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A social relations analysis of liking for and by peers: Associations with gender, depression, peer perception, and worry

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ABSTRACT

Keywords:

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Depression
Social anxiety
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We used social relations modeling (SRM; mixed modeling and SOREMO) to examine liking among peers (*affective preferences*) in relation to gender and socioemotional problems. Participants ($N = 278$, age 10 to 13) rated how much they liked each other and reported depressive symptoms, negative beliefs, and social worries. Boys and girls were equally liked, but liked same-gender more than cross-gender peers. Genders showed similar consensus about liking for same-gender peers; rater differences were important for cross-gender liking. Depressed preadolescents were liked less but did not like classmates less. Participants who attributed more negative qualities to peers were less liked and liked others less. SRM showed no associations between worry and affective preferences, whereas others analyses indicated those with high worry were less liked. SRM results were compared to results using more typical methods, and recommendations were made for using same-gender vs. cross-gender ratings and summary affective preference scores.

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Peer acceptance or rejection is seen as an important factor for young people's behavior, mental health and success at school and beyond (e.g., see Parker, Rubin, Price, & DeRosier, 1995 for a review). Studies in this area have benefited from the development of methods in which children's or adolescents' acceptance and rejection (affective preference) are determined based on the aggregate of all nominations or ratings received from classmates or grademates.

Aggregated affective preference has been shown to be associated with children's and adolescents' externalizing and internalizing symptoms. Regarding externalizing behaviors, reviews (Bierman, 2003; Geiger, Zimmer-Gembeck, & Crick, 2004; Parker et al., 1995) describe how young people who are less liked also are regarded as more physically or relationally aggressive, whereas accepted peers are seen as more prosocial. Regarding internalizing symptoms, adolescents who are less liked have been found to show more depressive symptoms (Hecht, Inderbitzen, & Bukowski, 1998; Martin, Cole, Clausen, Logan, & Stroscher, 2003; Parker & Asher, 1987; Rose & Rudolph, 2006; Rudolph, Hammen, & Burge, 1994, 1997). It is known that such symptoms tend to entail negatively biased cognitions about relationships, such as negative views of acceptance by others (McCarty, Vander Stoep, & McCauley, 2007; Rudolph & Clark, 2001; Rudolph, Hammen, & Burge, 1997; Zimmer-Gembeck, Hunter, & Pronk, 2007). Yet, less clear is whether socioemotional problems also lead to lower affective preferences for others. Such information is needed to account for the conjoint roles of individual cognitive biases and social behaviors when explaining why adolescents with socioemotional problems have difficulties with peer relationships. In the current study, we examined associations between affective perceptions and socioemotional problems, taking into account the views of each member of classroom peer groups. The results provide information about the roles of *the individuals and peers in*

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socioemotional and peer relationship problems, which is critical for interventions designed to reduce socioemotional problems and to promote positive peer relationships.

Participants' gender also was assumed to play a key role for two reasons. First, among children and adolescents, gender has been associated with affective preferences, both in terms of how much one likes a person as well as how much one is liked by the other (Card, Hodges, Little, & Hawley, 2005). Second, gender is associated with socioemotional problems; girls show higher depressive symptomatology and anxiety beginning in early adolescence (Rose & Rudolph, 2006). Hence, we accounted for the role of gender when examining associations between affective preferences and socioemotional functioning.

The participants were preadolescents between the ages of 10 and 13 years. These ages were selected because of the heightened importance of peer relationships at this age (Rose & Rudolph, 2006), the known preponderance of gender segregated peer groups (Maccoby, 1998), the rise in socioemotional problems that is manifest or about to occur (Rose & Rudolph, 2006), and the association between peer problems and socioemotional problems at this age (Zimmer-Gembeck et al., 2007; Zimmer-Gembeck, Hunter, Waters, & Pronk, 2009). Preadolescence may also be a particularly important time for intervention to reduce the likelihood of continuing problems with peers and escalation in socioemotional and other difficulties.

Q3 Conceptual framework and statistical methodology

We relied upon the social relations model (SRM; Kenny, 1991, 1994) for conceptual guidance and statistical techniques. The SRM allowed us to simultaneously account for being liked by peers and liking for others. When data are available from group members who rate how much they like each other, SRM accounts for variance in affective preferences due to the persons being rated, the persons giving the rating, and the effects of dyads. Consider the following example: Jodi provides a rating of how much she likes Naomi. This rating can be influenced by Naomi and characteristics of Naomi (a target effect on liking), such as friendliness or other behaviors, but is likely to be influenced by Jodi's views of other people, too (a rater effect on liking). Particular aspects of the relationship between Naomi and Jodi may also be influential (a dyad effect on liking). Jodi can behave in ways that deflate Naomi's typical friendly behavior or Jodi and Naomi can share common interests that result in similar ratings of each other. Although the current study was a cross-sectional study with correlational results, we use terminology typical when using SRM by referring to these three sources of variances as target effect, rater effect and dyad effect.

Although this method can proportion variance to target, rater and dyad, it is not clear what accounts for these effects unless "fixed factors" are considered in the SRM model. Preadolescents' self-reports of depressive symptoms, attributions of negative qualities to peers (peer-relevant cognitions), social worry, and gender were fixed factors investigated in the current study. We examined how levels of depressive symptoms, attribution of negative qualities to peers and relationship worries were associated with how much participants were liked by others and how much they liked others. We also examined gender as a correlate of liking for and by peers.

