The Social Adjustment of Deaf Adolescents in Segregated, Partially Integrated, and Mainstreamed Settings

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This study examined the social adjustment of deaf adolescents enrolled in segregated (n = 39), partially integrated (n = 15), and mainstreamed (n = 17) settings, comparing them with a control group of hearing students (n = 88). Segregated students showed the lowest levels of adjustment overall. Partially integrated students reported better adjustment than mainstreamed students with deaf peers; mainstreamed students reported better adjustment than partially integrated students with hearing peers, showing the same levels of adjustment with hearing peers as hearing students. Regardless of placement, deaf students reported better or equal adjustment with deaf than with hearing peers. Social adjustment with deaf peers was related to American Sign Language (ASL) skill and adjustment with hearing peers to spoken English. These findings suggest that deaf students can benefit from both segregated and integrated placements as complementary forms of social experience that each contribute to overall adjustment.

Mainstreaming has become an increasingly important option in the education of students who are hearing impaired, a recent survey indicating that 51% are currently integrated (Schildroth & Hotto, 1993). Research presents a mixed picture of the outcomes. On the one hand, deaf students in the mainstream have higher levels of achievement than those in segregated settings (Jensema, 1975; Reich, Hambleton & Houldin, 1977), although this may reflect selective placement rather than program outcomes.

On the other hand, deaf students in the mainstream tend to be socially isolated and to feel lonely, to have lower self-esteem, and to be less well adjusted than those in segregated settings (Antia, 1982; Charlson, Strong, & Gold, 1992; Farrigua & Austin, 1980; Foster, 1988; Kennedy, Northcott, McCauley, & Williams, 1976; Reich, Hambleton & Holdin, 1977; Schaffermeyer, 1990). A few studies have not obtained these negative findings (e.g. Frustenberg & Doyal, 1994; Lederberg, Rosenblatt, Vandell, & Chapin, 1987), and there is evidence that special programming can improve the relationships between deaf and hearing students (Davis, 1986; Kluwin & Gonscher, 1994; Ladd, Munson & Miller, 1984). The preponderance of the evidence, however, supports segregated placements for fostering socioemotional growth.

Most research has treated placement as a dichotomous variable, comparing segregated and mainstreamed students. Stinson and his colleagues conducted a study of the social adjustment of hard-of-hearing and deaf adolescents in the United States (Stinson, Whitmore, & Kluwin, in press) and a second
in England (Stinson & Whitmore, 1991), both of which included a wide range of partially integrated and mainstreamed settings, although they did not include a segregated group. They used the Social Activity Scale, which measures several aspects of adjustment, including social interaction, feelings of relatedness, and overall perceived social competence.

Results showed that social adjustment varied with degree of mainstreaming. In general, hearing-impaired students interacted more with same-status peers. However, interaction with hearing peers increased with increasing mainstreaming, so that those most frequently mainstreamed interacted more with hearing than with hearing-impaired peers. Regardless of degree of mainstreaming, however, hearing-impaired students felt more closely related to same-status than to hearing peers, and some of the more fully mainstreamed groups showed lower levels of perceived social competence. It thus appears that increasing exposure may foster increased interaction with hearing peers, but self-concept may suffer, and hearing-impaired students continue to feel more strongly related to same status peers.

There is evidence that these relationships are mediated by communicative competence, with oral skill predicting adjustment in the mainstream and sign proficiency predicting adjustment in segregated settings (Leigh & Stinson, 1991). Communication proficiency has been implicated in many facets of social and mental health in deaf persons (Greenberg & Kusche, 1989; Musselman, MacKay-Soroka, Trehub, & Simon-Eagle, in press; Weisel & Bar-Lev, 1992). Thus an understanding of the relationships among communicative competence, educational placement, and social adjustment could enhance educators’ ability to make placement decisions that benefit students’ overall development.

The purpose of the present study was to investigate the social adjustment of deaf students in a full range of educational settings, including segregation, partial integration, and mainstreaming. The study was designed to compare the adjustment of deaf students vis-à-vis both deaf and hearing peers, to assess the contributions of social participation and relatedness to perceived social competence, and to assess the contribution of communicative competence to social adjustment.

