSR fell within the Nonclinical range. It should be noted, however, that a portion of adolescents fell within the Clinical range (i.e., 20% on internalizing behavior problems and 20% on externalizing behavior problems), indicating that these adolescents endorsed a level of symptoms that could be indicative of clinical impairment. With regard to friendship characteristics, adolescents reported overall positive relationships, as evidenced by higher mean scores on the NRI-RQV and ratings of friendship closeness provided for identified friends. For both of these measures, mean scores were significantly higher than the mid-point of the scale (NRI-RQV: $t(119) = 3.10, p = .01$; closeness: $t(123) = 10.23, p < .001$).

Table 1. **Sample Means and Standard Deviations**

<i>Variable</i>	<i>M</i>	<i>SD</i>	<i>Actual Range</i>	<i>Possible Range</i>
Participant Characteristics				
Age	16.46	0.96	15-19	15-19
Friendship Characteristics				
Friendship Quality	3.24	0.85	1.47-5.00	1-5
Perceived Friendship Closeness	3.94	1.02	1-5	1-5
Self and Informant Ratings				
Self-Ratings of Internalizing Problems	15.71	8.63	0-39	0-58
Self-Ratings of Externalizing Problems	13.13	6.32	2-33	0-52
Informant Ratings of Internalizing Problems	8.27	5.76	0-26	0-58
Informant Ratings of Externalizing Problems	7.68	6.39	0-27	0-52
Outcome Variables				
Standardized Difference Score-Internalizing	-0.01	10.40	-2.80-2.42	-4.00-4.00
Standardized Difference Score-Externalizing	0.15	0.97	-2.84-2.34	-4.00-4.00

Note. Standardized difference score means were calculated based on participants that were included in dyad-based analyses. Positive values represent higher symptoms reported by the target adolescent being rated, whereas negative values represent higher symptoms reported by the friend informant.

Analysis of Informant Symptom Endorsements

In order to determine if there was a difference between male and female friend informants with regard to their behavior problem ratings, item endorsement frequencies were analyzed by sex of the informant. For male informants on the internalizing behavior problems scale, 17 out of the 29 items were reported with low frequency. In contrast, female informants provided low

endorsements for only 10 out of 29 items. With regard to the externalizing behavior problems scale, male informants demonstrated low endorsements on 18 out of 26 items. In contrast, female informants provided low endorsements on only 6 out of 26 items.

Metric of Agreement. Given that previous research suggested that standardized difference scores were the most representative estimate of agreement (De Los Reyes and Kazdin, 2004), this metric was utilized in the present study. To create standardized difference scores, the internalizing behavior problems and externalizing behavior problems scale scores created from self-ratings and informant ratings were standardized before being subtracted from each other. In order to investigate whether agreement between adolescent self-ratings and those of their friend informants were significantly different for reports of internalizing behavior problems and externalizing behavior problems, the standardized difference score from these two scales were compared via a paired samples t-test. This comparison revealed no significant difference in average agreement between adolescent self-ratings and those of their friend informants for internalizing behavior problems ($M = -0.01, SD = 1.06$) and externalizing behavior problems ($M = 0.15, SD = 0.97$), $t(119) = 1.54, p < .13$.

Correlational Analyses

So that relationships among predictor variables (adolescent self-ratings of internalizing behavior problems and externalizing behavior problems, friend informant ratings of internalizing behavior problems and externalizing behavior problems, ratings of friendship quality and closeness), and outcome variables (agreement on internalizing behavior problems and externalizing behavior problems) could be examined, correlational analyses were conducted. See Table 2.

Agreement Between Adolescent Self-Ratings and Those of Friend Informants.

Adolescent-informant agreement for internalizing behavior problems was related significantly to adolescent self-ratings of externalizing behavior problems ($r = -.27, p < .05$). Likewise, adolescent-

informant agreement for externalizing behavior problems was related significantly to self-ratings of externalizing behavior problems ($r = -.27, p < .01$) and rated closeness with matched friend ($r = -.20, p < .05$). With regard to the relationships among informant ratings and predictor variables, adolescent self-ratings of internalizing behavior problems ($r = .27, p < .01$) and externalizing behavior problems ($r = .23, p < .05$) were related significantly to ratings of friends' internalizing behavior problems. Similarly, adolescent self-ratings of internalizing behavior problems ($r = .21, p < .05$) and externalizing behavior problems ($r = .42, p < .01$) were related significantly to ratings of friends' externalizing behavior problems.

