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Awareness of peers' judgments of oneself: Accuracy and process of metaperception

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This research focused on children's awareness of peers' social judgments of them, age differences in accuracy attained, and the process by which accuracy is achieved. Children were accurately aware of peers' perceptions of them on behavioral, social status, and ability dimensions in Grades 1 through 6. Older children were more accurate than younger children, yet even the youngest children were able to accurately infer peers' judgments of them. In terms of process, the best fitting model suggested that academic ability affects both self and others' (i.e., teacher and peers') perceptions, and that self-perception is the basis for predicting others' judgments of oneself. Because self and other perception have a common cause (i.e., academic performance) accuracy is achieved.

Keywords: accuracy of metaperception; interpersonal perception; metaperception; peer perception; social relations model

Do children know accurately how other children view their academic ability, deportment, social status, or affect? Although this basic question has received some empirical attention (e.g., Ausubel, Schiff, & Gasser, 1952; Cillessen & Bellmore, 1999; Felson, 1989), its implications for theory in social, developmental, educational, personality, and clinical psychology warrants additional research. This question is significant because awareness of others' judgments of oneself is considered to be a central process within symbolic interactionism (Cooley, 1902; Goffman, 1959), social learning (Bandura, 1969, 1986), social cognition (Dodge, 1986; Hartup, 1992), and interpersonal (Selman, 1980) theories of behavior. The present research addressed *metaperception* (predictions of others' judgments of oneself) among children in early and late middle childhood within the context of the classroom. The academic context is a setting where peers spend a significant proportion of their time, and the social cognitive processes operating within it has important implications for academic performance (Steele & Aronson, 1995) and social status (Chang, 2004).

Although quantitative reviews (Kenny, 1994; Kenny & DePaulo, 1993) document that adults are accurately aware of how others view them, there are insufficient data to draw this conclusion for children. Differences in the cognitive development of adults and children preclude the assumption that this phenomenon operates identically across the lifespan. Additionally, studies of children's awareness of peers' social cognitions about them have almost exclusively used sociometric ratings as data (see Cillessen & Bukowski, 2000). Typically, children would be asked to indicate "Who likes you the most?" or "Name the three children that would most like to play with you." In the present study we used a rating method in which children were led individually through a structured interview that permitted them to make trait judgments of peers, as well

as predictions of peers' judgments of them under controlled laboratory conditions. Teacher ratings, self-ratings, and academic achievement data were also collected. The peer perception data were analyzed using the social relations model and we followed the Kenny and Albright (1987) method for estimating *meta-accuracy*, defined as accurate awareness of others' judgments of oneself. Then, structural equation models of the process of achieving meta-accuracy were specified and estimated.

Theoretical analysis of metaperception

In school, children learn norms to guide behavior and to evaluate others and the self (Chang, 2004). A common norm in American schools is that one should be silent while the teacher is speaking. Violations result in public sanctions imposed by the teacher to shape behavior, and communicates to others what behaviors are acceptable or unacceptable. Public responses to a student by a teacher serves to establish, in part, the child's reputation within the context (Chang, 2003; Chang, Liu, Wen, Fung, Wang, & Xu 2004), and has implications for peer acceptance (Dodge, Coie, Pettit, & Price, 1990). Moreover, when the teacher establishes subgroups within the class that read books in different locations that vary in difficulty, class members are cued as to the reading ability of subgroup members. Public performance (e.g., reading aloud and answering questions) and responding to queries from peers about performance (e.g., "What did you get?") also provides information to others regarding ability. Children know clearly who is in the "reading enrichment group" or "math plus" and grouping by ability is a very common practice in American schools (Snow, 1986). Because this grouping is the result of teacher placement, that is itself based upon reliable psychometric measures of cognitive