Target, rater and dyad effects in preadolescents' affective preferences

There are many benefits of using nomination or rating inventories to assess affective preferences. Participants usually nominate from a list of others in a group (e.g., in their class or grade) or rate affective preferences for every other person on a continuous scale. These assessments provide a sound measure of *generalized affective preferences*, which can be seen as the aggregate of target, rater, and relationship contributions to affective preferences. However, the use of such a round robin design, in which all members of a group rate all other members, has rarely been used to full advantage when studying child or adolescent affective preferences (for exceptions, see Card et al., 2005; Malloy, Sugarman, Montvilo, & Ben-Zeev, 1995). Commonly, peer ratings have been used only to index affective preferences for the target, based on the assumption that variation in affective perception are sufficiently explained by the child being perceived, over and above influences from characteristics of the child who is perceiving the other and the partners' relationship characteristics (Simkins & Parke, 2002). However, all three sources of variance are emphasized in contemporary theories about the nature of social relationships (e.g., Duck, Acitelli, Manke, & West, 2000; Dunn, 1997; Simkins & Parke, 2002), in theories that attempt to integrate individual differences in behavior and perception with person-environment dynamics and processes (Mischel & Shoda, 1998), and in studies that aim to understand perceptual processes that are formed by individuals' and others' opinions and filtered through subjective experience (Christensen & Kashy, 1998; Kenny, 1994; Marcus & Askari, 1999; Robins, Mendelsohn, Connell, & Kwan, 2004).

Given there have been so few studies applying the SRM to peer affective preferences, it is difficult to determine the degree to which targets, raters and dyads account for preference. Hence, some of the following study hypotheses had to be delineated from related bodies of work. First with regards to *target effects*, they have been described as indicators of the strength of group consensus about a specific child (Malloy et al., 1995), we expected a strong target effect for affective preferences. Kenny (1991) argued that six factors determine group consensus: exposure to the target, different rater's exposure to the same behavior, behavioral consistency of the target, shared meaning systems (common interpretation of target behavior by raters), information beyond the targets' behavior that affects the raters' judgments, and discussion of targets' characteristics among raters. Thus, we expected that consensus would be high when studying preadolescents' affective preferences because all share exposure to each other in the classroom, all are likely to notice behavioral consistency, and there is frequent talk about each other. Second, we also expected that *rater effects* on affective preferences would be similarly strong, because each target

in a classroom is also a rater and young people have been shown to show individual preferences and differences when rating the same peer (Card et al., 2005; Malloy et al., 1995).

Third, it was difficult to anticipate how much of the variance in liking would be due to the relationship. Nevertheless, we expected dyadic reciprocity to be high, because familiar pairs tend to have similar affective preferences for each other (either liking or disliking each other; Hartup & Abecassis, 2002; Park & Fink, 1989). In support of mutual like and dislike within pairs and groups, one previous study reported a dyadic reciprocity correlation of .29 and a generalized reciprocity correlation of .33 in an SRM analysis of preadolescents in grade 6 (Card et al., 2005). These two correlations indicate that liking scores within dyads tend to covary (i.e., if A liked B, B liked A), and that preadolescents who report more liking of others are also more liked themselves. We expected similar findings.

Correlates of preadolescents' affective preferences

Gender

Gender segregation is prominent in toddlerhood and seems to peak in late childhood and preadolescence (Eisenberg, Martin, & Fabes, 1996; Maccoby, 1998; Ruble & Martin, 1998; Strough & Covatto, 2002). Most preadolescents spend much more time with same-gender peers than with peers of the other gender at school (Sroufe, Bennett, Englund, Urban, & Shulman, 1993; Strough & Covatto, 2002), have gender preferences for social interaction (Eisenberg et al., 1996; Fabes, 1994; Maccoby, 1998; Zarabatany, Hartmann, & Rankin, 1990), and like members of their own gender more than the other gender (Bukowski, Gauze, Hoza, & Newcomb, 1993; Card et al., 2005). Low cross-gender interaction frequency and gender-specific preferences are accompanied by less communication and separate shared meaning systems; thus, boys likely know less about girls than about other boys, and vice versa. Since familiarity and shared interests are key ingredients of liking and friendship (Kandel, Davies, & Baydar, 1990; Vanzetti & Duck, 1996), cross-gender dyads are expected to report less liking than same-gender dyads because there is less actual and perceived similarity in interests and fewer positive interactions. When all individuals in a classroom are asked to make affective judgements of each other, cross-gender dyads can be expected to rely more on stereotypes and perceived differences than same-gender dyads. In SRM terms, this implies that the target effect (i.e., consensus) will be less strong than the rater effect for cross-gender ratings when compared to same-gender ratings, because it is more likely that individual schemas, biases and preferences are relied upon when individuals rate others with whom they are less familiar. Most importantly, as was found in a prior study (Card et al., 2005), an interaction effect is anticipated whereby boys are expected to like boys more than girls, and girls are expected to like girls more than boys.

Depressive symptoms

Depressed children and adolescents are known to have perceptual biases that are relevant to their interactions with classmates and are linked to lower acceptance within the peer group (Rose & Rudolph, 2006). For example, students who report high levels of depressive symptoms tend to be less liked by their classmates (Caldwell, Rudolph, Troop-Gordon, & Kim, 2004; Levendosky, Okun, & Parker, 1995; Vernberg, 1990), which provides indirect evidence for Coyne's (1976a, 1976b) view that people eventually reject depressed individuals because of repeated, negatively valenced social interactions. Several theories (Coyne, 1976b; Crick & Dodge, 1994; Hammen, 2005; Joiner, 2000; Sacco & Dunn, 1990; Segrin, 2001) draw attention to the proximal thinking patterns and social behaviors found among depressed individuals. Overall, theories and previous research suggest that our findings will show preadolescents with more depressive symptoms to be rated as less liked by their peers.

It was difficult to predict whether depressed compared to nondepressed preadolescents would indicate less liking for their peers. Although negative cognitive appraisals have been found to be more prevalent among preadolescents who report more depressive symptoms than others (e.g., McCarty et al., 2007; Rudolph & Clark, 2001; Rudolph et al., 1997), these are usually appraisals of the self in relationships (e.g., self-perceptions of social competence or likelihood of rejection by others) rather than affective perceptions (i.e., liking) for others. In the one previous study that used SRM (Marcus & Askari, 1999), there was no evidence that dysphoric undergraduate students (those with Beck Depression Inventory scores above 10) liked others less than nondysphoric persons after short dyadic interactions with each other.