Table 2. **Correlations Among Predictors and Dependent Variables**

	1	2	3	4	5	6	7	8
1. Self-Ratings of Internalizing Behavior Problems	--							
2. Self-Ratings of Externalizing Behavior Problems	.33**	--						
3. Friendship Quality	-.05	-.03	--					
4. Perceived Friendship Closeness	-.14	.09	.81**	--				
5. Ratings of Friend Internalizing Behavior Problems	.27**	.23*	-.05	.04	--			
6. Ratings of Friend Externalizing Behavior Problems	.21*	.42**	.12	.24**	.27**	--		
7. Standardized Difference Score-Internalizing	-.12	-.27**	-.09	-.14	-.18	-.08	--	
8. Standardized Difference Score-Externalizing	-.18	-.22*	-.15	-.20*	-.51**	-.45**	.35**	--

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

Differences Across Demographic Groups

A series of MANCOVAs were conducted to examine differences among demographic variables and adolescents' friendship quality, friendship closeness, adolescent self-ratings of internalizing and externalizing behavior problems, and informant ratings of internalizing and externalizing behavior problems.

Adolescent Sex. Female adolescents ($M = 17.42, SD = 0.91$) reported significantly higher levels of internalizing behavior problems for themselves than did male adolescents ($M = 11.23, SD = 1.50, F(1, 116) = 12.51, p < .001$). Female adolescents also provided significantly higher ratings of their friend's internalizing ($M = 9.01, SD = 0.71, F(1, 116) = 4.92, p < .03$) and externalizing ($M = 8.42, SD = 0.68, F(1, 116) = 4.74, p < .04$) behavior problems relative to male adolescents (internalizing: $M = 5.94, SD = 1.19$, externalizing: $M = 5.55, SD = 1.13$)

Friend Dyad Sex Composition. With regard to the sex composition of the friendship dyad, adolescents who were in female only dyads ($M = 18.04, SD = 0.93$) reported significantly higher levels of internalizing behavior problems for themselves relative to male only ($M = 10.50, SD = 1.83$) and mixed-sex dyads ($M = 11.78, SD = 1.93, F(2, 116) = 9.27, p < .001$). Additionally, female only dyad members reported significantly higher levels of friend internalizing behavior problems ($M = 9.53, SD = 0.74$) relative to members of male only dyads ($M = 5.20, SD = 1.50, F(2, 116) = 5.07, p < .01$).

Adolescent Grade. Adolescents in their sophomore year reported significantly higher levels of friendship quality ($M = 3.55, SD = 0.10$) than adolescents in their junior ($M = 4.91, SD = 0.12$) and senior years ($M = 3.05, SD = 0.13, F(2, 116) = 10.27, p < .001$). Similarly, adolescents in their sophomore year also rated themselves as closer to their matched friend ($M = 4.23, SD = 0.12$) compared to adolescents in their junior ($M = 3.79, SD = 0.15$) and senior years ($M = 3.71, SD = 0.17, F(2, 116) = 4.27, p < .02$).

Hierarchical Linear Modeling (HLM)

Model Specification and Data Preparation. For the current study, hierarchical linear modeling (HLM) represented the most appropriate tool for statistical analysis because adolescents were matched with friends and ratings were provided reciprocally. This particular analysis accounts for the interpersonal relationships of friendship dyad members and the nonindependence of the ratings they provided. The degree of nonindependence among outcome measures also was

investigated using the intraclass correlation (ICC), an estimate of the independence of outcome variables from the grouping variable (Garson, 2013). In the present study, there was a significant ICC for agreement of both internalizing behavior problems ($r_p = -.15, p < .06$) and externalizing behavior problems ($r_p = -.34, p < .001$). Of note, it is recommended that these analyses use a more liberal alpha of .20 because nonindependence can be difficult to detect and ignoring nonindependence can result in bias in variance and degrees of freedom (Kenny, Kashy, & Cook, 2006). Thus, it was important to take the dyadic nature of the data into account through the use of HLM.

