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## Evaluating the Psychological Concomitants of Other-Sex Crush Experiences during Early Adolescence

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### Abstract

Very little empirical attention has been paid to other-sex crush experiences during adolescence. As a result, it is not known whether such experiences, which appear to be relatively common, impact psychological adjustment outcomes. This two-wave (3 month interval) longitudinal study of 268 young adolescents (48% girls; *M* age at Time 1 = 11.84 years) examined the psychological concomitants of other-sex crush experiences (having and being viewed by others as a crush). Anxious-withdrawal and gender were evaluated as moderators. Peer nomination measures at Time 1 assessed both types of crush experiences and mutual friendship involvement, and participants completed self-report measures of loneliness and depressive symptoms at Times 1 and 2. The results from regression analyses revealed significant associations between having an other-sex crush and depressive symptoms at Time 1, after accounting for the effects of mutual friendship. Two interaction effects also revealed that crush status was a risk factor for depressive symptoms at low levels of anxious-withdrawal but a protective factor at high levels. The findings provide the first empirical evidence that other-sex crush experiences are developmentally significant during early adolescence.

### Keywords

Crushes; Adolescence; Peers; Loneliness; Depressive Symptoms

### Introduction

After neglect for many years, romantic experiences during adolescence are now receiving considerable theoretical and empirical attention (Collins, 2003; Furman & Rose, 2015). From recent research, it is becoming clear that romantic involvement and the quality of romantic relationships during *middle* and *late adolescence* help to explain variability in

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#### Authors' Contributions

JB conceived of the study, participated in its design and coordination, performed the statistical analyses, and drafted the manuscript; RE participated in the design and interpretation of the data and helped to draft the manuscript. Both authors read and approved the final manuscript.

#### Compliance with Ethical Standards

##### Ethical Approval

This study was approved by the University at Buffalo, The State University of New York Institutional Review Board (IRB).

##### Informed Consent

Written parent consent and adolescent assent was obtained for all participants in the study.

several psychosocial adjustment outcomes, including depressive symptoms, externalizing problems, and substance use (e.g., Beckmeyer, 2015; Collibee & Furman, 2015; Ha, Dishion, Overbeek, Burk, & Engels, 2014). Romantic experiences during *early adolescence* (10–14 years), however, can be difficult to study because few young adolescents are engaged in romantic relationships (Carlson & Rose, 2007; Roisman, Booth-LaForce, Cauffman, & Spieker, 2009). Romantic relationship interest and motivation are also low during early adolescence, especially when compared to interest in social status and popularity (Kindelberger & Tsao, 2014; LaFontana & Cillessen, 2010). Yet, there is some indication that other types of romantic experiences, such as *crushes* (defined as target-specific likings for another person, characterized by one-sided romantic attraction or feelings; Bowker, Spencer, Thomas, & Gyoerkoe, 2012), become increasingly common during early adolescence, with one recent study reporting that 56% percent of young adolescents ( $M_{\text{age}} = 12.74$  years) had at least one current other-sex crush on grade-mates (Bowker et al., 2012). In this study, having a crush was not related to socio-behavioral adjustment indices but being viewed by many other-sex peers as a crush was (e.g., popularity, social preference).

Very few studies have considered other-sex crush experiences during early adolescence (for three exceptions, see Bower, Nishina, Witkow, & Bellmore, 2015; Bowker et al., 2012; Hurlock & Klein, 1934). Thus, many unanswered questions exist, with perhaps the most important being: Do other-sex crush experiences (both having and being viewed as an other-sex crush) impact young adolescents psychologically? By utilizing a longitudinal sample of young adolescents, the current study investigated (1) the psychological concomitants of having and being viewed as an other-sex crush during early adolescence, and (2) whether the psychological concomitants of other-sex crush experiences depend on the individual adolescent characteristics of anxious-withdrawal and gender.

### **The Psychological Significance of Other-Sex Crush Experiences during Early Adolescence**

To date, most of what is known about other-sex crush experiences is descriptive in nature. For instance, several concurrent and retrospective studies revealed that most young adolescents have at least one *current* (and unreciprocated) other-sex crush and that the majority of older adolescents and young adults report having had at least one other-sex crush in their *past*, specifically during early adolescence, and before their first dates and romantic relationships (Bowker et al., 2012; Hearn, O’Sullivan, & Dudley, 2003; Hurlock & Klein, 1934; Kornreich, Hearn, Rodrigues, & O’Sullivan, 2003). These findings are consistent with theory and research on other-sex peer and romantic experiences indicating that young adolescents spend considerable time thinking about other-sex peers and romantic issues before actually interacting with or forming mutual heterosexual romantic relationships (e.g., Blyth, Hill, & Thiel, 1982; Connolly, Craig, Goldberg, & Pepler, 2004; Connolly, Nguyen, Pepler, Craig, & Jiang, 2013). There is also evidence that a small group of young adolescents (~25%), who are popular and physically attractive, come to receive the majority of crush nominations or are highly “crushed upon” (Bower et al., 2015; Bowker et al., 2012). These young adolescents are characterized as having high *crush status* (Bowker et al., 2012).