Method

Participants

Deaf participants. The study included 72 deaf adolescents enrolled in a variety of settings across Ontario, including segregated and regular classes in public schools, and day and residential programs in provincial schools for the deaf. This group was drawn from the early childhood sample studied by Musselman, Lindsay, and Wilson (1988), a sample that was highly representative of the population of deaf children. The adolescent sample consisted of all those from the original sample who were located and agreed to participate. Students ranged in age from 14 to 19 years ($M = 16.4$), with hearing threshold levels of 70 to 120 dB ($M = 98$ dB). Because of the greater reluctance of male adolescents to participate, the sample was not equally representative of male and female subjects (36% male and 64% female). The adolescent sample did not differ significantly from the early childhood sample on hearing loss, performance IQ, age, or socioeconomic status (Blishen & Roberts, 1976). Thus, except for sex, the sample was broadly representative of the population of deaf adolescents.

Using self-reported data, we grouped deaf students according to educational setting as follows: segregated (SEG)—0 classes with hearing students, $n = 39$; partially integrated (PI)—1 to 4 classes with hearing students, $n = 15$; mainstreamed (MS)—5 or more classes with hearing students, $n = 17$. A number of the PI (10) and MS students (3) had an educational interpreter in one or more of their classes.

Hearing participants. A hearing sample (H) was included for comparison purposes. The hearing group consisted of 88 students, half from a single urban and half from several suburban high schools. Hearing students also ranged in age from 14 to 19 ($M = 16.1$). The sample was 64% male and 36% female. None was receiving any special education service.
Measures

Background information on deaf students. Using the most recent audiograms, we calculated pure tone averages for the better ear. Students were administered the age-appropriate Wechsler Performance and Verbal IQ tests; the Verbal tests were administered in the students' strongest communication modality, either spoken language, Simultaneous Communication (SimCom), or American Sign Language (ASL) (Nizzero, Musselman, & MacKay-Soroka, 1993).

Social adjustment measures. The Social Activity Scale developed by Stinson and his colleagues was adapted for this study (see Table 1). Since our sample included only students who were deaf, we simplified the wording and layout in order to reduce the required reading levels, and we used a single three-point response scale throughout (Almost Never, Sometimes, Almost Always). We pilot tested the modified scales and conducted reliability studies. Our measure included two participation scales, one assessing the frequency of interaction with peers in class and a second assessing social interaction outside of school. The emotional security scale assessed feelings of relatedness. There were two versions of each of these three scales, one oriented toward deaf peers and a second, toward hearing peers. The final scale, perceived social competence, assessed students' overall sense of their ability to establish good peer relationships.

Measures of communicative competence. Using an interview format, we assessed deaf students' conversational proficiency in three modalities: spoken English, SimCom, and ASL. The interviews represent an adaptation of the Sign Communication Proficiency Interview developed by Newell, Caccamise, Boardman, and Holcomb (1983). Following previous studies of deaf adolescents (Geers & Moog, 1989; Moores, Kluwin, Johnson, Cox & Blennerhassett, 1987), each teen interacted with three conversational partners: a hearing person using spoken English, a hearing person using SimCom, and a deaf person using ASL. The interviews, which lasted about 30 minutes, were open-ended and followed students' interests, with interviewers trained to foster genuine dialogue. We used probes of increasing complexity to elicit students' highest levels of performance, which we then rated on a 12-point scale, ranging from No Ability to Advanced+ (Aka-matsu, Musselman, & Miller, 1994).

Procedure

We administered appropriate sections of the questionnaire to participants according to group. All deaf students completed the social participation and emotional security scales in both deaf-and hearing-oriented versions. SEG students completed the in-class participation scale in the deaf-oriented version, MS students completed this scale in the hearing-oriented version, and PI students completed both versions. H students completed only the hearing-oriented version of these three scales. All four groups completed the perceived social competence scale.