Given that HLM takes multiple levels of data into account, predictor variables can be classified according to whether they occur at the individual person level or at the group level. In the present study, variables that were specific to the adolescent were considered as level 1 variables, including demographic variables (sex, grade) and measures of adolescents' own functioning (self-ratings of internalizing and externalizing behavior problems). Variables that were relevant to the dyad were considered as level 2 variables and included adolescents' rated degree of closeness, friendship quality, and dyad type (i.e., females only, males only, or mixed-sex). To determine whether each member's ratings of closeness and friendship quality should be entered separately, members' ratings on these variables were compared. Results revealed that there were no significant differences between each dyad member's rating of closeness ($t(61) = -0.31, p < .76$) or friendship quality ($t(57) = -1.97, p < .07$) as it relates to the other member of the dyad. In order to increase power and aid in interpretation, the ratings provided by each member of the dyad for these variables were averaged and entered as one level 2 variable.

Level 1 variables were centered around the grand mean, and all variables were entered as fixed variables with a random overall intercept (Kenny et al., 2006). To find the model of best fit, each model was built by adding each predictor variable, beginning with level 1 predictors and followed by level 2 predictors. Each time a new predictor was added to the model, improvement in

the model was determined by the log-likelihood statistic or degree of unexplained observations after the model was fit. Thus, the change in log-likelihood from the old and new models was assessed for significance (Field, 2009). Variables that were not significant or did not improve the model were removed before adding in additional variables (Nezlek, 2012). A maximum likelihood method for estimating model parameters was used because it produced a better estimate of fixed variables and allowed models to be compared to assess improvement in model fit (Field, 2009).

HLM for Internalizing Behavior Problems. Predictor variables were entered in the following order based on previous research and variable type: self-ratings of internalizing and externalizing behavior problems (level 1 measurements of informant functioning); sex and grade (level 1 demographic variables); friendship quality and degree of closeness (level 2 friendship quality); and sex dyad (level 2 demographic variable). In the model with the best fit, self-ratings of internalizing behavior problems ($F(1, 106.16) = 7.72, p < .01$) predicted significantly self-informant agreement on internalizing behavior problems. Although self-ratings of externalizing behavior problems ($F(1, 113.92) = 2.31, p < .13$) and average relationship quality ($F(1, 26.00) = 3.62, p < .07$) did not predict agreement significantly, they significantly improved the fit of the model and, thus, were included. Results revealed that increased self-ratings of internalizing behavior problems were associated with a decrease in agreement ($b = -0.03, t(106.16) = -2.78, p < .01$). See Table 3 for measures of goodness of fit and predictor estimates for each model.

To further investigate the relationship between predictor variables and the ratings of internalizing behavior problems that were provided by informants, an additional model was created with raw informant ratings of internalizing behavior problems serving as the dependent variable. Predictor variables were entered in the same manner. In the model with best fit, self-ratings of internalizing behavior problems ($F(1, 115.88) = 12.27, p < .01$) predicted significantly informant ratings of internalizing behavior problems. Friendship quality ($F(1, 48.98) = 1.51, p < .29$) improved significantly the model, despite its lack of significance as a predictor. Analysis of

significant predictors revealed that increased self-ratings of internalizing behavior problems ($b = 0.21, t(115.88) = 3.50, p < .01$) were associated with an increase in informant ratings of internalizing behavior problems. See Table 4 for model parameters and goodness of fit.

Table 3. **Model Parameters and Fit for Internalizing Behavior Problem Agreement**

	Model 1	Model 2	Model 3	Model 4	Model 5¥	Model 6	Model 7
Fixed Components							
Intercept	-0.03	-0.03	0.06	0.17	0.84	1.05*	0.89
Self-Ratings of Internalizing Behavior Problems	-0.03**	-0.03**	-0.03**	-0.03**	-0.03**	-0.03**	-0.03**
Self-Ratings of Externalizing Behavior Problems		-0.02*	-0.02*	-0.02	-0.02	-0.02	-0.02
Sex (male)			-0.32				
Grade (Sophomore)				-0.29			
Grade (Junior)				-0.24			
Relationship Quality					-0.27	-0.01	-0.34*
Degree of Closeness						-0.27	
Sex Dyad (Female)							-0.27
Sex Dyad (Male)							0.32
Deviance (-2LL)	343.90	340.28	338.10	338.80	327.89* *	326.12	323.52

