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Misperceptions of Social Rejection: A Closer Examination of Inter-rater Discrepancies

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Misperceptions of Social Rejection:
A Closer Examination of Inter-rater Discrepancies

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts
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College of Arts & Sciences
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Abstract

Previous research suggests that discrepant ratings of symptoms, behaviors, and competencies may have important implications for childhood adjustment. Consequently, several theoretical explanations regarding the meanings and implications of inter-rater discrepancies have been proposed. The current study examined several largely unexplored issues regarding the statistical and conceptual properties of discrepant ratings; these include heterogeneity of agreement, shared method variance, and direction-specific effects. In a sample of 384 seventh and eighth-grade adolescents, it was found that each of the issues is integral in the interpretation of significant relationships between discrepant ratings of social rejection and childhood adjustment variables. More specifically, results demonstrated that the influence of shared method variance appears to be largely related to heterogeneity of agreement, and that accounting for shared method variance can increase, decrease, or even change the direction of the relationship between discrepancy scores and other variables. Also, results showed that the magnitude of discrepancies can be unrelated, equally related, or differentially related to the adjustment variables for the different forms of bias. Altogether, the findings of this study have implications for the theoretical conceptualization and statistical analysis of inter-rater discrepancy scores.

Introduction

Social rejection is a complex construct often defined differently across studies through the use of varying methodological strategies. In the broadest sense, rejection can be active (e.g., teasing, physically harming) or passive (e.g. ignoring, excluding) and can refer to a person's social status or instances in which a person's social status is diminished (Bierman, 2004; Leary, 2001, 2005). Additionally, social rejection can be assessed both globally and specifically. For instance, respondents are sometimes asked to rate the degree to which they, or others, are the recipient of specific aggressive behaviors (i.e. victimized); other times they may be asked to globally assess how rejected, disliked, or excluded they, or others, are by providing more general ratings of social acceptance. Further variability in the definition of social rejection partly stems from the issue of determining *who* decides if a person is, or has been, rejected. Some researchers define rejection as a person's self-perceptions of their own social standing and interactions with peers (see Leary, 2005) while others define rejection from external perspectives (i.e., peers, parents, teachers, etc.; see Bierman, 2004; McDougall, Hymel, Vaillancourt, & Mercer, 2001).

Across numerous studies, self- and others' reports of social rejection and acceptance have independently demonstrated associative and predictive value for important developmental adjustment constructs including aggression, delinquency, social withdrawal, low self-esteem, and depression (Coie, Dodge, & Kupersmidt, 1990; Cole, 1990; Cole & Carpentieri, 1990; Dodge, Bates, & Pettit, 1990; Harter, 1983; Hymel,

Franke, & Freigang, 1985; Ialongo, Vaden-Kiernan, & Kellam, 1998; Kupersmidt & Coie, 1990; Newcomb, Bukowski, & Pattee, 1993). However, since no rater provides a “gold standard” report of social performance (De Los Reyes & Kazdin, 2004; De Los Reyes & Prinstein, 2004; Richters, 1992), more recent investigations have proposed and tested methods for maximizing the utility of collecting and integrating data from multiple raters’ perspectives. When examining reports from multiple informants, it is quite common that the informants will not agree on a child’s level of functioning (Achenbach, McConaughy, & Howell, 1987; Youngstrom, Loeber, & Stouthamer-Loeber, 2000), and it is especially common that children will not agree with others when assessing their own social performance (Boivin & Begin, 1989; Brendgen, Little, & Krappmann, 2000; Graham & Juvonen, 1998; Juvonen, Nishina, & Graham, 2001; Krantz & Burton, 1986; Ladd & Kochenderfer-Ladd, 2002; Österman et al., 1994; Panak & Garber, 1992; Patterson, Kupersmidt, & Griesler, 1990; Perry, Kusel, & Perry, 1988; Rubin, Hymel, Lemare, & Rowden, 1989). Given the impact of social relations on childhood and adolescent adjustment (Cillessen & Bellmore, 1999; Hymel et al., 1985; Parker & Asher, 1987), and the potential benefits of incorporating reports from multiple informants into child assessment (Angold & Costello, 1996; Piacentini, Cohen, & Cohen, 1992; Silverman & Eisen, 1992; De Los Reyes & Kazdin, 2005), discrepant and concordant ratings of rejection have received more recent attention in numerous studies.

Of the possible methods for integrating multi-informant data, inter-rater discrepancy scores have gained in popularity and have been used to generate support for theories regarding the meaning and implications of inaccurate, or biased, self-perceptions. Although several procedures exist for computing discrepancy scores, and

have been debated (see De Los Reyes & Kazdin, 2004; Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007), investigations of biased *self-perceptions* in childhood compare children's self-reported levels of performance, symptoms, behaviors, or competence to external indices of the same construct. In the context of child assessments, external indices can include parents, teachers, peers, treatment providers, and objective assessments (e.g. experimental performance tasks or standardized testing). Discrepancy scores are typically computed in one of three ways: 1) by subtracting the raw externally-reported score from the raw self-reported score (e.g., Hoza, Pelham, Dobbs, Owens, & Pillow, 2002), 2) by subtracting the standardized external report from the standardized self-report (e.g., Owens & Hoza, 2003), or 3) by using the residual scores created from regressing the self-report onto the external report (e.g., McGrath & Repetti, 2002). Each method of computing discrepancy scores yields somewhat different interpretations (for a discussion, see De Los Reyes & Kazdin, 2004); however, each method ultimately produces scores that exist on a similar continuum. On this continuum, positive values represent *overestimations* (also referred to as positive biases), negative values represent *underestimations* (also referred to as negative biases), and scores approaching zero indicate accurate self-perceptions (or inter-rater agreement). Regardless of computational method, the findings generated from the use of social performance (i.e. levels of social acceptance or rejection) discrepancy scores consistently suggest that the scores are associated with both internalizing symptoms and externalizing behaviors.

Several researchers have noted important limitations and complications to be considered when examining discrepancy scores (Cronbach, 1958; Zuckerman & Knee, 1996). In the following, their perspectives will be presented as well as additional

conceptual and statistical issues to be considered when assessing inter-rater discrepancies. Although the current study focuses specifically on social *rejection*, previous research on discrepancy scores has primarily used multiple informants' reports of social *acceptance*. It is important to note that the terms acceptance and rejection may be conceptually distinct constructs that can coexist in varying degrees; however, they have often been used interchangeably in previous research and ultimately reflect some level of inclusionary/exclusionary status (for a discussion, see Leary, 2005). Moreover, findings regarding rejection and acceptance are largely similar, and contribute to similar theories regarding social standing and social interaction. As such, findings generated from discrepant ratings of both social acceptance *and* rejection will be presented to support the aims and hypotheses of the current study with the notion that both constructs share similar conceptual underpinnings and are related to adjustment variables in similar ways.

Theoretical Perspectives on Discrepant Ratings

There is some debate as to whether or not accurate self-appraisals are good or bad for mental health. Some researchers have argued that overly positive self-evaluations may hinder the development of social skills and cause adjustment difficulties (Colvin, Block, & Funder, 1995). On the other hand, overestimations have also been suggested to be indicative of positive mental health as they may increase motivation to attempt challenging tasks and protect against experiences of negative emotion (Bandura, 1997; Diener & Milich, 1997; Taylor & Brown, 1988, 1994). Similarly, it has been proposed that positive self-perceptions in the social domain may encourage children to continue

interacting with peers, which could aid in maintaining current relationships and lead to the development of new ones (Brendgen, Vitaro, Turgeon, Poulin, & Wanner, 2004).

According to the self-verification theory (Swann, 1987; Swann & Hill, 1982), people may resist change to their self-perceptions by acknowledging feedback that coincides with their self-perception while disregarding contradictory feedback.

Additionally, when globally assessing one's own performance or competence, people may be more likely to recall previous events that conform to their self-view (Pasupathi, 2001; Ross, McFarland, & Fletcher, 1981; Santioso, Kunda, & Fong, 1990). In support of the self-verification theory, studies have shown that depressed individuals often give little attention to positive feedback (Phillips, 1984; Phillips & Zimmerman, 1990; Wagner & Phillips, 1992) and that they may even distort neutral or positive information such that it is perceived as negative (Hayley, Fine, Marriage, Moretti, & Freeman, 1985; Leitenberg, Yost, & Carroll-Wilson, 1986). While these actions may reinforce negative self-perceptions, they could also lead to an "illusion of incompetence" such that depressed individuals believe they are less competent than others report (Langer, 1979).

In a similar light, Baumeister and colleagues have suggested that when individuals receive negative social feedback, they can respond in two different ways: 1) they can reject the feedback and attempt to maintain their self-view by taking a defensive stance, or 2) they can accept the feedback and incorporate it into their self-perception (Baumeister, Smart, & Boden, 1996). The former reaction is more likely to result in hostile behavior (i.e. aggression) while the latter is more likely to produce internalizing symptoms (e.g. depression) and lead to social withdrawal (Baumeister et al., 1996). Children with positively biased self-perceptions who do not acknowledge negative social

feedback may consequently fail to improve their social behaviors, and as a result, become more rejected by their peers in the future (Baumeister et al., 1996). Given that lower levels of social acceptance have been found to lead to increases in depressive symptoms (Panak & Garber, 1992), positive biases could serve as a risk factor for internalizing symptoms in the long-term. Additionally, several researchers have theorized that positive biases may only be protective of the development of future psychopathology if small to moderate in size but serve as a risk factor if more extreme (Baumeister, 1989; Taylor & Armor, 1996). Evidence to support an optimal range of positive bias is insufficient and inconclusive as one study found that both moderate *and* extreme biases were concurrently associated with aggression (David & Kistner, 2000) while another study found that only extreme biases predicted short-term increases in aggression (Brendgen et al., 2004).

Other researchers have proposed that discrepant ratings may result from certain perceptual or cognitive deficits. The “ignorance of incompetence” hypothesis states that a lack of skills in a particular domain may cause a child to inaccurately assess self and others’ levels of performance in that domain (Dunning, Johnson, Ehrlinger, & Kruger, 2003; Kruger & Dunning, 1999); however, some evidence shows that children with ADHD, who are prone to overestimate self-performance, may only show bias in *self*-perceptions and not the perceptions of others (Evangelista, Owens, Golden, & Pelham, 2007). This suggests that positively biased children may not lack the ability to accurately evaluate performance in general, but simply have a lack of self-awareness or insight (Evangelista et al., 2007). Further, given that overestimations naturally occur in early childhood (Bjorklund & Green, 1992; Harter, 1990), it may also be that the cognitive processes necessary to generate accurate self-evaluations develop more slowly in children

who overestimate their levels of functioning (Milich, 1994). While cognitive deficits or immaturity may be possible explanations for *positive* biases, these hypotheses do not contribute to the explanation of *negative* biases. If these cognitive explanations for positive biases were correct, even if only partially, it would suggest that the causes of positive biases are fundamentally different from the causes of negative biases. Few, if any, studies have directly evaluated whether cognitive deficits may only be specific to positive biases.

Based on research to this point, it is difficult to determine whether biased ratings of social acceptance can be explained by certain sensitivities to social stimuli, attributional styles, or cognitive deficits. However, given the potential implications of biased self-perceptions for the development, maintenance, and treatment of internalizing and externalizing symptoms (discussed below), it is important that researchers continue to examine potential explanatory mechanisms in order to better understand and more effectively treat biased individuals.

Discrepancy Scores and Externalizing Behaviors

One of the most consistent findings across studies is an association between externalizing behaviors and discrepant ratings of social acceptance. Despite low peer- and teacher-reported levels of social acceptance, children with higher levels of externalizing behaviors (i.e. aggression, hyperactivity/impulsivity, conduct problems) often view their social relations positively and self-report similar, if not higher, levels of social performance than children with fewer externalizing behaviors (Boivin & Begin, 1989; Brendgen, Vitaro, Turgeon, & Poulin, 2002; David & Kistner, 2000; Gresham, MacMillan, Bocian, Ward, & Forness, 1998; Hoza et al., 2004; Hoza, Pelham, Dobbs,

Owens, & Pillow, 2002; Hoza, Waschbusch, Pelham, Molina, & Milich, 2000; Hughes, Cavell, & Grossman, 1997; Hymel, Bowker, & Woody, 1993; Patterson et al., 1990; Zakriski & Coie, 1996). Studies examining discrepancy scores have shown that children with higher levels of aggressive behavior are more likely to overestimate their social performance (Brendgen et al., 2004; Garrison, Earls, & Kindlon, 1983). Similarly, other studies have found that positive biases of social acceptance are more likely to exist for aggressive children who are rejected as compared to aggressive children who are not (Hymel et al., 1993; Patterson et al., 1990; Zakriski & Coie, 1996). Further, high levels of overt and relational aggression have demonstrated independent associations with overestimations of social performance (David & Kistner, 2000). Longitudinally, while overestimations have even been found to predict short-term (i.e. 6 months) increases in aggression (Brendgen et al., 2004), they have also been found to be unrelated to short-term (i.e. 6 months) change in aggressive behavior (Hughes, Cavell, & Prasad-Gaur, 2001).

In ADHD research, overestimations have been referred to as positive illusory bias (PIB; Hoza et al., 2002), and researchers have found that children with ADHD have greater PIB than comparison children, regardless of the criterion rater (i.e. mothers, fathers, teachers, peers, blind observers; Abikoff et al., 2004; Diener & Milich, 1997; Evangelista et al., 2008; Hoza et al., 2004, 2002, 2000; Owens & Hoza, 2003). The consistent presence of the bias across different criterion raters, suggests that self-reports, and not others' reports, are the source of bias for children with ADHD (Hoza et al., 2004). Also for these children, positive biases have been found to be the largest in a child's area of greatest deficit (Hoza et al., 2004, 2002). Further, the influence of

comorbid conduct problems on the relationship between PIB and ADHD is unclear. In one study, children with ADHD had greater PIB when they also displayed conduct problems (Hoza et al., 2002) while in another study, the presence of co-occurring conduct problems was not associated with higher levels of PIB (Hoza et al., 2004).

Longitudinally, findings from a recent study examining the trajectories of PIB in children with ADHD demonstrated that the children maintained their positive biases over a six-year period (Hoza et al., 2010). Additional findings from the study showed that aggression led to increases in socially-derived PIB over time, but that PIB in the social domain did not predict increases in aggression (Hoza et al., 2010).

Overall, findings from cross-sectional studies consistently suggest that overestimations of social acceptance are associated with higher levels of externalizing behaviors. Although several studies have examined the bidirectional relationship of externalizing behaviors and biased ratings over time, the results of these longitudinal investigations are mixed and warrant further attention.

Discrepancy Scores and Internalizing Symptoms

In addition to findings supporting an association between discrepant ratings and externalizing behaviors, multiple studies suggest that biased ratings are also related to levels of internalizing symptoms. More specifically, depressed children have been found to underestimate their social performance relative to peer reports (Brendgen et al., 2002; Kistner, Balthazor, Risi, & David, 2000), and several studies have shown that social acceptance discrepancy scores are negatively associated with depressive symptoms both in typically developing samples (Brendgen et al., 2004; Cillessen & Bellmore, 1999; Kistner et al., 2000; McGrath & Repetti, 2002) and in samples of children with ADHD

(Hoza et al., 2004, 2002; Mikami, Calhoun, & Abikoff, 2010). Similarly, results from several studies have shown that overestimations of victimization are associated with greater depressive symptoms (Cillessen & Bellmore, 1999; De Los Reyes & Prinstein, 2004). Interestingly, De Los Reyes and Prinstein (2004) found that overestimations of overt victimization were only related to depressive symptoms for boys, while overestimations of relational and reputational victimization were associated with depressive symptoms regardless of gender. This finding suggests that biased ratings may have gender-specific influences on internalizing symptoms when different forms of victimization are considered.