One of three researchers administered the questionnaire to groups of students as part of the larger study, with instructions presented in each student's preferred mode of communication (i.e., ASL, SimCom, or spoken English), and students completed sample items. During administration, which generally

<p>| Table 1 Sample items and reliabilities of social adjustment scales |</p>
<table>
<thead>
<tr>
<th>Scale</th>
<th>Number of items</th>
<th>Sample item</th>
<th>Alpha*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-class</td>
<td>5</td>
<td>I talk to deaf/hearing students in class.</td>
<td>.69 (Deaf) .81 (Hearing)</td>
</tr>
<tr>
<td>Social</td>
<td>7</td>
<td>I go to parties at deaf/hearing friends' homes.</td>
<td>.90 (Deaf) .88 (Hearing)</td>
</tr>
<tr>
<td>Emotional security</td>
<td>7</td>
<td>I feel happy with deaf/hearing students my age.</td>
<td>.74 (Deaf) .73 (Hearing)</td>
</tr>
<tr>
<td>Perceived social competence</td>
<td>11</td>
<td>I have a lot of friends in this school.</td>
<td>.74</td>
</tr>
</tbody>
</table>

*Alpha is the Kuder-Richardson estimate of reliability, calculated separately for deaf-oriented and hearing-oriented scales.
required 20 to 30 minutes, students were encouraged to ask questions about any items they did not understand. We administered communication proficiency interviews and intelligence tests on a one-to-one basis and obtained additional background information from student questionnaires and parent interviews.

Data Analysis

The data on background characteristics and communicative competence were first analyzed in order to detect group differences that might affect the dependent variables. Differences among the groups in social adjustment with deaf and hearing peers, the contribution of peer participation and relatedness to perceived social competence, and the contribution of communication skills to social adjustment were analyzed using appropriate multivariate techniques, both analysis of variance and stepwise multiple regression, as required.

Results

Differences Among Groups

Background characteristics. We analyzed differences among groups using one-way analyses of variance, with significant main effects followed by Helmert contrasts in order to isolate group differences. Helmert contrasts are orthogonal comparisons in which each mean is compared with the combined mean of subsequent groups; thus, the first contrast compared the SEG mean with the combined mean of the PI, MS, and H groups; the second contrast compared the PI mean with the combined mean of the remaining groups; and so on.

The four groups were compared on age and socio-economic status, which we found not to differ significantly. The three groups of deaf students did not differ on Performance IQ (M = 99.58, SD = 12.99). On Verbal IQ, a one-way analysis of variance revealed the presence of significant differences [F(2, 63) = 8.08, p = .001]; the Helmert contrasts indicated that SEG students (M = 75.5) scored significantly lower than the combined mean of the other two groups [F(1, 63) = 23.21, p = .000], and that PI students (M = 83.1) scored lower than MS students (M = 85.4) [F(1, 63) = 15.99, p = .000], while the PI (M = 84.0) and MS groups (M = 85.4) did not differ. The groups also had significantly different hearing threshold levels, as measured by pure tone average in the better ear [F(2, 63) = 5.33, p = .007]; the Helmert contrasts indicated that SEG students (M = 102.3) did not differ from the remaining students, but that PI students (M = 104.3) had significantly less hearing than MS students (M = 90.3) [F(1, 63) = 7.71, p = .007].

Communicative competence. The three groups of deaf students differed significantly on all three measures of communicative competence. On the spoken English interview [F(2, 63) = 18.63, p = .000], Helmert contrasts indicated that SEG students (M = 3.01) scored significantly lower than the combined mean of the other two groups [F(1, 65) = 23.21, p = .000], and that PI students (M = 3.30) scored lower than MS students (M = 5.00) [F(1, 65) = 14.04, p = .000]. On the Sim-Com interview [F(2, 65) = 3.46, p = .037], the SEG group scored lower (M = 4.09) than the other two groups [F(1, 65) = 6.91, p = .011], while the PI (M = 4.36) and MS (M = 4.38) groups did not differ. On the ASL interview [F(2, 65) = 26.14, p = .000], the SEG students (M = 4.21) scored higher than the two other groups combined [F(1, 65) = 18.65, p = .000], and PI students (M = 4.29) scored significantly higher [F(1, 65) = 33.63, p = .000] than MS students (M = 2.22).