But do these relatively common or normative other-sex crush experiences actually matter or have an impact on adolescent development? Crush experiences have long been theorized to

be strongly and directly influential on the course of adolescent development (Adams-Price & Greene, 1990; Rybak, 1965; Siegel & Shaughnessy, 1995). As an example, drawing from Eriksonian theory (Erikson, 1950), Adams-Price and Greene (1990) posited that adolescent crushes allow for “safe” experimentation with romantically and sexually charged thoughts and emotions. The ability to safely experiment with such new and potentially distressing thoughts and feelings, as opposed to refusing to recognize them, should, in turn, contribute to healthier self and identity development during adolescence (Adams-Price & Greene, 1990).

Although theoretically indicated, relatively little is known about the developmental significance of crush experiences during early adolescence, in large part because only one study, to our knowledge, considered a psychological adjustment outcome (i.e., loneliness, Bowker et al., 2012), and no studies of crushes have been longitudinal. Clearly the research on crush experiences during early adolescence would benefit from considering additional psychological outcomes, both concurrently and longitudinally. Thus, the present study extends past research by considering the concurrent and prospective associations between other-sex crush experiences during early adolescence and two psychological outcomes: loneliness *and* depressive symptoms, two of the most commonly considered outcomes in peer relations and romantic experience research (e.g., Anderson, Salk, & Hyde, 2015; Woodhouse, Dykas, & Cassidy, 2012).

This investigation and its hypotheses are informed by two opposing theoretical developmental frameworks. The first are *social timetable theories of adjustment* which emphasize the importance of the *timing* of social experiences (such as those with peers and romantic partners) and life events when considering such experiences in relation to adjustment (Elder, 1975). These theories are often applied to the study of first romantic relationships and marriages. Due to social norms regarding the approximate ages at which social experiences are expected to occur, such as how old one should be for involvement in *first* romantic relationships, those who have such experiences at the normative or typical time (relative to peers) are considered “on-time” while those who have such experiences earlier or later are considered “off-time” (Neugarten, 1979). Off-time social experiences, particularly when the timing is early, are thought to lead to adjustment difficulties due to negative social sanctions and/or the lack of internal (e.g., coping strategies) and social resources (Neugarten, 1979). In support of these theories, early romantic relationship involvement (during early adolescence, when such involvement is not common), particularly by girls, has been associated with externalizing and internalizing problems (e.g., Connolly & McIsaac, 2009). An application of these theories to other-sex crush experiences would suggest that because having a crush during early adolescence appears to be increasingly common and therefore on-time, such an experience should not be related to negative psychological outcomes, such as loneliness and depressive symptoms. Although a small number of adolescents are “crushed on,” or have high crush status (Bowker et al., 2012), increasingly common romantic feelings may protect adolescents with high crush status (who presumably feel good about being romantically desirable, even if limited interaction occurs; Hurlock & Klein, 1934) from psychological maladjustment. Indeed, Hurlock and Klein (1934) found that while some adolescents reported avoiding their crushes, some adolescents (approximately 40 percent) reported acting in a “sentimental way” around and giving

presents and poetry to their crushes, suggesting that adolescents who are highly “crushed upon” may have some awareness of their crush status (and therefore could be impacted by it). These hypotheses are consistent with the results from the Bowker et al. (2012) study whereby neither having nor being an other-sex crush was related to loneliness.

*Developmental task theories*, however, lead to a different set of predictions (Roisman et al. 2009; Roisman, Masten, Coatsworth, & Tellegen, 2004). These theories also focus on the timing of social experiences, but suggest that many experiences that are common or normative might lead to adjustment difficulties if they represent *emerging* developmental tasks and are not yet *salient* developmental tasks for which the individual is prepared. These theories offer a compelling explanation for findings revealing that romantic relationship involvement during middle adolescence is associated with psychosocial difficulties (e.g., Furman & Collibee, 2014; Joyner & Udry, 2000). By contrast, Furman and Collibee (2014) found that having a committed romantic partner during young adulthood was associated with lower levels of internalizing and externalizing problems, which they suggest is because romantic relationship involvement is a *salient* developmental task during young adulthood, and therefore promoting adjustment at this time. With regard to internalizing problems, the authors posit that romantic relationships may become less distracting and also less stressful during young adulthood when individuals are developmentally “ready” for such relationships. Drawing from this set of theories, if romantic involvement during middle adolescence is an *emerging* developmental task, then crush experiences during early adolescence may also be considered an *emerging* developmental task, in spite of their increasingly common nature. Put another way, the emergence or salience of the task is thought to be independent of the commonality or frequency of early adolescent participation in the task. Thus, according to developmental task theories, having and being an other-sex crush during early adolescence may be a very common experience for which young adolescents are nevertheless inadequately prepared. This lack of preparation may lead to feelings of discomfort, negative affect, and depressive symptoms. Loneliness may also develop if adolescents feel like they are less prepared than their peers to deal with such experiences and if the somewhat limited social contact with the involved other-sex peers (the crushers or the crushees) leads to feelings of social dissatisfaction and aloneness (Laursen & Williams, 1997; Woodhouse et al., 2012). Due to the paucity of studies in this area of research, both sets of hypotheses were considered in the present study.

