

DEVELOPMENTAL ASSOCIATIONS BETWEEN NONVERBAL ABILITY AND SOCIAL COMPETENCE

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Abstract. *The ability to accurately read social information is necessary for social competence. Because nonverbal behavior provides significant information about others' emotional states, children's difficulties recognizing nonverbal expressions were predicted to correlate with lower social competence ratings. Aspects of nonverbal errors relevant to social competence were predicted to vary across developmental stages, according to changing social tasks outlined by Sullivan. Teachers rated social competence for children at three different ages ($n = 43$, 4-6 years, $n = 69$, 7- 9 years, and $n = 53$, 10-12 years). To assess nonverbal skills, children completed the DANVA2 measure of nonverbal recognition for facial and vocal expressions. Results indicate both age and gender differences in relations between recognition of nonverbal emotions and social competence. In particular, intensity, modality, and type of emotion of nonverbal errors differentially predict social competence for girls and boys, across developmental stages. Implications for children's social adjustments and Sullivan's theory of development were described.*

Key words: *social competence, nonverbal skill.*

The ability to accurately read social information is at the core of social competence, the capacity to form mutually satisfying relationships with others (Dodge, 1986; Feldman, Philippot, & Custrini, 1991). Recognition of nonverbal expressions provides information regarding others' affective states, and is necessary for situationally appropriate responses. Thus, social relationships have difficulty progressing if those involved cannot identify and process others' emotions accurately (Feldman et al., 1991). Furthermore, children's social competence has been associated with psychological adjustment in adulthood (e.g., Cowen, Pederson, Barbigian, Izzo, and Trost, 1973). Because accurate recognition of nonverbal expressions facilitates appropriate social behavior, acquisition of this skill is an important developmental task (e.g. Kiesler, 1996; Sullivan, 1953).

Previous research has clearly established associations between nonverbal skills and social competencies. For example, the ability to read and express facial expressions is related to social competence in preschool children (Field & Walden, 1982; Philippot & Feldman, 1990) and elementary school children (Custrini & Feldman, 1989; Edwards, Manstead, & MacDonald, 1984). However, this association is not always consistent or straightforward: nonverbal ability and social competence are correlated for some age groups but not for others (Nowicki & Duke, 1994), while some studies found this association for girls but not for boys (e.g. Custrini & Feldman, 1989). Thus, there appear to be developmental and sex-related continuities and discontinuities in relations between nonverbal skills and social competence.

Assuming that many adult relationship skills originate in childhood socialization, a theoretical and developmental framework seems essential to clarify the changing role of nonverbal skills for social competence over time (Nowicki, 1997; Pilsner & Asher, 1987). Such a framework is inherent in the interpersonal model of personality developed by Sullivan (1953). He proposed that personality develops through close interpersonal relationships experienced across an individual's lifetime (Carson, 1969; Chapman, 1985). For example, formation of a satisfactory parent-child relationship and acquisition of verbal language are primary tasks of *infancy* and *childhood* stages. In particular, however, social challenges of *juvenile* and *preadolescence* stages provide the framework for successful development of mature adult relationships. Because of their importance for later social competence, the present study focused on these two developmental stages.

According to Sullivan's model, the major social task for the juvenile stage child is to develop satisfactory peer relationships, beyond those that may have formed in the family. For most children, this stage coincides with the beginning of full-time formal schooling. Children move from the familiarity of family interactions into new social environments consisting of both peers and teachers who are strangers to them. Children are challenged to learn to express themselves and to understand the diverse nonverbal and verbal communications of unfamiliar others. Many children adjust smoothly to these new social demands. Those who fail to learn appropriate interpersonal skills at this age, however, may begin to receive negative feedback from peers and teachers, risking the beginning of a downward spiral toward social failure and isolation. For example, research suggests that, among kindergartners, peer friendships predict school performance and school anxiety (Ladd, 1990). Furthermore, the quality of children's peer relations in elementary school predicts school avoidance, disruption, and failure during adolescence (Parker & Asher, 1987).

