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Past research indicates that children's social preference is an important predictor of childhood depressive symptoms. Children's negative self-perceptions have also been identified as a significant predictor of childhood depressive symptoms. However, few studies have examined bias in children's self-perceived social preference (i.e. their self-perceptions of peer status) by comparing these self-perceptions to peer-reported social preference. This comparison yields both the degree to which a child is accurate in their self-perception, as well as, the direction of these inaccuracies, known as perceptual bias. The current study compared self-report and peer-report of social preference to examine both positively and negatively biased self-perceptions in middle childhood. The goal was to examine the mediating role of bias in the relation between social preference and depressive symptoms in middle childhood. A series of regression analyses confirmed significant relations between social preference and negatively biased self-perceptions as predictors of children's depressive symptoms. As predicted, negatively biased self-perceptions also predicted depressive symptoms. Negatively biased self-perceptions mediated the relation between social preference and depressive symptoms in 5th grade for children who underestimated their social preference. Implications for future research examining the role of social preference and bias in the development childhood depressive symptoms are discussed.

THE ROLE OF BIAS IN EXPLAINING THE RELATION  
BETWEEN SOCIAL PREFERENCE AND  
DEPRESSIVE SYMPTOMS IN  
MIDDLE CHILDHOOD

by

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## CHAPTER I

### INTRODUCTION

Establishing positive peer relationships is one of the primary developmental tasks of middle childhood (Cicchetti & Toth, 1998). Positive peer interactions play a crucial role in children's acquisition of social skills and their ability to recognize social norms (Gooren, van Lier, Stegge, Terwogt, & Koot, 2011). Middle childhood is also a critical period in the development of children's self-perceptions (Cole et al., 2001). Due to the significance of social and cognitive factors in the functioning of children in this age group, these factors are often important in predicting adaptive and maladaptive outcomes in middle childhood. An important outcome that has been closely linked to peer relationships and self-perceptions is the development of childhood depressive symptoms. While numerous studies have examined either social or cognitive predictors of childhood depressive symptoms, few studies have explored both factors simultaneously. Given the significance of peer relationships and self-perceptions to children's functioning in middle childhood, it is important to examine these risk factors together in an effort to better understand their role in the development of childhood depressive symptoms.

## **Childhood Depressive Symptoms**

While the occurrence of depression is uncommon in school-aged children, there is some evidence that suggests that depressed adolescents start experiencing symptoms in middle childhood (Hammen & Rudolph, 2003). Prior to this stage in development, depressed children typically do not exhibit social or cognitive symptoms of depression (Hammen & Rudolph, 2003). In fact, eight-year olds report more symptoms relative to withdrawal from family and peers, as well as negative perceptions about their current situation than were reported by younger children (Kashani, Rosenberg, & Reid, 1989). This change in symptom presentation corresponds with the growing importance of the peer group in middle childhood (Cicchetti & Toth, 1998).

These changes in depressive symptoms are captured by Cole's competency-based theory of depression (1990) which suggests that negative feedback from others can result in the formation of negatively biased self-perceptions. This theory posits that negatively biased self-perceptions put children at a greater risk for developing depressive symptoms. This theory also suggests that children, who are exposed to negative feedback from their parents, teachers, and peers, will generalize this feedback across different competency domains. For instance, a child that is well liked by the peer group might begin to feel that fewer peers like her after receiving poor grades from her teachers. In this example, the child has generalized her perceived academic competence to her perceived social competence. Consistent with this theory, numerous studies have found that negative self-perceptions in children predict increased depressive symptoms at a later time point (Robinson, Garber, & Hilsman, 1995; AlGhamdi, Manassis, & Wilansky-Traynor, 2011).



## **Individual Differences in Depressive Symptoms**

Middle childhood is also an interesting timepoint for examining the individual differences in depressive symptoms experienced across groups. While the number of clinically depressed children is equally distributed across gender during middle childhood, girls report more symptoms of depression during this stage in development (Hammen & Rudolph, 2003, Cole, Martin, Peeke, Seroczynski, & Fier, 1999). For example, Cole and colleagues (2001) found greater symptoms of depression reported among 5th grade girls when compared to 5th grade boys. There are several explanations in the literature regarding the gender imbalance seen in children experiencing depressive symptoms, including both gender differences coping with interpersonal stress (Rudolph & Hammen, 2003), as well as the tendency for girls to view themselves more negatively than boys (Cole et al., 2001).

While gender has been more broadly studied with respect to depression, few studies have examined individual differences in depressive symptoms across race (Costello et al., 1996). This is partially due to the paucity of diverse samples included in studies investigating childhood depressive symptoms (Hammen & Rudolph, 2003). However, Hayward and colleagues found significant differences in depression rates across age between European American females and African American females. European American females experienced an increase in post-puberty depression rates that was not found among African American females (Hayward, Gotlib, Schraedley, & Litt, 1999). Differences in depressive symptoms across race have been attributed to cultural differences in the expression of depressive symptoms, as well as negative environmental

conditions that might be differentially associated with race (Hammen & Rudolph, 2003). Given the differences in depressive symptoms found across gender and race, these demographic variables will be examined as potential covariates for the primary study analyses.

### **Peer Relationships**

A great deal of the literature examining stressful peer relationships in middle childhood has focused on children who are rejected by their peers. Peer rejection, traditionally defined as being disliked by one's peers (Ladd, 1999), has been identified as an antecedent of depressive symptoms in middle childhood and adolescence (Kupersmidt & Patterson, 1991; Panak & Garber, 1992). More recent studies have explicitly defined the rejected child as the target of the collective peer group's negativity (Dodge, Lansford, Burks, Bates & Petit et al., 2003) and have conceptualized peer rejection as a significant interpersonal stressor linked to the onset of depressive symptoms in school-aged children (Ladd & Troop-Gordon, 2003; Deater-Deckard, 2001). A study of 2nd grade children found that rejected girls were twice as likely to report depressive symptoms in the fourth grade, when compared with non-rejected girls (Kupersmidt & Patterson, 1991). Additionally, Panak and Garber (1992) found that increases in peer rejection were associated with increases in depression in elementary-school aged children. As indicated by these findings, peer rejection is a major stressor for school-aged children that can lead to the development of childhood depressive symptoms.