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ability, one should expect that children's social judgments would be consensual and accurate. Previous studies have supported these hypotheses (Furr & Simpkins, 1999; Malloy, Sugarman, Montvilo, & Ben-Zeev, 1995; Malloy, Yarlus, Montvilo, & Sugarman, 1996; Simpkins, Furr, Parke, Kim, & McDowell, 1999) and confirm that children's peer perceptions show a high level of consensus (i.e., agreement) and accuracy for judgments on academic, behavioral, and social dimensions. These processes that produce consensus should also produce accurate metaperception. During middle childhood there is dramatic neural integration of the brain (Hudspeth & Pribram, 1990) that is associated with increasingly more abstract and logical cognition about objects. Children's social cognitions show a dramatic change and, when compared to younger children (Grades 1–4), older children (Grades 5 and 6) show greater consensus in peer judgments, particularly on dimensions related to social status (Malloy et al., 1995; Shantz, 1983). Consequently, the accuracy of metaperception was also expected to be greater among older children because of this increased cognitive development. To analyze the metaperception process, we specified and estimated structural equations of competing theoretical models of the determinants of metaperception. One, the *symbolic interactionist* model, states that others' judgments and responses to an individual affect one's metaperception, and in turn, self-perception. A theoretical alternative, the *direct observation* model, states that metaperception is caused by the observation of one's own behavior. A third alternative, the *self-theory* model, states that people assume that their behavior and characteristics, as they perceive them, are readily apparent to others as well. Abundant data are consistent with the self theory model (Kenny, 1994; Kenny & DePaulo, 1993) although there is also support for the direct observation model (Albright & Malloy, 1999).

Children's metaperceptions

Within developmental psychology there has been enduring interest in meta-knowledge, defined as knowledge about the processing of information (Flavell, 1988). An extension of this concept focuses on thinking about the thinking of another in regard to the self, which is the essence of metaperception. Selman (1980) has theorized about *perspective coordination* among children; the basis of progressively more abstract social judgment about self, others, and others in regard to the self. He hypothesized that the cognitive ability to engage in metaperception (termed *mutual perspective* in his work) should emerge between the ages of 7 and 12. In a seminal study of children's awareness of their relative social status, Ausubel et al. (1952) reported that children know accurately their sociometric status in the peer group. In a related study, Miller, Kessel, and Flavell (1970) reported that children in second and third grade may know their social status, but their accuracy remains under 50% through the sixth grade. In a study of fourth-grade students, Cillessen and Bellmore (1999) reported that children were accurately aware of which classmates liked them the most and the least.

Clearly, there is not sufficient research on children's metaperceptions. The existing data are somewhat contradictory, age differences in meta-accuracy have not been adequately studied, nor has there been sufficient use of new methodological tools well suited for this research.

Measurement of peer perceptions and metaperceptions

A standard psychometric approach in peer judgement studies has been the sociometric nomination technique (e.g., Coie, Dodge, & Cappelletti, 1982) in which children nominate peers that best fit a particular criterion, such as classmates "liked the most". A less structured approach involves unconstrained verbal descriptions of peers that are then content analyzed (Dornbusch, Hastorf, Richardson, Muzzy, & Vreeland 1965). This research departed from both methods. First, we selected dimensions relevant to social life in the academic context that have been used in past research (Chang, 2004; Coie et al., 1982; Malloy et al., 1995). Within, but not between, classrooms, groups of children were formed randomly. In the laboratory, children were guided individually through a standard interview by a research assistant to collect peer ratings on the dimensions using interval scales. Children also rated themselves and were rated by their teachers on the same dimensions. Children also predicted the overall rating of them by "most of the children" in their randomly formed group.

Analysis of peer perceptions and metaperceptions

A social relations analysis (Kenny, 1994) was used to analyze the peer perception data. This analysis decomposes peer perceptions into components called perceiver, target, and relationship effects. The perceiver effect is an individual's tendency to judge multiple targets similarly when, in fact, they vary randomly on a dimension. The target effect indexes the agreement among multiple perceivers' judgments of a single individual. The uniqueness effect is one individual's reaction to another specific individual controlling for their respective perceiver and target effects. Equation 1 represents child i 's judgment of peer j on dimension X :

$$X_{ij} = M + \alpha_i + \beta_j + \gamma_{ij} + \epsilon_{ij} \quad (1)$$

In equation 1 α_i is i 's perceiver effect, β_j is j 's target effect, γ_{ij} is i 's unique judgment of j , M is a constant and ϵ is error of measurement.