If children succeed at forming peer relationships during the juvenile stage, they are ready to move to the preadolescent social stage, where relationship tasks become more challenging. Sullivan proposed that the major task for preadolescent children was to form an intimate, nonerotic, same-sex relationship with another child, a "chum." Chums engage in consensual validation, a process in which they "check out" their own and other's perceptions of reality, thereby correcting erroneous or potentially distorted ideas about the social world. The chum relationship serves as a model for the later development of appropriate sexualized relationships in the adolescence stage. Indeed, research suggests that there are developmental changes in the quality of friendships in preadolescence and adolescence, and that the ability to establish close friendships at this age has implications for overall adjustment (Buhrmester, 1990).

In the present study, children's nonverbal processing ability and social competence were assessed during the transition from childhood to the juvenile stage (ages 4-6), as well as during two of the stages Sullivan described as fundamental to the development of mature adult relationships, the juvenile (ages 7-9) and preadolescent stages (ages 10-12). The pattern of associations between accurate nonverbal recognition and social competence were predicted to differ by age. For children in the youngest group (ages 4 to 6), errors identifying nonverbal emotions expressed by *adults* were predicted to be associated with lower social competence. Because establishing satisfactory peer relationships is an emerging social goal for juvenile stage children (ages 7-9), lower social competence was predicted to relate to errors identifying other *children's* (as well as *adults'*) nonverbal emotions. For preadolescents (ages 10-12), when the major relationship task involves forming an intimate same-sex "chum" relationship, errors identifying nonverbal emotions of peers (*children*) were predicted to relate to lower social competence. Given previous evidence of sex differences, the pattern of associations between nonverbal recognition and social competence was also predicted to differ by gender, although more specific predictions were not proposed.

In addition to lacking a theoretical and developmental framework, previous studies also used a variety of measures of nonverbal ability, which may have contributed to inconsistent findings. Little empirical attention has considered whether measures assess different aspects of nonverbal skills, or how to integrate results across diverse measures. This study used a well-standardized measure of nonverbal emotion recognition. To address the complexity of social interactions, this measure included multiple modalities of nonverbal emotion (both facial and vocal expressions) expressed at varying levels of intensity by both adults and children (Nowicki, 1997).

METHOD

Participants

There were 169 children from an Atlanta-area private school who participated in this cross-sectional study. Participants included 22 girls and 21 boys ages 4 to 6, 36 girls and 33 boys ages 7 to 9, and 28 girls and 25 boys ages 10 to 12.

Measures

Classroom teachers provided two social competence ratings for each child. One rating referred to the ability of children to form relationships with adults: "This child is able to build and maintain satisfactory relationships with adults." The other rating referred to social competence with peers: "This child is popular with peers." Each judgement was rated on a four point scale ranging from *very accurate* to *slightly accurate* to *slightly inaccurate* to *very inaccurate*. Higher scores reflected more negative social competence ratings.

Diagnostic Analysis of Nonverbal Accuracy (Nowicki & Duke, 1994). To measure ability to read expressions of emotion, the revised Diagnostic Analysis of Nonverbal Accuracy (DANVA2, Nowicki & Duke, 1994) was administered to all children. Two of the seven tests that comprise the DANVA were used in the present study: receptive facial expression (adult and child) and receptive tone of voice (adult and child). Support for the

overall construct validity of the DANVA was presented in a study of 1001 six through ten year old children (Nowicki & Duke, 1994), with updated and refined measures of receptive facial expression and tone of voice used in this study.