Rejected children are typically conceptualized as children who have low social preference. Social preference, or the degree to which a child is liked by their peers, serves

as an indicator of children's social adjustment and engagement in positive social interactions. Therefore, children with low social preference are expected to experience greater difficulty with their peers and demonstrate less competency in interpreting relevant social information from peer interactions than children with high social preference (Crick & Dodge, 1994). This puts children with low social preference at greater risk for misinterpreting feedback from their peers. According to Cole's model, children with low social preference are likely to view themselves negatively as a result of their maladaptive peer interactions. Consistent with this theory, Kistner and colleagues (2006) found that self-reported peer rejection predicted depressive symptoms at a later time point, but the same association was not found between peer-reported rejection and depressive symptoms. As indicated by the findings discussed above, rejection from the peer group has been identified as an important predictor of depressive symptoms in middle childhood. However, Kistner et al.'s (2006) findings suggest that children's self-perceptions of their social environment might also play a major role in predicting childhood depressive symptoms.

### **Self-perceptions in Middle Childhood**

Middle childhood is marked by significant changes in children's interpretations of their personal abilities, which are known as self-perceptions (Eccles, Wigfield, & Blumenfeld, 1993). Prior to this stage, a child's concept of success is grounded in newly learned skills in areas where he or she previously experienced difficulty, like learning to read or ride a bike (Cole, Jacquez, & Maschman, 2001). Beginning in middle childhood, children start to differentiate between biased and unbiased standards of performance,

which generalizes to the interpretation of external feedback and how children assess their personal abilities (Nicholls & Miller, 1983). As stronger cognitive abilities emerge in this phase of development, children begin examining their own skills, while also considering the skills of others. This is the first point in development in which children utilize social comparisons as a method for self-assessment (Nicholls & Miller, 1983; Cole et al., 2001). As a result, this age group is better able to assess their own skills with greater accuracy, such that children's self-perceptions indicate less inflation (Eccles et al., 1993) and become more consistent with the appraisals of others (Cole et al., 2001). Although there is increased consistency between self-perceptions and peer appraisal in middle childhood, some children continue to struggle with accurately determining where they stand in comparison to their peers. Moreover, during middle childhood, children typically develop self-perceptions that are more consistent with outside appraisals, which are referred to as accurate self-perceptions (Campbell & Fehr, 1990). However, children with social difficulties typically demonstrate greater inaccuracy in their perceived social preference in comparison to socially adjusted children (Cillessen & Bellmore, 1999; Boivin & Begin, 1989; Brendgen, Vitaro, Turgeon, Poulin & Wanner, 2004). Perceptual inaccuracy of self-perceptions is defined as the deviation between a child's own perceptions and the perceptions of their peer group (Campbell & Fehr, 1990; Kistner et al., 2006).

### **Biased Self-perceptions**

In order to understand how self-perceptions might influence children's adjustment, it is essential to understand biases found in children's self-perceptions (Brendgen et al., 2004). Bias is defined as the direction of a child's perceptual

inaccuracies, such as overestimating or underestimating their own social preference (Campbell & Fehr, 1990). The direction of a child's inaccuracy is important to consider as a factor that influences his or her social interactions (Brendgen et al, 2004; Cillessen & Bellmore 1999). Taylor and Brown (1988, 1994) have argued that positively biased self-appraisals, known as overestimation, protect individuals from experiencing negative feelings (Brendgen et al, 2004). For example, children who overestimated their skills in several domains reported fewer depressive symptoms over time (Cole et al., 1999). Additionally, another study found that rejected boys positively biased self-perceptions predicted greater levels of social preference two years later (Sandstrom & Coie, 1999). Alternatively, Baumeister and colleagues (2000) argue that overestimation of abilities increases the likelihood that an individual will react negatively when others challenge these positive beliefs. Thus, children who overestimate their social preference will expect friendly behavior from the peer group; if this expectation is not met, the child may use this negative feedback to reassess their self-perceptions, or develop feelings of resentment towards the peer group (Brendgen et al., 2004; Baumeister et al., 2000). The former option may put the child at risk for experiencing depressive symptoms. The latter may increase the likelihood that the child will respond aggressively towards the peer group (Brendgen et al., 2004), which could result in a decrease in the child's social preference among peers. Consistent with this notion, previous research has found that children who overestimated their level of social preference were liked less by peers at a later time point (Hughes, Cavell, & Prasad-Gaur, 2001). As indicated by these findings,

researchers remain divided on whether overestimation is considered adaptive or maladaptive in middle childhood.

While findings are unclear regarding positively biased self-perceptions, the majority of the research suggests that children's negatively biased self-perceptions, also known as underestimation, are associated with childhood depressive symptoms (Rudolph & Clark, 2001; Ladd & Troop-Gordon, 2003; Cole et al., 2001). This fits with Cole's competency-based theory of depression (1990), which suggests that the formation of negatively biased self-perceptions in response to negative feedback from others can lead to the development of childhood depressive symptoms. Consistent with this theory, previous research has found that negative self-perceptions were associated with greater levels of depressive symptoms at a later time point (Robinson, Garber, & Hilsman, 1995; AlGhamdi, Manassis, & Wilansky-Traynor, 2011). Hoffman and colleagues (2000) found that children's perceptions of their competence, when compared with outside raters, predicted later depressive symptoms. Furthermore, these researchers found that middle school children who underestimated their competence were more likely to report increased symptoms of depression at a later time point. As suggested by these findings, children's biased self-perceptions function differently in predicting childhood depressive symptoms.