Note * $p < .05$, ** $p < .01$, *** $p < .001$, ¥Final model

Table 4. **Model Parameters and Fit for Internalizing Behavior Problems Informant Ratings**

	Model 1	Model 2	Model 3	Model 4	Model 5¥	Model 6	Model 7
Fixed Components							
Intercept	8.41***	8.36***	9.06***	8.09***	3.80	3.85	2.72
Self-Ratings of Internalizing Behavior Problems	0.18**	0.14*	0.18**	0.18**	0.21**	0.21**	0.18**
Self-Ratings of Externalizing Behavior Problems		0.10					
Sex (male)			-2.37				
Grade (Sophomore)				0.89			
Grade (Junior)				-0.24			
Relationship Quality					1.41	1.47	1.09
Degree of Closeness						-0.06	
Sex Dyad (Female)							0.04
Sex Dyad (Male)							3.07
Deviance (-2LL)	787.34	785.49	784.28	726.62	755.97**	755.97	750.30

Note * $p < .05$, ** $p < .01$, *** $p < .001$, ¥Final model

HLM for Externalizing Behavior Problems. For this model, predictor variables were entered in the following order: self-ratings of internalizing and externalizing behavior problems

(level 1 measurements of informant functioning); sex and grade (level 1 demographic variables); friendship quality and degree of closeness (level 2 friendship quality); and sex dyad (level 2 demographic variable). Results of the final model revealed that there were no significant predictors for externalizing behavior problems self-informant agreement. See Table 5 for measures of goodness of fit and parameter estimates for this model.

Table 5. **Model Parameters and Fit for Externalizing Behavior Problems Agreement**

	Model 1	Model 2	Model 3	Model 4	Model 5¥	Model 6	Model 7
Fixed Components							
Intercept	0.16*	0.15	0.14	0.26	0.56	0.71	0.70
Self-Ratings of Externalizing Behavior Problems	-0.01	-0.01	-0.01	-0.01	-0.01	0.00	-0.01
Self-Ratings of Internalizing Behavior Problems		-0.01					
Sex (male)			0.05		0.08		
Grade (Sophomore)				-0.13			
Grade (Junior)				-0.16			
Relationship Quality					-0.12	0.10	-0.13
Degree of Closeness						-0.21	
Sex Dyad (Female)							-0.17
Sex Dyad (Male)							-0.14
Deviance (-2LL)	324.71	323.92	324.63	324.10	315.09**	312.85	314.60

Note. * $p < .05$, ** $p < .01$, *** $p < .001$, ¥Final model

In order to better understand the relationship between rater and friendship characteristics and the ratings of externalizing behavior problems that were provided by informants, an additional model was created with raw informant ratings of externalizing behavior problems serving as the dependent variable. Predictor variables were entered in the same manner. In the model with best fit, self-ratings of externalizing behavior problems ($F(1, 112.92) = 19.35, p < .001$), rater sex ($F(1, 85.07) = 6.60, p < .02$), friendship quality ($F(1, 52.08) = 5.18, p < .03$), and rated degree of closeness ($F(1, 50.99) = 10.93, p < .03$) all served as significant predictors. Analysis of significant predictors revealed that increased self-ratings of externalizing behavior problems ($b = 0.27, t(112.92) = 4.40, p < .001$) and friendship closeness ($b = 3.22, t(50.99) = 3.31, p < .01$) were associated with an increase in informant ratings of externalizing behavior problems, whereas higher relationship

quality ratings ($b = -2.75$, $t(52.08) = -2.28$, $p < .03$) and male gender ($b = 3.03$, $t(88.07) = -2.57$, $p < .02$) were associated with a decrease. See Table 6 for model parameters and goodness of fit.