### **Anxious-Withdrawal and Gender as Factors that Impact the Concomitants of Crush Experiences**

In accordance with child by environment models of risk and adaptation (e.g., Magnusson, 1998), we also considered the possibility that the impact of having and being an other-sex crush may depend on the individual adolescent characteristics of anxious-withdrawal and gender. Support for the importance of individual characteristics in explaining variability in the outcomes of *romantic involvement* has previously been documented (e.g., Szewedo, Chango, & Allen, 2015).

Anxious-withdrawal refers to the consistent display of solitary behavior in the company of familiar and unfamiliar peers (Rubin, Coplan, & Bowker, 2009). Anxious-withdrawn (also

known as shy or anxious-solitary) youth desire to be with peers but avoid and withdraw due to their temperamentally-based social fears and anxiety (and not due to peer difficulties). However, their behavior, which is believed to be judged by peers as atypical and unusual, oftentimes leads to peer problems, including peer exclusion, rejection, and victimization (Oh et al., 2008). In fact, anxious-withdrawal is one of the most commonly studied individual risk factors for peer difficulties (Deater-Deckard, 2001). Thus, anxious-withdrawn youth spend considerable time alone and on the periphery of the social scene due to their anxieties and fears and also due to their peer difficulties. There is also some indication that anxious-withdrawn youth are fearful of negative evaluation and rejection-sensitive (London, Downey, Bonica, & Paltin, 2007; Rubin et al., 2009). Taken together, anxious-withdrawn youth may have more experience with unilateral and non-reciprocated relationships, including crushes. Drawing from developmental task theories, such solitary and unilateral experiences may lead crush experiences to be *salient* (rather than emerging) tasks for which anxious-withdrawn youth are prepared. They may also be more comfortable with unilateral relationships, which are non-rejecting and free of stressful expectations for social interaction (and perhaps free of any direct interaction whatsoever; Bowker et al., 2012), and thus may not be impacted by or may even benefit psychologically from both having and being viewed by others as an other-sex crush.

Gender was also examined as a potential moderator for several reasons. First, there is evidence of gender differences in the nature and behavioral correlates of other-sex peer experiences (e.g., Furman & Collins, 2009). Bowker et al. (2012) also reported that, while girls were more likely to have at least one other-sex crush, boys received a greater number of crush nominations. Second, it should be noted that there was no support for gender as a moderator of the associations between crush experiences and psychological adjustment in the Bowker et al. (2012) study. However, gender does moderate to some extent the impact of other types of other-sex peer experiences, including romantic relationship involvement (Brendgen, Vitaro, Doyle, Markiewicz, & Bukowski, 2002; Haydon & Halpern, 2010; Joyner & Udry, 2000). For instance, Joyner and Udry (2000) found that romantic relationship involvement was related to elevated levels of depressive symptoms for adolescent girls but not boys. Finally, there is some indication that girls are more strongly impacted by certain types of unilateral peer relationships than boys. For instance, Thomas and Bowker (2013) found that girls (but not boys) with desired friendships (which are not mutual) reported greater loneliness than girls without desired friendships, after accounting for related peer experiences, such as mutual friendship involvement. In addition, evidence suggests that girls rate their friendships as more stressful than do boys (Rudolph, 2002), and women tend to report their unrequited love experiences as more psychologically stressful than men (Baumeister, Wotman, & Stillwell, 1993). Thus, it is possible that girls' greater interpersonal sensitivity may make other-sex crush experiences more relevant and also more impactful on their psychological well-being.

## The Current Study

Guided by past research and developmental theory and child by environment models (Bowker et al., 2012; Hurlock & Klein, 1934; Elder, 1975), the present study tested whether two types of other-sex crush experiences (having and being an other-sex crush)

independently impact psychological well-being (loneliness, depressive symptoms). We evaluated these associations concurrently and prospectively, during early adolescence, the developmental period during which crush experiences are thought to first emerge and steadily increase in both prevalence and influence. Also of interest was whether anxious-withdrawal would attenuate and being female would enhance the associations.

## Methods

### Participants

Participants were 268 (140 boys) sixth-grade students ( $M$  age at Time 1 = 11.84 years;  $SD=0.49$ ) from two public middle schools located in the northeast United States. All sixth-grade students from both schools were invited to participate in a larger longitudinal study, which focused on changes in peer relationships (e.g, friendship). Parental consent and adolescent assent to participate in the study was obtained (consent rate = 70%), and all students who returned their consent forms (regardless of their decision to participate) received T-shirts and were entered in a drawing to win a gift certificate (see Bowker, Adams, Bowker, Fischer & Spencer, 2015; Markovic & Bowker, 2015, for additional study information). Fifty-nine percent of participants self-identified as Caucasian, 19% as African-American, 3% as Hispanic/Latino, and the remaining 19% self-identified as belonging to a different minority group, being biracial, or did not indicate an ethnicity. Six participants dropped out of the study due to moving away from their schools and thus were excluded from analyses.