Only a few studies have examined the bidirectional relationship between social performance biases and depression longitudinally. In samples of typically developing children, positive biases have been found to predict short-term (i.e. 6 months) and long-term (i.e. 2-3 years) decreases in depressive symptoms (Brendgen et al., 2004; Cole, Martin, Peeke, Seroczynski, & Fier, 1999; Hoffman, Cole, Martin, Tram, & Seroczynski, 2000). However, positive biases have also been found to be unrelated to long-term (i.e. 2-3 years) change in depressive symptoms (Cole, Martin, Peeke, Seroczynski, & Hoffman, 1998; McGrath & Repetti, 2002). In the other direction, depressive symptoms have been found to predict long-term increases in negative biases (Cole, Martin, Peeke, Seroczynski, & Fier, 1999; Cole, Martin, Peeke, Seroczynski, & Hoffman, 1998; Hoffman et al., 2000). Longitudinal studies of children with ADHD have shown that the development of depressive symptoms in these children may be attenuated by the presence of positive biases (Hoza et al., 2010; Mikami et al., 2010; Mikami & Hinshaw, 2006).

There is also some evidence to suggest that depression may inhibit the development of positive biases throughout early and late adolescence (Hoza et al., 2010).

In contrast to externalizing behaviors, internalizing symptoms appear to be related to underestimations of acceptance or overestimations of rejection. Similar to externalizing behaviors, longitudinal findings are mixed and the potential bidirectional relationship between discrepancies and internalizing symptoms warrants further investigation.

Treatment Implications

A lack of concordance between self- and others' views has critical implications for the treatment of childhood psychopathology (for a review, see De Los Reyes & Kazdin, 2005). In the initial stages of treatment, the lack of agreement on a child's problem areas can make the generation of targets for treatment more difficult (De Los Reyes & Kazdin, 2005). This is especially true since children may be more likely to deny difficulties in their areas of greatest weakness (Hoza et al. 2004, 2002). Further, even if a child agrees with others about problem areas, the child may not believe that their functioning is necessarily problematic and may be less motivated to change their behavior in treatment (Hoza et al., 2004; Owens et al., 2007; Phares & Danforth, 1994).

Researchers have debated as to whether clinicians should adopt a "top-down" or "bottom-up" approach when treating children with positive biases. In other words, positive bias could be reduced by increasing levels of self-awareness (i.e. reducing self-perceptions to match others' reports of behavior) or by increasing levels of performance (i.e. raising others' reports of behavior to match self-perceptions; Hoza et al., 2004). Although some researchers have proposed that raising children's self-concepts may

reduce the symptoms of depression and aggression (Cairns & Cairns, 1988; Harter, 1983; Kuhne, Dunning, & Tannock, 1997), others have argued that boosting self-perceptions may increase aggressive behavior (Baumeister et al., 1996). Similarly, while some researchers propose that positive feedback may reduce defensiveness (Diener & Milich, 1997), others have suggested that it could also reinforce skewed self-perceptions (Hoza et al., 2002). With regards to a top-down approach, emphasizing the concordance between self- and others' perceptions may lead children to provide concordant ratings that may not necessarily be accurate (Angold et al., 1987). Alternatively, more accurate self-evaluations could be reached indirectly by teaching self-evaluation strategies instead of directly targeting a child's actual levels of performance (Hoza et al., 2002).

Findings from ADHD treatment studies suggest that psychosocial interventions, which primarily adopt a bottom-up approach, are less effective for children with overly positive self-views or positive biases (Hoza & Pelham, 1995; Mikami et al., 2010). In one study of treatment response to an intensive summer treatment program for children with ADHD, children with positive biases of social acceptance became more disliked by peers while children with positive biases of behavioral conduct increased in conduct problems (Mikami et al., 2010). This suggests that a treatment's effectiveness in a particular domain (i.e. behavioral, social, academic) may be influenced by overly positive self-perceptions of performance in that domain at the beginning of treatment (Mikami et al., 2010). More specifically, researchers have theorized that failure to acknowledge personal deficits may inhibit motivation to improve performance during the course of treatment (Hoza & Pelham, 1995; Mikami et al., 2010). In short, supplemental or alternative

programs may be necessary for children with biased self-perceptions such that they maximally benefit from previously established psychosocial treatments.

Critical Perspectives on Discrepancy Scores

Despite their wide use and compelling findings, discrepancy scores have received criticism for their statistical properties. As mentioned earlier, discrepancy scores can be computed in several ways; however, the method that has been recommended most highly is a difference score approach in which a standardized criterion rating is subtracted from an individual's standardized self-rating (De Los Reyes & Kazdin, 2004; Owens et al., 2007). One major criticism of using difference scores is that any relationship they may have with a dependent variable could simply be the result of a strong relationship between one of the component variables (i.e. the variables used to compute the discrepancy score) and the dependent variable (Cronbach, 1958). As such, difference scores may not offer any additional predictive value above their component variables (Cronbach, 1958). Not surprisingly, difference scores are strongly correlated with their component variables (Cronbach, 1958; De Los Reyes & Kazdin, 2004), and it has been suggested that the scores are simply the sum of their components (Zuckerman & Knee, 1996). Further, since measurement error from both component variables is combined in the computation of difference scores, the reliability of the scores is lower than the reliability of the component variables (Edwards, 2001). Despite these criticisms, other researchers argue that the scores offer unique value (Tisak & Smith, 1994a, b), and that any lower reliability of the scores simply means that observed effects will be conservative estimates of the true relationship between difference scores and dependent variables (Colvin et al., 1995).

There are several other, thus far unexplored, areas of discrepancy scores that may influence the interpretation of significant findings. Generally, researchers consider self-reports of internalizing symptoms (e.g. depression, anxiety) to be more valid than others' reports, and they consider others' (i.e. teacher, parent, peer) reports of behavioral symptoms (e.g., aggression, social skills) to be more valid than self-reports. Consequently, many researchers use self-reports of internalizing symptoms and others' reports of behavioral symptoms as their primary measures of psychosocial functioning. It is also common knowledge that ratings provided by the same rater are more likely to be associated with one another due to shared method variance. Accordingly, researchers have found that self-reported peer rejection is more closely aligned with internalizing symptoms (for a meta-analytic review, see Hawker & Boulton, 2000) while peer-reported peer rejection is more closely aligned with behavioral symptoms (e.g., David & Kistner, 2000). Given this information, and the criticism of difference scores presented above, it may be that observed relationships between difference scores and adjustment variables are largely due to the shared method variance that exists between a component variable and a dependent variable. For example, a significant association between social acceptance discrepancy scores and depressive symptoms could be a reflection of a strong relationship between *self-reported* acceptance and *self-reported* depressive symptoms, which may be more theoretically meaningful and partially attributable to shared method variance. Conversely, if other-reported aggression were the dependent variable, its association with discrepancy scores may be mostly attributable to the other-reported rating of acceptance. Surprisingly, few researchers report the associations between the

component variables and the dependent variables, and presently, no studies have accounted for shared method variance in their analyses of discrepancy scores.

Ultimately, the goal of multi-informant assessments is to evaluate whether reports from multiple raters add to the prediction of outcomes above and beyond any single rater's report. Often, hierarchical regressions are used to test for significant increases in incremental variance resulting from the inclusion of additional main effects or interaction terms. However, unlike interaction terms, difference scores do not permit a test of main effects prior to the inclusion of the difference score (on a subsequent step) because the component variables constitute all of the variance in the difference score (Zuckerman & Knee, 1996). In other words, if a researcher entered both component variables prior to the inclusion of the difference score, the difference score would not have any unique variance to be used in the prediction of a dependent variable. Although, as implied above, a researcher could choose to control for the component variable with the strongest association with the dependent variable while testing to determine if the difference score adds any incremental variance. The component variable with the strongest association with the dependent variable would, in most circumstances, likely be the one that is provided by the same rater. Overall, the suggested approach would test to determine whether difference scores (i.e. the inclusion of ratings from an additional rater) add to the prediction of a dependent variable after accounting for shared method variance.

Traditional conceptualizations of discrepancy scores may also benefit from reexamination. The driving assumption of discrepancy scores is that individuals who under- or overestimate their performance are fundamentally different from one another and/or are different from individuals with accurate self-perceptions. While substantial

evidence exists to suggest that this is the case, most of this evidence is based on the accompanying assumption that accurate individuals are homogenous on the constructs of interest, as dictated by the discrepancy continuum. However, this assumption is conceptually flawed as individuals who are “accurate” undoubtedly differ on the level of performance agreed upon and consequently present with different symptoms. For instance, two individuals could both be accurate with regards to their levels of social acceptance, but one person may accurately report *high* social acceptance while the other person may accurately report *low* social acceptance. It would not be logical to expect these two individuals to have similar levels of depression given that self-reported rejection has been found to have a strong positive association with depressive symptoms (Hawker & Boulton, 2000); thus, one would expect the individual reporting low acceptance to have higher levels of depressive symptoms than the individual reporting high acceptance. Similarly, one would not expect two individuals who self-report high social acceptance to differ greatly on depressive symptoms simply because one is biased and the other is not; both of these individuals would likely have equally high levels of self-esteem and positive mood as a result of their high levels of perceived social acceptance.

A study conducted by Gresham, Lane, MacMillan, Bocian, & Ward (2000) offers some evidence in support of the heterogeneity of agreement and the potential influence of shared method variance. These researchers created four different groups to represent concordant and discrepant ratings of social functioning: Positive Illusory Bias, Positive Nondiscrepant (i.e. child agrees with teacher on high social functioning), Negative Nondiscrepant (i.e. child agrees with teacher on poor social functioning), and Negative

Illusory Bias. Results of the study showed that the Positive Illusory Bias and Negative Nondiscrepant groups (i.e. the groups in which teachers were more likely to rate poorer social performance) did not differ from each other with regards to teacher-reported problem behavior. However, these groups had significantly higher levels of problem behavior when compared to the Negative Illusory Bias and Positive Nondiscrepant groups (i.e. the groups in which teachers were more likely to rate higher social performance), which did not differ from each other (Gresham et al., 2000). In contrast, when a self-report measure of self-image was used as the dependent variable, the Positive Illusory Bias and Positive Nondiscrepant groups (i.e. the groups in which children were more likely to self-report higher social performance) did not differ from one another; however, these groups had significantly higher levels of self-image compared to the Negative Illusory Bias and Negative Nondiscrepant groups (i.e. the groups in which children were more likely to self-report poorer social performance), which did not differ from each other (Gresham et al., 2000). Overall, results of this study suggest that shared method variance may indeed play a role in the heterogeneity of agreement as group differences seemed to revolve around the matching of the rater of social functioning with the rater of the dependent variable. Replication of these results is needed to confirm that the influence of shared method variance may play a large role in significant discrepancy score findings.

Another issue that has yet to be addressed is the continuum upon which discrepancy scores exist. As mentioned earlier, the discrepancy continuum ranges from underestimation (i.e. negative scores) to overestimation (i.e. positive scores) with scores approaching zero indicating inter-rater agreement. The presence of agreement in the

center of the continuum makes significant associations with other constructs difficult to decipher. To illustrate this point, consider the following hypothetical statement: “discrepancy scores were positively associated with aggression, indicating that individuals who overestimated their social acceptance were more likely to be aggressive compared to those who were accurate *or* underestimated their level of acceptance.” As can be seen in this statement, the continuum does not represent a singular construct (i.e. discrepancy), and discrepancy scores do not necessarily represent low or high levels of discrepancy. In other words, low scores do not represent smaller discrepancies and high scores do not represent larger discrepancies. Instead, the scores represent the interaction of the magnitude of discrepancy and the direction of the discrepancy (i.e. positive or negative). By creating separate variables for discrepancy magnitude and direction, researchers could determine whether these underlying components independently or jointly offer predictive utility in psychological research. For instance, the previously established positive association between social acceptance discrepancy scores and aggression could be true, and aggression could be positively associated with positive biases and negatively associated with negative biases. On the other hand, it could be that aggression is only associated with one form of bias, and not the other, or that aggression is associated with the size of the discrepancy regardless of the type of bias. If direction-specific effects exist, or do not exist, then researchers could generate more refined theoretical explanations for why discrepant ratings might occur and develop more specific treatment directives for individuals who are more biased in their self-assessments.

Current Study

The overarching aims of the current study were to examine heterogeneity of agreement, shared method variance, and direction-specific effects through a series of systematic analyses designed to highlight the influence of each issue on the interpretation of discrepancy score findings. Data from a sample of middle school children were used to study the relationship of social rejection discrepancy scores with self-reported internalizing symptoms (i.e. negative mood and self-esteem) as well as peer-reported social behaviors (i.e. relational aggression, overt aggression, prosocial behavior, and social withdrawal). In efforts of conducting a more thorough and comprehensive evaluation of rejection, two levels of self- and peer-reported rejection were assessed – one level assessed global evaluations of rejection and the other assessed evaluations of specific rejection experiences (i.e. victimizing behaviors). Although self-esteem, negative mood, and aggression have been examined frequently in previous research, prosocial behavior and social withdrawal have been examined less within the context of social discrepancy scores; thus, their inclusion was primarily exploratory. All primary analyses were followed by supplemental analyses testing for gender effects; however given the lack of conclusive gender-specific effects in previous research (Achenbach et al., 1987; Brendgen et al., 2004, Cole et al., 1998; Evangelista et al., 2008; McGrath & Repetti, 2002), gender analyses were also exploratory in nature. Since findings regarding gender differences in the forms of aggression are mixed (Underwood, 2003), relational and overt aggression were examined separately instead of simply combining the two forms into one aggression variable.

In line with previous research, social rejection discrepancy scores were hypothesized to be negatively associated with peer-reported aggression and self-esteem and positively associated with negative affect. Regarding shared method variance, it was expected that self-reported rejection would be more strongly associated with self-esteem and negative affect (i.e. the other self-reported variables) than would peer-reported rejection. Similarly, it was expected that peer-reported rejection would be more strongly associated with the sociometric variables than would self-reported rejection. Tests of gender differences in all primary study variables were conducted to provide support for the decision to account for gender differences in subsequent analyses.

The issue of heterogeneity of agreement was addressed by creating discrepancy categories, similar to the study by Gresham et al. (2000). The final groups for comparison included: Positive Bias (PB), Positive Agreement (PA), Average Agreement (AA), Negative Agreement (NA), and Negative Bias (NB). Given the theoretical rationale provided earlier for the heterogeneity of agreement, and the findings of Gresham et al. (2000), it was hypothesized that self-reported levels of social rejection would dictate the group differences in levels of self-reported internalizing symptoms and that peer-reported levels of social rejection would dictate the levels of peer-reported externalizing symptoms across the groups. More specifically, groups in which a child self-reported low social acceptance (i.e. Negative Bias, Negative Agreement) were expected to have lower levels of self-esteem and higher levels of negative affect than the groups in which a child self-reported high social acceptance (i.e. Positive Bias, Positive Agreement). With regards to the peer-reported dependent variables, groups in which peers reported low social acceptance (i.e. Positive Bias, Negative Agreement) were expected to have higher

levels of aggression than the groups in which peers reported high social acceptance (i.e. Positive Agreement, Negative Bias).

Following the categorical analyses, a series of regression analyses were conducted to determine if continuous discrepancy scores contribute any incremental value above the shared method variance they have with the dependent variables. Given the lack of previous studies that account for shared method variance, these analyses were primarily exploratory; however, based on the rationale presented earlier, it was hypothesized that the associations between discrepancy scores and the dependent variables would be significantly weaker once shared method variance was accounted for in the analyses.