Table 6. Model Parameters and Fit for Externalizing Behavior Problems Ratings

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6 [¥]	Model 7
Fixed Components							
Intercept	7.61***	7.65***	78.39***	7.05***	6.69*	4.59	2.83
Self-Ratings of Externalizing Behavior Problems	0.30***	0.29***	0.29***	0.27***	0.28***	0.27***	0.38***
Self-Ratings of Internalizing Behavior Problems		0.03					
Sex (male)			-2.81*	-3.26**	-2.53*	-3.03*	-3.07
Grade (Sophomore)				1.48			
Grade (Junior)				2.72			
Relationship Quality					0.51	-2.75*	-2.89
Degree of Closeness						3.22**	3.44**
Sex Dyad (Female)							1.99
Sex Dyad (Male)							1.50
Deviance (-2LL)	761.92	761.57	756.35	752.73	734.17**	723.95***	722.57

Note. * $p < .05$, ** $p < .01$, *** $p < .001$, ¥Final model

Discussion

Given the potential utility of friend informants and research suggesting that friends may provide accurate and valuable information (Swenson & Rose, 2009), the present study investigated the agreement between adolescent self-ratings and those of friend informants on internalizing and externalizing behavior problems within the context of friendship and peer informant characteristics. The hypothesis that agreement for externalizing behavior problems would be significantly higher than agreement for internalizing behavior problems was not supported. Previous research with parent ratings suggested that externalizing behavior problems resulted typically in higher agreement given the more salient nature of these symptoms (Achenbach, 2011; Penney & Skilling, 2012). This same effect was demonstrated in prior research for friend informants (Swenson & Rose, 2003), although the research was significantly more limited regarding these informants. The findings of the present study suggested that adolescent friend

informants were able to rate both internalizing and externalizing behavior problems to the same degree. This finding also was supported by the low rate of relative difference between behavior problem ratings provided by adolescents themselves and those provided by their friends, suggesting that the agreement between these informants was high. Given this similar agreement across behavior problems, friend informants may be particularly useful for providing information regarding adolescents' behavior problems that historically was more difficult for parent and teacher informants to rate.

Further, it was expected that both individual and relationship characteristics, such as higher friendship quality, closeness, and female sex, would be related to better agreement between adolescent self-ratings and those provided by their friends. This hypothesis also was not supported. Interestingly, while friendship quality and closeness was not related to the agreement between adolescents and their friends, it was related to the number of externalizing behavior problems that were reported by adolescents about their friends. In particular, adolescents who perceived their friendships with the target friend to be closer reported higher levels of externalizing behavior problems for themselves, whereas adolescents who reported higher quality relationships with their target friend reported lower levels of externalizing behavior problems for that friend. Notably, this finding was inconsistent with previous research on friendship quality, which suggested that ratings of externalizing behavior problems were not impacted by such factors (Swenson & Rose 2009).

Additionally, rater sex was related significantly to ratings of externalizing behavior problems, such that female informants provided significantly higher ratings. Further, examination of item endorsements revealed that male adolescents endorsed an appreciably more limited range of items relative to female adolescents. Previous research suggested that male adolescents were more likely to provide higher ratings of externalizing behavior problems when looking more generally at peers (Lauer & Renk, 2013) and that they were more likely to rate behavior negatively

(Fox et al., 2008). It appears that the male adolescents in the present study were less likely to endorse a broad range of behavior problems in general, which suggested that they either perceived fewer of these behavior problems as problematic or that these behavior problems were less noticeable to them. With regard to externalizing behavior problems in particular, this finding was supported by research suggesting that externalizing behavior problems are associated more typically with males (Leadbeater, Kuperminc, Blatt, & Hertzog, 1999). Thus, male adolescents may have viewed externalizing behavior problems as particularly more normative and less extreme, especially within the context of friendship, and provided lower, less clinically concerning ratings.

In contrast, the hypothesis that informant behavior problems would be associated with decreased agreement was supported partially. Previous research suggested that informant ratings may be biased when there were existing informant behavior problems (Epkins, 1994). Specifically, research suggested that friend informants were biased by their own behavior problems but that they also were more accurate (Kenny & West, 2010; Swenson & Rose, 2009). In addition, other research suggested that perceived similarity was important due to the tendency for individuals to seek out others who were similar (Romero & Epkins, 2008). In other words, the bias that may result from the presence of behavior problems in informants themselves was not as problematic because these same behavior problems were more likely to be present within adolescents who were being rated. In the present study, this finding was observed inconsistently across ratings. In particular, informants' internalizing behavior problems were related to a significant decrease in agreement for friend internalizing behavior problems. Further, adolescent self-ratings of internalizing behavior problems also were related significantly to increased informant reports of internalizing behavior problems. This pattern of results suggested that the presence of internalizing behavior problems for the informant may have biased negatively their ratings of their friends' internalizing behavior problems.