Peer-relevant cognitions

One potentially important aspect of peer-relevant cognitions is one's own understanding of how much others accept or reject them, sometimes called "meta-perception" (Bellmore & Cillessen, 2003; Kenny, 1994). Another component is the tendency to view peers as mean and untrustworthy rather than as available and dependable (Downey & Feldman, 1996; Downey, Lebolt, Rincon, & Freitas, 1998; Rudolph & Clark, 2001; Rudolph et al., 1997). Negative views of peers have been associated with affective preferences both theoretically (Harter, 1999; Leary & Downs, 1995; Leary, Schreindorfer, & Haupt, 1999) and empirically (Crick & Ladd, 1993; Rudolph, Hammen, & Burge, 1995; Zimmer-Gembeck et al., 2007). Thus, peers would rate classmates with a high level of negative peer-relevant cognitions as less liked. In SRM terms, we expected the target effect on liking to be strongly associated with preadolescents' negative peer-relevant cognitions.

Regarding the effect of raters' peer-relevant cognitions on their own liking of others, no previous study has been conducted. Yet there was enough support in other literature to make us expect that participants with elevated negative peer-relevant cognitions would indicate less liking for their peers. In particular, negative peer-relevant cognitions are likely to reflect dissatisfaction with peer relationships. Relationship satisfaction and liking for another have been considered as associated aspects of relationship quality (e.g., Furman & Buhrmester, 1985, 1992) and have been described as two related elements of the quality of friendships that are important to social development (Berndt, 2002).

Social worry

Finally, general social worry may be associated with liking for and by peers. Young people have been found to ignore or neglect socially inhibited and wary peers (Rubin, Burgess, Kennedy, & Stewart, 2003; Rubin, Chen, & Hymel, 1993; Younger, Schneider, Wadeson, Guiguis, & Bergeron, 2000), socially anxious children are more likely to be rejected (Rubin, Hymel, & Mills, 1989), and rejected and neglected adolescents tend to report more social anxiety than accepted peers (Interbitzen, Walters, & Bukowski, 1997). Although the measure included here tapped worries about social interactions rather than social anxiety or social withdrawal, we relied on these previous findings to hypothesize that preadolescents with heightened levels of social worry will be less liked by their classmates.

There is even less literature to guide a hypothesis about social worry and liking for others. Studies have shown that individuals with clinical levels of social anxiety have a range of cognitive biases when interpreting social information (e.g., Banerjee & Henderson, 2001; Bell-Dolan, 1995; Chansky & Kendall, 1997; Muris, Merckelbach, & Damsma, 2000). Although there is no SRM study of children or adolescents that examined the role of social anxiety or social worry in affective preferences, one previous study of undergraduate students (Christensen, Stein, & Means-Christensen, 2003) showed that those with social phobia compared to controls rated others more negatively after brief dyadic interactions. We expected that elevated levels of social worry would tap both subclinical and clinical levels of social anxiety. Therefore, we expected that socially worried preadolescents would indicate less liking for others.

Study aims and hypotheses

In summary, the goals of the current study were to use SRM to determine how target, rater and dyad effects can explain liking for others and being liked by others, and how liking is associated with targets' and raters' gender, symptoms of depression, negative peer-relevant cognitions, and social worry. Both SPSS multilevel modeling and SOREMO (Kenny, 1998) were used. These analyses were complemented with typical analytical methods (*t*-tests, ANOVA and multiple regressions) to examine four sets of hypotheses. First, we hypothesized that the target and rater would account for significant and about equal proportions of variance in affective perceptions, and that significant dyadic reciprocity in affective perceptions would exist. Second, we expected that target and rater gender would be associated with ratings received and given, with boys liking boys more than girls and girls liking girls more than boys. Third, preadolescents high in depressive symptoms would be less liked by others, but it was not expected that they would necessarily like others less than nondepressed participants. Fourth, preadolescents with high negative peer-relevant cognitions and social worry would be less liked and like their peers less. Gender was accounted for when testing the final two sets of hypotheses, given the widely documented gender differences in depressive symptoms, social anxiety, and peer-relevant cognitions (Rose & Rudolph, 2006).

Method

Participants

Participants were 278 students from 15 classrooms in three public (state) schools who had parental consent to participate; the study had approval by human subject review boards (university and state education department). The number of participants per classroom ranged from 10 to 25 students. The consent rate was just over 75%, and each classroom had a rate over 70%. Participants were in grades 6 and 7; age ranged from 10 to 13 ($M = 11$, $SD = .9$), and there was an equal number of boys ($n = 139$) and girls ($n = 139$). In the area of Australia where this study was conducted, students are in primary school from grades 1 to 7 and move to high school (or "college") for grades 8 to 12.

The schools were moderate in size (500–800 students). Two schools served primarily low-middle-income areas, whereas the third school had a primarily middle-income student population. The participants were representative of their communities; most were White Australian (87%), 8% were Aboriginal Australian or Pacific Islanders (e.g., Maori, Samoan), 3% Asian, and 2% African or South American.

Parents reported their education and family composition as part of the consent process. Of the mothers, 23% had completed high school only, 32% had left high school after 10th grade (which is relatively common in Australia), 10% had left prior to 10th grade, 22% completed vocational school, and 10% had a university degree. Fathers' education levels were similar: 31% high school completion only, 29% 10th grade completion only, 8% left high school prior to 10th grade, 21% had just vocational training, 11% a university degree. Most children lived with two parents (68%) or with their mother only (27%).