Reliability of the Social Adjustment Questionnaire

Kuder-Richardson alpha coefficients were computed for each of the social adjustment scales as a measure of interitem reliability (see Table 1). These varied from .69 to .90, which represents a range of fair to good.

Group Differences in Social Adjustment

Although gender was not originally of interest, the unequal representation of male and female subjects within the sample required that it be taken into account. Preliminary analysis indicated that male and female subjects differed significantly on several of the social adjustment measures. Therefore each dependent variable was analyzed using a two-way analysis of variance, with gender as the first factor and group nested within gender as the second factor. Helmert contrasts nested within gender were used to provide orthogonal...
Table 2  Summary of analyses of variance (F values) on social adjustment scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Effects</th>
<th>Helmert contrasts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SEG</td>
</tr>
<tr>
<td>Deaf peers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-class participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(df = 3,51)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td>0.25</td>
<td>3.87</td>
</tr>
<tr>
<td>Gender X Group:</td>
<td>9.68***</td>
<td>15.50***</td>
</tr>
<tr>
<td>Social participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(df = 5,68)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td>1.96</td>
<td>4.43*</td>
</tr>
<tr>
<td>Gender X Group:</td>
<td>4.31**</td>
<td>0.16</td>
</tr>
<tr>
<td>Emotional security</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(df = 2,66)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group:</td>
<td>4.25*</td>
<td>2.69</td>
</tr>
<tr>
<td>Hearing peers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-class participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(df = 5,85)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td>0.50</td>
<td>n/a</td>
</tr>
<tr>
<td>Gender X Group:</td>
<td>4.03**</td>
<td>n/a</td>
</tr>
<tr>
<td>Social participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(df = 7,157)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td>1.02</td>
<td>2.50</td>
</tr>
<tr>
<td>Gender X Group:</td>
<td>10.17***</td>
<td>41.28***</td>
</tr>
<tr>
<td>Emotional security</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(df = 7,156)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td>2.50</td>
<td>2.41</td>
</tr>
<tr>
<td>Gender X Group:</td>
<td>4.86***</td>
<td>17.69***</td>
</tr>
<tr>
<td>Perceived Social Competence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(df = 7,149)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td>5.54*</td>
<td>0.08</td>
</tr>
<tr>
<td>Gender X Group:</td>
<td>2.81**</td>
<td>10.56***</td>
</tr>
</tbody>
</table>

Note. Of the total degrees of freedom for each analysis, 1 is allocated to Gender, 2 to 4 to Group X Gender, depending on the number of groups, and 1 to each of the Helmert contrasts within Gender. SEG = segregated; PI = partially integrated; MS = mainstreamed (m) = male, (f) = female.

*p < .05  **p < .01  ***p < .001.

comparisons of the group means. These analyses are summarized in Table 2.

Adjustment with deaf peers. Analysis of the social adjustment scales referring to deaf peers found significant differences among the SEG, PI, and MS groups on all measures. On in-class participation with deaf students, there was no main effect for gender, but a significant Group X Gender interaction: Helmert contrasts indicated that SEG girls reported significantly less participation than PI girls, with the data for boys showing a nonsignificant trend in the same direction (see Figure 1).

The data on social participation with deaf peers again found no main effect for gender but a significant Group X Gender interaction: Helmert contrasts indicated that SEG boys reported significantly more participation than other boys, although this was not true for girls; both PI boys and girls reported higher participation rates than MS boys and girls (Figure 2).

The analysis of reported emotional security with deaf peers found neither a main effect for gender nor a Group X Gender interaction. Therefore, these data were analyzed using a one-way analysis of variance with group as the sole factor. The results found a significant main effect for group; the Helmert contrasts indicated that SEG students did not differ from other students, but that PI students reported significantly greater feelings of security than MS students (Figure 3). The apparent difference between SEG and PI students was further analyzed using a post hoc comparison (multiple range test, least significant difference method), the results indicating that SEG students scored significantly lower (p ≤ .05).