Adult facial expressions. The Diagnostic Analysis of Nonverbal Accuracy-Form 2, Adult Facial Expressions (DANVA2-AF) consists of 24 photographs of female and male adult facial expressions of happy, sad, angry, and fearful emotions (Nowicki & Carton, 1993). College age adults ($n = 21$) ranging in age from 18 to 29 were read vignettes with happy, sad, angry, and fearful themes and then asked to respond with the appropriate facial expression. There were four different vignettes, two of high intensity and two of low intensity, for each of the four emotions. The final 24 photographs were selected from a larger sample of 108 which were presented to samples of college students ($n = 102$) and fourth grade students ($n = 48$), who viewed each photograph and judged whether it was happy, sad, angry, or fearful and indicated how intense it was on a five point scale. Photographs in which the emotion on was agreed upon by at least 80% of the subjects were included in the final form of the test, with an equal number of male ($n = 12$) and female ($n = 12$) and high ($n = 12$) and low ($n = 12$) intensity faces for each emotion. Because there were three high and three low intensity faces for each emotion, there was an unequal number of males and females in each intensity group. Intensity of the facial expression was assumed to be a more important variable to control, however, than the gender of the model.

Construct validity data have been presented by Nowicki and Carton (1993) and in other studies (Bailey, 1996; Baum, 1997; Clark, 1993; Collins, 1996; Goonan, 1995; Halpern, 1996; McClanahan, 1996; Mumley, 1996; Nowicki, 1995; Nowicki & Rowe, 1997; Rowe, 1996). (1) Convergent validity was shown when scores from the adult facial expressions subtest correlated significantly with those from the original DANVA adult facial expression subtest, $r(64) = .34, p < .01$ in a sample of college students. (2) Linear trend analysis based on the results of 10 studies showed that accuracy scores increase with age up to age 3. (3) Scores have been found to be internally consistent as measured by coefficient alphas in children as young as four (Goonan, 1996, $n = 34$, .71) and as old as 15 (Baum, Logan, WalkeI, Tomlinson & Schiffman, 1996, $n = 27$, .78). The average coefficient alpha across 10 studies was .78. (4) Higher accuracy scores have been found to be significantly correlated with higher social competence as rated by teachers (Collins, 1996) and parents (McClanahan, 1996) as well as with higher internal control expectancies (Halpern, 1996; McClanahan, 1996; Halpern, 1997) and lower depression (Nowicki & Rowe, 1997).

Child facial expressions. The Diagnostic Analysis of Nonverbal Accuracy-Form 2, Child Facial Expressions (DANVA2-CF) consists of 24 photographs of child facial expressions, with 12 female and 12 male subjects showing an equal number of high and low intensity happy, sad, angry, and fearful faces. Children between the ages of 6 and 10 ($n = 18$) were read vignettes with happy, sad, angry, or fearful themes and asked to respond with the appropriate facial expressions. The vignettes were taken from the original DANVA's expressive section. The process used to select the final 24 photographs of child expressions was similar to that reported for the adult facial expressions above. Photographs in which the emotion was agreed upon by 80% of the subjects were included in the final form of the test. Photographs included an equal number of male and female and high and low intensity faces, with three high and three low intensity facial expressions for

each of the four emotions. Again, there was an unequal number of males and females represented in the high and low intensity faces for each emotion.

Construct validity information is available from 8 studies (Clark, 1993; Goonan, 1995; Halpern, 1996; McClanahan, 1996; Nowicki, 1995; Rowe, 1996; Stillion, 1996; Verbeek, 1996). (1) Convergent validity was shown when scores from the DANVA2-CF correlated significantly with those from the original DANVA child faces test $r(101) = .54, p < .01$ in children ($M = 8.2$ years). (2) Linear trend analysis from the results of 8 studies indicated that accuracy scores increase with age. (3) Internal consistency as estimated by coefficient alpha averaged .76 across 8 studies in children as young as age four and as old as age 16. (4) Higher accuracy scores on the DANVA2-CF were significantly correlated with higher social competence as rated by teachers (Collins, 1996) and parents (McClanahan, 1996) and with greater internal control expectancies (Halpern, 1996; McClanahan, 1996; Nowicki & Rowe, 1997).