Procedure

Questionnaires were administered to participants in their classrooms during school hours in the third quarter of the school year; sessions lasted approximately 45 min. Questionnaires included questions about age, gender and ethnicity, as well as about depressive symptom, social anxiety, and peer-relevant perceptions, and ratings of peer liking in a round robin design (Card & Little, 2005; Malloy et al., 1995).

Instructions and all questions were read aloud. Individual debriefing was made available to students following the data collection and a parent was notified if his/her child scored above 20 (in the clinical range) on the measure of depressive symptoms. Participants received a school-related gift at the time of testing and teachers received small gifts (chocolates). The classroom with the highest rate of returned consent forms (regardless of participation) received a lunch.

Measures

Peer rating inventory: liking

Each participant rated each classmate on a 5-point scale ranging from 1 (*do not like at all*) to 5 (*like a lot*). On average, classrooms had 19 participating students, so each child received an average of 18 ratings. For brevity, we refer to this measure as 'liking'. For some analyses, ratings for each child were averaged so that each child received a continuous score (ranging from 1 to 5), with higher scores indicating more liking. Gender-specific average liking scores were created for rating of girls by girls, ratings of girls by boys, ratings of boys by boys, and ratings of boys by girls.

Depressive symptoms

The Children's Depression Inventory (CDI; Kovacs, 1985) was used to assess depressive symptoms. The CDI is a widely used, 27-item self-report questionnaire designed to measure the presence and severity of a wide range of depressive symptoms. For each item, respondents were required to choose one of three statements. Summing responses across all items formed the overall score, so that higher scores reflected more severe symptoms. The scale showed high internal consistency, $\alpha = .88$.

Negative peer-relevant cognitions

The Perception of Peers and Self Questionnaire (POPS; Rudolph et al., 1995, 30 items) was used to measure perceptions of acceptance by peers ("self" subscale) and perceptions of peers ("peer" subscale). Each subscale contained 15 items. The self subscale measured perceptions of one's own social acceptance by peers and failures in the context of peer relationships, and tapped what adolescents think and feel about themselves within the peer domain (e.g., When other kids do not want to be around me, it's probably because there's something wrong with me; responses from 1 (*almost never*) to 5 (*almost all the time*)). The peer subscale measured generalized perceptions of peers and friendship along dimensions such as lack of dependability and unsupportiveness (e.g., "Other kids will try to put you down or tease you if they have a chance"; scale from 1 (*almost never*) to 5 (*almost all the time*)). The scales had high internal consistencies, self $\alpha = .74$, peer $\alpha = .78$. Because of the high correlation between the subscales and their similar correlations with other measures (see Table 1), subscales were averaged to form one measure of negative peer-relevant cognitions.

Social worry

The Social Worries Questionnaire – Pupil (SWQ; Spence, 1995) was used to assess general concerns about social events and interactions. Participants reported their nervousness in with regard to 13 social situations (e.g. going to parties, meeting new people; on a scale from 0 (*not true*) to 2 (*mostly true*)). Total scores were calculated as sums across all situations, with higher scores reflecting a greater level of worry. The scale has good internal reliability, with $\alpha = .82$ (Sofronoff, Attwood, & Hinton, 2005) and $\alpha = .77$ (Spence, Donovan, & Brechman-Toussaint, 2000). Interitem consistency in the current study, $\alpha = .83$, matched consistency found in previous studies.

Table 1
Correlations between measures ($N = 278$).

	1	2	3	4	5	6	7	8	9
1 Liking of others	–								
2 Liking of same-gender others	.71**	–							
3 Liking of cross-gender others	.85**	.30**	–						
4 Liking by others	.33**	.21**	.33**	–					
5 Liking by same-gender others	.16**	.29**	.03	.80**	–				
6 Liking by cross-gender others	.29**	.11	.40**	.83**	.44**	–			
7 Depressive symptoms	–.10	–.11	–.04	–.20**	–.18**	–.13	–		
8 Negative peer-relevant cognitions	–.25**	–.19**	–.21**	–.28**	–.25**	.20**	.61**	–	
9 Social worry	–.11	–.05	–.12*	–.17**	–.11	–.17**	.40**	.45**	–
M	3.31	3.81	2.85	3.32	3.81	2.86	8.31	7.42	1.80
SD	.53	.58	.73	.59	.68	.70	7.45	4.75	.42

* $p < .05$. ** $p < .01$.

Overview of the data analytic strategy

We used multilevel modeling procedures (available in SPSS) to conduct the primary SRM analyses with round robin data (Card et al., 2005; Card & Little, 2005; Kenny, 1994, 1998), and confirmed the primary analyses with SOREMO. In the multilevel models, the variance in liking was partitioned into three parts: the variance due to individual differences in raters (rater effect), the variance due to individual differences in targets of ratings (target effect), and the variance due to relationships (dyad effect). In SOREMO, rater and target variance were estimated. Multilevel modeling and SOREMO make these estimates without assuming that ratings are independent from each other. Additionally, SOREMO was used to estimate generalized and dyadic reciprocity between liking ratings. Generalized reciprocity indexed the association between ratings made by groups of individuals and the received ratings of group members. Dyadic reciprocity indexed similarity in ratings between pairs of participants.

To examine depressive symptoms, negative peer-relevant cognitions and social worry in these models, the continuous scores were transformed into dichotomous variables to indicate typical as compared to extreme levels of each. After reviewing theories and empirical literature, we expected that depressive symptoms, negative peer-relevant cognitions and social worries would become relevant for peer interactions only at a higher than typical level. Thus, dichotomizing measures resulted in comparisons of typical groups to those who had extreme values. In addition to this theoretical reason for dichotomizing measures, there also was an empirical reason. Model stability could be compromised when continuous variables were used because ~~we~~ there were not large enough numbers of participants at ~~each~~ of the continuous levels. Forming dichotomous variables provided sample sizes within each of the groups that were sufficiently large for stable estimates of effects.