### **Goals and Hypotheses**

According to the studies reviewed above, social preference and self-perceptions are important predictors of childhood depressive symptoms. However, the current literature remains unclear on how these constructs contribute to the development of

childhood depressive symptoms. Therefore, the current study contributes the existing literature by examining bias as a mediating mechanism explaining the relation between social preference and children's depressive symptoms. Due to the distinct findings in predicting depressive symptoms from overestimation and underestimation, these groups were examined separately to test the mediating effect of bias in predicting depressive symptoms for each group. Additionally, the literature suggests differences exist in depressive symptoms across gender and race. Using a sample of 5th grade children from an ongoing longitudinal study, the following hypotheses were tested:

1. In order to contribute to the limited literature examining gender differences in childhood depressive symptoms, it was hypothesized that depressive symptoms may vary for males and females. Additionally, it was hypothesized that depressive symptoms would vary depending on the child's race.
2. Low social preference was expected to predict greater symptoms of depression.
3. Low social preference was also hypothesized to predict greater bias between children's self-reported social preference and their peer-rated social preference.
4. It was expected that greater bias in children's self-reported social preference and their peer-rated social preference would predict greater levels of depressive symptoms.

5. Bias was hypothesized to partially mediate the relation between social preference and depressive symptoms.
6. It was expected that the pattern of results would differ based on whether children overestimated or underestimated their social preference.



## CHAPTER II

### METHOD

#### **Recruitment and Attrition**

The current study utilized data from three cohorts of children who are part of an ongoing longitudinal study of social and emotional development. The goal for recruitment was to obtain a sample of children who were at risk for developing future externalizing behavior problems, and who were representative of the surrounding community in terms of race and socioeconomic status (SES). All cohorts were recruited through child day care centers, the County Health Department, and the local Women, Infants, and Children (WIC) program. Potential participants for cohorts 1 and 2 were recruited at 2-years of age (cohort 1: 1994-1996 and cohort 2: 2000-2001) and screened using the Child Behavior Checklist (CBCL 2-3; Achenbach, 1992), completed by the mother, in order to over-sample for externalizing behavior problems. Children were identified as being at risk for future externalizing behaviors if they received an externalizing T-score of 60 or above. Efforts were made to obtain approximately equal numbers of males and females. This recruitment effort resulted in a total of 307 children. Cohort 3 was initially recruited when infants were 6 months of age (in 1998) for their level of frustration, based on laboratory observation and parent report, and were followed through the toddler period (see Calkins, Dedmon, Gill, Lomax, & Johnson, 2002, for more information). Children from Cohort 3 whose mothers completed the CBCL at two

years of age were then included in the larger study (N = 140). Of the entire sample (N = 447), 37% of children were identified as being at risk for future externalizing problems. There were no significant demographic differences between cohorts with regard to gender,  $\chi^2(2, N = 447) = .63, p = .73$ , race,  $\chi^2(2, N = 447) = 1.13, p = .57$ , or two-year SES,  $F(2, 444) = .53, p = .59$ .

Of the 447 originally selected participants, six were dropped because they did not participate in any data collection at 2 years old. Families lost to attrition included those who could not be located, moved out of the area, declined participation, or did not respond to phone and letter requests to participate. At age 10, when the participants were in 5th grade, 357 families participated. No significant differences were noted between families who did and did not participate in the 10-year assessment in terms of child gender,  $\chi^2(1, N = 447) = 3.31, p = .07$ ; race,  $\chi^2(3, N = 447) = 3.12, p = .08$ ; 2-year SES,  $t(432) = .02, p = .98$ ; or 2-year externalizing T score,  $t(445) = -.11, p = .91$ .

### **Participants**

The sample for the current study included 208 children (122 females, 86 males) who participated in the 5th grade timepoints. 64.9% of the sample was European American, 30.3% African American, 3.4% biracial and 1.4% other. Families were economically diverse based on Hollingshead (1975) scores at the 10-year assessment, with a range from 12 to 66 (M = 44.52, SD = 11.65) thus representing families from each level of social strata typically captured by this scale. Hollingshead scores that range from 40 to 54 reflect minor professional and technical occupations considered to be representative of middle class. Children were included in the current study if they had

completed sociometric interviews in 5th grade in addition to the 10-year lab visit, which occurred within the same year.

## **Procedures**

*Sociometric Interviews.* Consent for sociometric interviews was obtained from the local superintendent, the principal, the teachers, and the parents of children in the class. Only children whose parents provided consent were included in the sociometric assessment. Sociometric interviews were conducted at least 8 weeks into the academic year by trained graduate students using standard sociometric practices (see Coie, Dodge, & Coppotelli, 1982). Children were interviewed in a group and were presented with a roster of peers in their grade who were participating. Questions were read aloud and each child indicated which peers fit descriptors by filling in a circle next to the classmates' names. For each description, children were permitted to nominate as many peers as they wanted and were also permitted to nominate across gender. Unlimited nominations allow for more reliable results and a reduction in measurement error (Terry, 2000). Cross-gender nominations increase the stability of the measurement for the nominations to determine social preference. Because peer nomination data uses information from multiple reporters, the reliability of single-item peer nomination scales tends to be quite high (Coie, Dodge, & Kupersmidt, 1990).

*10-year assessment.* Participants also attended a 10-year laboratory assessment with their mothers for during which children completed a battery of behavioral assessments examining social, emotional, and cognitive functioning as well as parent-

child interactions. For the current study, questionnaires examining childhood depressive symptoms were utilized from the 10-year assessment.