Next, discrepancy magnitude and discrepancy direction were examined as separate variables, and the traditional discrepancy score was treated as the interaction of the two variables. This series of analyses included these discrepancy terms to determine whether discrepancy magnitude was meaningful for only one form of bias, meaningful in the same way for both forms of bias, or differentially meaningful for the two forms of bias. Given the conclusions of previous research, it was expected that a full interaction effect would exist for the concurrent prediction of self-esteem, negative affect, and both forms of aggression. In other words, it was anticipated that for positively biased individuals, the magnitude of discrepancy would be positively associated with aggression and self-esteem and negatively associated with negative affect. For negatively biased individuals, the opposite pattern was expected.

Final analyses combined the aforementioned analytical approaches by accounting for shared method variance while testing for direction-specific effects. Although these analyses were also novel, it was hypothesized that the strength of any main effects or

interaction effects produced in the preceding direction-specific analyses would be reduced after accounting for shared method variance.

Method

Participants

The sample consisted of 384 seventh and eighth grade students (12-14 years of age; 53% male) from two middle schools in a mid-sized town located in Southeast Finland. The sample was almost entirely Caucasian with an ethnic composition of 96% Finnish, 2% Russian origin, and 2% other. Twenty-five classrooms were included in the study, and classroom sizes ranged from 17 to 21 students. Students' academic schedules were structured such that they spent approximately half of the school day in "core" classes with students from their homeroom and the rest of the day in elective classes with students from other homerooms. Parental consent and adolescent assent were acquired prior to the data collection.

Students completed the assessment in one of their core classes in the middle of their spring semester. Both written and verbal instructions were provided by study staff, and students were encouraged to ask for assistance if needed. The current study was conducted using Time 1 data from a much larger longitudinal investigation of social goals and social behavior, titled Motivation in Adolescent Social Development (MASD). In the MASD study, survey assessments at each of the three time points took approximately 45 minutes.

Measures

The protocol included both self- and peer-reported measures. All self-reported measures were completed using a 7-point Likert type rating scale with values ranging

from “Strongly disagree” to “Strongly agree”. For all self-reported variables, respondents’ mean scores were used in analyses. All peer-reported variables were assessed using sociometric nomination procedures. Specifically, participants were asked to nominate up to ten students from their homeroom (i.e. those with whom they spent half of the school day) who were most representative of the construct being assessed. Participants were also given the option of *not* providing nominations if no one from their homeroom could be described by the sociometric prompt.

Self-perceived Rejection. Self-perceived rejection was assessed both globally and specifically. In other words, one measure evaluated more globalized self-perceptions of rejection while the other evaluated individuals’ perceptions of specific rejection experiences. Global self-perceptions of rejection were assessed using the single item “*I feel like I’m rejected by others.*” Self-perceptions of specific rejection experiences were assessed using six items modeled from the Revised Olweus Bully/Victim Questionnaire (Olweus, 1996; see Appendix A for all items). Reliability for the scale was good (Cronbach’s $\alpha = .89$).

Self-esteem. Self-esteem was assessed using six-items from the Rosenberg Self-esteem Scale (Rosenberg, 1962). The measure included three positively worded items (e.g., “*On the whole, I am satisfied with myself*”) and three negatively worded items (e.g., “*At times I think I am no good at all*”; for the complete measure, see Appendix B). The validity and reliability of the Rosenberg Self-esteem Scale has been demonstrated in previous research (Carmines & Zeller, 1979; Rosenberg, 1962). Internal consistency of the measure for the sample was good (Cronbach’s $\alpha = .86$).

Negative Affect. Negative affect was assessed using the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), which has been widely used in previous research. The negative affect subscale of the PANAS has demonstrated acceptable internal consistency, stability over a short time period, and excellent convergent and divergent validity with the positive affect subscale (Watson et al., 1988). In the current study, respondents were asked to rate the truthfulness of statements (e.g., “*I have felt sad*”) regarding their affective state over “*the past couple of weeks*”. The specific items used in this study assessed “*sad*,” “*down*,” and “*unhappy*” affective states (for complete measure, see Appendix C; Cronbach’s $\alpha = .91$).

Sociometric Nominations. All sociometric prompts (see Appendix D) were preceded by the leading stem “*Who in your class...*” and were followed by ten blank spaces for participants to list the names of nominated classmates. A ten-person nomination limit has been used in previous research (e.g. Franzoi, Davis, & Vasquez-Suson, 1994) and is thought to encourage greater voter selectiveness compared to unlimited nominations (Cillessen, 2009). Similar to the assessment of self-reported rejection, peer-reported rejection was established both globally and specifically. Global peer-perceptions of rejection were assessed with the prompt “*do you not like*” while peer-perceptions of specific rejection behaviors were assessed with the prompts “*is victimized (e.g., made fun of or put down) by others*,” and “*gets pushed around by others*” (Cronbach’s $\alpha = .84$). Overt aggression was assessed using the prompts “*fights with others*,” “*pushes, kicks, or punches others*,” and “*says mean things to others*” (Cronbach’s $\alpha = .90$) whereas relational aggression was assessed with the prompts “*says mean things about others*,” “*ignores others or stops talking to them*,” and “*gossips or*

spreads rumors about others” (Cronbach’s $\alpha = .68$). The prompts “*helps others*,” “*is friendly and easily approachable*,” and “*cooperates and shares with others*” were used to assess prosocial behavior (Cronbach’s $\alpha = .89$). Withdrawn behavior was assessed with the prompts “*spends time alone*,” “*withdraws outside the group*,” and “*prefers to keep his/her distance from others*” (Cronbach’s $\alpha = .93$).

For all sociometric prompts, the total number of raw nominations a child received was divided by the total number of nominators who completed the sociometric assessment to create a proportion score. These proportion scores were then averaged for each sociometric construct to create final scores to be used in analyses. The proportion score method of quantifying sociometric data has been used in previous research (Hodges & Perry, 1999) and this method was selected, as opposed to the standardization method (Coie, Dodge, & Coppotelli, 1982), to maximize the comparability of individual nomination scores across classrooms while also accounting for varying classroom sizes. If nominations were standardized by classroom, then each person’s peer-rated social rejection score would become a function of the mean and standard deviation of their class, which could be strongly influenced by outliers in such small samples and differ greatly across classrooms.

Results

Computation of Discrepancy Scores

Similar to previous research (e.g. De Los Reyes & Prinstein, 2004), discrepancy scores were computed using self-reports and sociometric reports of social rejection. As recommended by De Los Reyes and Kazdin (2004), self- and peer-reported rejection scores were standardized before computing discrepancies. In line with the argument above for the use of proportion scores, discrepancy scores were standardized by grade, as opposed to standardized by classroom, to maintain comparability across classrooms. Additionally, the current study's measures, like most measures used to compute discrepancies, did not provide children with a concrete reference point (e.g., the average child in your class, the average child in your grade, or the average child your age) by which they could evaluate themselves and their peers. Thus, it was assumed that the children's self-evaluations, and evaluations of peers, were naturally in reference to the most global arena, which would be the average child of their age. In this study, the closest estimate of the average child of their age was the average child in their grade. By standardizing the proportion scores by grade, it was assumed that the mean and standard deviation of the observed scores were very similar to the actual mean and standard deviation of the grade. Because students interacted with peers in their core classes *and* peers in elective classes (i.e. from the larger grade population), they most likely accessed and used, grade-level comparisons when determining nominations. Therefore,

estimations of the grade-level distribution of nomination scores were likely similar to the actual grade-level distribution.

After the scores were standardized by grade, discrepancy scores were computed independently for global and specific rejection by subtracting the standardized peer-reported rejection scores from the standardized self-reported rejection scores. High discrepancy scores represented overestimations of rejection (i.e. negative bias) while low scores represented underestimations of rejection (i.e. positive bias). All analyses were conducted separately for global and specific rejection.

Descriptive Analyses

Means, standard deviations, and Pearson correlations for all study variables can be found in Table 1. In line with previous research, it was hypothesized that individuals who overestimated their levels of social rejection (i.e. have positive discrepancy scores) would be more likely to have higher levels of negative mood and lower levels of self-esteem and aggression than individuals who underestimated their levels of rejection. Consistent with this hypothesis and the findings of De Los Reyes and Prinstein (2004), both the specific and global rejection discrepancy scores were moderately associated with self-esteem ($r = -.20, p < .001$; $r = -.25, p < .001$) and negative affect ($r = .26, p < .001$; $r = .23, p < .001$) in the hypothesized directions. Also, global discrepancy scores were moderately, and negatively, associated with overt and relational aggression ($r = -.32, p < .001$; $r = -.30, p < .001$). Contrary to my hypotheses and the findings of De Los Reyes and Prinstein (2004), specific rejection (i.e. victimization) discrepancy scores were not significantly correlated with either form of aggression.

It was also hypothesized that self-reported rejection would be more strongly associated with self-esteem and negative affect (i.e. the other self-reported variables) than would peer-reported rejection. Similarly, it was expected that peer-reported rejection would be more strongly associated with the sociometric variables than would self-reported rejection. Both forms of self-reported rejection (global and specific) were strongly associated with self-esteem ($r = -.50, p < .001$; $r = -.37, p < .001$) and negative affect ($r = .46, p < .001$; $r = .46, p < .001$), while neither form of peer-reported rejection was significantly related to these variables. Also, global peer-rated rejection had stronger associations with overt aggression ($r = .40$ vs. $r = -.03$), relational aggression ($r = .41$ vs. $r = -.06$), and prosocial behavior ($r = -.24$ vs. $r = -.15$) than global self-rated rejection. Similarly, specific peer-rated rejection had a stronger positive association with withdrawn behavior ($r = .49$ vs. $r = .17$) than specific self-rated rejection.

Contrary to hypotheses, specific self-ratings of rejection were positively, and significantly, associated with overt aggression ($r = .10, p < .05$) whereas specific peer-ratings of rejection were not significantly associated with overt aggression. Additionally, the significant positive correlations for global reports of rejection with withdrawn behavior were similar across raters ($r = .27$ vs. $r = .23$). Similarity of correlations across raters was also present in the associations of specific reports of rejection with prosocial behavior ($r = -.11$ vs. $r = -.09$).

Consistent with the results of previous studies (e.g., Crick, 1997; Crick & Grotpeter, 1995), an independent samples *t*-test revealed that girls had significantly lower levels of self-esteem and overt aggression and significantly higher levels of negative affect, relational aggression, and prosocial behavior than did boys (see Table 2). No

significant gender differences were observed for withdrawn behavior. The presence of significant gender differences for almost all of the adjustment variables supported plans to account for gender effects in later analyses.

Heterogeneity of Agreement: Categorical Analyses

Heterogeneity of agreement was examined by forming bias and agreement categories for both global and specific rejection discrepancy scores (see Figure 1). A cutoff of 1SD was used to separate the extremely biased raters from those who were more moderately biased. Children were categorized as negatively biased (NB; global, $N = 58$; specific, $N = 54$) if their discrepancy score was 1SD above the mean and positively biased (PB; global, $N = 53$; specific, $N = 27$) if their score was 1SD below the mean. The remaining children who fell within 1SD of the mean were categorized into one of three agreement groups. To segment the agreement groups, children who fell .5SD above or below the mean for self-reported rejection were respectively labeled as being in negative agreement (NA; global, $N = 47$; specific, $N = 45$) or positive agreement (PA; global, $N = 143$; specific, $N = 149$) with their peers. The remaining children who fell within .5SD of the mean level of self-rated social acceptance were considered to be in average agreement (AA; global, $N = 79$; specific, $N = 119$). The cutoff of .5SD was chosen because the majority of children naturally clustered around the mean and this cutoff resulted in more balanced group sizes, which was better for group comparisons.

Gresham and colleagues (2000) used a different technique to create bias and agreement groups in their study. They formed groups by first categorizing the component variables into high and low performance. A 1SD cutoff was used for the self-reported data and a mean split was used for the peer-rated data. Discrepancy and agreement

groups were formed such that children with self-rated social acceptance scores 1SD above the mean and peer-rated acceptance scores below the mean were categorized as positively biased. Similarly, children with self-rated acceptance scores 1SD below the mean and peer-rated scores above the mean were categorized as negatively biased. The agreement groups included children whose self-rated acceptance and peer-rated acceptance scores both fell above or below the cutoffs.

The method used in the current study was different in that the continuous discrepancy data, not the individual component variable data, was used to form the bias and agreement groups. In other words, the current method identified strongly biased individuals first; then, the remaining data was used to create the agreement categories. This method considered individuals with scores falling above or below the means for both self- and peer-rated rejection to be biased if their scores were highly discrepant, and it considered individuals with scores on opposite sides of the self- and peer-reported means to be in agreement if their scores were not highly discrepant. Thus, the bias groups in the current study may be more representative of actual bias and agreement than the groups formed in the study by Gresham et al. (2000).

After the grouping variable was created, four MANCOVA analyses were conducted to determine if the five groups were significantly different on the constructs of interest. Given to the findings of Gresham and colleagues (2000), it was expected the high self-reported rejection groups (i.e. NB and NA) would have lower levels of self-esteem and higher levels of negative affect than the low self-reported rejection groups (i.e. PB and PA). For the peer-reported dependent variables, it was expected that the high peer-reported rejection groups (i.e. PB and NA) would have higher levels of aggression

than the low peer-reported rejection groups (i.e. PA and NB). The examination of group differences in withdrawn and prosocial behavior was primarily exploratory.

One set of MANCOVA analyses included the discrepancy categories (global or specific rejection) as the grouping variable, self-esteem and negative affect as the dependent variables, and gender as a covariate. The other set of MANCOVA analyses were similar except that the peer-reported variables (i.e. overt aggression, relational aggression, prosocial behavior, withdrawn behavior) were entered as the dependent variables in place of the self-reported variables. All significant group effects were examined using post-hoc Bonferroni-adjusted pairwise comparisons.

The first MANCOVA examined differences in *global* rejection discrepancy groups on the self-reported dependent variables. For this MANCOVA, there was a significant effect of discrepancy groups on levels of self-esteem, $F(4, 372) = 20.44, p < .001$ and negative affect, $F(4, 372) = 16.23, p < .001$. In line with the earlier *t*-test analysis, a significant effect of gender (Wilk's $\lambda = .94, p < .001$) was found for both self-esteem, $F(1, 372) = 12.80, p < .001$ and negative affect, $F(1, 372) = 18.11, p < .001$. Consistent with hypotheses, post-hoc analyses revealed that the NB group had significantly lower levels of self-esteem and higher levels of negative affect than the AA, PA, and PB groups (see Table 3). The NA groups had significantly lower levels of self-esteem than the PA group, and significantly higher levels of negative affect than both the PA and PB groups.

The second MANCOVA examined differences in the *specific* rejection discrepancy groups on the self-reported dependent variables. In this analysis, there was a significant effect of discrepancy groups on levels of self-esteem, $F(4, 376) = 12.56, p <$

.001 and negative affect, $F(4, 372) = 22.36, p < .001$. A significant gender effect (Wilk's $\lambda = .93, p < .001$) also emerged for self-esteem, $F(1, 376) = 14.21, p < .001$ and negative affect, $F(1, 376) = 22.86, p < .001$. Similar to the first MANCOVA analysis, post-hoc analyses revealed that the NB group had significantly lower levels of self-esteem and higher levels of negative affect than the AA, PA, and PB groups (see Table 4). Also, the NA group had significantly lower self-esteem and higher levels of negative affect than the PA group but not the PB group.