Hypotheses

Theoretically, children should use available social cues to judge others (Chang, 2003) and they should be accurate (Malloy et al., 1996). We reasoned that those cues, and observation of one's own behavior (cf. Albright & Malloy, 1999) would be used to accurately infer others' judgments of the self, and led us to expect reliable meta-accuracy throughout middle childhood. In addition to social cues, overt classroom behavior (e.g. reading aloud), and information sharing among peers (e.g. circulating emails or gossip in a peer group about attitudes and preferences) also provides information that affects self-evaluation, others' evaluations, and the prediction of others' evaluations. Consequently, accurate metaperception should be observed even among the youngest students in elementary school because they have access to information regarding peers' judgments of them, objective information about ability (Snow, 1986), and teacher responses (Chang, 2003; Chang et al., 2004; Rubovits & Maehr, 1973). Malloy et al. (1995) found that consensual judgments of peers (i.e., agreement regarding which peers are high or low on a trait) increased strongly in late middle childhood (Grades 5 and 6); a

developmental period when interpersonal judgments are expected to be much more abstract in comparison to those in early middle childhood (e.g., Grades 1–4; Selman, 1980). Consequently, we expected that the accuracy of metaperception would be greater among older than younger children.

Finally, we compared different structural equation models of the process of arriving at a metaperception. The self-based model assumes that observable behavior affects self-perception, and that in turn affects metaperception (Kenny, 1994). Accuracy is achieved because the self and others are similarly impacted by the observable behavior. An alternative model posits that objective information directly affects metaperception and that self or peer perceptions do not serve a mediating role. A final model assumes that behavior affects others' perceptions that, in turn, affect self-perceptions that, in turn, affect metaperceptions. The bulk of the data appear consistent with the model that metaperception is based on self-perception (Kenny, 1994); consequently, we expected that the structural equation model based on this theoretical specification would best fit the data.

Method

Participants

Participants were students in Grades 1 through 6 at an urban laboratory school with a mix of ethnicities and social class backgrounds on a college campus in New England, in America. Within classrooms, children were assigned randomly to groups of four to eight children; a group of four is the minimum necessary for a social relations analysis. In Grades 1 through 6 there were 27, 34, 34, 29, 36, and 31 females (191 total), and 26, 33, 38, 36, 32, and 29 males (194 total), respectively. Data were collected in the spring of the school year.

Procedures and measures

Children were taken individually to a laboratory and a research assistant asked them if they knew the other members of their randomly formed group. Because groups were formed within a single classroom, there was no case where a child was unfamiliar with group members. Perceivers made judgments of themselves and their classmates on eight dimensions: *well-behaved*, and *physical strength* (observable behavior); *mathematics ability* and *reading ability* (cognitive ability); *number of friends* and *popularity* (social status); *happiness* (general mood); and *attractiveness*. These dimensions were selected to broadly represent domains (cognition, behavior, peer status, and affect) relevant to the classroom context (Chang, 2004; Stormshak et al., 1999) and peer status (Kinderman, 1993). The order of presentation of dimensions and target peers was random for every perceiver. Ratings were made on a 7-point scale represented on an 8.5 × 11.0 inch cardboard sheet showing a line with a stick figure at each end of the scale. The scale had equal intervals and the numbers 1 through 7 equally placed on the scale. The low (1), midpoint (4), and high (7) end of the scale were described, for all eight dimensions, by a standard description that was read to each child before peer ratings were made. For example, the description of the reading ability dimension was:

Here is a student who is very good at reading. This student seems to always read well and doesn't get stuck on any of

the words. This other student is not very good at reading and always seems to get stuck on the words. Someone in the middle would be average in reading ability.