Further, informants' externalizing behavior problems did not impact the agreement between adolescent self-ratings and those of informants on externalizing behavior problems. In fact, informants' externalizing behavior problems were related significantly to increased reports of externalizing behavior problems. Thus, although the presence of informant externalizing behavior problems was related to increased reports of externalizing behavior problems, these reports appeared to be "accurate" in that they agreed with the ratings provided by the target adolescent. Overall, these results suggested that the presence of bias may be more or less helpful depending on the type of behavior problems being rated. If behavior problems are internalizing in nature, then bias may impact negatively the relative accuracy of these ratings. In contrast, behavior problems that are externalizing in nature may not suffer from the same negative impact of bias. This differential relationship may be due to the tendency for individuals who have externalizing behavior problems to seek out other individuals who have similar symptoms (Fortuin, van Geel, & Vedder, 2015). Interestingly, adolescents with internalizing behavior problems may not demonstrate this same tendency.

The results of the present study must be interpreted in light of its limitations, many of which were related to study measures and sample characteristics. Although this study and previous research suggested that peer informants can provide valuable clinical information, there are no existing well-validated rating scales that offer the means to obtain this information. The TRF was used in the present study to obtain friend ratings due to its strong psychometric properties and clinical utility regarding the acquisition of information relevant to school behaviors. Notably, this rating scale is meant to obtain information on teachers' observations and may include questions about behavior to which peers may not be privy (e.g., classroom performance). Thus, participants' responses to these questions may not have represented their direct observation of these behaviors (although items included for examination in the present study were selected carefully).

Additionally, adolescents reported friendships that were very positive and close in nature. Given the lack of significant effects for friendship quality, the lack of variation in positive friendship characteristics may have played a role. Specifically, the majority of adolescents who were matched successfully to a friend and included in the present study were female, resulting in significantly more female only dyads relative to male only or mixed-sex dyads. This distribution of sex dyads also could have impacted the variation in friendship quality, as this characteristic can vary among different types of dyads. The present study also did not exclude relationships that were romantic in nature, although “friendships” were targeted in all study materials. Because these relationships were not excluded, it is unknown how many of the dyads in the present study were linked romantically. Research suggested that romantic partners can be accurate in their rating agreement in adults (Foltz, Morse, & Barber, 1999), although past research has not explored this type of relationship in adolescent informant agreement. Finally, although a representative sample of adolescents was sought, data for this study were collected from adolescents enrolled in high school level psychology classes. Given that this class was an elective, adolescents who choose to enroll in this type of class could possess characteristics that set them apart from other adolescents.

Overall, results of the present study indicated that agreement between adolescent self-ratings and those of their friend informants was high across behavior problem presentations and that very few informant or relationship characteristics were related to these ratings. Although previous research investigated the impact of some of these factors on ratings provided by friend informants, the present study extended the research by investigating whether these factors were related to the actual agreement of the ratings provided by adolescents and their friends. Thus, understanding not only the perception of the target adolescent, but also whether or not this perception agreed with the perception of a close friend, could provide good clinical information. This information is particularly important given the ever changing social norms that are present for adolescents and the lack of access that other informants have to peer observations and other

related information that may be of clinical relevance. Because agreement between adolescents and typical informants (e.g., parents, teachers) tends to vary and because discrepancies can lead to negative long-term clinical outcomes, it will be beneficial to continue to explore the utility of friend informants. As the present study suggested, it may be beneficial to consider including information collected from friend informants to help inform diagnosis and treatment for adolescents, as may be clinically indicated.

In light of the results of the present study, it may be helpful for future studies to investigate more nuanced measures of friendship quality, including relationship characteristics such as support and disclosure. Such research may reveal that these aspects of friendship quality demonstrate an impact on informant agreement, over and above that provided by overall positive friendship quality. Additionally, the present study restricted agreement to self-ratings and to those provided by friends only, with these ratings not providing information regarding the differences in agreement with other informants (e.g., teachers, parents). Although friends can be perceived as providing “accurate” information regarding salient social norms, future research should aim to determine whether these ratings are in agreement with the perception of other informants as well as with more objective clinical measures.

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