### Procedures

Participants completed all measures in their schools in a group format (i.e., in their individual classrooms or the cafeteria) at two time points (Time 1: February; Time 2: May). Measures took students approximately 30–45 minutes to complete and were administered by trained research assistants. Participants were told that their answers were confidential and that they could skip any item and choose to stop completing the measures at any time. In addition to the measures described below, participants also completed several other measures, including measures of friendship quality and social information processing, which were not of interest herein. Teachers were not involved in the data collection.

### Measures

**Peer Nominations (Time 1)**—Peer nomination items were used to assess having and being viewed as a crush, anxious-withdrawal, and popularity. For all items, participants were instructed to nominate an unlimited number of same-sex and other-sex peers from their grade and school that best fit each item description. Self-nominations were permitted but excluded from analyses. Nominations *received* by each participant were first summed, proportionalized, and then standardized within grade and school (Cillessen, 2009). Due to the multiple-informant nature of peer nominations, single-item peer nomination assessments, like the one used herein to assess crushes, are considered reliable (Coie, Dodge, & Kupersmidt, 1990).

**Crushes:** Participants completed a single-item peer nomination, “Someone you have a crush on.” There was only one nomination made for a same-sex peer, consistent with past research on crushes during early adolescence (Bowker et al, 2012), and thus the focus was on other-sex nominations only. Based on crush nominations *made*, adolescents were identified as having a crush or not (i.e., presence of a crush; coded 0= no crush nominated, 1= crush nominated). In the present sample, 31% of adolescents reported having at least one other-sex crush (71 of the 228 participants with available data; 40 participants were either absent or failed to complete that portion of the measure packet), and girls were more likely than boys to report having at least one crush,  $\chi^2(1) = 4.45, p < .05, \phi = .14$ . Crush status was determined by the number of nominations received for this item; participants with higher scores on this variable represent those more frequently nominated as a crush by their classmates (Bowker et al., 2012). Fifteen percent of participants *received* at least one crush nomination by an other-sex peer. A *t*-test revealed that the number of crush nominations received did not significantly differ by gender,  $t(266) = 0.83, p = .41$ .

**Anxious-withdrawal:** Four items were used to assess anxious-withdrawal: “Somebody who is very shy”; “A person who doesn't talk much or who talks quietly”; “A person who hardly ever starts up a conversation” and “Someone who gets nervous about participating in group discussions” (e.g., Bowker & Spencer, 2010; Rubin, Wojslawowicz, Rose-Krasnor, Booth-LaForce, & Burgess, 2006). A composite anxious-withdrawal score was created for each participant by averaging these items; internal consistency was found to be good in the present sample ( $\alpha = .82$ ).

**Mutual friendship involvement (Time 1):** Participants wrote the names of their same-sex “very best friend,” “second best friend,” and three same- or other-sex “good” or “close” friends from their grade and school (Bukowski, Hoza, & Boivin, 1994). Mutual friendship involvement was determined if the friendship nominations were reciprocated (either as a “best” or “good” friend). Mutual friendship could not be determined for 21 participants who nominated only non-participants as their friends or did not complete the friendship nominations. Consistent with past studies on friendship during early adolescence (e.g., Parker & Asher, 1993), approximately 72% of participants in the present study had at least one mutual same-sex friend. Also consistent with past research (Parker & Asher, 1993), girls were more likely than boys to have at least one mutual friend,  $\chi^2(1) = 16.21, p = .001, \phi = .28$ .

### **Self-Report Measures (Times 1 and 2)**

**Loneliness:** Participants completed the Loneliness and Social Dissatisfaction Questionnaire (Asher, Hymel, & Renshaw, 1984), which includes 16 items assessing feelings of loneliness (e.g., “I feel alone”) and social dissatisfaction (e.g., “It’s hard for me to make friends”). Mean scores were calculated, with higher scores indicating greater loneliness. This measure had excellent reliability (T1:  $\alpha = .92$ , T2:  $\alpha = .91$ ).

**Depressive symptoms:** The Children’s Depression Inventory was used to evaluate depressive symptoms (CDI; Kovacs, 1992). Participants selected between three response options for each of the 10 items (e.g., “I am sad once in a while,” “I am sad many times,” or

“I am sad all of the time”). Mean scores were calculated with higher scores reflecting more feelings of depression. Internal consistency was good in the present sample (T1:  $\alpha = .73$ ; T2:  $\alpha = .76$ ).

## Results

### Descriptive Statistics and Zero-Order Correlations

Means, standard deviations, and zero-order correlations for all study variables are presented in Table 1. Being viewed by many as a crush (i.e., crush status) was related to mutual friendship involvement. Anxious-withdrawal was related positively to loneliness at T1 and T2 and depressive symptoms at T1. Gender was associated positively with anxious-withdrawal (such that higher scores on anxious-withdrawal were reported for girls) as well as crush presence and mutual friendship involvement. Consistent with the aforementioned chi-square results, girls were more likely to report having at least one crush and were more likely than boys to have at least one mutual friendship. Loneliness and depressive symptoms were correlated positively across time points, and were both related negatively to mutual friendship involvement. Given the significant associations between the mutual friendship variable and the independent and dependent variables, mutual friendship involvement was controlled in all subsequent analyses. Preliminary analyses revealed that ethnicity was not related to the study variables and did not alter the study findings when controlled.