## **Measures**

*Social Preference.* Social preference in 5th grade was used as the predictor variable in the current study. Social preference was measured using children's responses to the items "Who do you like to play with the most?" and "Who do you like to play with the least?" The total number of nominations for "like most" and "like least" were standardized to obtain separate z-scores and subsequently subtracted to calculate social preference ( $z$  "like most" –  $z$  "like least" = social preference; Coie et al., 1982). Lower scores indicated less likeability in the classroom, whereas higher scores represented greater likeability. This is a widely used technique for assessing a child's overall likeability within the classroom (Jiang & Cillessen, 2005).

*Depressive Symptoms.* The current study utilized the depression subscale from the Behavior Assessment System for School Children-2nd edition: Self-report of personality (BASC-2-SRP; Reynolds & Kamphaus, 2004). Responses for the BASC-2 were completed during the 10-year assessment. Participants were asked to rate the frequency of depressive behaviors described using both True and False items in addition to Likert-type rating from 0 (never) to 3 (almost always). The depression subscale on the BASC-2 assesses depressive symptoms such as crying easily, loneliness, or feeling sad and pessimistic. The general T-scores of the depression scale were utilized for the current study, with higher values indicating greater reported depressive symptoms. 9.4% of the current sample had T-scores of 65 or higher on the Depression subscale, which represent

at-risk levels of depression. Additionally, 6.4% of the current sample had T-scores greater than 70 which represents clinical levels of depressive symptoms. The BASC-2 is widely used across research domains and exhibits well established internal consistency, reliability, and validity (Reynolds & Kamphaus, 2004). Alpha levels for the BASC-2 depression subscale at age 10 in the current sample was .854.

*Biased Self-perceptions.* Both self-report of social preference and peer-report of social-preference were used to create a measure of bias. To measure self-perceived social preference, participants' responses to the items "Who likes to spend time with you?" and "Who doesn't like to spend time with you?" were examined. The total number of nominations for "likes you most" and "likes you least" were divided by the number of participating children in each grade to create proportion scores. The scores were subtracted to calculate a proportion score for self-reported social preference ( $p$  "likes you most" –  $p$  "likes you least" = self-reported social preference; Coie et al., 1982). This same procedure was used to calculate peer-reported social preference using the peer's responses to "Who do you like to spend time with the most?" and "Who do you like to spend time with the least?"

Children's overestimation and underestimation of their social preference among the peer group was measured using a procedure adopted in previous studies (Brendgen et al., 2004; Cole et al., 1998, 1999; Kistner et al., 2006; Hoffman et al., 2000; McGrath & Repetti, 2002). A standardized residual score was computed by regressing participants' self-perceived social preference on their peer-reported social preference. The remaining variance from this regression was used to measure participants biased self-perceptions.

Positive values indicated overestimation of social preference, whereas negative residual values indicated underestimation of social preference. Residual scores were chosen over a difference score to take into account the degree to which the assessment of self-reported social preference and peer-reported social preference are related (David & Kistner, 2000).

## CHAPTER III

### RESULTS

#### **Preliminary Analyses**

Descriptive statistics are provided in Table 1 for all study variables in the full sample and the two subgroups. Across the full sample, depressive symptoms were positively skewed (Skewness = 2.59). Social preference and bias were negatively skewed in the full sample (Skewness=-.59 and Skewness = -1.18, respectively). All skewness values fell within -3 and 3 and were determined to be normally distributed. Preliminary analyses assessed for the presence of significant differences based on gender across study variables. T-tests were conducted to examine these differences. Significant mean differences were found in the full sample for social preference, with females ( $M = .11$ ) having significantly higher social preference ratings compared to males ( $M = -.21$ ),  $t(1,206) = -2.25$ ,  $p < .05$ ). No significant mean differences in race were found for social preference, bias, or depressive symptoms in the full sample.

In order to examine how differences in bias would differentially impact children who underestimated or overestimated their social preference, the samples were split into subgroups based on their bias scores. An underestimation subgroup was created using participants that had negative scores for the bias variable. This subgroup represents children that reported having lower social preference than was reported by their peers. This group included 84 children (51 females, 33 males) that had bias scores falling below

zero. 58.3% of the underestimation subgroup was European American, 35.7% African American, 4.8% biracial and 1.2% other, which is representative of the full sample. For this subgroup, 9.6% of children reported T-scores (T-score > 65) on the BASC Depression subscale that fell in the at-risk range and 3.6% reported T-scores (T-score > 70) that fell in the clinically significant range. The percentage of T-scores that fell in the clinically significant range for the underestimation subgroup was lower than that of the full sample. Scores on the Hollingshead (1975) were similar to those found in the full sample, ranging from 17 to 66 (M= 43.35, SD = 11.06), thus representing an economically diverse subgroup. Additionally, T-tests were conducted to assess for the presence of significant differences based on gender and race in the underestimation subgroup. No significant mean in depressive symptoms or social preference were found across gender in the underestimation subgroup. However, significant mean differences in social preference were found across race in the underestimation subgroup,  $t(1, 77) = -2.39, p < .05$ . For this group, European American children had lower peer-rated social preference (M= -.01) than African-American children (M=.50).