The third MANCOVA, examining differences in the *global* rejection discrepancy groups on the peer-reported dependent variables, revealed significant group effects for overt aggression, $F(4, 373) = 11.78, p < .001$, relational aggression, $F(4, 373) = 8.25, p < .001$, withdrawn behavior, $F(4, 373) = 3.91, p < .01$, and prosocial behavior, $F(4, 373) = 4.81, p < .01$. There was also a significant gender effect (Wilk's $\lambda = .81, p < .001$) for overt aggression, $F(1, 373) = 9.91, p < .01$, relational aggression, $F(1, 373) = 7.48, p < .01$, and prosocial behavior, $F(1, 373) = 4.81, p < .01$. In partial support of hypotheses, post-hoc analyses showed that the PB group had significantly higher levels of overt and relational aggression than all other groups (see Table 3). The NB and NA groups had significantly higher levels of withdrawn behavior compared to the PA group but not the PB group. For prosocial behavior, the PA group had significantly higher levels of the behavior than the NA and PB groups but no others.

The final MANCOVA examined differences in specific rejection discrepancy groups on the peer-reported dependent variables and yielded significant group effects for overt aggression, $F(4, 377) = 2.77, p < .05$ and withdrawn behavior, $F(4, 377) = 15.31, p < .001$. A significant gender effect (Wilk's $\lambda = .82, p < .001$) also existed for overt

aggression, $F(1, 377) = 10.53, p < .01$, relational aggression, $F(1, 377) = 6.07, p < .05$, and prosocial behavior, $F(1, 377) = 18.76, p < .001$. In contrast to hypotheses, post-hoc analyses revealed that the NB, NA, PA, and PB groups had similar levels of overt and relational aggression (see Table 4). For withdrawn behavior, the PB group had significantly higher levels than all other groups. Also, the NA group had significantly higher levels of withdrawn behavior than the AA and PA groups but similar levels compared to the NB group.

Shared Method Variance and Direction-specific Effects: Continuous Analyses

The next set of analyses included three primary series of hierarchical regressions. For each, regressions were conducted individually with the self-reported adjustment variables (i.e. self-esteem and negative affect) and peer-reported adjustment variables (i.e. overt aggression, relational aggression, prosocial behavior, withdrawn behavior) entered individually as the dependent variable. Additionally, each series of regressions was conducted separately for global and specific rejection discrepancy scores.

Regression Series #1: Shared Method Variance. The initial series of hierarchical regressions tested the hypothesis that the strength of the relationship between discrepancy scores would be reduced after accounting for shared method variance. First, hierarchical regression analyses were conducted to establish the relationship between discrepancy scores and the dependent variables after controlling for gender. These regressions included gender on Step 1 and the discrepancy scores on Step 2. Unstandardized beta coefficients for the discrepancy scores and their 95% confidence intervals are reported in Tables 5 & 6.

Then, additional hierarchical regressions were conducted to determine the relationship between the discrepancy scores and the dependent variables after controlling for both gender *and* shared method variance. The structure of these regressions differed slightly for the self- and peer-reported dependent variables. When predicting the self-reported dependent variables, gender was entered on Step 1, self-reported rejection was entered on Step 2, and the discrepancy score was entered on Step 3. When predicting the peer-reported dependent variables, the hierarchical structure was the same except peer-reported rejection was entered on Step 2 in the place of self-reported rejection. The results of these regression analyses are summarized in Tables 7-10.

If the unstandardized beta coefficients produced from the analyses controlling for shared method variance fell outside of the 95% confidence intervals for the beta coefficients produced from the analyses *not* controlling for shared method variance, then it could be concluded that accounting for shared method variance significantly ($p < .05$) altered the relationship between the discrepancy scores and the dependent variables. Visual comparisons of the beta coefficients' size and direction were used to determine the exact manner in which the inclusion of shared method variance was influential.

Accounting for shared method variance significantly reduced the association of global rejection discrepancy scores with self-esteem (*Unstd Beta* = $-.24$, $p < .001$ reduced to *Unstd Beta* = $-.03$, $p = \text{n.s.}$) and negative affect (*Unstd Beta* = $.29$, $p < .001$ reduced to *Unstd Beta* = $.03$, $p = \text{n.s.}$) such that they were no longer significant. The associations between the discrepancy scores and both forms of aggression were also significantly reduced (Overt: *Unstd Beta* = $-.02$, $p < .001$ reduced to *Unstd Beta* = $-.01$, $p < .01$; Relational: *Unstd Beta* = $-.02$, $p < .001$ reduced to *Unstd Beta* = $-.01$, $p < .05$); however,

these associations remained significant. In contrast to hypotheses, the inclusion of peer-reported global rejection in the regression lead to a significant *increase* in the associations of global rejection discrepancy scores with withdrawn (*Unstd Beta* = .00, $p =$ n.s. increased to *Unstd Beta* = .02, $p < .01$) and prosocial behavior (*Unstd Beta* = .00, $p =$ n.s. increased to *Unstd Beta* = -.01, $p =$ n.s.). For withdrawn behavior only, the relationship increased from nonsignificant to significant.

Similar to above, accounting for shared method variance significantly reduced the association of specific rejection discrepancy scores with self-esteem (*Unstd Beta* = -.21, $p < .001$ reduced to *Unstd Beta* = .01, $p =$ n.s.) and negative affect (*Unstd Beta* = .39, $p < .001$ reduced to *Unstd Beta* = .02, $p =$ n.s.) such that they became nonsignificant. Interestingly, the relationship between specific rejection discrepancy scores and withdrawn behavior changed in direction (*Unstd Beta* = -.01, $p < .01$ changed to *Unstd Beta* = .01, $p < .05$). More specifically, the significant negative association became significantly positive. The associations of specific rejection discrepancy scores with overt aggression, relational aggression, and prosocial behavior remained unchanged and nonsignificant throughout the regressions.

Tertiary gender analyses revealed a significant interaction effect for gender and global rejection discrepancy scores ($\beta = -.14$, $p < .05$) when predicting overt aggression and after controlling for global peer-rated rejection. Using Aiken and West's (1991) guidelines for examining significant two-way interactions, a negative relationship between global discrepancy scores and overt aggression was found for boys only ($\beta = -.27$, $p < .001$). An illustration of this interaction can be found in Figure 2.

Regression Series #2: Direction-specific Effects. The next series of regression analyses examined whether direction-specific effects exist for discrepancy scores in the prediction of the adjustment variables. Given the findings of previous research, a full interaction effect was expected for the discrepancy variables in the prediction of self-esteem, negative affect, and both forms of aggression. Specifically, the magnitude of positive biases was expected to be positively associated with aggression and self-esteem and negatively associated with negative affect. For negative biases, the opposite pattern was expected.

For this series of hierarchical regressions, separate variables were created for discrepancy magnitude and direction for both global and specific rejection discrepancy scores. Discrepancy magnitude was defined simply as the absolute value of the original discrepancy score. Discrepancy direction was considered positive (i.e. +1) if the original discrepancy score was greater than or equal to zero (Global: $N = 176$; Specific: $N = 238$) and considered negative (i.e. -1) if the original discrepancy score was less than zero (Global: $N = 205$; Specific: $N = 146$). Discrepancy magnitude, discrepancy direction, and the interaction between these variables (i.e. original discrepancy scores) were entered as predictors in the next series of analyses. For these hierarchical regressions, gender was entered on Step 1, discrepancy magnitude and direction were entered on Step 2, and the interaction of magnitude and direction was entered on Step 3. As above, the regressions were conducted separately for the global and specific rejection discrepancy variables.

For both the global and specific rejection discrepancy variables, a significant interaction between magnitude and direction emerged for self-esteem (Global: $\beta = -.17, p < .05$; Specific: $\beta = -.20, p < .01$) and negative affect (Global: $\beta = .18, p < .05$; Specific: β

= .23, $p < .01$; see Tables 11 & 12). Probing of these significant interactions revealed that the magnitude of global rejection negative biases and specific rejection negative biases was negatively related to self-esteem ($\beta = -.33, p < .001$; $\beta = -.30, p < .001$; Figures 3 & 4) and positively related to negative affect ($\beta = .30, p < .001$; $\beta = .31, p < .001$; Figures 5 & 6). Significant interaction effects were also found for the global rejection discrepancy variables when predicting overt and relational aggression (Overt: $\beta = -.32, p < .01$; Relational: $\beta = -.29, p < .001$; see Table 13). Follow-up analyses of these interactions showed that the magnitude of positive biases was positively related to both overt ($\beta = .30, p < .001$; Figure 7) and relational aggression ($\beta = .28, p < .001$; Figure 8). Lastly, a significant interaction was found for the specific rejection discrepancy variables when predicting withdrawn behavior ($\beta = -.27, p < .001$; see Table 14). Post-hoc probing of this interaction indicated that the magnitude of positive biases was positively related to withdrawn behavior ($\beta = .36, p < .001$, Figure 9).

In secondary analyses, the potential moderating effects of gender on the relationship between the discrepancy score variables and the dependent variables were tested by adding two-way interaction terms for gender in Step 3 and a three-way interaction term for gender on Step 4. Results of these analyses did not reveal any significant interaction effects for gender and, therefore, are not presented.

Regression Series #3: Shared Method Variance and Direction-specific Effects. The final series of hierarchical regressions accounted for shared method variance while also testing for direction-specific effects. Although these analyses were primarily exploratory, the testable hypotheses for these regressions were a combination of the hypotheses from the first two series of regressions. To be specific, the strength of the

main effects or interaction effects produced in the second series of regressions was expected to be reduced after accounting for shared method variance.

When examining the self-reported dependent variables, gender was entered on Step 1, self-reported rejection was entered on Step 2, discrepancy magnitude and direction were entered on Step 3, and the interaction between magnitude and direction was entered on Step 4. The hierarchical structure was the same when predicting the peer-reported dependent variables except peer-reported rejection was entered on Step 2 in place of self-reported rejection. Again, the regressions were conducted separately for the global and specific rejection discrepancy variables.

Unlike in the second series of regressions, no significant main effects or interaction effects were found when examining the self-reported dependent variables (see Tables 15 & 16). When examining the peer-reported dependent variables, a significant main effect was observed for global rejection discrepancy direction when predicting relational aggression (see Table 17) such that positively biased individuals were more likely to be relationally aggressive than negatively biased individuals ($\beta = -.11, p < .05$). A main effect was also found for global rejection discrepancy magnitude when predicting prosocial behavior such that more biased individuals were less likely to be prosocial ($\beta = -.11, p < .05$). Significant interaction effects were found for the global rejection discrepancy variables when predicting overt aggression ($\beta = -.16, p < .05$) and withdrawn behavior ($\beta = .25, p < .01$). Probing of the interaction for overt aggression did not reveal any significant relationships between global discrepancy magnitude and overt aggression for either direction of bias; however, as with relational aggression, a significant main effect for direction indicated positively biased individuals were more likely to be overtly

aggressive than negatively biased individuals ($\beta = -.14, p < .01$). Examination of the other interaction revealed that the size of global rejection positive biases was negatively related to withdrawn behavior ($\beta = -.24, p < .05$; see Figure 10).

A significant interaction was also found for the specific rejection discrepancy variables when predicting withdrawn behavior ($\beta = .16, p < .05$; see Table 16). Similar to above, probing revealed that the size of specific rejection positive biases was negatively related to withdrawn behavior ($\beta = -.16, p = .06$; see Figure 11). When comparing the second and third series of regressions, it should be noted that the relationship between the magnitude of discrepancy scores and withdrawn behavior changed from positive to negative after accounting for shared method variance.

In secondary analyses, the potential moderating effects of gender were tested by adding two-way interaction terms for gender on Step 4 and a three-way interaction term for gender on Step 5. These analyses did not reveal any significant moderating effects of gender on the relationship between the discrepancy score variables and the self- and peer-reported dependent variables.

Table 1

Means, standard deviations, and correlation coefficients for all study variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. Rejection_SelfSpec	2.26	1.26	--											
2. Rejection_SelfGlobal	2.10	1.46	.57***	--										
3. Rejection_PeerSpec	0.04	0.09	.15**	.06	--									
4. Rejection_PeerGlobal	0.08	0.10	.07	.03	.39***	--								
5. Discrepancy_Specific	-0.01	1.20	.55***	.31***	-.50***	-.23***	--							
6. Discrepancy_Global	-0.01	1.31	.27***	.45***	-.14**	-.52***	.36***	--						
7. Self-esteem	5.18	1.24	-.37***	-.50***	.01	.00	-.20***	-.25***	--					
8. Negative Affect	2.76	1.71	.46***	.46***	.01	-.03	.26***	.23***	-.49***	--				
9. Overt Aggression	0.04	0.10	.10*	-.03	.02	.40***	-.04	-.32***	.02	-.07	--			
10. Relational Aggression	0.05	0.07	.07	-.06	.02	.41***	-.09	-.30***	-.01	.00	.70***	--		
11. Withdrawn Behavior	0.04	0.10	.17**	.27***	.49***	.23***	-.16**	.02	-.08	.13*	-.07	-.01	--	
12. Prosocial Behavior	0.11	0.11	-.11*	-.15**	-.09	-.24***	-.06	.05	.14**	-.01	-.26***	-.21***	-.14***	--

*** $p < .001$, ** $p < .01$, * $p < .05$

Table 2

Results from t-test analyses examining gender differences in study variables

Variables	Girls		Boys		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
<u>Self-reports:</u>					
Global rejection	2.18	1.60	2.03	1.32	0.94
Specific rejection	2.15	1.19	2.37	1.31	-1.70
Self-esteem	4.97	1.30	5.36	1.17	-3.10**
Negative affect	3.10	1.87	2.46	1.49	3.72***
<u>Peer reports:</u>					
Global rejection	0.08	0.10	0.08	0.11	-0.22
Specific rejection	0.03	0.08	0.05	0.10	-2.15*
Overt aggression	0.03	0.08	0.06	0.11	-3.30**
Relational aggression	0.05	0.08	0.04	0.06	2.43*
Withdrawn behavior	0.04	0.10	0.05	0.11	-0.44
Prosocial behavior	0.14	0.12	0.08	0.09	4.54***
<u>Discrepancy scores:</u>					
Global rejection disc	0.01	1.35	-0.03	1.29	0.29
Specific rejection disc	-0.06	1.09	0.04	1.28	-0.85

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 3

MANCOVA results showing estimated marginal means and standard errors for the global discrepancy groups after co-varying for gender

Dependent Variables	Global Discrepancy Groups					Wilk's λ
	Negative Bias	Negative Agreement	Average Agreement	Positive Agreement	Positive Bias	
<u>Self-report:</u>						.78
Self-esteem	4.33 (.15) ^a	4.61 (.16) ^{ab}	5.07 (.13) ^b	5.74 (.09) ^c	5.24 (.15) ^{bc}	
Negative affect	3.88 (.21) ^a	3.51 (.23) ^{ab}	2.85 (.18) ^{bc}	2.14 (.13) ^d	2.46 (.22) ^{cd}	
<u>Peer-report:</u>						.81
Overt aggression	0.02 (.01) ^a	0.05 (.01) ^a	0.03 (.01) ^a	0.03 (.01) ^a	0.12 (.01) ^b	
Relational aggression	0.03 (.01) ^a	0.04 (.01) ^a	0.04 (.01) ^a	0.04 (.01) ^a	0.09 (.01) ^b	
Withdrawn behavior	0.07 (.01) ^a	0.07 (.02) ^a	0.05 (.01) ^{ab}	0.02 (.01) ^b	0.05 (.01) ^{ab}	
Prosocial behavior	0.10 (.01) ^{ab}	0.09 (.02) ^a	0.11 (.01) ^{ab}	0.14 (.01) ^b	0.07 (.02) ^a	

Notes: MANCOVA analyses covarying gender were conducted separately for self- and peer-reported dependent variables. Wilk's λ values are significant at $p < .001$. Significant group differences determined using Bonferroni-adjusted pairwise comparisons.