Dichotomous scores were formed by recoding scores in the top quartile as 1 and other scores as 0. Participants with a CDI score above 12 were identified as high in depressive symptoms ($n = 61$, 22% of boys and 22% of girls) and the other 217 participants were placed in the normative (low depressive symptoms) group. Those with a score of 2 or more were identified as having high negative peer-relevant cognitions ($n = 72$, 31% of boys and 20% of girls); 207 were considered low in negative peer-relevant cognitions. Preadolescents with a score above 10 were identified as having high social worry ($n = 69$, 24% of boys and 26% of girls), whereas the other 209 were considered to be low in social worry.

To confirm findings based upon these dichotomous variables, we also used SOREMO to output estimates of rater and target variance in each child's affective preferences and correlated these with continuous scores for depressive symptoms, negative peer-relevant cognitions and social worry. These analyses yielded two sets of results. First, multilevel modeling tested whether liking for and by others differed between preadolescents who were high compared to low in symptoms or relationship views and concerns. Second, correlations of rater and target variance with participants' symptoms tested whether those who were less liked and who liked others less also had relatively more depressive symptoms, negative ~~views~~ and social worry.

Results

Descriptive statistics, zero-order correlations, and comparisons of boys and girls

Means and SD's of each measure, and correlations between all measured variables are shown in Table 1. There were small to moderate correlations between measures of liking for and by others, ranging from $r = .03$ to $r = .40$. Two of these were not significant: Liking for same-gender peers ~~and~~ liking by cross-gender peers ~~was not related~~, $r = .03$, ~~as well as the converse, liking for cross-gender peers and liking by same-gender peers~~, $r = .11$.

Overall, preadolescents with more depressive symptoms were less liked by their peers, $r = -.20$, and less liked by their same-gender peers, $r = -.18$, both $p < .01$, but they were not less liked by cross-gender peers and did not like their classmates relatively less than those who were less depressed. Preadolescents who reported more social worry were less liked by peers, $r = -.17$, $p < .01$ and by cross-gender peers, $r = -.17$, $p < .01$, but not less liked by their same-gender peers. Participants with relatively more social worry liked their cross-gender peers somewhat ~~less than others~~, $r = -.12$, $p < .05$, but social worry was not associated with liking for same-gender peers. Negative peer-relevant cognition was significantly and negatively associated with all measures of liking for and by peers, r 's ranged from $-.28$ to $-.19$, all $p < .05$.

Variance in ratings and correlations

In a multilevel model without fixed factors, target, rater and dyadic variance in liking ratings were significantly larger than 0, with effects of .256, .179 and .029, respectively, all $p < .01$. Generalized and dyadic correlations between ratings were estimated with SOREMO.¹ The generalized correlation was $r = .22$, $p < .01$. This showed that liking for others was associated with how much they were liked by others and that affective preferences for others had some tendency to be reciprocated. As expected, the dyadic correlation was significant, $r = .51$, $p < .01$, indicating mutual like or dislike within dyads.

¹ All models summarized in Table 2 were estimated with SPSS multilevel modeling and SOREMO. SPSS results are reported in Table 2; results from SOREMO were quite similar to those from SPSS. SOREMO was used for estimating rater and partner variance ~~for each child~~, and for estimating generalized and dyadic reciprocity.

Table 2

Mixed modeling results for the fixed effects of gender, depressive symptoms, peer-relevant cognition and social concern on liking for and by peers.

Fixed effects	Model 1	Model 2	Model 3	Model 4
Gender of rater	–1.06 (.07)**	–1.06 (.07)**	–1.04 (.07)**	1.06 (.07)**
Gender of target	–.90 (.07)**	–.90 (.07)**	–.87 (.07)**	–.90 (.07)**
Gender of rater × Gender of target	1.85 (.06)**	1.84 (.06)**	1.84 (.06)**	1.84 (.06)**
Depression of rater	–	.02 (.07)	–	–
Depression of target	–	.22 (.08)**	–	–
Negative peer-relevant cognitions of rater	–	–	.21 (.07)**	–
Negative peer-relevant cognitions of target	–	–	.26 (.07)**	–
Social worry of rater	–	–	–	.07 (.07)
Social worry of target	–	–	–	.12 (.08)

Estimate is the value for the group coded 0 (e.g., boys or low depressive symptom group) compared to the group coded 1 (girls or the high depressive symptom group).

* $p < .05$. ** $p < .01$.

Liking for and by peers: gender, depression, peer-relevant cognitions and social worry

We next used SRM to examine how liking for peers and liking by peers were associated with gender, depressive symptoms, negative peer-relevant cognitions, and social worry. Four SRM models¹ were estimated (see Table 2). The first model focused on gender. The second model focused on depressive symptoms after accounting for gender; the third model focused on peer-relevant cognitions after accounting for gender, and the fourth model was examined social worries. After this, another three models were re-estimated for subgroups of participants separated by gender of target and rater.

Gender

There was a significant association between liking and the interaction of gender of the rater and gender of the target (see Table 2). As expected, boys liked boys more than girls and girls liked girls more than boys. In both cases, children rated their own gender about one point higher than the other gender; $M \approx 2.8$ for cross-gender ratings, $M \approx 3.8$ for same-gender ratings.² In addition, there was a small main effect of gender of the rater, but no effect of gender of the target on liking. Boys liked others less than girls did (rater effect), M boys = 3.26 vs. M girls = 3.39, $p < .05$, but boys and girls were not differentially liked by others, M boys = 3.34, M girls = 3.31, ns .

When the round robin design was split into two round robin designs with boys only or girls only, target and rater effects were significant for boys' ratings of boys, .318 and .169, respectively, both $p < .01$. Similarly, target and rater effects for girls' ratings of girls were .336 and .220, both $p < .01$, and were not different from boys' ratings of boys.