Following the peer ratings, the child indicated the rating "most of the children will give you" using the same rating scale (i.e., the metaperception ratings). Teachers also rated their students on these dimensions using identical scales. Additionally, standardized mathematics and reading achievement test scores (Metropolitan Achievement Test) were collected, when available, from students' school records.

Research design and statistical analyses

The design of the measurement model of peer perceptions was the round-robin. This design is a two factor structure with random levels (specific children) of the perceiver and target factors. A social relations analysis of the round robin data was accomplished using software called SOREMO (Kenny, 1987). Structural equation models were estimated using the LISREL software (Jöreskog & Sörbom, 1993).

Results

Estimation of variance components

The peer perception data were analyzed using the social relations model to estimate the perceiver, target, and relationship components of Equation 1. The variances of these components were then estimated, and the hypothesis that the component variance is equal to zero was tested. Malloy et al. (1995) reported that, across the eight dimensions in this study, the proportion of total variance due to the target (i.e., s_{β}^2 that is a measure of consensus) was much stronger than the relative proportion of variance due to the perceiver (i.e., s_{α}^2 that is a measure of assimilation). They also documented substantial consensus in peer judgments of cognitive ability, deportment, physical strength, attractiveness, and popularity. However, judgments of affect were not consensual. This is important because consensus is a necessary condition mathematically for there to be accurate metaperception (Albright & Malloy, 1999).

Meta-accuracy among males and females

Meta-accuracy, or awareness of how one is generally judged by others, was estimated by the correlation of the target's effect on peer judgments (the β component) and the target's single prediction of the average rating by others. Results in Table 1 show that for both females and males there was statistically significant meta-accuracy at all grade levels with the exception of females at Grade 3. Across all grades and dimensions, the average correlation was $r = .24$ ($p < .05$). The equivalent estimate for males was $r = .33$ and for females was $r = .23$, and both were significantly different from zero ($p < .05$). At all age levels, students were accurately aware of peers' judgments of them. In Table 2 meta-accuracy correlations are presented for females and males by dimension. Statistically significant meta-accuracy was observed on all dimensions except for affect (i.e., happy) among females.

To test for grade and gender effects on meta-accuracy the following analysis was performed. For each student, target effects and metaperceptions on the eight dimensions were

Table 1*Average meta-accuracy by grade level across dimensions*

Grade	Meta-accuracy correlations	
	Females	Males
1	.24* (27)	.34* (26)
2	.17* (34)	.26* (33)
3	.11 (34)	.32* (38)
4	.22* (29)	.28* (36)
5	.26* (36)	.47* (32)
6	.41* (31)	.29* (29)
Mean	.23* (191)	.33* (194)

Note. Meta-accuracy correlations aggregated across dimensions. The number of individuals is in parentheses.

* $p < .05$.

Table 2*Average meta-accuracy by dimensions across grade levels*

Dimension	Meta-accuracy correlations	
	Females	Males
Attractive	.20*	.18*
Mathematics	.26*	.32*
Reading	.27*	.28*
Physical strength	.29*	.37*
Well behaved	.29*	.45*
Number of friends	.19*	.43*
Popularity	.33*	.36*
Affect (happy)	.00	.19*

Note. Meta-accuracy correlations aggregated across grade.

* $p < .05$.

standardized as Z scores based on data from the 385 participants. Then the difference between the standardized target effects and the standardized metaperceptions were computed for each of the dimensions. Following Malloy et al. (1995) five constructs were formed using Z scores. Two constructs (attractiveness and affect) had single indicators. The remaining three constructs had two indicators. A cognitive ability factor (indicated by the mathematics and reading ability variables), an observable behavior factor (indicated by the well-behaved and physical strength variables) and a popularity factor (indicated by the popularity and number of friends variables) were computed by averaging standardized target effects and metaperceptions. Then, differences between standardized target effects and standardized metaperceptions were computed for the constructs. The larger the difference, the lower the accuracy of metaperception.