Table 4

MANCOVA results showing estimated marginal means and standard errors for the specific discrepancy groups after co-varying for gender

Dependent Variables	Specific Discrepancy Groups					Wilk's λ
	Negative Bias	Negative Agreement	Average Agreement	Positive Agreement	Positive Bias	
<u>Self-report:</u>						.78
Self-esteem	4.43 (.16) ^a	4.61 (.17) ^{ab}	5.26 (.11) ^c	5.58 (.10) ^c	5.21 (.22) ^{bc}	
Negative affect	4.01 (.21) ^a	3.72 (.23) ^{ab}	2.72 (.14) ^c	1.99 (.13) ^d	2.73 (.29) ^{bcd}	
<u>Peer-report:</u>						.78
Overt aggression	0.05 (.01) ^{ab}	0.08 (.01) ^a	0.03 (.01) ^b	0.05 (.01) ^{ab}	0.04 (.02) ^{ab}	
Relational aggression	0.04 (.01) ^a	0.07 (.01) ^a	0.04 (.01) ^a	0.04 (.01) ^a	0.05 (.01) ^a	
Withdrawn behavior	0.04 (.01) ^{ab}	0.08 (.01) ^b	0.03 (.01) ^a	0.02 (.01) ^a	0.17 (.02) ^c	
Prosocial behavior	0.09 (.02) ^a	0.09 (.02) ^a	0.12 (.01) ^a	0.12 (.01) ^a	0.10 (.02) ^a	

Notes: MANCOVA analyses covarying gender were conducted separately for self- and peer-reported dependent variables. Wilk's λ values are significant at $p < .001$. Significant group differences determined using Bonferroni-adjusted pairwise comparisons.

Table 5

Unstandardized beta coefficients and 95% confidence intervals for global rejection discrepancy scores predicting dependent variables after controlling for gender.

Dependent Variables	Beta	95% CI	
		Lower	Upper
Self-esteem	-0.24***	-0.327	to -0.144
Negative affect	0.29***	0.166	to 0.418
Overt aggression	-0.02***	-0.031	to -0.017
Relational aggression	-0.02***	-0.021	to -0.011
Withdrawn behavior	0.00	-0.006	to 0.010
Prosocial behavior	0.00	-0.005	to 0.012

*** $p < .001$

Table 6

Unstandardized beta coefficients and 95% confidence intervals for specific rejection discrepancy scores predicting dependent variables after controlling for gender.

Dependent Variables	Beta	95% CI	
		Lower	Upper
Self-esteem	-0.210***	-0.311	to -0.108
Negative affect	0.388***	0.251	to 0.524
Overt aggression	-0.004	-0.012	to 0.005
Relational aggression	-0.005	-0.010	to 0.001
Withdrawn behavior	-0.014**	-0.023	to -0.005
Prosocial behavior	-0.005	-0.014	to 0.005

** $p < .01$; *** $p < .001$

Table 7

Regression summary results for global discrepancy scores predicting self-reported dependent variables while controlling for gender and shared method variance

Predictors	Self-esteem			Negative Affect		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.02**			.04***		
Gender		.37 (.13)	.15**		-.64 (.17)	-.19***
Step 2	.25***			.21***		
Global Rej (self)		-.43 (.04)	-.50***		.54 (.05)	.46***
Step 3	.00			.00		
Global Disc		-.03 (.05)	-.03		.03 (.07)	.02
Total R ²	.27***			.24***		

** $p < .01$; *** $p < .001$

Table 8

Regression summary results for specific discrepancy scores predicting self-reported dependent variables while controlling for gender and shared method variance

Predictors	Self-esteem			Negative Affect		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.03**			.04***		
Gender		.39 (.13)	.16**		-.64 (.17)	-.19***
Step 2	.15***			.23***		
Specific Rej (self)		-.39 (.05)	-.39***		.65 (.06)	.48**
Step 3	.00			.00		
Specific Disc		.01 (.06)	.01		.02 (.08)	.01
Total R ²	.17***			.27***		

** $p < .01$; *** $p < .001$

Table 9

Regression summary results for global discrepancy scores predicting peer-reported dependent variables while controlling for gender and shared method variance

Predictors	Overt Aggression			Relational Aggression			Withdrawn Behavior			Prosocial Behavior		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.03**			.02*			.00			.05***		
Gender		.03 (.01)	.17**		-.02 (.01)	-.12*		.01 (.01)	.02		-.05 (.01)	-.23***
Step 2	.16***			.17***			.05***			.05***		
Global Rej (peer)		.38 (.04)	.40***		.27 (.03)	.41***		.23 (.05)	.23***		-.25 (.05)	-.23***
Step 3	.02**			.01*			.03**			.01		
Global Disc		-.01 (.00)	-.15**		-.01 (.00)	-.12*		.02 (.01)	.19**		-.01 (.01)	-.10
Total R ²	.21***			.20***			.08***			.11***		

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 10

Regression summary results for specific discrepancy scores predicting peer-reported dependent variables while controlling for gender and shared method variance

Predictors	Overt Aggression			Relational Aggression			Withdrawn Behavior			Prosocial Behavior		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.03**			.02*			.00			.05***		
Gender		.03 (.01)	.17**		-.02 (.01)	-.12*		.01 (.01)	.02		-.05 (.01)	-.23***
Step 2	.00			.00			.24***			.00		
Specific Rej (peer)		.00 (.06)	.00		.03 (.04)	.04		.56 (.05)	.49***		-.07 (.06)	-.06
Step 3	.00			.01			.01*			.01		
Specific Disc		-.01 (.01)	-.06		-.01 (.00)	-.09		.01 (.00)	.11*		-.01 (.01)	-.10
Total R ²	.03**			.02*			.25***			.06***		

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 11

Regression summary results for the interaction between global discrepancy magnitude and global discrepancy direction as a predictor of self-reported dependent variables, while controlling for gender

Predictors	Self-esteem			Negative Affect		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.02**			.04***		
Gender		.38 (.13)	.15**		-.65 (.17)	-.19***
Step 2	.09***			.06***		
Global Disc Mag		-.32 (.07)	-.23***		.36 (.09)	.19***
Global Disc Dir		-.26 (.06)	-.21***		.30 (.09)	.17**
Step 3	.01*			.02*		
Mag x Dir (Global)		-.16 (.07)	-.17*		.24 (.10)	.18*
Total R ²	.13***			.11***		

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 12

Regression summary results for the interaction between specific discrepancy magnitude and specific discrepancy direction as a predictor of self-reported dependent variables, while controlling for gender

Predictors	Self-esteem			Negative Affect		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.03**			.04***		
Gender		.39 (.13)	.16**		-.64 (.17)	-.19***
Step 2	.07***			.08***		
Specific Disc Mag		-.21 (.08)	-.14**		.26 (.10)	.13**
Specific Disc Dir		-.19 (.07)	-.14**		.39 (.09)	.22***
Step 3	.02**			.02**		
Mag x Dir (Specific)		-.21 (.08)	-.20**		.33 (.10)	.23**
Total R ²	.09***			.14***		

** $p < .01$; *** $p < .001$

Table 13

Regression summary results for the interaction between global discrepancy magnitude and global discrepancy direction as a predictor of peer-reported dependent variables, while controlling for gender

Predictors	Overt Aggression			Relational Aggression			Withdrawn Behavior			Prosocial Behavior		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.03**			.02*			.00			.05***		
Gender		.03 (.01)	.17**		-.02 (.01)	-.12*		.01 (.01)	.02		-.05 (.01)	-.23***
Step 2	.10***			.09***			.01			.04**		
Global Disc Mag		.02 (.01)	.17**		.01 (.00)	.14**		.01 (.01)	.09		-.02 (.01)	-.18***
Global Disc Dir		-.03 (.01)	-.26***		-.02 (.00)	-.25***		.00 (.01)	.00		.01 (.01)	.06
Step 3	.05***			.04***			.00			.00		
Mag x Dir (global)		-.02 (.01)	-.32**		-.02 (.00)	-.29***		.00 (.01)	.02		.00 (.01)	.05
Total R ²	.18***			.14***			.01			.09***		

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 14

Regression summary results for the interaction between specific discrepancy magnitude and specific discrepancy direction as a predictor of peer-reported dependent variables, while controlling for gender

Predictors	Overt Aggression			Relational Aggression			Withdrawn Behavior			Prosocial Behavior		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.03**			.02*			.00			.05***		
Gender		.03 (.01)	.17**		-.02 (.01)	-.12*		.01 (.01)	.02		-.05 (.01)	-.23***
Step 2	.00			.01			.04***			.01		
Specific Disc Mag		.01 (.01)	.06		.00 (.00)	.02		.03 (.01)	.21***		-.01 (.01)	-.06
Specific Disc Dir		.00 (.01)	-.05		-.01 (.00)	-.08		-.01 (.01)	-.07		-.01 (.01)	-.06
Step 3	.00			.00			.03***			.00		
Mag x Dir (specific)		.00 (.01)	-.03		.00 (.00)	-.06		-.02 (.01)	-.27***		.00 (.02)	.00
Total R ²	.03*			.02			.08***			.06***		

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 15

Regression summary results for the interaction between global discrepancy magnitude and direction as a predictor of self-reported dependent variables while controlling for gender and shared method variance

Predictors	Self-esteem			Negative Affect		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.02**			.04***		
Gender		.37 (.13)	.15**		-.64 (.17)	-.19***
Step 2	.25***			.21***		
Global Rej (self)		-.43 (.04)	-.50***		.54 (.05)	.46***
Step 3	.00			.00		
Global Disc Mag		-.07 (.07)	-.05		.02 (.09)	.01
Global Disc Dir		-.04 (.06)	-.04		.01 (.08)	.01
Step 4	.00			.00		
Mag x Dir (Global)		-.01 (.06)	-.01		.04 (.09)	.03
Total R ²	.27***			.24***		

** $p < .01$; *** $p < .001$

Table 16

Regression summary results for the interaction between specific discrepancy magnitude and direction as a predictor of self-reported dependent variables, while controlling for gender and shared method variance

Predictors	Self-esteem			Negative Affect		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.03**			.04***		
Gender		.39 (.13)	.16**		-.64 (.17)	-.19***
Step 2	.15***			.23***		
Specific Rej (self)		-.39 (.05)	-.39***		.65 (.06)	.48***
Step 3	.00			.00		
Specific Disc Mag		-.00 (.08)	.00		-.08 (.10)	-.04
Specific Disc Dir		.05 (.07)	.04		-.01 (.09)	.00
Step 4	.00			.00		
Mag x Dir (Specific)		-.03 (.08)	-.02		.02 (.10)	.01
Total R ²	.18***			.27***		

** $p < .01$; *** $p < .001$

Table 17

Regression summary results for the interaction between global discrepancy magnitude and direction as a predictor of peer-reported dependent variables, while controlling for gender and shared method variance

Predictors	Overt Aggression			Relational Aggression			Withdrawn Behavior			Prosocial Behavior		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.03**			.02*			.00			.05***		
Gender		.03 (.01)	.17**		-.02 (.01)	-.12*		.01 (.01)	.02		-.05 (.01)	-.23
Step 2	.16***			.17***			.05***			.05***		
Global Rej (peer)		.38 (.04)	.40***		.27 (.03)	.41***		.23 (.05)	.23***		-.25 (.05)	-.23***
Step 3	.02*			.01			.01			.01		
Global Disc Mag		.01 (.01)	.06		.00 (.00)	.02		.00 (.01)	.00		-.01 (.01)	-.11*
Global Disc Dir		-.01 (.01)	-.14**		-.01 (.00)	-.11*		.01 (.01)	.11 [†]		.00 (.01)	-.02
Step 4	.01*			.00			.02**			.00		
Mag x Dir (global)		-.01 (.01)	-.16*		-.01 (.00)	-.09		.02 (.01)	.25**		-.01 (.01)	-.10
Total R ²	.22***			.20***			.08***			.12***		

[†] $p < .06$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 18

Regression summary results for the interaction between specific discrepancy magnitude and direction as a predictor of peer-reported dependent variables, while controlling for gender and shared method variance

Predictors	Overt Aggression			Relational Aggression			Withdrawn Behavior			Prosocial Behavior		
	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β	ΔR^2	b (se b)	β
Step 1	.03**			.02*			.00			.05***		
Gender		.03 (.01)	.17**		-.02 (.01)	-.12*		.01 (.01)	.02		.00 (.00)	.00
Step 2	.00			.00			.24***			.00		
Specific Rej (peer)		.00 (.06)	.00		.03 (.04)	.04		.56 (.05)	.49***		.00 (.00)	.00
Step 3	.01			.01			.01			.01		
Specific Disc Mag		.01 (.01)	.09		.00 (.01)	.01		-.01 (.01)	-.09		.00 (.00)	.00
Specific Disc Dir		-.01 (.01)	-.06		-.01 (.00)	-.07		.01 (.01)	.10*		.00 (.00)	.00
Step 4	.00			.00			.01*			.00		
Mag x Dir (specific)		-.01 (.01)	-.10		.00 (.01)	-.07		.01 (.01)	.16*		.00 (.00)	.00
Total R ²	.04*			.02			.26***			.06***		

* $p < .05$; ** $p < .01$; *** $p < .001$

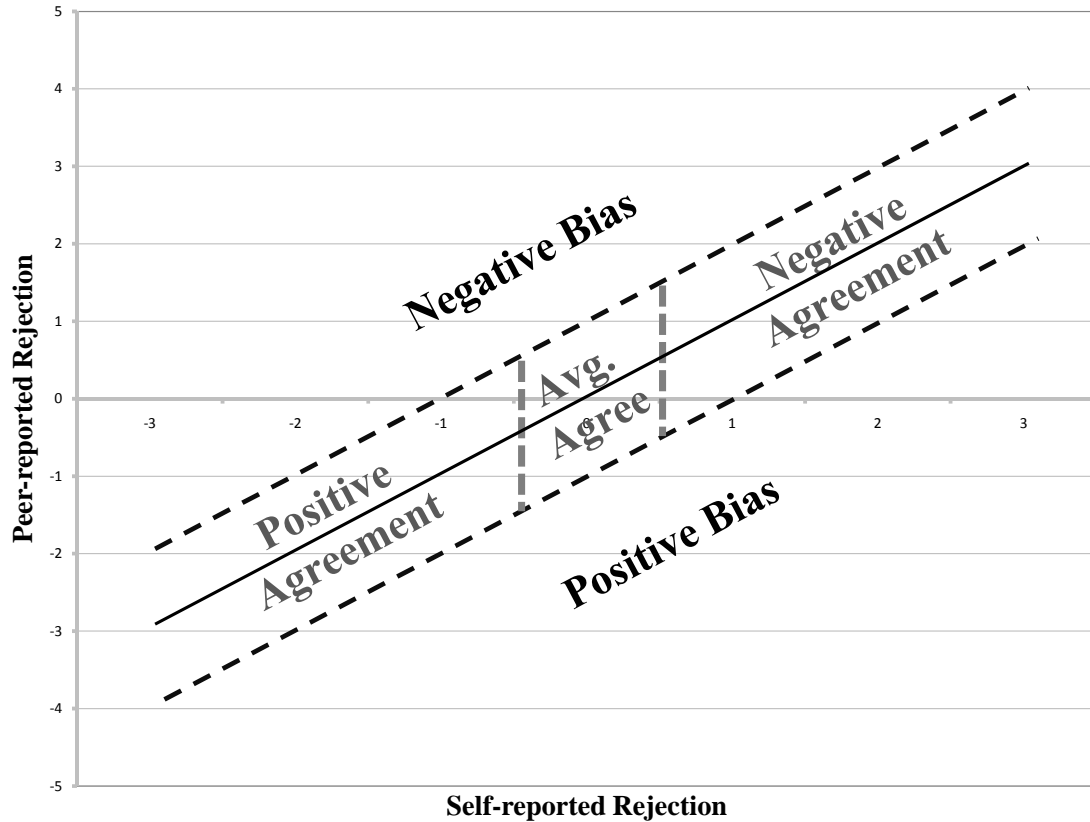


Figure 1. Graphical illustration of the categorization of discrepancy groups. The solid dark line passing through (0,0) represents perfect agreement of self- and other-reported rejection. The dark dashed lines above and below the perfect agreement line represent the 1SD cutoff that was used to create the positive and negative bias groups. The lighter dashed lines (vertical) represent the .5SD cutoff that was used to partition the agreement groups.