Adult paralinguage. The Diagnostic Analysis of Nonverbal Accuracy-Form 2, Adult Paralinguage (DANVA2-AP, Baum & Nowicki, in press) is a new subtest which was not included in the original DANVA. To construct the paralinguage test, two professional actors responded to vignettes designed to elicit happy, sad, angry, and fearful feelings by saying a neutral sentence, "I am going out of the room now but I'll be back later," to reflect the appropriate emotion at different levels of intensity. This neutral sentence was used previously by Maitland (1977) who found that it was rated as "neutral" by 90% of the undergraduate and 85% of the children surveyed. Audio samples of the sentences produced by the two actors were played for college-age ($n = 147$) and fourth grade ($n = 57$) subjects, who listened to trials and judged type of emotion and intensity on a 5-point scale. The final form of the test contains equal numbers of male and female trials of high and low intensity happy, sad, angry, and fearful voices. Support for construct validity was presented by Baum and Nowicki (in press). (1) Linear trend analysis on data from six studies using the DANVA2-AP with different aged subjects (Baum et al., 1996; Collins, 1996; McClanahan, 1996; Mitchell, 1995; Nowicki 1995; Rowe, 1996) showed that mean accuracy increased with age. (2) Results from 8 studies showed coefficient alphas ranged from .71 in four-year-old subjects to .78 in college students, with a median coefficient alpha of .76. Test-retest reliability over six weeks was .83 in a sample of college students ($n = 68, M = 19.4$ years). (3) DANVA2-AP scores were related to indices of social competence in children as young as three years of age (Verbeek, 1996), as well as in preschool (Goonan, 1995), elementary (McClanahan, 1996), and high school participants (Baum et al., 1996). In addition, higher DANVA2-AP accuracy scores were related to higher external control expectancies in college students (Nowicki, 1995). (4) DANVA2-AP scores were not related to measures of IQ in preschool (Goonan, 1995), elementary (McClanahan, 1995), or high school children (Baum et al., 1996). However, greater accuracy on the DANVA2-AP scores was related to greater achievement in a study of African-American children ($M = 10$ years of age) by Collins (1996). (5) Baum et al. (1997) reported that for 54 adolescents between the ages of 12 and 18, DANVA2-AP error scores were significantly associated with neuropsychological measures purported to index right hemisphere and executive functioning, including the Benton Facial Recognition Test (BFRT), $r = -.35, p < .01$, and the Wisconsin Card Sorting Test (WCST), Percent Perseverative Errors, $r = .31, p < .05$ (Baum et al., 1996). Regression analysis indicated that accuracy on the BFRT and percent perseverative errors on the WCST accounted for 24 percent of the variance in DANVA2-AP accuracy scores.

Child paralanguage. This test consisted of 16 trials in which a 10-year-old-female child repeats the sentence, "I am going out of the room now, but I'll be back later" with voice tone varying to communicate happy, sad, angry, and fearful emotions. Thirty-six of these stimuli were presented to fourth grade children ($n = 54$) who rated whether they were happy, sad, angry, or fearful. Trials that were agreed on by at least 80% of the participants as communicating a particular emotion were selected for the final form. The child paralanguage subtest has been used in previous studies with children ($n = 1001$) the same age as those in the present study (Nowicki & Duke, 1994). Internal consistency estimates via coefficient alphas averaged .79 and test-retest estimates over a four-week period averaged .81. In addition, scores have been related in predictable ways to locus of control and indicators of social competence (Collins, 1996; McClanatlan, 1996; Nowicki & Duke, 1994).

PROCEDURE

After being introduced to the examiner by their classroom teacher, children were taken to a small quiet room and tested individually. The examiner told them: I am going to show you some pictures of people's faces and I want you to guess how they are feeling. I want you to guess if they are happy, sad, angry, or afraid. Do you know what those words mean? Can you tell me something that makes you happy? ...sad? ...angry? ...afraid? Now I am going to show you some faces one at a time. I will show you each face for only a short time so you have to be ready to look carefully. Here is the first face. Ready. Is this person happy, sad, angry, or afraid?