### Missing Data

It should be noted that the data were inspected for skew and kurtosis; a number of variables were skewed, however, transforming the data did not alter the results, and thus, the untransformed data were used. There was no missing data on the crush status and anxious-withdrawal variables. However, there was some missing at random data on the self-report psychological outcome measures due to absenteeism during the data collection and/or failure to complete the entire packet of measures. As noted previously, there was also some missing data on the crush presence and mutual friendship involvement data. Thus, degrees of freedom are somewhat reduced in the regression analyses described below (see Tables 2 and 3). However, analyses did not reveal any differences between participants with and without complete data.

### Examining Unique Associations between Having and Being a Crush and Depressive Symptoms and Loneliness with Anxious-withdrawal and Gender as Moderators

A total of eight hierarchical linear regression models evaluated the central study hypotheses. In all models, mutual friendship and the independent variables (crush presence or crush status) were entered in Step 1, moderators (gender and anxious-withdrawal) were entered in Step 2, and two- and three-way interactions were entered in Steps 3 and 4, respectively. Either loneliness or depressive symptoms served as the dependent variable. The models were tested concurrently (i.e., predicting T1 loneliness and depressive symptoms) and longitudinally (i.e., predicting T2 loneliness and depressive symptoms), controlling for earlier levels of loneliness and depressive symptoms. To increase interpretability and reduce the degree of multicollinearity, variables were centered prior to forming interactions (Aiken & West, 1991). Significant interactions were probed using procedures outlined by Aiken and



West (1991). Only those significant main and interaction effects that were entered at a step that yielded a significant increment in the amount of variance are interpreted and described. The results are reported in Tables 2 (for crush presence) and 3 (for crush status).

**Crush presence predicting loneliness**—When T1 loneliness served as the dependent variable, mutual friendship involvement (at Step 1) and anxious-withdrawal (at Step 2) emerged as significant predictors. When T2 loneliness was the dependent variable, crush presence and T1 loneliness were significant and positive predictors at Step 1, and the main effect of anxious-withdrawal was significant at Step 2.

**Crush presence predicting depressive symptoms**—In the model evaluating T1 depressive symptoms as the outcome, significant main effects were found for mutual friendship and crush presence at Step 1, and anxious-withdrawal at Step 2. When T2 depressive symptoms served as the dependent variable, T1 depressive symptoms was a significant predictor at Step 1, and the interaction between anxious-withdrawal and gender at Step 3 was significant. Follow-up simple slope analyses revealed that anxious-withdrawal was related positively to T2 depressive symptoms for girls ( $\beta = 0.24, p < .01$ ), but not for boys ( $\beta = -0.32, p = .20$ ), after accounting for levels of depressive symptoms at T1.

**Crush status predicting loneliness**—In the concurrent model, mutual friendship and anxious-withdrawal were significant predictors of T1 loneliness at Steps 1 and 2, respectively. Considering T2 loneliness as the dependent variable, T1 loneliness was a significant predictor at Step 1 and anxious-withdrawal was a significant predictor at Step 2.

**Crush status predicting depressive symptoms**—When T1 depressive symptoms served the outcome, there were main effects of mutual friendship and anxious-withdrawal at Steps 1 and 2, respectively. Additionally, a significant interaction emerged at Step 3 between crush status and anxious-withdrawal. Follow-up simple slope analyses revealed that crush status was associated *negatively* with depressive symptoms at high levels of anxious-withdrawal (1 SD above the mean;  $\beta = -0.71, p < .05$ ), but *positively* associated at low levels (1 SD below the mean;  $\beta = 0.53, p < .01$ ), and unrelated at medium levels (at the mean;  $\beta = -0.09, p = .35$ ). Evaluating T2 depressive symptoms as the dependent variable, T1 depressive symptoms was a significant predictor at Step 1, and a significant interaction between crush status and anxious-withdrawal also emerged at Step 3. Simple slope analyses revealed that crush status predicted *increases* in depressive symptoms at low levels of withdrawal ( $\beta = 0.60, p < .01$ ), but was unrelated to depressive symptoms at high ( $\beta = -0.42, p = .14$ ) and medium levels of withdrawal ( $\beta = 0.09, p = .33$ ).

As a robustness check, we re-ran all of the regression models controlling for depressive symptoms when predicting loneliness and controlling for loneliness when predicting depressive symptoms. The findings were very similar to those without the extra control variables such that only one of the reported findings involving the crush variables differed (i.e., when predicting Time 2 loneliness, the interaction involving crush status and anxious-withdrawal was no longer significant).