When the round robin design was split into two half-block designs with only boys' ratings girls or only girls' ratings boys, there were gender differences in ratings. When boys rated girls, the target effect was similar to when they rated boys, .299 vs. .318, but the rater effect on liking was significantly larger when boys rated girls rather than boys, .248 vs. .169, $p < .05$. Hence, boys' consensus about their liking for girls was similar to their consensus when rating boys, but boys' individual differences in preferences were more important to their liking of girls than boys. Girls' ratings of boys showed a similar pattern. When girls rated boys, the target effect was similar to when they rated girls, .298 vs. .336, but the rater effect on liking was significantly larger when they rated boys rather than girls, .424 vs. .220, $p < .05$. Hence, girls' consensus about their liking for boys was similar to their consensus about girls, but girls differed more in their liking of boys than in liking of girls.

Depressive symptoms

After accounting for gender of the actor, target and the gender interaction, participants' own depressive symptoms were not associated with their ratings of others (see Table 2). Note that this is the case even when just extreme levels of depressive symptoms were considered. However, depressive symptoms were associated with ratings received from others. Depressed preadolescents were overall less liked than others, liking $M = 3.15$ for depressed, $M = 3.37$ for nondepressed, $p < .01$.

Multiple regression modeling was used to confirm the association of raters' and targets' depressive symptoms with affective preferences after accounting for gender. Most results were consistent with SRM. Target variance was significantly associated with depressive symptoms, $\beta = -.22$, $p < .01$, showing that preadolescents were relatively less liked when they had more depressive symptoms. Rater variance was not significantly associated with depressive symptoms, $\beta = -.11$, ns , confirming that there was no association between depressive symptoms and how much participants liked their peers.

Negative peer-relevant cognitions

After accounting for gender, negative peer-relevant cognition was associated with how much preadolescents liked others and how much others liked them (see Table 2). Preadolescents who had high negative peer-relevant cognitions liked others less, $M = 3.16$ and 3.37, respectively, $p < .01$. Children with high negative peer-relevant cognitions also were less liked,

² Estimated marginal means are reported.

$M = 3.09$ and 3.37 , respectively, $p < .01$. Multiple regression results were consistent with these results. Rater variance was associated with negative peer-relevant cognitions, $\beta = -.23$, $p < .01$, and so was target variance, $\beta = -.31$, $p < .01$.

Social worry

After accounting for gender of the actor, target and the gender interaction, neither social worry of the rater or the partner was associated with liking (see Table 2). Somewhat in contrast, multiple regression modeling showed that participants with more social worry were less liked by others, with a negative association of social worry with target variance, $\beta = -.22$, $p < .01$. However, there was no association of social worry with rater variance, $\beta = -.12$, $p = .053$, showing that participants with more social worry did not like their peers less than those with less social worry.

Follow-up group comparisons

To follow-up the SRM and multiple regression analyses, boys' and girls' mean levels of liking for and by peers were compared (see Table 3). Boys' ratings of boys and girls, and girls' ratings of boys and girls also were compared using paired t -tests (see Table 3). Findings were consistent with other analyses. Girls liked others more than boys did, boys liked boys more than girls, and girls liked girls more than boys. There was no significant difference in how much boys and girls were liked by others or by their same-gender classmates. However, boys liked girls slightly more than girls liked boys.

Finally, 2 (group) \times 2 (gender) ANOVAs were used to compare children classified as high or low in depressive symptoms, negative peer-relevant cognitions and social worry (see Table 4). As was found previously, participants reported less liking for classmates who had high depressive symptoms compared to those with low symptoms, but liking for participants with high or low social worry did not differ. Consistent with others findings, there was no average difference in liking for others in comparisons of depressed versus nondepressed groups and groups with high versus low social worry. Also as was found previously, preadolescents were less liked and liked their classmates less, on average, when they were high rather than low in negative peer-relevant cognitions.

Discussion

The goal of the current study was to identify intraindividual processes involved in preadolescents' affective perceptions. Toward this aim, a social relations model (SRM) was used to investigate gender-based and individual perceptual processes that can be responsible for naturally occurring perceptions of like and dislike within everyday classroom-based peer groups. The SRM is based on the expectation that the perceiver and the target of perception would reciprocally influence each other. Hence, when affective perceptions are gathered for all classmates, the reciprocal nature of the perceptions can be modeled by accounting for perceiver, target and dyad effects. A secondary aim of the study was to determine whether affective perceptions are associated with gender, symptoms of depression, attributions of negative characteristics to peers (negative peer-relevant cognitions), and worries about social interactions.

Previous research has shown that liking in the peer group depends upon gender of the rater, gender of the target, and the gender mix of the dyad (e.g., Card et al., 2005). Findings of the current study support this and also confirm prominent same-gender preferences in preadolescents (Bukowski et al., 1993; Strough & Covatto, 2002; see Eisenberg et al., 1996; Ruble & Martin, 1998 for reviews). In particular, findings showed that boys like boys more than girls, girls like girls more than boys, and that there is a slight gender difference in overall affective preference for others, with girls liking others slightly more than boys like others. The current study shows that this difference can be explained by a gender difference in cross-gender ratings: Girls liking of boys was slightly greater than boys' liking of girls; same-gender affective preferences were about the same among girls and boys.

The SRM gave us a framework for thinking of perceptions as influenced by the perceiver, the target of the perception and the relationship between perceiver and target; these influences were referred to as rater, target and dyad effects. Because the target effect is described as an indicator of consensus among participants and the rater effect partials out individual differences in ratings of the same others, we expected both target and rater effects to be prominent and similar in magnitude. This

Table 3

Simple gender comparisons ($N = 278$).