Multivariate ANOVA was then performed. This analysis included sex of the metaperceiver (two levels) and grade (six levels) as between subjects factors. The standardized difference between target effects and metaperceptions on the five constructs served as a vector of dependent measures. Individual was unit of analysis, however the df for the error term was adjusted down by the number of groups (i.e., round-robins) in the study which was 78. Results showed that the differences between judgments and metaperceptions did not vary signifi-

cantly across grades ($F(25,1787) = 1.05, p > .05$). There was a statistically significant gender effect ($F(5,291) = 3.82, p < .05$). Univariate analyses showed that the gender effect was restricted to the popularity ($F(1,295) = 6.19, p < .05$) and attractiveness ($F(1,295) = 8.56, p < .05$) constructs. Although males and females were accurate in metaperception, females tended to underestimate judgments of themselves, whereas males tended to overestimate judgments (standardized differences of .13 and -.12 for the popularity construct and .20 and -.19 for the attractiveness construct for females and males, respectively). The gender main effect was not moderated by grade ($F(25,1787) = .997, p > .05$).

The analysis of standardized differences between one's target effect based on peer judgments (i.e., β) and one's general prediction of that target effect focused primarily on inaccuracy (over- or underestimation of metaperception). In addition, we were also interested in differences in the level of meta-accuracy attained by males and females in early and late middle childhood. We therefore computed a two factor repeated measures ANOVA with grade as the unit of analysis and the average meta-accuracy correlation (within grade) across dimensions as the dependent measure. One repeated factor was the gender of meta-perceiver (male and female) and the other factor, age level, was a between subjects factor (early middle childhood (< 11) versus late middle childhood ≥ 11). Partitioning of age levels was based on findings from previous studies (Malloy et al., 1995, 1996) suggesting that interpersonal perceptions in late middle childhood (ages 11–12) may be substantially different from those at younger ages. Results of this analysis failed to show a gender main effect ($F(1,4) = 2.03, p = .23$) or a gender by age level interaction ($F(1,4) = .39, p = .57$). We did observe a main effect due to age level ($F(1,4) = 17.91, p = .01$) with significantly higher levels of meta-accuracy in late middle childhood compared with early middle childhood.

Modeling the metaperception process

To study the process of metaperception we specified a structural equation model that permitted estimation of the parameters of the self-theory, the symbolic interactionist, and the direct observation models. The structural equation models focused on the academic ability (reading and mathematics) perceptions and metaperceptions, because only for these dimensions were standardized achievement data available. The model in Figure 1 has five latent variables: academic ability

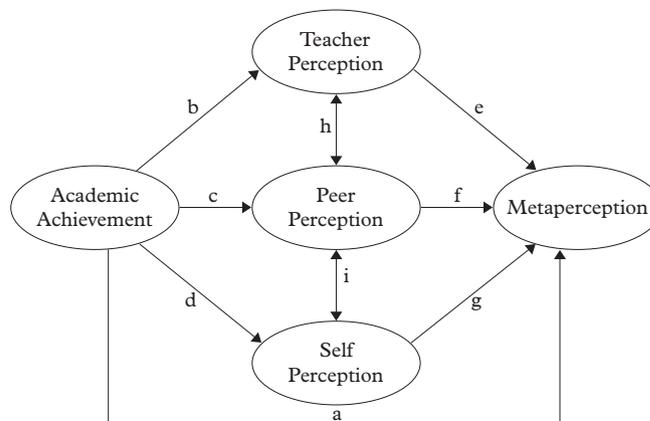


Figure 1. Model of the metaperception process.