## Discussion

Although there has been speculation that adolescent crushes impact adolescent development, there is little direct empirical evidence on the issue. The goal of the current study was to take a step toward addressing this gap, by evaluating the concurrent and prospective associations between both having and being an other-sex crush and two psychological outcomes (loneliness, depressive symptoms) during early adolescence. Anxious-withdrawal and gender were also evaluated as potential moderators. As in prior research (Bowker et al., 2012), both types of other-sex crush experiences were not related concurrently to loneliness. However, having an other-sex crush was associated significantly with Time 1 depressive symptoms. Also of note, regression analyses revealed that anxious-withdrawal (but not gender) moderated the concurrent and longitudinal associations between crush status (or being viewed by many as an other-sex crush) and depressive symptoms.

To expand on the Bowker et al. (2012) study, which was limited by a single time point and a single psychological outcome (loneliness), the current research design was longitudinal and used both depressive symptoms and loneliness as outcomes. The approach revealed several novel findings, including a significant association between having at least one other-sex crush (or crush presence) and depressive symptoms, after accounting for the effects of mutual friendship involvement. Significant linkages with loneliness were not revealed, highlighting the importance of considering more than one psychological outcome in this relatively new area of empirical research. But why is having an other-sex crush a risk factor for depressive symptoms but not loneliness? Attention will need to be paid to what underlies these different findings. Long ago, Hurlock and Klein (1934) found that the majority of adolescents reported that their crushes occupied their thoughts and that they felt self-conscious in the presence of their crush, suggesting that having a crush can be cognitively time-consuming and also involve some degree of self and social discomfort. Thus, one possibility is that having a crush does not lead to social dissatisfaction and loneliness, especially if it is viewed as relatively normative to have one, but instead fosters rumination and depressive feelings (Nolen-Hoeksema, 2000). Indeed, the strong emotions and feelings presumed to be associated with crushes as well as their unrequited and unilateral nature seem likely to lead to repetitive and passive thinking and worry (e.g., “Does my crush know that I exist?”; “Will my crush ever notice me?”), and eventually, sad feelings and despair. Consistent with developmental task theories, the young adolescent may not be prepared for such intense cognitions and emotions. Hurlock and Klein (1934) also found that many adolescents confided in their close friends about their crushes; this was especially true for girls. Thus, it is also plausible that having a crush is related to depressive symptoms vis-à-vis *co*-rumination (Rose, 2002). Of course, the associations between having a crush and depressive symptoms in this study were not longitudinal, highlighting the need for additional research that carefully tests the direction of effects. Indeed, the present study was guided by past theory and research suggesting that crush experiences have an impact on the psychological well-being of adolescents, but it is certainly possible that adolescents with depressive (and ruminative) tendencies are more likely to develop crushes than their peers, similar to how psychologically distressed adults are more likely to develop social surrogacy

relationships (one-sided relationships with celebrities or fictional characters; Derrick, Gabriel, & Hugenberg, 2009).

Also particularly novel, the current research demonstrated that the degree to which crush status is associated with depressive symptoms during early adolescence depends on anxious-withdrawal. More specifically, high crush status emerged as a *risk* factor for depressive symptoms at low levels of anxious-withdrawal but as a *protective* factor at high levels of anxious-withdrawal. Thus, in accord with child by environment models of risk and adaptation, it appears that varying levels of anxious-withdrawal alter the ways in which adolescents experience and are impacted by being viewed by many peers as an other-sex crush. At first blush the findings might seem inconsistent with recent evidence that anxious-withdrawn youth report greater psychological distress when their peers are nice to them (or direct prosocial and kind behavior towards them; Bowker, 2014). However, the attention associated with being an other-sex crush is likely less direct, with less direct social interaction or exchange (Hurlock & Klein, 1934). Hence, although anxious-withdrawn youth tend to be uncomfortable with most peer experiences and may feel some heightened self-consciousness with being a crush, they may also feel at ease with and be especially likely to benefit from *quasi*-peer experiences that are one-sided and involve little social interaction, such as crushes, perhaps because such experiences are not viewed as socially taxing and help to alleviate some social insecurities.

But then the current findings raise the following question: Why does crush status appear to be a risk factor for depressive symptoms for non-withdrawn youth? One possibility is that non-withdrawn young adolescents are uncomfortable with the lack of direct contact and interaction that presumably is part of being crushed on by many (Hurlock & Klein, 1934). Unlike anxious-withdrawn youth, they may be inexperienced with (and not prepared for) such types of peer experiences. Indeed, most other types of group-level peer experiences that involve positive affection or attention, such as popularity or peer acceptance, involve *direct* social interaction and exchanges (e.g., adolescents may direct friend bids toward or directly try to impress popular youth; Eder, 1985). It may also be that non-withdrawn youth are “crushed on” by many peers whom they do not like, including those who are withdrawn, which in turn, fosters feelings of sadness and despair. They might also feel uncomfortable with unreciprocated affection and worry about hurting others. Given anxious-withdrawn youths’ peer difficulties, however, being crushed on by *any* peers might be viewed differently and likely even positively. Of course, these ideas are based on the assumption that despite limited direct social interaction, young adolescents are aware of their high crush status (perhaps through gossip and rumors). Hurlock and Klein (1934) provided some empirical support for this assumption, but additional research is clearly needed. Indeed, one major limitation of our study was that “crush awareness” was not assessed. Thus, it appears critical for future investigators to first establish that young adolescents are in fact aware when they are crushed on by peers, and to second query young adolescents about associated feelings and cognitions. It may be that crush awareness functions as a moderator such that those adolescents who are highly aware of their crush status are the most impacted by it. In light of research revealing bidirectional associations between anxious-withdrawal and peer difficulties (Oh et al., 2008), it might also be useful in future research to determine whether

crush experiences, with their assumed limited requirements for social interaction, actually contribute to or strengthen anxious-withdrawn youth's solitary tendencies.