An additional overestimation subgroup was created using participants that had positive scores for the bias variable. This subgroup represents children that reported having higher social preference than was reported by their peers. This group included 124 children (71 females, 53 males) that had bias scores greater than zero. 69.4% of the underestimation subgroup was European American, 26.6% African American, 2.4% biracial and 1.6% other, which is representative of the demographics found in the full sample. A lower percentage of children in the overestimation group fell in the at-risk



score range than was found in the underestimation subgroup. However, a similar percentage of children in the clinically elevated range for both the overestimation and underestimation subgroups. 4% of the participants in the overestimation subgroup fell in the at-risk range and 3.2% of the participants reported T-scores that fell in the clinically significant range (T-score > 70). Scores on the Hollingshead (1975) were similar to those found in the full sample and the underestimation subgroup, ranging from 12 to 66 (M= 43.45, SD = 12.03), thus representing an economically diverse subgroup. Additionally, T-tests were conducted to assess for the presence of significant mean differences across study variables based on gender and race in the overestimation subgroup. No significant mean differences in social preference or depressive symptoms were found across gender or race in the overestimation group. Finally, no significant mean differences in race or gender were found for the children's self-reported depression scores were detected in the full sample or the two subgroups. Therefore, race and gender were not utilized as covariates in the present sample.

### **Bivariate Analyses**

Correlational analyses were conducted between all study variables for the full sample and the overestimation and underestimation subgroups. Social preference was significantly and negatively correlated with depressive symptoms in both the full sample and both subgroups ranging from  $r = -.39$  to  $r = -.44$ . For the group that underestimated their social preference, social preference was significantly and positively associated with bias ( $r = .25$ ). Such that, low social preference was associated with lower bias scores, which represent greater underestimation. For this same group, bias was significantly and

negatively associated with depressive symptoms ( $r = -.32$ ). Such that children that had lower bias scores, which indicates greater underestimation, reported higher values on the Depression subscale. While a significant association was found between social preference and depressive symptoms in the overestimation subgroup ( $r = .44$ ), no significant associations were found between social preference and bias. Similarly, no significant differences were found between social preference and depressive symptoms. The correlation values for the full sample and overestimation and underestimation subgroup are listed in Table 2.

### **Primary Analyses**

The current study examined bias as a mediator between social preference and depressive symptoms for the full sample. First, social preference was examined as a predictor of depressive symptoms. Regression analyses yielded a significant main effect of depressive symptoms on social preference,  $t(1,206) = -6.06, p < .01$ . Next, social preference was tested as a predictor of bias. The results failed to establish the hypothesized effect of bias on social preference,  $t(1,206) = -.10, NS$ . Similarly, bias failed to predict depressive symptoms as initially hypothesized,  $t(1,206) = -1.95, NS$ . Because the analyses did not confirm H2 and H3, bias was not tested as a mediator between social preference and depressive symptoms for the full sample. The results of these analyses are listed in Table 3.

To determine whether directional bias was a mediator between social preference and depressive symptoms, participants were grouped by their score on the bias variable, with negative scores representing underestimation bias and positive scores representing

overestimation bias. The hypothesized effect of bias was tested using a single mediator model for the two groups. The first step was to determine if social preference predicted bias for each group. Regression analyses yielded a significant effect of bias on social preference for children who underestimated their social preference,  $t(81) = 2.35, p < .05$ . However, social preference failed to predict bias for participants who overestimated their social preference,  $t(139) = .06, NS$ . Because this relation was not significant, the group of children who overestimated their social preference was not considered further in the mediation analyses. After establishing social preference as a significant predictor of bias for the underestimation group, the next step was to determine if bias predicted depressive symptoms for this group. Regression analyses confirmed bias as a significant predictor of depressive symptoms,  $t(81) = -3.02, p < .01$ . The results of these analyses are listed in Table 3.

Finally, the indirect effect of bias on social preference and depressive symptoms was tested for significance using the bootstrapping method with bias-corrected confidence estimates (MacKinnon, Lockwood, & Williams, 2004). For these analyses, 95% confidence intervals of the indirect effects were obtained with 5000 bootstrap resamples (Preacher & Hayes, 2008). The results confirmed the indirect effect of bias in the relation between social preference and depressive symptoms (lower CI = -1.25, upper CI = -.02). Figure 1 and Table 3 display the results of these analyses.

## CHAPTER IV

### DISCUSSION

Middle childhood is a period marked by growing emphasis on children's peer relationships, in addition to a shift in how children perceive their skills and abilities. As a result, social and cognitive factors play an important role in the development of depressive symptoms in middle childhood. While past research has examined both social preference and biased self-perceptions as risk factors for depressive symptoms, relatively few studies have examined the contribution of these factors simultaneously in predicting childhood depressive symptoms in middle childhood. The current study sought to explain the relation between social preference and depressive symptoms through biased self-perceptions. This question was examined using both peer-reported and self-reported social preference to determine how these predicted depressive symptoms. It was predicted that bias would mediate the relation between social preference and depressive symptoms. Additionally, this relation was explored in the context of directional biases by grouping children who overestimated or underestimated their social preference. The overall results of the study confirmed that both social preference and bias are important predictors of childhood depressive symptoms for children who underestimated their status.

The first hypothesis posited that social preference would significantly predict depressive symptoms, such that children with low social preference would report greater

symptoms of depression. The results confirmed this hypothesis indicating that low social preference, as reported by the child's peers, predicted higher levels of depressive symptoms in middle childhood. These results confirm previous findings that suggest that peer difficulties are a significant interpersonal stressor that can lead to the development of depressive symptoms in school-aged children (Ladd & Troop-Gordon, 2003; Deater-Deckard, 2001). These findings fit in with numerous other studies that have identified peer rejection as a predictor of depressive symptoms in this age group (Kupersmidt & Patterson, 1991; Panak & Garber, 1992; Kiesner, 2002).