The examiner showed each photograph for two seconds and recorded the child's response. Twenty-four photos were presented in this manner. The child facial expressions test was introduced similarly. The adult paralanguage (voices) test was introduced in the following way: "I want you to listen to a grownup say a sentence. He or she will say the same sentence, 'I am going out of the room now and I will be back later.' I want you to listen to that sentence and tell me if the grownup is happy, sad, angry, or afraid. Now here is the first sentence. Listen closely and tell me if the grownup is happy, sad, angry, or afraid" All 24 trials were administered, followed by the child paralanguage test.

Half the children were administered the facial expression tests first, and half were administered the paralanguage tests first. Children were offered the opportunity to take a break after each test, if desired.

RESULTS

Associations between nonverbal errors and social competence ratings were analyzed with zero-order correlations and stepwise multiple regression, by developmental stage and by gender. Results supported the prediction of both age and gender differences in relations between nonverbal skills and social competence. In addition, exploratory analyses indicated that modality, intensity level, and emotion of nonverbal errors differentially predicted social competence for girls and boys, across developmental stages.

As predicted, for boys ages 4-6, ratings of social competence with adults and peers correlated with errors on both *adults'* and *children's* faces and voices (Table 1). By modality, intensity, and emotion, boys' errors primarily on *facial* expressions, *low intensity*

emotions, and *sadness* and *anger* were significantly related to lower social competence. In particular, boys' errors on adult faces expressing low intensity emotions accounted for 31-34% of the variance in social competence with adults and peers, respectively.

As predicted, for girls ages 4-6, lower social competence with adults was associated with errors identifying *adults'* emotions (Table 1). Girls' popularity with peers, however, was not related to nonverbal recognition skills at this age. By modality, intensity, and emotion, girls' errors on *facial* expressions, *high intensity* emotions, and *anger* were significantly related to lower social competence. In particular, girls' errors on high intensity adult faces and voices accounted for 47% of the variance in social competence with adults.

Table 1. Gender differences in correlations between nonverbal errors and social competence ratings, by age

4 to 6 years old
"Satisfactory adult relationships"

Girls (n = 22)	Fisher's Z	Boys (n = 21)
Adult faces total errors	r = .48*	Adult faces total errors
ns	ns	Adult voices sad
Adult faces high intensity	r = .42*	ns
ns		Adult faces low intensity
ns		Child faces low intensity
ns		Adult voices high intensity
Adult faces sad high	r = .43*	ns
ns		Child faces sad low
Adult voices angry high	r = .54**	ns

* p < .05, ** p < .01

Stepwise multiple regression:

Adult voices angry high

Adult faces high intensity

F (2, 19) = 10.34, p = .000, adj. R² = .47

Adult faces low intensity

F (1, 19) = 9.9, p = .005, adj. R² = .31

4 to 6 years old
"Popular with peers"

Girls (n = 22)	Boys (n = 21)
ns	Adult faces total errors
ns	Adult faces angry
ns	Child voices fear
ns	Adult faces high intensity
ns	Adult faces low intensity
ns	Child faces low intensity
ns	Adult faces sad high
ns	Adult faces angry low
ns	Child faces sad low

* p < .05, ** p < .01

Stepwise multiple regression:

Adult faces low intensity

F (1, 19) = 11.19, p = .003, adj. R² = .34

As predicted, for boys ages 7-9, peer competence correlated with accurate identification of *children's* and *adult's* faces and voices, in particular identification of fearful, angry, and happy emotions at both high and low intensities (Table 2). Boys' social competence with adults, however, was not related to nonverbal accuracy. By modality, intensity, and emotion, boys' errors on both *vocal* and *facial* expressions, in particular errors to *low intensity* emotions and *anger*, correlated significantly with peer social competence. Together, errors on adults' vocal expressions of fear and children's facial expressions of anger accounted for nearly 25% of the variance in peer social competence at this age.

For girls ages 7-9, lower social competence with adults correlated only with errors identifying *facial* expressions of *fear* in adults (Table 2). As with younger girls, peer social competence and nonverbal accuracy were not significantly related. In stepwise multiple regression, errors on adult facial expressions of fear accounted for 11 % of the variance in social competence with adults.