(AA), teacher perception of AA, peer perception of AA, self-perception of AA, and metaperception of peers' ratings of AA. In this model academic ability had four indicators provided by Metropolitan Achievement Test scores on vocabulary, spelling, number concept, and mathematics computation; teacher ratings on mathematics and reading ability indicated the teacher rating construct; peer ratings on these dimensions indicated the peer rating construct; self-ratings on these dimensions indicated self perception; and metaperceptions on these dimensions indicated the metaperception construct. There were complete data on all variables for 199 children. Error components of indicators produced by a common method of measurement (e.g., an individual produces multiple scores) were correlated. This included self-ratings and metaperceptions on mathematics and reading ability, and error components of four pairs of indicators of academic achievement. Covariance matrices were computed for male and female metaperceivers separately and a multiple group analysis was conducted with LISREL 8.12 (Jöreskog & Sörbom, 1993). The pattern of fixed and free parameters was identical for the male and female samples and there were no constraints across groups.

The structural equations showed that the model fit the data equally well in the male and female samples (overall χ^2 (78) 95.01, $p = .092$ with RMSEA of .033 with 90% confidence intervals of 0 to .055 with $p = .89$). The parameter estimates (reported in an unstandardized metric) showed a highly consistent pattern of associations among the latent variables for males and females. Academic achievement was associated with teacher perceptions and for females parameter b (see Figure 1) was 1.41 ($Z = 5.72$) and .36 ($Z = 4.08$) for males. Academic achievement was also associated with peer perceptions of academic ability and for females parameter c was .78 ($Z = 3.63$) and .20 ($Z = 3.65$) for males. Academic ability was associated with self perception of AA for females and parameter d was .39 ($Z = 2.24$), however this association was not statistically significant for males (parameter d = .08, $Z = 1.71$). Teachers and peers agreed when judging the academic ability of females (parameter h = .29, $Z = 3.76$) and males (parameter h = .31, $Z = 3.20$); moreover there was also significant self and peer agreement for females (parameter i = .18, $Z = 2.49$) but not for males (parameter i = .07, $Z = .99$). For both sexes, self perceptions of AA were significantly associated with metaperceptions on AA (parameter g = 5.94, $Z = 2.05$ for females and g = 1.20, $Z = 4.00$ for males), whereas teacher and peer perceptions of AA were not associated with metaperception of AA for females (parameters e and f equal to .16 ($Z = .15$) and $-.31$ ($Z = -.23$), respectively) or males (parameters e and f equal to .09 ($Z = .58$) and .02 ($Z = .14$), respectively). Also, for females and males AA was not directly associated with metaperception of AA (parameter a = $-.91$ ($Z = -.56$) and $-.04$ ($Z = -.66$), respectively).

An alternative restricted model was also estimated using the multiple groups procedure. In the restricted model the direct path from AA to metaperception was constrained to zero for both males and females. This model had a χ^2 (80) = 95.78, $p = .11$ and the chi square difference between this restricted and the full model was .51 with two degrees of freedom and was not statistically significant showing that this constraint did not adversely affect model fit for males or females. Following this, another restricted model was specified that added the constraint that the paths from objective academic achievement to self-perception were equal to zero in both the male and

female samples. This model yielded a χ^2 of 105.92 with 82 df and the difference between chi squares for the full and this restricted model was 10.91 with 4 df ($p < .05$) and showed that constraint of these paths significantly reduced model fit.

Structural equation modeling of the merged data

The multiple groups analysis showed that the overall model fit the data equally well in the male and female samples. As a result, the male and female data were merged. The model of Figure 1 was estimated for the full sample yielding a χ^2 (39) = 71.29, $p = .0012$ with RMSEA = .065 (90% confidence interval of .040 to .088 with $p = .15$) and showed that the model fit the combined gender data quite well (NNFI = .99). Results showed that academic achievement was associated with teacher (parameter b = .79, $Z = 7.44$), peer (parameter c = .56, $Z = 5.51$) and self perceptions (parameter d = .22, $Z = 2.75$) of academic ability, but was unrelated directly to metaperception (parameter a = $-.09$, $Z = -1.13$). Teacher (parameter e = .06, $Z = .66$) and peer (parameter f = $-.03$, $Z = -.31$) perceptions were not significantly associated with metaperception; however, self-perception was related significantly to metaperception (parameter g = .99, $Z = 4.40$). Teacher and peer judgments were significantly associated (parameter h = .23, $Z = 5.00$), as were peers' ratings and targets' self-perceptions (parameter i = .10, $Z = 2.52$).