In the present study, children's self-perceptions of their social preference were compared with the perceptions of their peers. Bias was examined by looking at the degree to which peer rated social preference predicted children's self-reported social preference. It was hypothesized that children with low social preference, who are believed to be less adept at interpreting social information from peers (Crick & Dodge, 1994), would demonstrate greater bias. However, the results of the present study found no relation between social preference and biased self-perceptions for the full sample. These results are inconsistent with past studies that have suggested that children low in social preference are inaccurate in determining which of their peers like them (Cillessen & Bellmore, 1999). Additionally, it was hypothesized that children who demonstrated greater bias in their self-perceptions would also have greater symptoms of depression. This hypothesis was based on Cole's competency based theory of depression (1990), which suggests that negative self-perceptions put children at risk for experiencing depressive symptoms. The results in the full sample did not provide support for this

hypothesis, which is inconsistent with previous studies that have found a significant relation between children's biased self-perceptions and depressive symptoms (Kistner et al., 2006; Cole et al., 2001). However, the results from previous studies utilized different measures for assessing bias and inaccurate self-perceptions. The current study used standardized residuals, which lacks specificity when compared with the bias measures utilized in other studies. While the bias variable captured how children's self-perceptions deviated from their peer group, it did not adequately control for the direction of self-perceptions, which could explain why social preference did not predict bias in the full sample. Additionally, directional biases have been utilized in studies of both social preference and depressive symptoms. Due to lack of significant findings between bias and the remaining study variables in the full sample, separate groups were used to examine the predictive relation of social preference on directional biases, in addition to the predictive relation between directional biases and depressive symptoms.

In order to more closely examine the direction of bias and how it relates to children's depressive symptoms, the sample was split into two groups based on their bias scores. Children with negative bias scores were separated into a group of children who underestimated their social preference. This subgroup consisted of children who reported having lower social preference than was reported by their peer group. Additionally, the children with positive bias scores were placed in a subgroup that overestimated their social preference. This subgroup represented children who reported having higher social preference than was reported by their peer group. For the underestimation group, social preference significantly predicted bias scores, such that children with low social

preference reported greater levels of underestimation. For the overestimation group, social preference failed to significantly predict bias scores. These results are possibly due to an overall positivity bias within the overestimation group, which refers to the tendency for children to perceive themselves more positively (Bandura, 1997; Taylor & Brown, 1994). Research supporting the existence of a positivity bias in children suggests that positively biased self-perceptions are a developmental adaptation that applies to children in early and middle childhood, regardless of their social preference. It is possible that a relation between social preference and bias scores was not found in the overestimation subgroup, because both children with low and high social preference are likely to perceive themselves as more liked by their peer group than they actually are. While some studies have explored social preference as a predictor of the degree to which children's perceptions are aligned with their peer group, previous research has not examined social preference as a predictor of bias, or the direction of children's inaccurate perceptions. Therefore, further studies are needed to explore the nature of this relation between these two constructs.

The third hypothesis tested Cole's competency based theory of depression, which suggests that children with negative self-perceptions are more likely to experience depressive symptoms (Cole, 1990). The initial results in the full sample did not appear to support this hypothesis, as bias was not a significant predictor of depressive symptoms for the full sample. However, bias scores functioned differently in the overestimation and the underestimation groups. Consistent with Cole's theory, bias significantly predicted depressive symptoms for children who underestimated their social preference. These

results are consistent with several other studies that have examined the underestimation bias as a predictor of depressive symptoms in children (Rudolph & Clark, 2001; Ladd & Troop-Gordon, 2003; Cole et al., 2001).

When the same hypothesis was tested in the overestimation group, the results failed to support bias as a significant predictor of depressive symptoms. These results are inconsistent with previous research suggesting that overestimation is protective against childhood depressive symptoms (Cole et al., 1999; Brendgen et al., 2004). For example, a study examining self-evaluations in elementary school children found that positive self-evaluations predicted lower levels of self-reported depressive symptoms over time (Cole et al., 2001). It is possible that the current study did not yield similar results because both bias and depressive symptoms were measured at the same timepoint. Additionally, previous studies have generally found that overestimation predicts changes in depressive symptoms over time. The present study did not examine changes in depressive symptoms, which could explain why bias failed to predict depressive symptoms in the overestimation group.

The primary aim of the current study was to examine bias as a mediator between social preference and depressive symptoms. The criteria to test mediation were only met in the underestimation subgroup. The mediation analyses confirmed an indirect effect of underestimation in the relation between social preference and depressive symptoms. These results suggest that the amount of bias experienced for children that underestimate their social preference contributes to the relation between social preference and depressive symptoms. The overall results of the current study provide additional support



for Cole's competency based theory of depression. The results of the current study confirm that negatively biased self-perceptions partially explain the relationship between social preference and depressive symptoms in middle childhood.

The results of the current study provide support for one of the dominant theories in the development of childhood depressive symptoms. The current study contributes to the literature by examining both the contribution of social experiences and children's self-perceptions in predicting childhood depressive symptoms. Additionally, the current study provided support for Cole's competency based theory of depression in that the degree to which children underestimated their social preference was predictive of depressive symptoms. Furthermore, the indirect effect of bias on the relation between social preference and depressive symptoms for children who underestimated their social preference provided further support for Cole's theory. These results confirm that both social preference and bias are significant contributors to the experience of depressive symptoms in middle childhood. These results are consistent with the changes in depressive symptoms found in middle childhood, in which children report greater symptoms relative to social and cognitive factors when compared with earlier stages in development (Kashani, Rosenberg, & Reid, 1989).

### **Limitations and Future Directions**

The shortcomings of the current study offer future directions for research in the development of childhood depressive symptoms. As mentioned previously, the current study only utilized one timepoint for children's depressive symptoms. Therefore, the relation between children's reported bias and depressive symptoms can only be

interpreted concurrently as opposed to across time. Future studies should utilize reports of depressive symptoms from multiple timepoints in order to determine whether bias is associated with changes in depressive symptoms over time. Additionally, another limitation is that a small portion of the current sample displayed elevated levels of depressive symptoms. This is likely due to the initial recruitment techniques in which children were oversampled for externalizing behaviors at age 2. Furthermore, the current study utilized a community sample and therefore the findings are not considered generalizable to children diagnosed with depression in this age group. Future studies should utilize children with a wider range of depressive symptoms to examine the predictors of these symptoms in middle childhood more precisely. Another limitation of the current study is the broad usage of social preference as a risk factor for depressive symptoms. Past research indicates that one good friend is protective against the negative effects of peer rejection (Parker & Asher, 1993; Sanderson & Siegal, 1995; Vernberg, 1990). Therefore, it would be informative for future studies to examine the buffering effect of friendship quality on the present study's hypothesized model.