	All, $N = 278$		Boys (B), $n = 139$		Girls (G), $n = 139$		B vs. G $t (277)$
	M	SD	M	SD	M	SD	
Liking of others	3.32	.59	3.24	.49	3.38	.56	−2.11*
Liking by others	3.32	.59	3.33	.57	3.30	.61	.40
Liking by same-gender others	3.81	.68	3.75	.68	3.87	.68	−1.41
Liking by cross-gender others	2.86	.70	2.95	.66	2.77	.75	2.18*
Boys' liking of others	3.24	.49	3.75	.68	2.77	.75	14.14****
Girls' liking of others	3.38	.56	2.95	.66	3.87	.68	14.74****

* $p < .05$. ** $p < .01$.

^a Paired t -test.

Table 4Associations of liking with children's depressive symptoms, negative peer-relevant cognition and social concern after adjusting for gender ($N = 278$).

	Low		High		$F(1,275)$
	M	SE	M	SE	
Depressive symptoms	$n = 217$		$n = 61$		
Liking of others	3.32	.04	3.29	.07	.18
Liking by others	3.37	.04	3.14	.07	7.23**
Negative peer-relevant cognitions	$n = 207$		$n = 72$		
Liking of others	3.38	.04	3.09	.06	17.41**
Liking by others	3.40	.04	3.09	.07	15.08**
Social worry	$n = 209$		$n = 69$		
Liking of others	3.34	.04	3.23	.06	2.10
Liking by others	3.35	.04	3.20	.07	3.26 ^a

Estimated marginal means are reported.

* $p < .05$. ** $p < .01$.^a $p = .072$.

was the case and findings were similar to two previous studies of affective preferences in preadolescents (Card et al., 2005; Malloy et al., 1995). Further, there was evidence for strong dyadic reciprocity in preferences, corroborating that there are peer dyads that have mutual like or dislike for each other. This indicates that in different settings, the networks of relationships can make a difference. There was also moderate generalized reciprocity among preadolescents; those who gave high ratings tended to receive relatively high ratings from others, and vice versa. Again, this is consistent with other research using peer reports of preadolescent and early adolescent children (Card et al., 2005).

There were also striking similarities in the pattern of target and rater effects when boys were examined separately from girls. When boys rated boys (and girls rated girls), the target and rater effects were similar to those found in the sample as a whole. Differences in this pattern only emerged for boys' ratings of girls and for girls' ratings of boys. In both boys and girls, consensus (the target effect) was weaker than individual differences in preferences (the rater effect) when members of the other gender were rated. Thus, boys' and girls' preferences are about equally accounted for by consensus and individual differences when they report preferences for their own gender, but consensus accounts for less variance than individual differences when preadolescents report their liking of the other gender. Overall, this suggests that gender segregation and comparably low familiarity with the other gender play a significant role in preadolescents' ratings of their classmates. This may also suggest that boys and girls converge in their liking of members of their own gender during preadolescence; liking of members of the other gender may indeed be more dependent on the rater (and his or her individualized experiences, attitudes and biases) than on the actual characteristics of the rated person.

When the SRM findings are considered along with the results from the traditional analyses that were conducted in the current study (simple correlations and multiple linear regressions), three implications emerged. First, there was evidence that limiting ratings (in a round robin design) to candidates of same-gender as the rater would result in higher average ratings for boys and for girls. Second, preadolescents' ratings of the opposite gender may be more a result of the characteristics (and personal experiences) of the rater than ratings for the same-gender. When, as is typical for most classrooms, about equal numbers of boys and girls participate and scores are aggregated across the peer group, this would likely not influence how ratings of liking are associated with other constructs. For example, more traditional analyses that limited scores for affective preference to same-gender ratings, showed results that were similar to those of the SRM after adjusting for gender of the rater and gender of the target being rated.

After accounting for the reciprocal influence of gender, findings also support the small but rapidly growing body of literature documenting how high but (usually) subclinical levels of depressive symptoms can play a role in the development of interpersonal difficulties (e.g., Caldwell et al., 2004; Zimmer-Gembeck et al., 2007, 2009). Preadolescents with more depressive symptoms were liked less than others and they attributed more negative qualities to their peers. However, depressive symptoms had little association with liking for peers at school. What does covary with such negative affective perceptions of peers are one's own perception of their low peer acceptance and negative beliefs about the traits and behaviors of peers, including believing peers to be mean and untrustworthy. It is these negative peer-relevant cognitions, rather than depressive symptoms, that were associated with both giving and receiving lower liking ratings. In sum, preadolescents who have more depressive symptoms also tend to have more negative peer-relevant cognitions; they perceive themselves to be less accepted and believe that their peers are more untrustworthy and mean. Nonetheless, they do not like their classmates less, even though they are slightly less liked. However, when preadolescents with very negative peer-relevant cognitions are identified, it is these preadolescents who like their classmates less and are less liked by their classmates.

Previous research has identified socially anxious individuals as less liked by others (Interbitzen et al., 1997; Rubin et al., 1989) and as having more negative thoughts about others (Christensen et al., 2003). Therefore, we anticipated that preadolescents' social worry would also be associated with their affective perceptions. Multiple regressions showed that participants with more social worry tended to be less liked, but SRM models showed that this association was not significant, even for those with extreme levels of social worry. More consistently, all analyses indicated that there was no association between

social worry and liking of peers. Thus, although social worry is associated with more negative peer-relevant cognitions, preadolescents with very high levels of social worry seem only to be marginally less liked and do not have lower affective preferences for their classmates when compared to those with less worry.

Our findings are consistent with previous research that focused on undergraduate students interacting with strangers or interacting with individuals in the same university course (Christensen & Kashy, 1998; Marcus & Askari, 1999). For example, individuals who report relatively more loneliness have been found to be more negative about their own likeability but not to like others less (Christensen & Kashy, 1998); undergraduate women who were high in depressive symptoms expected others to like them less but did not like others less (Marcus & Askari, 1999). However, our findings also diverge from some of these studies. For example, we found that preadolescents with high depressive symptoms were liked less than others, but Marcus and Askari (1999) did not find this among their sample of university women. Also, we found that preadolescents with high social worry were not liked less than others. In contrast, Christensen et al. (2003) reported that university students with high social anxiety were rated as less likeable than others after they engaged in short interactions with each other.