A restricted model was estimated in which the direct effect of AA on MP was constrained to zero and produced a χ^2 (40) = 72.68, $p = .0012$ with RMSEA = .064 (90% confidence interval of .04 to .087 with $p = .15$) and showed that the model fit the combined gender data well (NNFI = .99). Fixing this parameter to zero did not affect model fit adversely. An additional restricted model was estimated in which the paths from AA to MP as well as those from teacher and peer perceptions to MP were also fixed to zero and this yielded χ^2 (42df) = 72.72, $p = .002$ with RMSEA = .061 (90% confidence interval of .036–.084 with $p = .21$) and showed that this constrained model fit the data quite well (NNFI = .99). Therefore this more parsimonious model was judged to be the best fitting model for the combined data.

Discussion

This research assessed children's awareness of peers' judgments of them on cognitive, social, behavioral, and affect dimensions. We studied metaperception in an important social context in the lives of children, the school, in an attempt to attain ecological validity, while simultaneously maintaining controlled laboratory conditions. The research questions of particular interest were: What is the level of accuracy in children's metaperceptions? Are older children more accurate than younger children? And what processes determine metaperceptions?

Level of meta-accuracy

Given the evidence for consensus (Malloy et al., 1995) and accuracy of social perception (Malloy et al., 1996) among children, we predicted that metaperceptions would be accurate as well, and this was confirmed. Among both male and female perceivers there was statistically significant meta-accuracy at all grade levels with the exception of females at Grade 3.

This evidence for accuracy of metaperception among even the youngest children in our sample may seem counter-intuitive given well-established theories of cognitive development that suggest limited abstract ability at this age (Piaget, 1970), and the assumption that young children lack the neural integration (Hudspeth & Pribram, 1990) and associated cognitive development to take an abstract meta-perspective (Selman, 1980; Shantz, 1983). However, from the perspective of socio-cultural theory (e.g., Vygotsky, 1978; Wertsch, 1985) these data are readily explained. In school adults determine key elements of the social structure such as ability grouping, public acknowledgement of success and failure, and consequences for unacceptable deportment (Chang, 2004). These structural features of school life, coupled with public performances, and access to information about others in the peer group conveys a great deal of information about the self and others. This information is used by the self and others to form social judgments that are consensual and accurate (Malloy et al., 1995, 1996); consequently, metaperceptions are accurate as well. These results suggest that children, even those in first and second grade, can effectively use available social cues and observations of their own public behavior to make accurate predictions of others' social judgments of them.

This accuracy of metaperception likely derives from another process as well. Children, particularly young children, are less bound by social norms that in everyday social life preclude direct communication of one's evaluations of another (Felson, 1980). If young children communicate their evaluations of one another, meta-accuracy will be increased. Moreover, children spend considerable time together in school. In this context, a salient source of information about classroom peers is the teacher, whose reactions to a student also affects peers' reactions to that student (Chang et al., 2004; Howes, Hamilton, & Matheson, 1994; Wentzel, 1998, 2002). This very high level of acquaintance and the abundant information available about peers in school on academically relevant dimensions explains the consistent evidence for meta-accuracy at all grade levels. A student said to one of the authors, "you could go to someone in this school that I have never talked to and you would find that they know a lot about me". Students are aware that others can gather accurate information about them via channels other than direct communication or behavioral observation; that is, via reputation in the context.