Although the current findings do not decisively support one theoretical framework and longer longitudinal examinations are needed that span the different sub-periods of adolescence, we contend that the findings in this investigation are most consistent with *developmental task theories of adjustment* (e.g., Roisman et al., 2009; Furman & Collibee, 2015). Indeed, there do appear to be some psychological adjustment difficulties associated with other-sex crush experiences, despite such experiences becoming increasingly common. Taken together, the findings advance theory and knowledge in an emerging literature by uncovering some psychological "costs" associated with both types of other-sex crush experiences during early adolescence. However, our hypothesized underlying processes used to explain the findings will need to be evaluated in future research along with the impact of other individual adolescent characteristics including puberty timing and aggression, both of which have been associated with adolescent romantic relationships (e.g., Connolly et al., 2004; Houser, Mayeux, & Cross, 2015). The consideration of such variables in future research is critical as one limitation of our study is that our focal variables explained relatively little variance in loneliness and depressive symptoms. Bowker et al. (2012) revealed very little overlap between crush and romantic relationship nominations, but our data did not provide information on and very little is known about whether many crushes are eventually actualized (or become romantic relationships) or how or why they develop in the first place (e.g., what factors are most important and how much interaction is necessary?). A longer longitudinal study (e.g., longer than the 3 month time span in this study) would be helpful to examine the evolution of crushes over time; it would also help to evaluate whether the psychological impacts of other-sex crush experiences found herein are short-term or long-lasting. Moreover, our study does not address and virtually nothing is known about *same-sex* crushes, which may begin to increase in frequency during middle adolescence, and perhaps also in influence. Finally, it is worth noting that we found no effects of gender, which is consistent with the Bowker et al. (2012) study. Thus, it may be that other-sex crush experiences impact young adolescent girls and boys similarly. However, we believe that it remains possible that gender differences exist in ways that were not able to be detected in this study. As one possibility, girls' greater interpersonal sensitivity and emphasis on close relationships could cause their other-sex crush experiences to have a greater impact on the quality of and conflict in friendships (e.g., perhaps due to jealousy; Parker, Low, Walker, & Gamm, 2005). It is also plausible that being liked by many girls fosters competition within boys' friendships and peer group (Rose & Rudolph, 2006).

## Conclusion

This study on crushes and its findings represent an important step to recognizing and studying romantic experiences during early adolescence that appear to predate the development of romantic relationships. Our results confirmed that other-sex crush experiences are developmentally significant, above and beyond the effects of mutual friendship involvement, although the findings also suggested that ways in which such experiences impact psychological adjustment depend on the type of other-sex crush experience (having versus being an other-sex crush) as well as variability in anxious-

withdrawal. This study helps to better situate the newly studied construct of adolescent crushes within the emerging romantic experiences literature, and will perhaps lead to additional research that reveals a more nuanced understanding of different types and features of adolescent romantic experiences and when, in terms of development, they have the greatest significance and impact (Compian, Gowen, & Hayward, 2004; Furman & Rose, 2015; van Dulmen, Goncy, Haydon, & Collins, 2008). Of course, it is important to remember that just because other-sex crushes, or engagement with other emerging tasks, may be associated with periods of maladjustment, these periods of maladjustment do not necessarily lead to irreparable negative outcomes across the lifespan (Furman & Collibee, 2014). Thus, future research should consider other-sex crush experiences not only during early adolescence, but also during older adolescent and young adulthood developmental periods.

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### Conflicts of Interest

This study was supported by a NICHD grant (1R03 HD056524-01) awarded to Julie Bowker. NICHD had no involvement in the study design, data collection, analyses, or interpretation of results. NICHD also had no involvement in the writing or submission of this manuscript.

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## Biographies

Dr. Julie Bowker received her BS in Human Development from Cornell University and her PhD in Human Development from the University of Maryland, College Park. She is currently an Associate Professor of Psychology at the University at Buffalo, SUNY. Her research program focuses on the roles that peer relationships, particularly friendships, play in social and emotional development during late childhood and early adolescence.

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Table 1

Means, Standard Deviations, and Correlations among Study Variables

Variables	1	2	3	4	5	6	7	8	9
1. Crush Presence		.02	-.02	.14*	-.09	-.01	.11	.05	.07
2. Crush Status			-.08	-.05	-.11	-.04	-.03	.05	.20**
3. Anxious-withdrawal				.18**	.24**	.34***	.22**	.15	-.06
4. Gender					-.14	-.07	-.02	-.06	.28***
5. Loneliness T1						.76***	.55***	.35***	-.35***
6. Loneliness T2							.45***	.58***	-.25**
7. Depressive symptoms T1								.64***	-.23**
8. Depressive symptoms T2									-.23**
9. Mutual Friend									
<i>M</i>	0.31	0.00	0.00	--	1.64	1.59	0.30	0.30	--
<i>SD</i>	0.46	1.00	0.81	--	0.65	0.64	0.31	0.33	--

Note. Gender is coded 0= boys, 1=girls, Crush presence is coded as 0=no crush nominated, 1= crush nominated.