Adjustment with hearing peers. Analysis of the social adjustment scales referring to hearing peers found sig-
significant differences among the SEG, PI, MS, and H groups on all measures. The analysis of in-class participation with hearing peers found no effect for gender, but a significant Group \(\times\) Gender interaction: the Helmert contrasts found no differences for boys; PI girls, however, reported significantly less participation in regular classes than MS and H girls, while MS and H girls did not differ (Figure 4).

Social participation with hearing peers showed no effect for gender, but a significant Group \(\times\) Gender interaction: Helmert contrasts found no significant differences for boys. As is evident from Figure 5, however, the scores for girls increased systematically over the four groups: Helmert contrasts indicated that SEG girls reported significantly less social participation than other girls, PI girls participated less than MS and H girls, and MS girls participated less than H girls (Figure 5).

The analysis of reported emotional security with hearing peers obtained similar results: there was no effect for gender, but a significant Group \(\times\) Gender interaction: Helmert contrasts found no significant differences for boys; SEG girls reported significantly less emotional security than other girls, and PI girls felt less secure than MS and H girls, although the difference between MS and H girls was not significant (Figure 6).

**Perceived social competence.** The analysis of perceived social competence found a significant main effect for gender and a significant Group \(\times\) Gender interaction: the Helmert contrasts showed that SEG girls scored significantly lower than other girls; no other comparisons involving girls and none of the comparisons involving boys were significant (see Figure 7).

**Comparison of adjustment with deaf and hearing peers.** We compared the in-class participation of PI students with deaf and hearing peers using an analysis of variance with peers as a within-subjects factor. The results indi-
Table 3 Contributions of in-class participation, social participation, and emotional security with deaf and hearing peers to perceived social competence

<table>
<thead>
<tr>
<th>Group</th>
<th>Scale</th>
<th>SEG</th>
<th>PI</th>
<th>MS</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>r</td>
<td>R²</td>
<td>r</td>
<td>R²</td>
</tr>
<tr>
<td>Deaf Peers</td>
<td>In-class participation</td>
<td>.51**</td>
<td>.12**</td>
<td>.25</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Social participation</td>
<td>.48*</td>
<td>—</td>
<td>.67*</td>
<td>.45**</td>
</tr>
<tr>
<td></td>
<td>Emotional security</td>
<td>.66**</td>
<td>.44***</td>
<td>.45</td>
<td>.06</td>
</tr>
<tr>
<td>Hearing peers</td>
<td>In-class participation</td>
<td>n/a</td>
<td>n/a</td>
<td>—</td>
<td>.70*</td>
</tr>
<tr>
<td></td>
<td>Social participation</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>.55</td>
</tr>
<tr>
<td></td>
<td>Emotional security</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>.38</td>
</tr>
</tbody>
</table>

Note: The data were analyzed separately for each group using a stepwise multiple regression of all the appropriate deaf- and hearing-oriented scales on perceived social competence.

* p ≤ .05. ** p ≤ .01. *** p ≤ .001.

cated that PI students reported significantly more participation in classes with deaf than with hearing peers [F(1, 13) = 20.20, p = .001].

Comparisons of adjustment with deaf and hearing peers on the other scales were performed using two-way analyses of variance with peers as a within-subjects factor nested within group. The analysis of social participation found that SEG students reported significantly more participation with deaf than with hearing peers [F(1, 65) = 16.76, p = .000], while the differences for PI and MS students were not significant. The analysis of emotional security found that both SEG [F(1, 66) = 8.53, p = .005] and PI [F(1, 65) = 10.64, p = .002] students reported significantly greater security with deaf than with hearing peers, while the reports of MS students did not differ by peer group.