Possible explanations for inconsistencies across studies are the differing age of participants, differing levels of familiarity between participants, and choice of measurement. First, children, adolescents and adults likely differ in the features of others that influence their affective preferences, and there may be age-related changes in how individual characteristics influence affective preferences. This is true for gender; as children get older, preferences for the other gender can and do change (Collins & Sroufe, 1999; Strough & Covatto, 2002; Zimmer-Gembeck, 1999, 2002), and it could be true for other individuals characteristics such as aggression, assertiveness, impulsiveness and sociability (Bukowski, Sippola, & Newcomb, 2000; Pellegrini & Bartini, 2001; Pellegrini & Long, 2003). Second, familiarity is likely to influence affective perceptions. Liking for strangers after a short interaction may depend on quite different characteristics of the individual than liking for others where there is frequent interaction (Malloy & Albright, 1990), partly because there is more chance for consensus, group discussions, and social rules to be learned (Malloy et al., 1995). Third, although studies have used analytical methods similarly to those used here, a range of measures has been used to assess negative affect, depressive symptoms, social worry, anxiety and other internalizing symptoms. Because the focus is on social relationships, measures that tap overt displays of negative affect may provide different results than measures that focus only on easily masked worries. This may explain why the results for social worries in the current study diverged somewhat from previous studies of social anxiety. Overall, what is most apparent is the need for additional research to account for the roles of depressive or social anxiety symptoms in liking for and by others in males and females in many age groups. Moreover, given differences in preferred personality traits and behaviors between cultures (Card & Little, 2005), it is likely that diversity other than gender plays a role in liking for and by peers, and would be a useful direction for research on the formation of peer groups at school.

The findings in the current study support future consideration of reciprocal processes in interpersonal perceptions, and the consideration of multiple aspects of social perceptions including, for example, perceptions of the self in relationships, the perceptions of others views of the self, and the perception of the traits and behaviors of other people (e.g., see Hammen, 1992; McCarty et al., 2007; Rudolph et al., 1997). When multiple interpersonal perceptual elements are considered, all or some of our findings suggest that preadolescents with high levels of depressive symptoms and high social worry are less liked by others, but they do not have overly negative affective perceptions (liking) of others. This is consistent with the correlates of depression and anxiety identified in classic cognitive models of depression and related internalizing disorders (Beck, 1967; Coyne, 1976a, 1976b), and consistent with recent research focused on interpersonal correlates of depressive and anxiety symptoms (Hammen, 2005; Harter & Whitesell, 1996; McCarty et al., 2007; Rudolph & Clark, 2001; Rudolph, Lambert, Clark, & Kurlakowsky, 2001; Zimmer-Gembeck et al., 2007, 2009).

It is important to emphasize that these patterns culminate in being less liked by others and lower affective preference for classmates only when preadolescents have negative views of their peer acceptance and attribute more negative traits and behaviors to their peers. Consistent with these findings, rejection experiences and having more expectations of rejection have been associated with perceiving ambiguous interpersonal behavior as more uncaring, and with lower satisfaction with relationships (see Mort, 2006 for a review). When people anticipate dislike and rejection from others, they may be hyper-vigilant for rejection cues, interpret neutral events as hostile, and engage in negative behaviors that lead to being disliked and rejected. Theorizing about rejection sensitivity, hostile attributional biases, threats to self, and aggressive behavior suggest links that parallel such reciprocal processes within peer groups (Crick & Dodge, 1994; Dodge & Somberg, 1987; Downey, Bonica, & Rincon, 1999; Hubbard, Dodge, Cillessen, Coie, & Schwartz, 2001).

Some limitations of this study need to be considered when interpreting and generalizing the results. First, the study was limited to students in 15 classrooms. This can raise concerns about including too many fixed effects in a single model. Therefore, we did not examine the effect of depressive symptoms after adjusting for social worry or the effect of symptoms after adjusting for negative peer-relevant cognitions. The overlap in these measures should be kept in mind when interpreting results. Second, classmates were the focus. Findings may not apply to peer relationships outside of school. Third, rather than using clinical assessments of depression and anxiety, our assessment of depressive symptoms and social worry was based on commonly used self-report questionnaires and these were transformed into dichotomous indicators of high or low symptoms. Future research is needed to determine whether clinical mental health difficulties may have more detrimental influences on relationships with peers. Fourth, participants were ages 10–13 years in three schools. Although there was no school transition in the Australian context at this age, this is still a transitional age period in which peer relationships change rapidly, and so do perceptions and involvement with the other gender (Brown, 1990; Furman, Brown, & Feiring, 1999;

Zimmer-Gembeck, 2002). This can mean that the current study only captures the onset of relationship effects (which are based on familiarity and interaction) and that these effects may become even more powerful at later ages.

In conclusion, one purpose of the study was to isolate particular socio-cognitive biases and peer relationship difficulties during the preadolescent years that could assist in the refinement of interventions for young people who have socioemotional problems, such as depression and social anxiety. This information has been effectively applied in a treatment for girls with anxiety disorder and comorbid depression, in which cognitive behavioral therapy was integrated with interpersonal skills training (Waters, Donaldson, & Zimmer-Gembeck, 2008). The results also have implications for future research. Because SRM results were similar to those that were based on more traditional statistical methods with aggregated liking ratings, the findings provide confidence in past research that used aggregated scores. The findings of the current study also should assist with decisions about the collection of gender-specific versus cross-gender perceptions. At the same time, the separation of target, rater, and relationship effects opens up opportunities to move away from individual interpretations of difficulties in peer relationships, and to move toward assessments of reciprocal contributions within dyads and groups. This should eventually contribute to theory and research that acknowledges and empirically tests reciprocal processes in children and adolescents' social networks.

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