\*  $p < .05$ ,

\*\*  $p < .01$ ,

\*\*\*  $p < .001$

**Table 2**  
 Summary of Hierarchical Regression Analyses of Crush Presence Predicting Loneliness and Depressive Symptoms with Anxious-Withdrawal and Gender as Moderators.

Step, predictors	T1 Loneliness			T2 Loneliness			T1 Depressive Symptoms			T2 Depressive Symptoms		
	B	R <sup>2</sup>	F, ΔF	B	R <sup>2</sup>	F, ΔF	B	R <sup>2</sup>	F, ΔF	B	R <sup>2</sup>	F, ΔF
1. Mutual Friend	-0.50***	.13	(2,166)= 12.39, p<.001	-0.08	.58	(3,134)= 62.41, p<.001	-0.16***	.08	(2,159)= 6.48, p<.01	-0.02	.42	(3,128)= 30.74, p<.001
Crush Presence	-0.05			0.19***			0.09*			0.05		
T1 Lonely/Dep	-			0.69***			-			0.58***		
2. Anx-Withdrawal	0.21***	.19	(2,164)= 5.91, p<.01	0.12**	.61	(2,132)= 4.46, p<.05	0.07*	.11	(2,157)= 3.05, p<.05	0.06	.44	(2,126)= 2.77, p=.07
Gender	-0.09			-0.06			0.01			-0.02		
3. Crush-x-Anx	-0.07	.20	(3,161)= 0.96, p=.42	-0.05	.61	(3,129)= 0.55, p=.65	0.02	.12	(3,154)= 0.30, p=.83	0.10	.48	(3,123)= 3.06, p<.05
Anx-x-Gender	0.17			-0.01			0.08			0.19*		
Crush-x-Gender	0.14			-0.16			0.03			0.12		
4. Crush-x-Anx-x-Gender	-0.45	.21	(1,160)= 1.14, p=.29	-0.22	.62	(2,128)= 0.66, p=.42	-0.10	.12	(1,153)= 0.19, p=.66	-0.02	.48	(1,122)= 0.02, p=.89

Note: Dep = T1 Depressive symptoms; Lonely = T1 Loneliness; Anx = T1 Anxious-withdrawal; Crush = Crush presence, coded as 0= no crush nominated, 1= at least one crush nominated

\* p<.05,

\*\* p<.01,

\*\*\* p<.001

**Table 3**  
 Summary of Hierarchical Regression Analyses of Crush Status Predicting Loneliness and Depressive Symptoms with Anxious-Withdrawal and Gender as Moderators.

Step, predictors	T1 Loneliness			T2 Loneliness			T1 Depressive Symptoms			T2 Depressive Symptoms		
	B	R <sup>2</sup>	F, ΔF	B	R <sup>2</sup>	F, ΔF	B	R <sup>2</sup>	F, ΔF	B	R <sup>2</sup>	F, ΔF
1. Mutual Friend	-0.48***	.13	(2, 167)= 11.95, p<.001	-0.10	.54	(3, 135)= 51.80, p<.001	-0.16**	.05	(2, 160)= 4.60, p<.01	-0.04	.42	(3, 129)= 30.89, p<.001
Crush Status	-0.03			-0.02			0.01			0.03		
T1 Lonely/Dep	-			0.66***			-			0.59***		
2. Anx-Withdrawal	0.21***	.19	(2, 165)= 6.24, p<.01	0.11*	.56	(2, 133)= 3.14, p<.05	0.07*	.09	(2, 158)= 3.05, p<.05	0.05*	.44	(2, 127)= 2.34, p=.10
Gender	-0.11			-0.01			0.02			-0.00		
3. Crush-x-Anx	0.16	.21	(3, 162)= 1.36, p=.26	-0.15	.56	(3, 130)= 0.55, p=.65	-0.20*	.14	(3, 155)= 2.75, p<.05	0.10	.48	(3, 124)= 2.83, p<.05
Anx-x-Gender	0.23			-0.08			0.01			-0.16*		
Crush-x-Gender	-0.06			-0.06			0.04			-0.04		
4. Crush-x-Anx-x-Gender	-0.66	.22	(1, 161)= 2.62, p=.11	-0.27	.56	(1, 129)= 0.84, p=.36	-0.21	.14	(1, 154)= 1.23, p=.27	0.11	.48	(1, 123)= 0.52, p=.47

Note: Dep = T1 Depressive symptoms; Lonely = T1 Loneliness; Anx = T1 Anxious-withdrawal; Crush = Crush Status

\* p<.05,

\*\* p<.01,

\*\*\* p<.001