Table 2. Gender differences in correlations between nonverbal errors and social competence ratings, by age

7 to 9 years old
"Satisfactory adult relationships"

Girls (n = 36)		Boys (n = 33)
Adult faces fear	r = .37*	ns

* p < .05, ** p < .01

Stepwise multiple regression:

Adult voices fear

F (1, 34) = 5.52, p = .02, adj. R² = .11

7 to 9 years old
"Popular with peers"

Girls (n = 36)		Boys (n=33)	
ns		Adult faces total errors	r = .38*
ns		Child faces angry	r = .44*
ns		Adult voices fear	r = -.35*
ns		Adult faces high intensity	r = .37*
ns		Child faces low intensity	r = .34*
ns		Child faces happy low	r = .36*
ns		Child faces angry low	r = .44*
ns		Adult voices fear low	r = -.36*

* p < .05, ** p < .01

Stepwise multiple regression:

Child faces angry

Adult voices fear

F (2, 30) = 6.49, p = .005, adj. R² = .26

As shown in Table 3, relations between nonverbal accuracy and social competence were reversed for preadolescent girls and boys. For boys ages 10-12, nonverbal errors were no longer associated with either peer or adult social competence ratings. For girls ages 10-12, however, errors primarily on children's and adults' *voices* correlated signifi-

cantly with both peer and adult social competence. In particular, errors identifying *vocal* expressions of *high intensity* emotions, and errors identifying expressions of *anger*, together accounted for 20%-39% of the variance in girls' social competence.

Table 3. Gender differences in correlations between nonverbal errors and social competence ratings, by age

10 to 12 years old
"Satisfactory adult relationships"

Girls (n = 28)		Boys (n = 25)
Child faces angry high	r = .48*	ns
Adult voices fear high	r = .40*	ns

* p < .05, ** p < .01

Stepwise multiple regression:

Child faces angry high

F (1, 26) = 7.83, p = .01, adj. R² = .20

10 to 12 years old
"Popular with peers"

Girls (n = 28)		Boys (n = 25)
Adult voices total errors	r = .43**	ns
Child voices total errors	r = .52**	ns
Adult voices angry	r = .43*	ns
Child voices sad	r = .40*	ns
Adult voices high intensity	r = .42*	ns
Adult voices angry high	r = .53**	ns

* p < .05, ** p < .01

Stepwise multiple regression:

Adult voices angry high

Child voices total high

F (2, 25) = 9.49, p = .001, adj. R² = .39

Overall sex differences in nonverbal accuracy were assessed by comparing the average number of nonverbal errors for boys and girls. When present, sex differences favored girls' greater accuracy. For the modality of *adult faces*, girls made fewer errors across all emotions, girls' M = 6.8, boys' M = 7.8, $t(165) = -2.39$, $p = .02$; when identifying *high intensity* emotions, girls' M = 3.4, boys' M = 4.0, $t(165) = -2.22$, $p = .03$; when identifying, girls' M = 2.6, boys' M = 3.1, $t(165) = -2.11$, $p = .04$; and when identifying *sadness* at high intensity, girls' M = 0.9, boys' M = 1.2, $t(165) = -1.97$, $p = .05$. For the modality of *adult voices*, girls made fewer errors identifying *sadness* at low intensity, girls' M = 1.1, boys' M = 1.4, $t(165) = -2.23$, $p = .03$. There were no significant differences between boys' and girls' identification of *children's faces*. For the modality of *children's voices*, however, girls made fewer errors across all emotions, girls' M = 3.2, boys' M = 4.4, $t(165) = -2.81$, $p = .005$, and when identifying *sadness*, girls' M = 1.4, boys' M = 2.0, $t(165) = -2.16$, $p = .03$.

Similarly, sex differences in teacher ratings of girls' and boys' average adult and peer social competence were compared. There were no significant sex differences in teacher ratings for social competence with adults (girls' M = 1.4, boys' M = 1.6; $t(166) = -1.48$,

$p = .14$) or ratings for social competence with peers (girls' $M = 1.7$, boys' $M = 1.9$; $t(163) = -1.62$, $p = .11$).