Determinants of perceived social competence. Stepwise multiple regression analyses were performed to assess the contribution of in-class participation, social participation, and emotional security with deaf and hearing peers to overall perceived social competence. We performed a separate analysis for each of the four groups using the appropriate scales. These are summarized in Table 3, which presents the simple correlations between each scale and perceived social competence, plus its contribution to the equation, if significant. These analyses revealed the presence of different patterns of relationships within each student group.

Among SEG students, the three scales referring to deaf peers showed moderate to strong relationships with perceived social competence, but none of the hearing peer scales was significantly related. The multiple regression analysis revealed that emotional security with deaf peers was associated with 44% of the variance in perceived social competence, and in-class participation with deaf peers contributed an additional 12%; social participation did not make an independent contribution to the equation.

Among PI students, the only scale that was significantly related to perceived social competence was social participation with deaf peers, which accounted for 45% of the variance in the equation.

Among MS students, both deaf- and hearing-oriented scales were related to perceived social competence. In-class participation with hearing peers accounted for 49% of the variance in the regression, and social participation with deaf peers accounted for an additional 14%.

Among H students, all three scales made significant and independent contributions to perceived social competence. In-class participation was associated with 32% of the variance, emotional security explained an additional 15%, and social participation, 8%.
Table 4 Summary of regressions of communicative competence on social adjustment with deaf peers

<table>
<thead>
<tr>
<th>Communicative competence</th>
<th>In-class participation</th>
<th>Social participation</th>
<th>Emotional security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speech</td>
<td>.12</td>
<td>- .22</td>
<td>- .01</td>
</tr>
<tr>
<td>Simultaneous communication</td>
<td>.30</td>
<td>.06</td>
<td>.17</td>
</tr>
<tr>
<td>American Sign Language</td>
<td>.43**</td>
<td>.10***</td>
<td>.36***</td>
</tr>
<tr>
<td>Total*</td>
<td>.18</td>
<td>.36</td>
<td>.00</td>
</tr>
</tbody>
</table>

Note. The analysis of in-class participation with deaf peers included segregated and partially integrated students; analyses of the other measures included mainstreamed students, as well.

**p < .01. ***p < .001.

Table 5 Summary of regressions of communicative competence on social adjustment with hearing peers and on perceived social competence

<table>
<thead>
<tr>
<th>Hearing peers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicative competence</td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>Speech</td>
</tr>
<tr>
<td>Simultaneous Communication</td>
</tr>
<tr>
<td>American Sign Language</td>
</tr>
<tr>
<td>Total R²</td>
</tr>
</tbody>
</table>

Note. The analysis of in-class participation with hearing peers included partially integrated and mainstreamed students; analyses of the other measures included segregated students, as well.

*p < .05. **p < .01. ***p < .001.

Contribution of Communication Competence to Social Adjustment

Stepwise multiple regression analyses were used to assess the contribution of communicative competence in spoken English, SimCom, and ASL to social adjustment. We analyzed each of the seven scales separately, collapsing data across the relevant student groups; confirmatory analyses were also performed within groups. Tables 4 and 5 summarize the results of these regressions on the deaf- and hearing-oriented scales, respectively, presenting the simple correlations as well as the contributions to the regression equations where significant.

Table 4 shows that competence in ASL contributed significantly to the in-class and social participation of deaf students with deaf peers, accounting for substantial portions of the variance in each case. Spoken English and SimCom scores were not significantly related to these two adjustment scores and did not enter into the equations. None of the communicative competence scores contributed to emotional security with deaf peers. Separate analysis of each group yielded a similar pattern, although ASL skill was significantly associated with in-class participation with deaf peers for SEG students, but not for PI students.

The analysis of social adjustment with hearing peers (Table 5) showed that competence in spoken English made a significant contribution to in-class participation, although this was only significant for PI and not MS students when the groups were analyzed separately. Spoken English also made a significant contribution to emotional security with hearing peers, although only a small proportion of the variance was accounted for and the relationship was not significant within any of the groups analyzed separately. Neither
SimCom nor ASL made significant contributions to any of the hearing-oriented scales.