Age differences in meta-accuracy

Although there was significant accuracy of metaperception at all age levels, older children showed greater accuracy than younger children. The cognitive development of children is strikingly different at different points in middle childhood (Piaget, 1970), and these differences have implications for social cognition and interpersonal understanding (Selman, 1980). The impact of these developmental differences on both cognitive and social functioning is one important reason why American educational systems often group children in Grades 1 through 4 in elementary schools, and those in Grades 5 through 8 in middle schools. On average, the cognitive development of fifth graders and beyond permits much more abstract cognitive operations that have implications for social cognition. Our data are consistent with this view and showed that the average level of accuracy in metaperception when averaged across all dimension was $r = .25$ among children in Grades 4 and under, and $r = .36$ among those in Grades 5 and

6. The ability to accurately infer others' judgments of oneself requires complex, abstract cognitive processes (Selman, 1980) that develops through childhood and reaches mature levels in adolescence (Malloy & Cillessen, 2007).

Gender and metaperception

Both females and males were accurately aware of peer judgments of them; however there were reliable differences due to gender on the popularity and attractiveness constructs. Males tended to overestimate and females tended to underestimate peers' judgments of them on these constructs. Research shows that on self-relevant dimensions, there is a general tendency toward self-enhancement bias (John & Robbins, 1994), defined as overestimation of others' judgments of one's self. Yet, males overestimated and females underestimated peers' judgments of them. Why might this be the case?

In American culture, males are socialized to be independent and dominant whereas females learn to be more communal and interdependent (Eagly, 1985), and this socialization has implications for status, power, and control of resources (Pratto & Walker, 2004). Differential socialization should also impact self-presentation (Goffman, 1959). For example, self-enhancement is more likely among students who are independent, whereas greater modesty has been observed among those with a communal, interdependent self-definition (Kurman, 2001). In this study, students were predicting judgments of them on important, status-relevant dimensions in the peer group. Consequently, the self-enhancement among males and the modesty among females that we observed can be explained by differential gender role socialization. Males may have been maintaining positive illusions when overestimating their status in order to bolster self esteem (Taylor & Brown, 1994), whereas females responded with socially prescribed modesty in order to avoid the appearance of vanity. Making a public claim that is inconsistent with gender role socialization and prevailing social norms could damage one's reputation in the peer group (Goffman, 1959).

Modeling the metaperception process

We also studied the process of metaperception by estimating structural equation models of metaperception of academic ability. The initial multiple group analysis that placed no constraints on the parameters of the model for male and female metaperceivers confirmed that the self-judgment model of metaperception (Kenny, 1994) fit the data equally well for both sexes. Only when the effect of academic achievement on self perception was constrained to zero did model fit show significant deterioration.

The parameter estimates for the combined data, paralleled closely the results of the multiple groups analysis. Academic achievement was associated with teacher, peer, and self-perception while only self-perception was associated with metaperception. Other agreement (i.e., teacher and peer) and self-peer agreement was also observed. Fixing the direct path from academic achievement to metaperception and the paths from teacher and peer perception to metaperception at zero did not adversely affect model fit.

The estimates for the best fitting restricted model offer a plausible explanation of how accurate metaperception for academic ability is achieved by children. In the academic context observable cognitive performance and associated cues

(e.g., ability grouping) provides the self, and others, information regarding academic competence. This information similarly affects teachers, peers, and the self, however the effect of this information on metaperception is mediated by self-perception and not by other perception as symbolic interactionist theory (Mead, 1934) predicts. In fact, we have no evidence that perceptions of the child by peers or the teacher are associated with metaperceptions. Rather, academic ability has an affect on self-perception, though weaker than its effect on teacher and peer perception, and only self-perception is significantly associated with metaperception.

This research is limited because we only studied the process of metaperception for academic ability because standardized achievement data were available for this construct. We do not claim that the process operates identically for other dimensions such as popularity or athletic ability, and research studying metaperception in other domains is warranted. Also, these results may not generalize beyond the classroom context because it is a unique social context in the lives of children. Consequently it would be useful to study metaperception in other social contexts to establish the generality of these findings.

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