DISCUSSION

The relative complexity of relations between nonverbal accuracy and social competence was one of the most striking findings of this study. Associations clearly varied by child's age and gender, by intensity and modality of nonverbal expression, by type of emotion, and by whether social competence was measured with adults or children. Within a Sullivanian framework, accurate identification of adults' emotions was expected to predict young children's social competence, identification of both adults' and peers' emotions was expected to predict juvenile children's social competence, and identification of peers' emotions was expected to predict preadolescents' social competence. While these hypotheses were supported in the youngest age group, they were differentially supported by gender for each of the two older age groups. Broadly, identification of adults' emotions continued to be relevant to social competence across all developmental stages (although in different ways for boys and girls). Identification of peers' emotions became more relevant for predicting social competence for older children, especially for girls.

Age and sex differences in relations between social competence and nonverbal skills

For children in the youngest developmental stage, before peer relationships are assumed to become central, errors on *adults'* nonverbal expressions were expected to correlate with lower social competence. This was indeed the case for girls' social competence. For boys, social competence was associated with errors on both adults' and peers' nonverbal expressions. For juvenile stage children, when establishing peer relationships is an emerging social goal, lower social competence was predicted to correlate with errors on other children's (as well as *adults'*) nonverbal expressions. This relation was supported for boys' peer competence only. Finally, for preadolescent children who, according to Sullivan, are learning to form "chum" relationships, errors identifying nonverbal expressions of peers (*children*) were predicted to correlate with lower social competence. Again, this prediction received partial support: girls' nonverbal errors on both children's and adults' expressions related to social competence. Interestingly, however, boys' errors (of any kind) no longer bore any relation to social competence. This divergence in relevance of nonverbal skills for preadolescent boys' and girls' social competence may reflect sex differences in social demands at this age. Considerable research indicates that peer socialization groups are quite distinct for preadolescent girls and boys, requiring fairly disparate language and interactional skills (e.g., Brody & Hall, 1993; Maccoby, 1990).

Clearly, the developmental stage of the child, his or her gender, and the status (adult or child) of the person displaying nonverbal emotions were factors which influenced relations between nonverbal skills and social competence. In addition, exploratory analyses suggested that other features of nonverbal information were relevant to a developmental account of social competence. For both boys and girls, social competence was differentially associated with nonverbal errors based on the intensity of emotion, the modality of

information (whether expressed via faces or voices), and the type of emotion (happiness, sadness, anger, or fear).

Intensity of nonverbal emotions and social competence

One of the more striking sex differences was the differential relation between intensity errors and social competence. Across all ages, girls' lower social competence was generally associated with poor recognition of *low intensity* expressions. Thus, sex differences in relations between intensity errors and social competence may suggest sex differences in correlated social skills, or in others' expectations for girls' and boys' nonverbal abilities. Given girls' generally stronger nonverbal skills (see review in Brody & Hall, 1993), for example, those who misidentify high intensity expressions may have other significant interpersonal deficits which compromise social competence. Alternately, peer and adult partners may be less tolerant of girls' mistakes to more intense nonverbal communications. Girls' generally strong language skills may often serve to compensate for difficulties responding to more complex, low intensity expressions, with little social consequence. Comparable hypotheses about the social impact of boys' errors recognizing low intensity expressions are more difficult to formulate, however. In future studies, inclusion of theoretically relevant moderator variables, such as self esteem or social anxiety, as well as assessment of more specific dimensions of social competence, seem necessary to understand the differential impact for boys and girls of misidentifying high and low intensity nonverbal expressions.