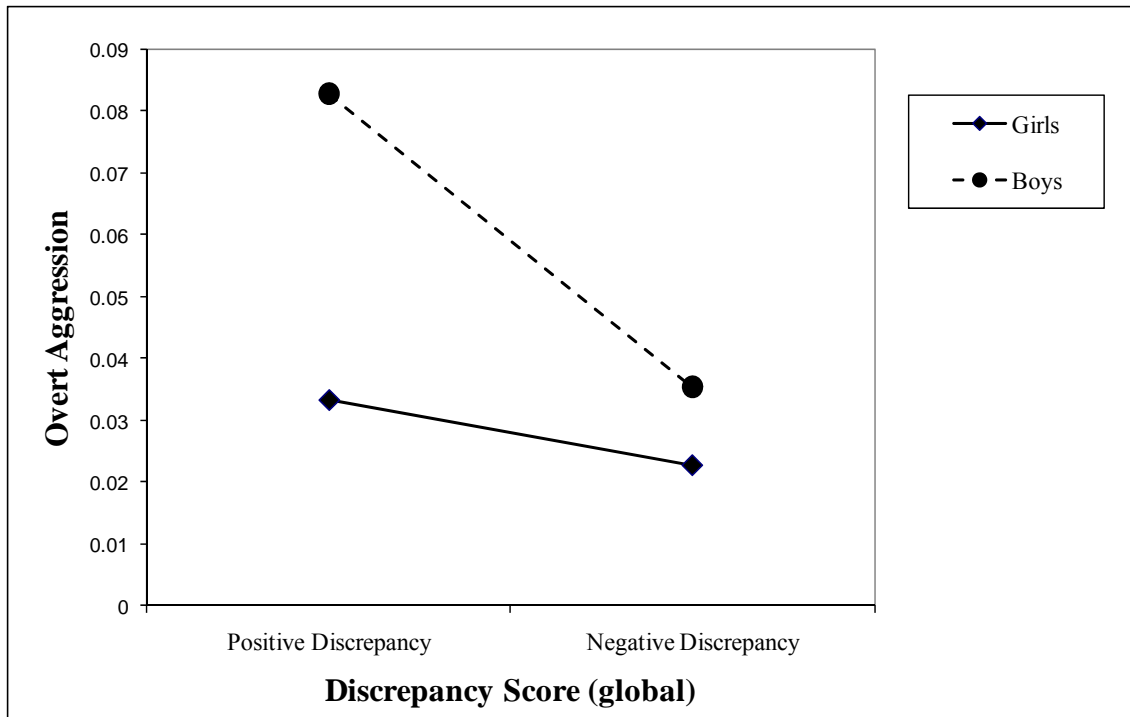


Figure 2. The moderating effect of gender on the relationship between global rejection discrepancy scores and overt aggression, after controlling for shared method variance.

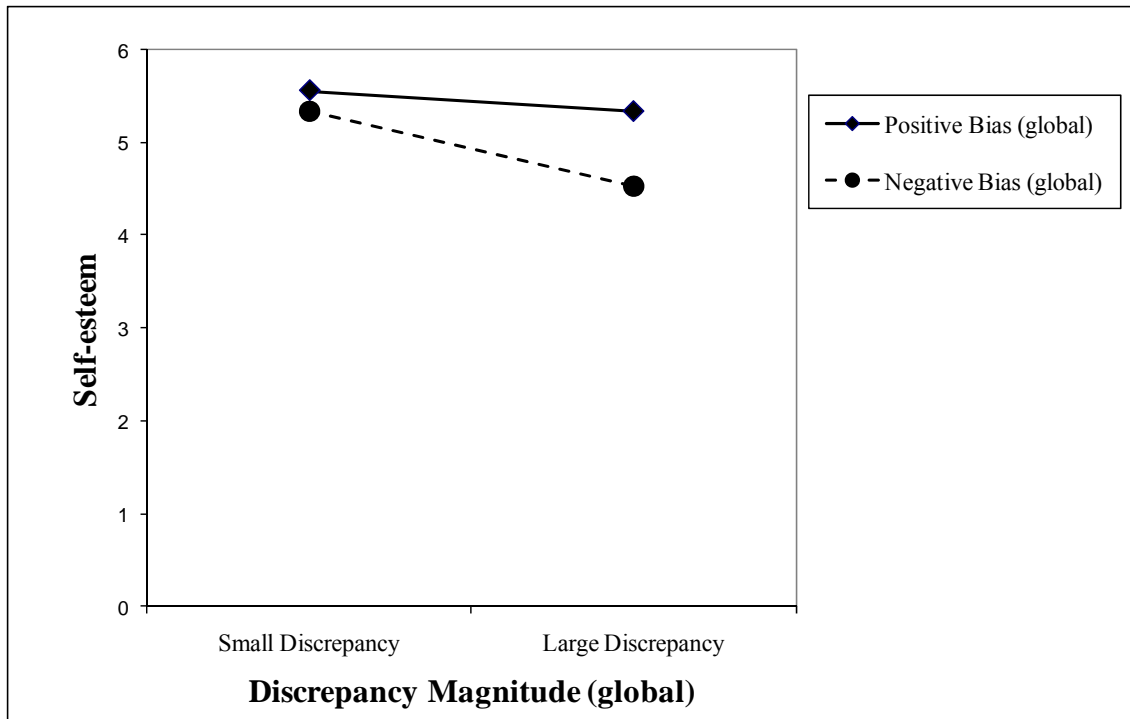


Figure 3. The moderating effect of global rejection discrepancy direction on the relationship between global rejection discrepancy magnitude and self-esteem, after controlling for gender..

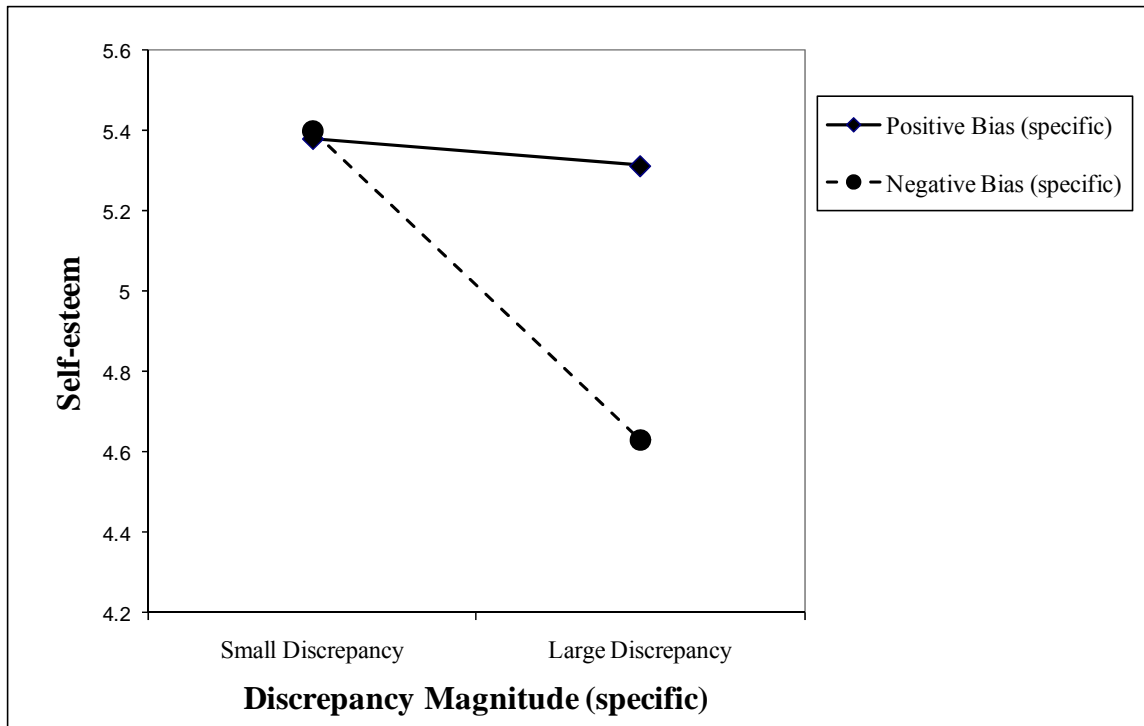


Figure 4. The moderating effect of specific rejection discrepancy direction on the relationship between specific rejection discrepancy magnitude and self-esteem, after controlling for gender.

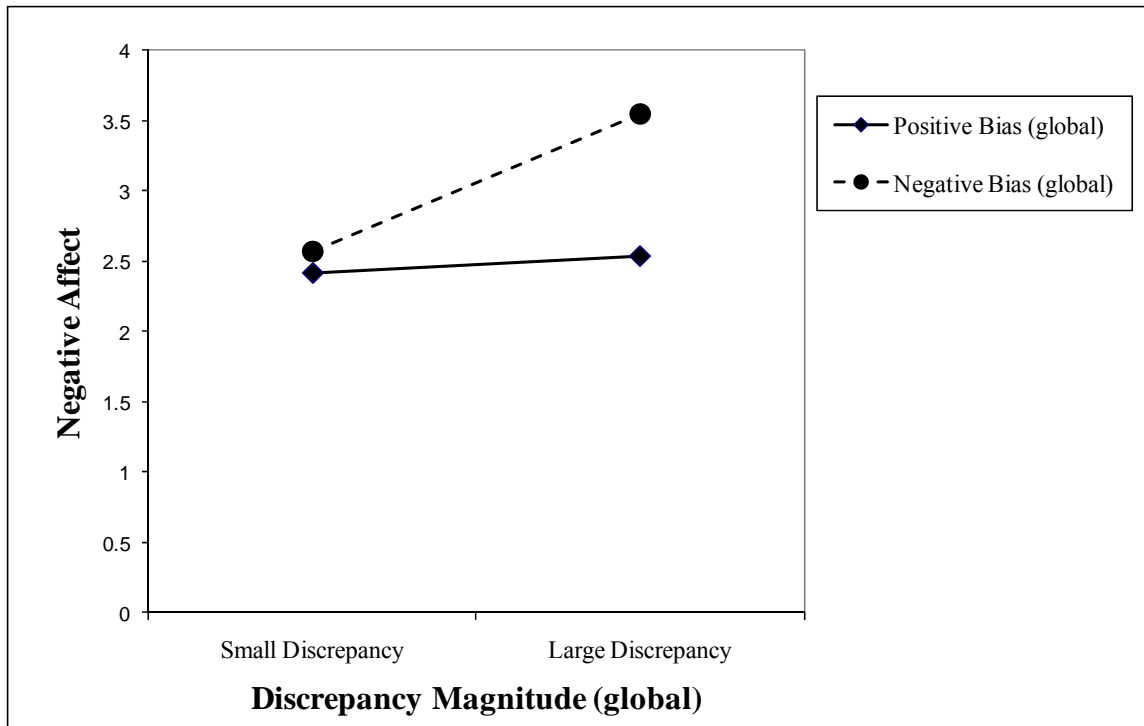


Figure 5. The moderating effect of global rejection discrepancy direction on the relationship between global rejection discrepancy magnitude and negative affect, after controlling for gender.

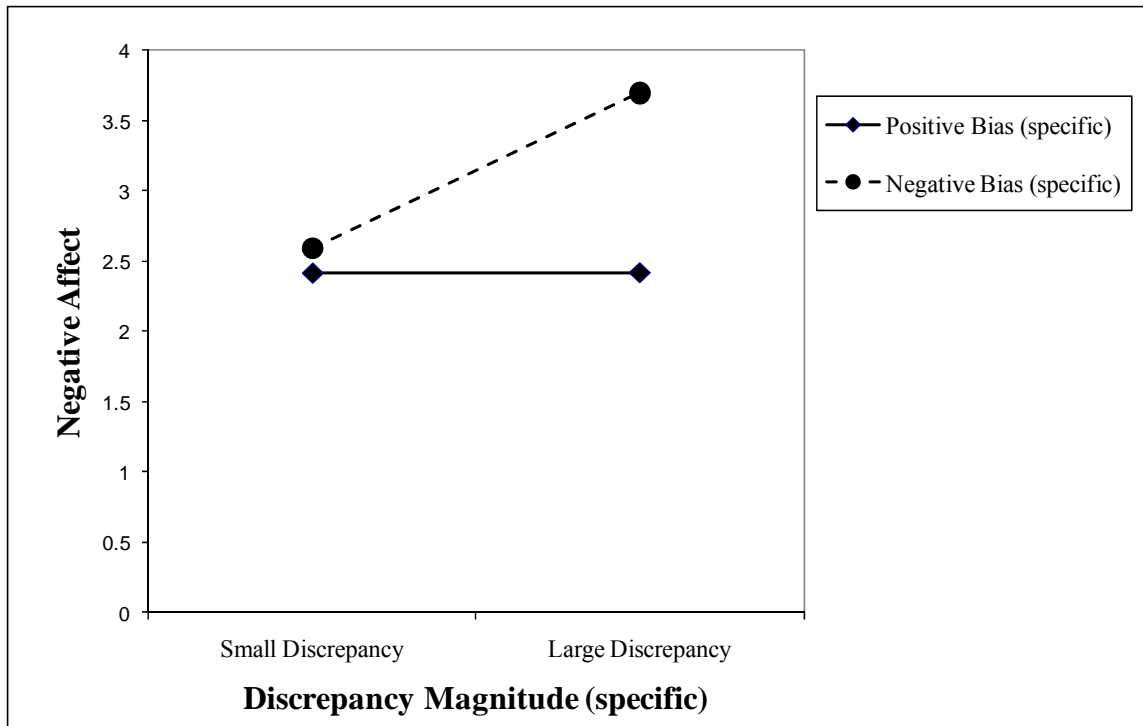


Figure 6. The moderating effect of specific rejection discrepancy direction on the relationship between specific rejection discrepancy magnitude and negative affect, after controlling for gender.