The measure of bias was also different than in some past studies. In past research, bias across multiple competency domains has been examined as a predictor of childhood depressive symptoms. (Hoffman et al., 1999, Cole et al., 2001, Cole et al., 1998). The present study was restricted to examining self-perceptions as they relate to social preference. Therefore, future studies should continue examining children's self-perceptions across multiple competency domains and examine the effect of peer appraisals on whether children overestimate or underestimate their skills in these

domains. Another limitation of the current study is the lack of specificity in the measurement of bias. The present study measured bias by using a standardized residual of peer-rated social preference on self-rated social preference. This method lacks some specificity because it does not take into consideration whether participants' nominations were reciprocated by other children. As a result, future studies should consider the number of reciprocated and unreciprocated nominations the child makes and receives in order to create a more accurate measure of bias. Despite these limitations, important conclusions regarding the importance of peer relationships and self-perceptions as predictors of childhood depressive symptoms are drawn.

Future studies should continue to explore the adaptive and maladaptive outcomes associated with overestimation of social preference. Children's overestimation of their competencies in middle childhood have been linked to adaptive outcomes such as decreased depressive symptoms (Cole et al., 1999) and increased social preference (Sandstrom & Coie, 1999). Additionally, the overestimation bias has been found to predict maladaptive outcomes in middle childhood, such as increased aggression (Brendgen et al., 2004). Therefore, future studies should continue exploring overestimation to determine whether this bias is adaptive or maladaptive for children. In particular, future research should explore how this bias relates to externalizing behaviors in middle childhood.

While the results of the present study are consistent with previous research that have examined the underestimation bias as a predictor of depressive symptoms in children (Rudolph & Clark, 2001; Ladd & Troop-Gordon, 2003; Cole et al., 2001), there

are several studies that have found evidence for the reverse relation between underestimation bias and depressive symptoms. For example, McGrath and Repetti (2002) found that children's depressive symptoms predicted both increased negative self-perceptions and underestimation of social and academic competence when compared with teacher-report in these domains. However, an association in the other direction, as suggested by the competency-based theory of depression, was not found in this study. These inconsistencies in findings are possibly indicative of a bidirectional relation between underestimation bias and depressive symptoms (Jacobs et al., 2008). Due to the mixed findings that exist in the literature on the relation between underestimation bias and the development of depressive symptoms, this is an area of research that requires further investigation.

### **Summary and Conclusions**

The results of the current study have important implications for understanding the origins of social and cognitive factors in childhood depressive symptoms. The current study focused on middle childhood, a time in development where the formulation of children's self-perceptions experience significant shifts and greater emphasis is placed on children's peer relationships. Due to these change, the present study aimed to examine children's social preference, as well as, self-perceptions and how these contribute to children's depressive symptoms in middle childhood. Overall, the present study demonstrated that children's social preference is a significant predictor of depressive symptoms. Specifically, low social preference is predictive of greater reported depressive symptoms. While a significant relation was not found between social preference and

overall bias in the full sample, social preference was a significant predictor of bias scores for children who underestimated their social preference. Additionally, bias scores were predictive of depressive symptoms for children who underestimated their social preference. The mediation analysis indicated that bias scores had an indirect effect on social preference and depressive symptoms for children that underestimated their social preference. The results of the present study suggest that both social and cognitive factors should be considered when exploring the development of depressive symptoms in middle childhood. These results indicate that future research should not only consider both of these factors, but should also explore these relations longitudinally in order to see how social preference and self-perceptions relate to depressive symptoms across time.

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APPENDIX A  
QUESTIONNAIRE ITEMS

BASC-2 Self Report of Personality (8-11): Depression Subscale

|   |  |
|---|--|
| Nothing ever goes right for me.                 | T/F                                    |
| I used to be happier.                           | T/F                                    |
| Nothing goes my way.                            | T/F                                    |
| I have too many problems.                       | T/F                                    |
| Nobody ever listens to me.                      | T/F                                    |
| Nothing is fun anymore.                         | T/F                                    |
| I don't seem to do anything right.              | T/F                                    |
| Nothing about me is right.                      | T/F                                    |
| I just don't care anymore.                      | T/F                                    |
| I feel depressed.                               | Never, Sometimes, Often, Almost Always |
| No one understands me.                          | Never, Sometimes, Often, Almost Always |
| I feel sad.                                     | Never, Sometimes, Often, Almost Always |
| I feel like my life is getting worse and worse. | Never, Sometimes, Often, Almost Always |