Modality of nonverbal emotions and social competence

With regard to modality, social competence for boys in the youngest and juvenile age groups was primarily associated with recognition of facial expressions. For the youngest girls, social competence was likewise associated with recognition of facial expressions. For juvenile girls, however, recognizing emotions expressed vocally, as well as via facial expressions, related to social competence. By preadolescence, girls' social competence correlated primarily with identifying vocal expressions. Overall, the relevance of emotion modality for social competence appears to diverge for boys and girls across development. While intriguing, interpretation of these sex and age differences must await longitudinal replication with a larger sample and more fine-grained assessment of dimensions of social competence.

Type of emotion and social competence

Of the four emotions, misidentification of *angry* expressions was most frequently related to lower social competence for both boys and girls, across all ages. Misidentification of *sad* and *fearful* expressions was also associated with social competence ratings, although less frequently. Based on multiple regression equations, errors identifying anger were associated with social competence for girls in the youngest age group, while no specific emotion errors were associated with boys' social competence at this age. In the juvenile stage, however, misidentifying anger (and fear) became relevant for boys' social competence; for girls, only errors identifying fear predicted social competence. By preadolescence, boys' errors were not significantly related to social competence, but errors

identifying anger (particularly in voices) again predicted social competence for girls. The preeminent role of accurately "reading" nonverbal anger may indicate that in fact "all emotions are not created equally" in terms of salience for social competence, perhaps for girls in particular.

Given the exploratory nature of these analyses, replication of relations between nonverbal ability and social competence, as moderated by child's age and gender as well as by features of nonverbal information (modality, intensity, and type of emotion), is clearly the next step. Likewise, a longitudinal design is necessary to confirm a developmental progression in relations between nonverbal ability and social competence. Longitudinal analyses can address the stability of nonverbal skills over time and cognitive development, as well as address the stability of social competence status. Furthermore, somewhat different patterns might have resulted if age groups were organized differently, or if a public school sample were used. Given evidence of low correlations between different methods of measuring social competence (Gresham & Reschly, 1987), inclusion of multimethod and multicontent measures (e.g. peer nominations and measures of quality of friendships) would clarify implications of nonverbal skills for social competence. Finally, social competence across development is likely influenced by a range of potential mediating or moderating variables not included in this study, such as temperament, learning history, and cognitive attributions.

Overall, results from this study suggested that nonverbal abilities are complex and multi-faceted, with implications for social functioning across development. Nonverbal recognition problems across multiple modalities, intensities, and types of emotion have differential implications for social competence, depending largely on age and gender. Awareness of this complexity is central to the assessment of nonverbal skills, and to future research and theory on the relevance of nonverbal abilities within a broader model of children's social development.

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RAZVOJNA POVEZANOST IZMEĐU NEVERBALNE AKTIVNOSTI I SOCIJALNE KOMPETENCIJE

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Sposobnost da se socijalne informacije tačno tumače jeste neophodan element socijalne kompetencije. S obzirom na to da neverbalno ponašanje pruža važne podatke o emocionalnim stanjima kod drugih osoba, pretpostavljalo se da će poteškoće koje deca imaju u prepoznavanju neverbalnih ekspresija biti u korelaciji sa nižim nivoom socijalne kompetencije. Pretpostavljalo se da će aspekti grešaka u tumačenju neverbalnog ponašanja varirati od jedne do druge razvojne faze, u skladu sa promenjenim socijalnim zadacima kako ih je prikazao Salivan. Nastavnici su gradirali socijalnu kompetenciju kod dece na tri različita uzrasta (n=43, 4-6 godina, n=69, 7-9 godina i n=53, 10-12 godina). Da bi se procenile veštine neverbalne komunikacije, deca su radila DANVA2 test za merenje neverbalnog prepoznavanja facijalnih i vokalnih ekspresija. Rezultati ukazuju na to da postoje razlike kako u uzrastu tako i u polu u odnosu izmedju prepoznavanja neverbalno izraženih emocija i socijalne kompetencije. Intenzitet, modalitet i tip emocije kod neverbalnih grešaka naročito diferencijalno predskazuju socijalnu kompetenciju kod dečaka i devojčica u različitim fazama razvoja. Opisane su implikacije po socijalnu prilagodjenost dece i Salivanova teorija razvoja.