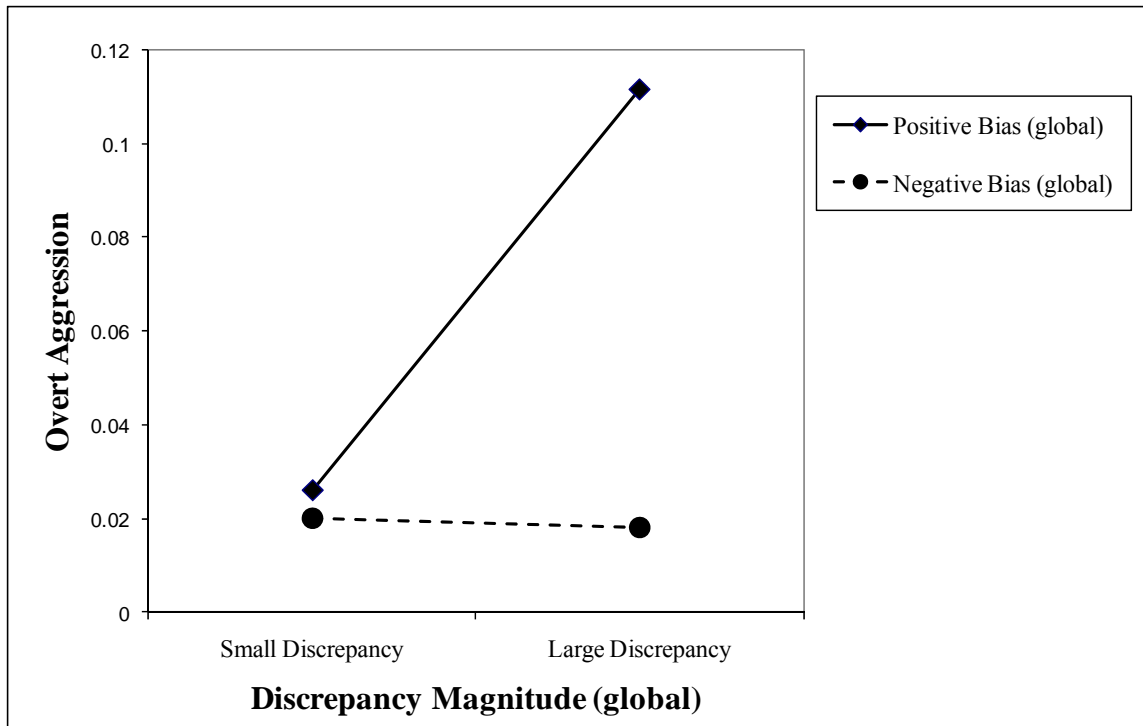


Figure 7. The moderating effect of global rejection discrepancy direction on the relationship between global rejection discrepancy magnitude and overt aggression, after controlling for gender.

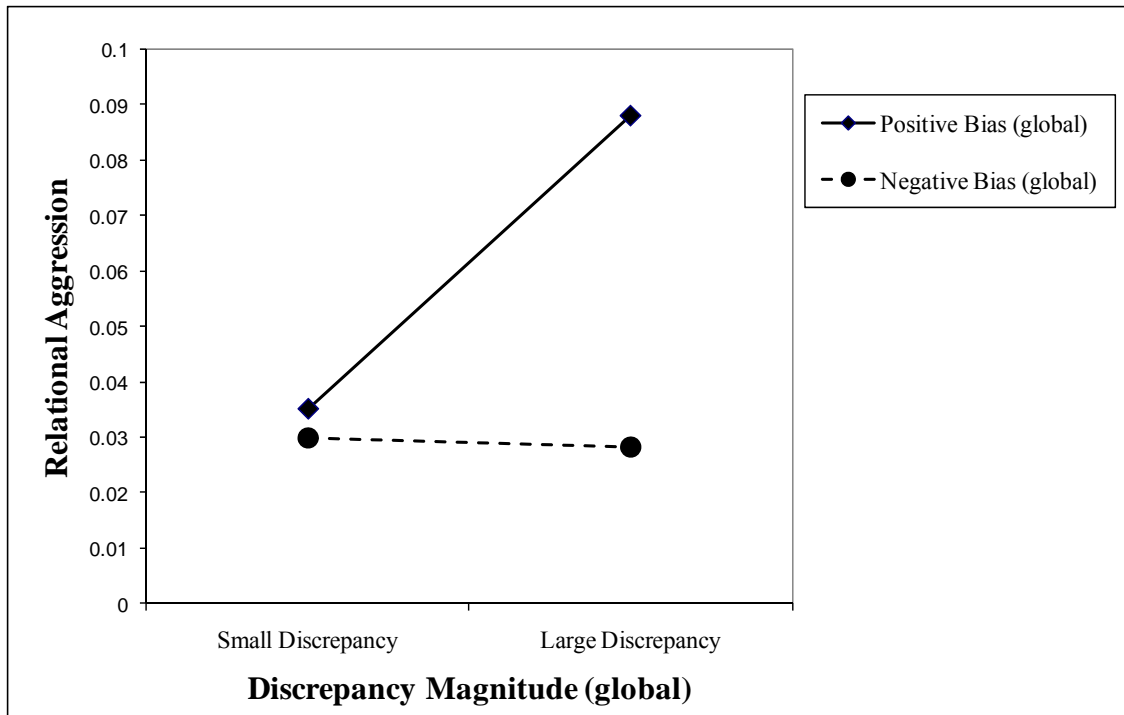


Figure 8. The moderating effect of global rejection discrepancy direction on the relationship between global rejection discrepancy magnitude and relational aggression, after controlling for gender.

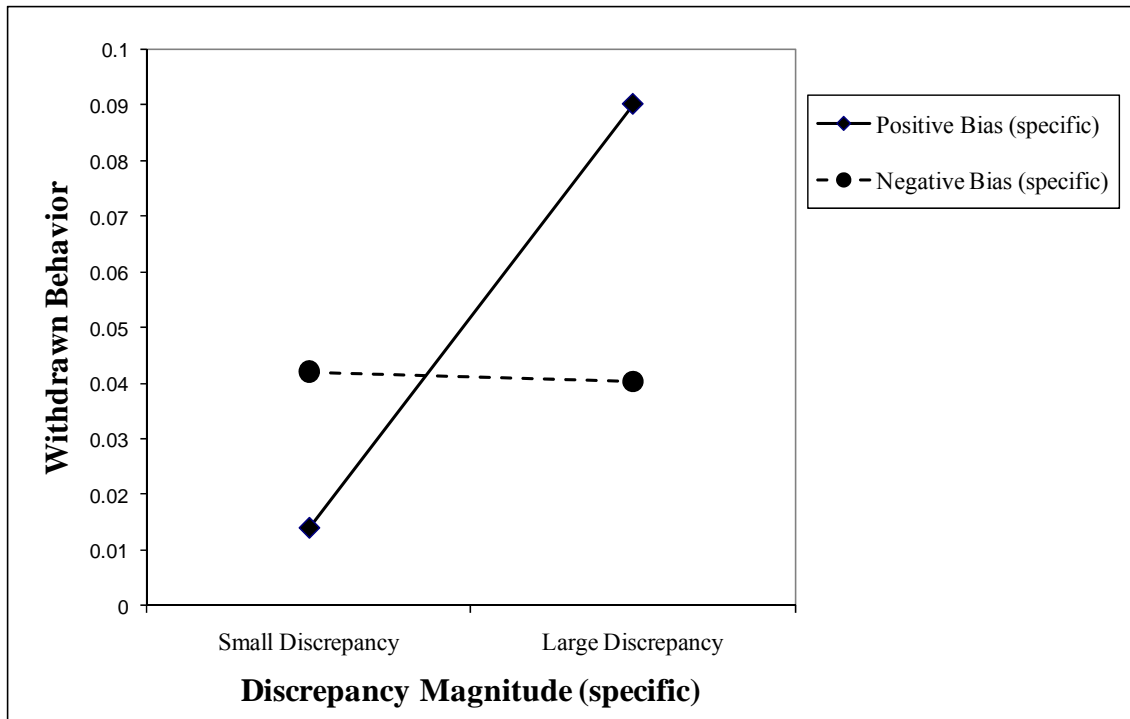


Figure 9. The moderating effect of specific rejection discrepancy direction on the relationship between specific rejection discrepancy magnitude and withdrawn behavior, after controlling for gender.

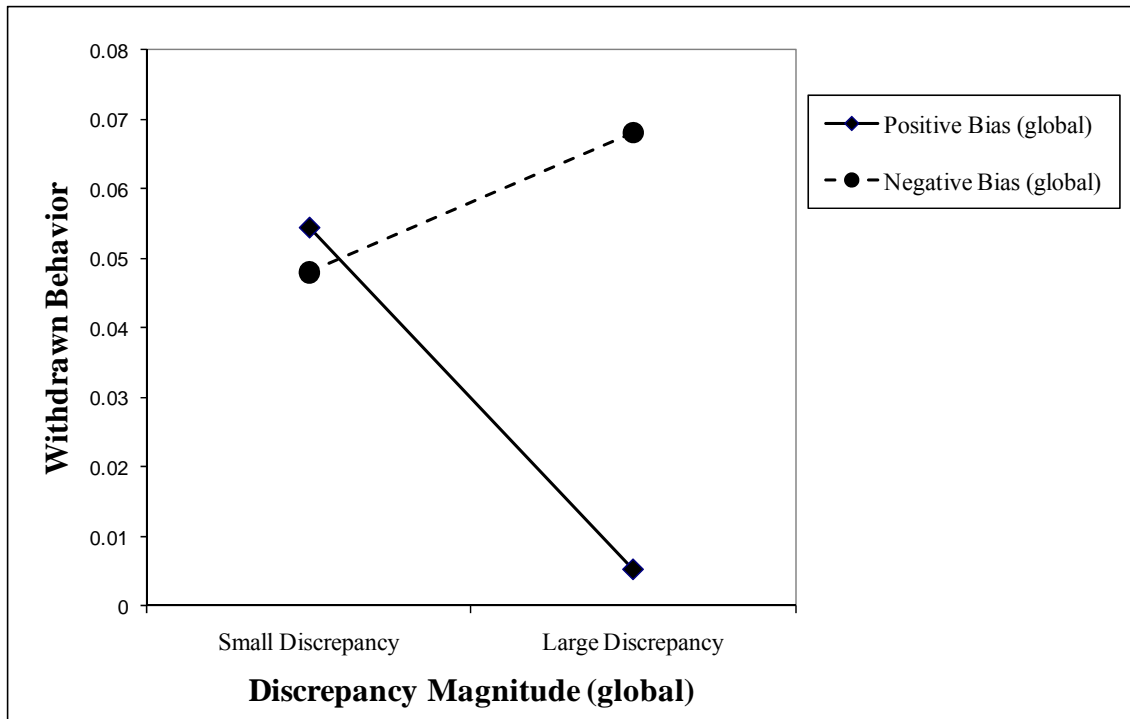


Figure 10. The moderating effect of global rejection discrepancy direction on the relationship between global rejection discrepancy magnitude and withdrawn behavior, after controlling for shared method variance and gender.

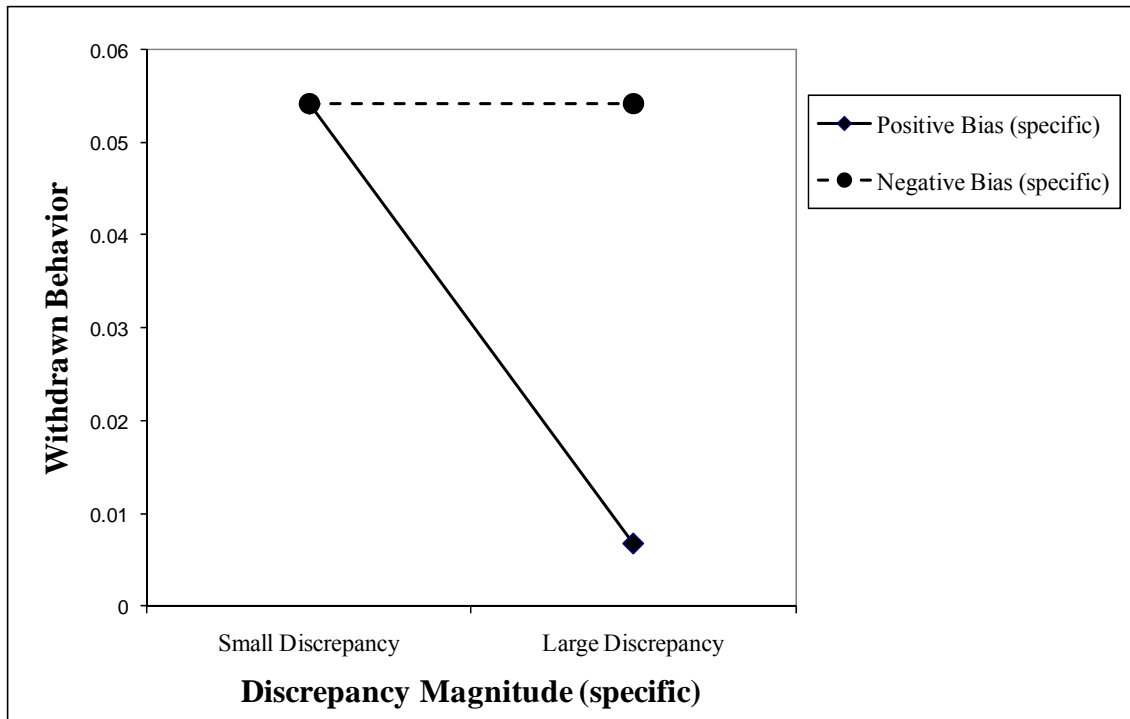


Figure 11. The moderating effect of specific rejection discrepancy direction on the relationship between specific rejection discrepancy magnitude and withdrawn behavior, after controlling for shared method variance and gender.

Discussion

The current study used conducted a systematic series of analyses to test the influence of heterogeneity of agreement, shared method variance, and direction-specific effects on the associations between discrepancy scores and childhood adjustment variables. Findings are summarized and interpreted as they relate to the individual adjustment variables. Practical and theoretical implications of results, limitations of this study, and possible directions for future research are also discussed.

Implications for Adolescent Adjustment

Self-esteem and Negative Affect. The findings and interpretations for self-esteem and negative affect are similar and will be discussed together. In line with previous studies examining the relationship between discrepancy scores and internalizing symptoms (Cillessen & Bellmore, 1999; De Los Reyes & Prinstein, 2004), discrepancy scores were negatively associated with self-esteem and positively associated with negative affect. However, findings from correlational, categorical, and regression analyses all demonstrated a strong influence of shared method variance on this relationship. Although a direction-specific effect emerged in the second series of regressions, this effect became nonsignificant after accounting for shared method variance in the final regression series. Also, none of the results for self-esteem or negative affect differed based on whether the discrepancy scores were for global or specific rejection.

These findings suggest that self-reported rejection may be primarily responsible for the previously established association between discrepancy scores and internalizing symptoms. In other words, children who are actually rejected by peers appear to have varying levels of internalizing symptoms while children who *feel* as though they are rejected by peers may present primarily with more symptoms, even if peers report the children to be well-liked. This suggests that rejection may only relate to internalizing symptoms if a child perceives the rejection and incorporates the rejection into their self-perceptions.

Overt and Relational Aggression. The interpretation of results for overt and relational aggression are similar and will be discussed together. In line with previous research (Brendgen et al., 2004; Garrison, Earls, & Kindlon, 1983), global rejection discrepancy scores were negatively correlated with both forms of aggression. In contrast, specific rejection discrepancy scores were not related to aggression in the correlational analyses or any other analysis conducted as part of this study. Findings related to specific rejection discrepancy scores were not significant or meaningful and will not be summarized here; however, possible reasons for a lack of findings for specific rejection discrepancy scores will be discussed.

For global rejection discrepancy scores, correlational and categorical analyses indicated that shared method variance could possibly be influential on the relationship between the scores and aggression. This tentative conclusion was clarified in the first regression analyses, which demonstrated that shared method variance significantly attenuated the relationship between global rejection discrepancy scores and aggression. However, these analyses also showed that the discrepancy scores remained significantly

associated with aggression, even after accounting for shared method variance. Similarly, significant main effects for global rejection discrepancy direction revealed in the second regression series remained present in the final regression series. The final main effect for discrepancy direction indicated that children with positive biases of their global rejection had higher levels of overt and relational aggression than children with negative biases, regardless of the magnitude of the discrepancies.