APPENDIX B  
TABLES AND FIGURES

*Table 1*

*Descriptive Statistics of Study Variables*

| <i>Measure</i>                                    | <i>Full Sample</i> |                               |             |             |                 |                 |                 |
|---|--------------------|-------------------------------|-------------|-------------|-----------------|-----------------|-----------------|
|   | <i>Mean</i>        | <i>Standard<br/>Deviation</i> | <i>Min.</i> | <i>Max.</i> | <i>Variance</i> | <i>Kurtosis</i> | <i>Skewness</i> |
| <i>BASC-2 SRP<br/>Depression</i>                  | 45.81              | 7.90                          | 40.00       | 85.00       | 62.44           | 7.41            | 2.59            |
| <i>5<sup>th</sup> Grace Social<br/>Preference</i> | -.02               | .99                           | -3.17       | 1.95        | .99             | .29             | -.59            |
| <i>Bias</i>                                       | -.04               | 1.04                          | -4.17       | 2.80        | 1.07            | 2.71            | -1.18           |
| <i>Underestimation Sample</i>                     |                    |                               |             |             |                 |                 |                 |
| <i>BASC-2 SRP<br/>Depression</i>                  | 46.04              | 8.36                          | 40.00       | 80.00       | 69.87           | 4.52            | 2.18            |
| <i>5<sup>th</sup> Grace Social<br/>Preference</i> | .12                | 1.01                          | -3.17       | 1.95        | 1.02            | 1.07            | -1.02           |
| <i>Bias</i>                                       | -.93               | .97                           | -4.17       | -.02        | .94             | 1.51            | -1.49           |
| <i>Overestimation Sample</i>                      |                    |                               |             |             |                 |                 |                 |
| <i>BASC-2 SRP<br/>Depression</i>                  | 45.67              | 7.61                          | 40.00       | 85.00       | 57.88           | 10.48           | 2.97            |
| <i>5<sup>th</sup> Grace Social<br/>Preference</i> | -.12               | .98                           | -2.76       | 1.81        | .96             | .11             | -.33            |
| <i>Bias</i>                                       | .57                | .50                           | .00         | 2.81        | .25             | 3.73            | 1.64            |

Table 2

*Correlation Coefficients for Independent and Dependent Variables*

| <i>Full Sample</i>            |        |      |
|-------------------------------|--------|------|
| Measure                       | 1      | 2    |
| 1. BASC Depression            |        |      |
| 2. Social Preference          | -.39** |      |
| 3. Bias                       | -.14   | -.01 |
| <i>Underestimation Sample</i> |        |      |
| 1. BASC Depression            |        |      |
| 2. Social Preference          | -.34** |      |
| 3. Bias                       | -.32** | .25* |
| <i>Overestimation Sample</i>  |        |      |
| 1. BASC Depression            |        |      |
| 2. Social Preference          | -.44** |      |
| 3. Bias                       | .03    | -.06 |

Table 3

Summary of Regression Analyses

|                                       | Full Sample |           |                 |                 | Underestimation Sample |           |                 |                 | Overestimation Sample |           |                 |                 |
|---------------------------------------|-------------|-----------|-----------------|-----------------|------------------------|-----------|-----------------|-----------------|-----------------------|-----------|-----------------|-----------------|
| <i>Direct Effects</i>                 | <i>B</i>    | <i>SE</i> | <i>Lower CI</i> | <i>Upper CI</i> | <i>B</i>               | <i>SE</i> | <i>Lower CI</i> | <i>Upper CI</i> | <i>B</i>              | <i>SE</i> | <i>Lower CI</i> | <i>Upper CI</i> |
| <i>Path A: SP → Bias</i>              | -.01        | .07       |                 |                 | .25*                   | .11       | ---             | ---             | -.06                  | .18       |                 |                 |
| <i>Path B: Bias → Depressive Sx's</i> | -.14        | .53       |                 |                 | -.32**                 | .91       | ---             | ---             | .03                   | 1.37      |                 |                 |
| <i>Path C: SP → Depressive Sx's</i>   | -.39**      | .51       |                 |                 | -.34**                 | .86       | ---             | ---             | -.44**                | .63       |                 |                 |
| <i>Indirect Effects</i>               |             |           |                 |                 |                        |           |                 |                 |                       |           |                 |                 |
| <i>Path C'</i>                        |             |           |                 |                 | -.28                   | .87       | -1.26           | -.02            |                       |           |                 |                 |

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

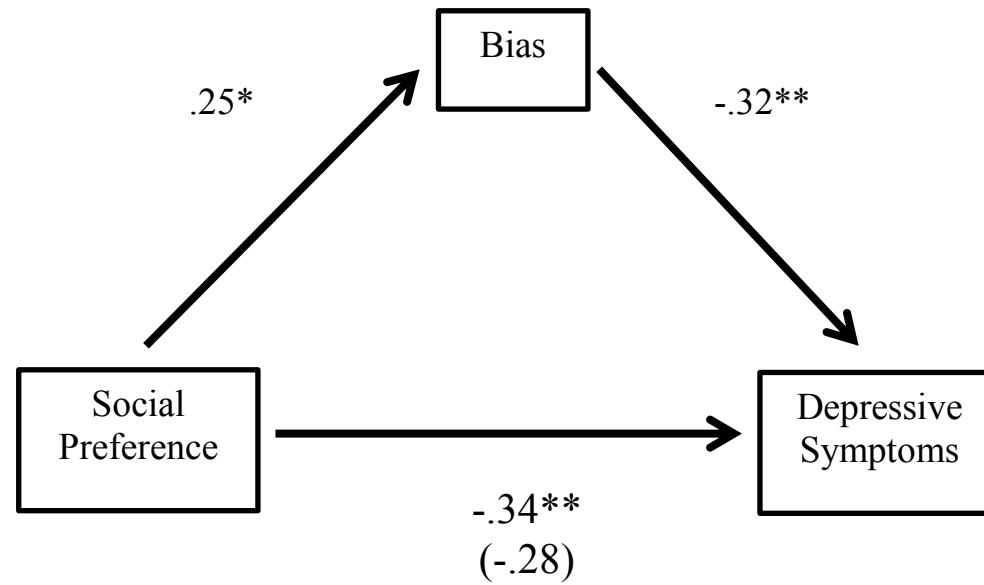


Figure 1. Indirect Effect of Social Preference Depressive Symptoms through Bias.  
Note: \* $p < .05$ , \*\*  $p < .01$ ,