As mentioned earlier, previous researchers have consistently demonstrated that aggressive children are more likely to be positively biased than accurate or negatively biased children. The current study's findings are more specific and suggest that the direction of bias, regardless of the magnitude, is related to aggression. According to Baumeister and colleagues (1996), when individuals receive negative social feedback, they can either reject the feedback and attempt to maintain their self-view by taking a defensive stance, or they can accept the feedback and incorporate it into their self-perception. Given that children with positive biases are more likely to self-report low levels of rejection, it seems probable that this group of children may be more at risk of taking a defensive stance towards the high levels of peer-reported rejection than children who self-report high levels of rejection. Therefore, positively biased children may be more likely to act aggressively towards peers as they may attribute negative social interactions to external, versus internal, reasons.

Also, when aggressive children rate their own levels of rejection they may not consider the fact that the recipients of their aggression most likely "do not like" them. For instance, if a child proactively rejects a peer, then the child most likely does not feel rejected by the peer. However, if a child is reactively aggressive towards a peer that has

rejected them, then the child may be more likely to consider the peer's perspective when evaluating their own level of rejection. More broadly, and in line with the views of Leary (2001), it could be that the inclusion of a peer's perspective in self-evaluations of rejected status depends on the rater's opinion of the peer. If a child values the peer's opinion, then the child may be more likely to consider the peer when making a self-evaluation of social rejection. On the other hand, if the child does not value the peer's opinion, then the child may be more likely to exclude the peer's perspective when making a self-evaluation of social rejection. Thus, the lack of a significant effect for discrepancy magnitude could be due to positively biased children's varying perceptions of peers.

Another possible explanation for the lack of a significant effect for discrepancy magnitude is that the magnitude of the discrepancies could represent the longevity of a child's aggressive status or the intensity of a child's aggressiveness more than just the number of peers who nominated the child as being aggressive. If a child has maintained an aggressive reputation over time, or has demonstrated high levels of aggression, peers may avoid giving the child negative social feedback due to the potential physical or social repercussions of being the messenger. In other words, discrepancies may increase as a result of the broadening gap in communication, both verbal and nonverbal, between an aggressive child and a fearful peer group.

Lastly, these findings suggest that global rejection and global rejection discrepancy scores have a much more meaningful association with aggression than specific rejection and specific rejection discrepancy scores. One possible explanation for this observation could be that peers nominate different types of children for the two different forms of rejection. For instance, when deciding who they "do not like," peers

may be more likely to nominate children who are either proactively or reactively aggressive. However, when deciding who is victimized by others, peers may be more likely to nominate reactively aggressive peers. Thus, similar to earlier interpretations above, the findings produced in this study could reflect some difference between the *functional* aspects of aggression and how they relate to discrepant ratings of social rejection.

Withdrawn Behavior. The relationship between discrepant ratings of social rejection and withdrawn behavior has not previously been examined. Therefore, all findings for withdrawn behavior are novel and interpreted tentatively. In correlational analyses, specific rejection discrepancy scores were negatively correlated with withdrawn behavior, but global rejection discrepancy scores were not significantly related to withdrawn behavior. Similar to aggression, it was difficult to determine from the correlation and categorical analyses whether shared method variance may affect the relationship between discrepancy scores and withdrawn behavior. However, the first series of regressions revealed that shared method variance was indeed influential in the relationship between discrepancy scores and withdrawn behavior. Unlike aggression and the internalizing variables, the relationship between discrepancy scores and withdrawn behavior became stronger and changed in direction after accounting for shared method variance. Although the second regression series only revealed a direction-specific effect for specific rejection discrepancy scores, the final regression series revealed direction-specific effects for both specific and global rejection. Notably, accounting for shared method variance changed the direction of the relationship between specific discrepancy magnitude and withdrawn behavior from the second series of regressions to the final

series. The direction-specific effects revealed in the final regression series indicated that positively biased children were less likely to be withdrawn if their biases were larger in magnitude.

These findings suggest that, regardless of peer-reported social rejection, individuals with strong positive biases are less withdrawn compared to individuals with smaller positive biases. In other words, children who strongly underestimate their social rejection may be more active in their peer group than children who only underestimate their social rejection slightly. The probability of being actively disliked or rejected by peers increases as a child associates with more peers, and the probability of having a larger positive bias increases as peer reports of rejection increase. Thus, withdrawn children would seem less likely to be *actively* disliked and, in turn, less likely to have a large positive bias. An even simpler explanation for the findings regarding positive biases and withdrawn behavior could be that more active children have an increasingly difficult time compiling, integrating, and/or evaluating the large amount of social feedback that they receive. As a result, their levels of accuracy are likely to be lower, and they may be more likely to quantitatively, not qualitatively, assess their social status using the number of interactions or number of *self-perceived* friendships they have as a measure of social success.

Prosocial Behavior. As for withdrawn behavior, studies have not previously examined the relationship between prosocial behavior and discrepant ratings of social rejection; therefore, all current findings for prosocial behavior are also novel. Correlation analyses showed that prosocial behavior was not associated with the discrepancy scores. As with the other peer-reported social behavior variables, it was unclear in the correlation

and categorical analyses whether shared method variance may affect the relationship between discrepancy scores and prosocial behavior. In the first regression series, the relationship between global rejection discrepancy scores increased after accounting for shared method variance, but the relationship did not reach significance. A significant main effect for global rejection discrepancy magnitude revealed in the second regression series remained significant in the final regression series and was largely unaffected after accounting for shared method variance. The main effect indicated that larger biases, regardless of their direction, were associated with less prosocial behavior.

These findings suggest that both positively and negatively biased individuals are viewed as less prosocial in their peer group. Negatively biased individuals may not be nominated as being prosocial because they may withdraw from the peer group and not frequently interact with peers. Regarding positive biases, it is not likely that children deemed to be rejected by peers would also be nominated as being prosocial. It could be that positively and negatively biased children share an inability to be prosocial towards other peers in their social network.

However, it is also possible that positively and negatively biased children may not feel the need to be prosocial. Negatively biased children may see their cause to be more and more helpless as their self-perceptions of rejection increase. Consequently, they may not make much effort to improve their peer interactions through the use of prosocial behavior. In contrast, positively biased children may think that prosocial behaviors are unnecessary as they believe that they are already well-liked. The potential relationship of motivation with positive biases is consistent with findings (e.g., Mikami et al., 2010) suggesting that children who are not aware of social rejection may not be motivated to

improve their behavior. Then again, it is also possible that positively biased children may just be oblivious to the specific prosocial behaviors of highly accepted peers. Therefore, when comparing themselves to highly accepted peers, positively biased children may not notice any differences in their behaviors.

Practical and Theoretical Implications

Overall, findings from this study provide conceptual and statistical clarifications for examinations of inter-rater discrepancies. In particular, results demonstrated that the influence of shared method variance is largely related to heterogeneity of agreement, and accounting for shared method variance can increase, decrease, or even change the direction of the relationship between discrepancy scores and adjustment constructs. Also, results showed that the *magnitude* of discrepancies can be unrelated, equally related, or differentially related to adjustment variables for the different forms of bias. Given these empirically-supported observations, it is recommended that researchers continue to account for shared method variance and test for direction-specific effects in future investigations of inter-rater discrepancies. In doing so, they can circumvent the flawed assumptions inherent to traditional examinations of continuous discrepancy scores and generate more detailed and accurate conclusions regarding the relationships of the scores with childhood adjustment. For instance, traditional examinations of continuous discrepancy scores have generated conclusions suggesting that positively biased children are more aggressive and have fewer internalizing symptoms than accurate or negatively biased children. However, controlling for shared method variance and testing for direction-specific effects in this study showed that that internalizing symptoms do not

have a concurrent relationship with discrepant ratings of rejection and that aggressive behavior is greatest in positively biased children, regardless of discrepancy magnitude.

Results regarding the associations between discrepancy scores and adjustment variables both coincide and contrast with the popular self-protective theory for positive biases (Bandura, 1997; Diener & Milich, 1997; Taylor & Brown, 1988, 1994). Based on the more specific and seemingly accurate conclusions generated by this study, biased ratings of social rejection appear to have no association with internalizing symptoms.

This conflicts with the theorized self-protective function of positive biases and implies that low self-reported rejection, regardless of its accuracy, is related to fewer internalizing symptoms. However, other findings from the current study indicate that positive biases could potentially be related to longitudinal decreases in internalizing symptoms.

Positively biased children appear to be more active in the peer group, and in line with the propositions of Brengden and colleagues (2004), continued activity in the peer group provides children with more opportunity to receive social feedback and consequently improve their social reputation. In other words, a rejected child who withdraws from the peer group is likely to retain their rejected status while a rejected child who remains active in the peer group may be more likely to combat the rejected status. It is possible that positively biased children could eventually learn, through social observations or direct instruction (i.e. guidance or therapy), how to improve their social status by increasing prosocial behavior, reducing aggressive behavior, and generally developing better social skills. Alternatively, it is also possible that positively biased children could eventually stop making efforts to improve their social acceptance, begin to withdraw from the peer group, and consequently develop higher levels of internalizing symptoms.

Study Limitations

The current study has several limitations that could affect the interpretation or generalizability of its findings. First, this study of discrepancy scores was the first to be conducted in a sample of Finnish adolescents. Although multiple checks were conducted to ensure that the current study's data were comparable to data gathered in non-Finnish samples, it is certainly possible that some findings may be unique to Finnish adolescents. Replication of analyses is needed in other samples to conclude whether the findings observed in the current study are consistent across different cultural groups. Also in reference to the sample, no information was collected for the children who chose *not* to participate in the current study. It is possible that these children could have had some influence on the grade-level means for the sociometric variables. However, given the high rate of participation, it is unlikely that these individuals would have had substantial influence on the means scores for the grade-level sociometric variables.

As with other studies that have computed discrepancies by comparing self-report to sociometric data, the different scales of measurement used across raters could make self- and peer-reports less comparable to one another. For self-reports, possible scores ranged from 1 to 7; but for peer-reports, possible scores ranged from 0% to 100%. As a result, the scale for peer-reported rejection offers more potential variability than does the scale for self-reported rejection. Also, the type of scale (i.e. rating vs. nomination) was different across rater groups. Self-reports allowed children to identify where they fall on a continuum of rejection. In contrast, the sociometric nominations required peers to use their own internally-derived dichotomous rating system to determine if a child should be nominated for a sociometric prompt; these judgments were then combined across

classmates to create a continuous peer-reported rejection score. Differences in the current study's forms of measurement could be partially responsible for the presence of discrepancies in ratings and, as a result, have some influence on the study's findings. Ideally, discrepancy scores should be computed using scores generated from identical scales. The current study attempted to reduce the influence of differing scales of measurement by standardizing the self- and peer-reports prior to computing the difference scores. Further, by comparing the study's data to data from other studies, particularly those that very similar scales across raters (e.g., Hoza et al., 2004; Mikami et al., 2010), there is reason to believe that discrepant ratings in this study are not simply a result of differing scale characteristics.

Also, similar to previous investigations of discrepant ratings, the current study did not provide children with a concrete point of reference from which to base their evaluations of social rejection. In other words, children were *not* explicitly instructed to determine their, or others', level of rejection compared to "*other children in your class*," "*other children in your grade*," "*other children in your school*," or "*other children your age*." If children and their peers use different points of comparison when assessing levels of social rejection, perhaps as implied through the form of measurement, discrepant ratings could result. The goal of analyzing discrepant ratings is to identify children who are *truly* biased and determine if they possess unique characteristics that could be important to understanding maladaptive behaviors, social relationships, and cognition. Without specifying the same point of reference for multiple raters, the identification of truly biased children becomes less accurate.

Directions for Future Research

The nontraditional method of analyzing discrepancy scores utilized in this study produced many novel results that should be interpreted with caution until replication studies are conducted. Future research on inter-rater discrepancies should attempt to replicate these findings in samples more comparable to those of previous studies (e.g., U.S. samples) using measures that are more consistent with previous research (e.g. Harter Self-perception Profile for Children; Harter, 1985). Additionally, the measures used to generate discrepancy scores should be nearly identical, with similar formatting and clearly specified points of reference for all raters.

Given the results of this study, researchers should continue to explore aggressive, withdrawn, and prosocial behaviors as potential associative or mediating factors for inter-rater discrepancies. High levels of social activity and aggression may be unique to positively biased children while low levels of prosocial behavior may be characteristic of both positively and negatively biased individuals. However, additional studies are warranted to determine if these behaviors are in fact unique to biased individuals and if any specific cognitive styles, social skills deficits, or levels of motivation may explain the relationship between social behaviors and discrepant ratings of social performance.

As mentioned earlier, longitudinal investigations that account for shared method variance and test for direction-specific effects are needed to more clearly determine the potential risk or protective functions of discrepant ratings over time. Although several longitudinal studies have been conducted, their findings could misrepresent the actual influence of discrepant ratings on childhood adjustment due to the issues presented in this study. With more accurate information about how biased self-perceptions affect

childhood adjustment, researchers could refine theoretical explanations for discrepant ratings and generate more specialized treatment programs for biased children, if necessary.

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Appendices

Appendix A: Measures of Self-perceived RejectionGlobal Rejection:

Strongly disagree

Strongly Agree

1. I feel like I'm rejected by others

1 2 3 4 5 6 7

Specific Rejection:

Strongly disagree

Strongly Agree

1. My peers call me names

1 2 3 4 5 6 7

2. My peers pick on me

1 2 3 4 5 6 7

3. My peers say mean things about me

1 2 3 4 5 6 7

4. My peers make fun of me

1 2 3 4 5 6 7

5. My peers hurt me

1 2 3 4 5 6 7

6. My peers hit or kick me

1 2 3 4 5 6 7

Appendix B: Measure of Self-Esteem

	Strongly disagree				Strongly Agree		
1. At times I think I am no good at all	1	2	3	4	5	6	7
2. On the whole, I am satisfied with myself	1	2	3	4	5	6	7
3. All in all, I am inclined to feel that I am a failure	1	2	3	4	5	6	7
4. I take a positive attitude toward myself	1	2	3	4	5	6	7
5. I feel that I have a number of good qualities	1	2	3	4	5	6	7
6. I feel I do not have much to be proud of	1	2	3	4	5	6	7

Items 1, 3, and 6 were reversed prior to mean computation.

Appendix C: Measure of Negative Affect

	Strongly disagree				Strongly Agree		
1. In the past couple of weeks, I have felt unhappy	1	2	3	4	5	6	7
2. In the past couple of weeks, I have felt down	1	2	3	4	5	6	7
3. In the past couple of weeks, I have felt sad	1	2	3	4	5	6	7

Appendix D: Sociometric PromptsOvert Aggression:

1. Who in your class fights with others?
2. Who in your class pushes, kicks, or punches others?
3. Who in your class says mean things about others?

Relational Aggression:

4. Who in your class says mean things about others?
5. Who in your class ignores others or stops talking to them?
6. Who in your class gossips or spreads rumors about others?

Prosocial Behavior:

7. Who in your class helps others?
8. Who in your class is friendly and easily approachable?
9. Who in your class cooperates and shares with others?

Withdrawn Behavior:

10. Who in your class spends time alone?
11. Who in your class keeps to him/herself?
12. Who in your class prefers to keep his/her distance from others?

Global Rejection:

13. Who in your class do you like the least?

Specific Rejection:

14. Who in your class is victimized (e.g., made fun of or put down) by others?
15. Who in your class gets pushed around by others?