The analysis of perceived social competence found that only ASL made a significant contribution to the equation. This relationship was stronger within the SEG group, accounting for 11% of the variance ($r = .34, p = .04$). Separate analyses of the PI and MS groups were inconclusive because of limitations in sample size. Nevertheless, it is interesting to observe that the strongest correlation within the MS group was observed between ASL scores and perceived social competence ($r = .48$).

Discussion

The three groups of deaf students differed systematically on a number of characteristics. Segregated students had relatively little hearing and poor spoken English. They also had relatively lower scores on measures that reflect English language skills (simultaneous communication and Verbal IQ), while their ASL skills were relatively good. Partially integrated students had similar levels of hearing, spoken English, and ASL competencies as segregated students, but better English language ability, as reflected in higher simultaneous communication and Verbal IQ scores. Mainstreamed students were similar to partially integrated students in simultaneous communication and Verbal IQ, but had more hearing and better spoken language. Their ASL skills were poorer, likely reflecting less need for, as well as decreased opportunity to develop, manual communication skills. These group differences may have been implicated in students' placements, and must be taken into account when interpreting the findings.

In general, segregated students were the most poorly adjusted of the four groups, reporting lower levels of adjustment with both deaf and hearing peers, as well as lower perceived social competence. Poorer adjustment with hearing peers is consistent with the poorer speech and English language skills of this group. However, the reason for their poorer adjustment with deaf peers and overall lower perceived social competence is unclear, since their ASL skills were good and Performance IQ scores did not suggest the presence of a generalized functional deficit. It is possible that segregated placement itself, with the restriction of students to limited spheres of activity, was a contributing factor.

Partially integrated and mainstreamed students showed contrasting patterns of adjustment. Overall, partially integrated students reported better adjustment with deaf peers than did mainstreamed students, while mainstreamed students reported better adjustment with hearing peers than did partially integrated students. As the groups did not differ on perceived social competence, it appears that satisfactory relationships with one peer group balanced poorer relations with the other.

With the exception of the social participation of mainstreamed girls, mainstreamed students reported a level of adjustment with hearing peers which equaled that of hearing students. Thus hearing status was not a factor in adjustment, suggesting that mainstreaming was a viable option for the students in this group.

Regardless of placement, deaf students were at least as well adjusted with deaf peers as with hearing peers. Segregated students consistently reported better adjustment with deaf than with hearing peers. Partially integrated students showed the same general pattern, although the differences were significant only for emotional security and in-class participation, the latter finding likely reflecting the advantage of small classes (Davis, 1986). These findings are consistent with previous studies showing poorer social adjustment between deaf and hearing persons than between persons with the same hearing status (Antia, 1982; Arnold & Tremblay, 1979; Brackett & Henniges, 1976).

Even though mainstreamed students had greater exposure to hearing than to deaf peers, they reported equal adjustment with these two groups. Thus, although academically integrated, mainstreamed students maintained social ties with deaf peers.

Furthermore, adjustment with deaf peers contributed to the perceived social competence of all three groups of deaf students. For segregated and partially integrated students, only adjustment with deaf peers contributed to perceived social competence, while for mainstreamed students, perceived social competence was predicted by adjustment with both deaf and hearing peers.

Due to differences among the groups in back-
ground characteristics, it is not possible to conclude that the better social adjustment of partially integrated and mainstreamed students was the outcome of regular-class placement. It is important to note, however, that we did not observe the usual disadvantages associated with integration (e.g., Charlson, Strong & Gold, 1992; Schaffer-Meyer, 1990). Our more positive findings may reflect the fact that integrated students had established strong relationships with deaf peers, an option which may have been less available to integrated students in other studies, most of whom were younger than the teenagers in the present sample.

Our findings differ in several respects from those by Stinson and his colleagues (Stinson et al., in press; Stinson & Whitmore, 1991). Those investigators found that participation with hearing peers increased as a function of mainstreaming, but that relational bonds did not increase, whereas in this study, both participation and relational bonds increased. Additionally, they found that those most fully mainstreamed were better adjusted with hearing than with deaf peers. These differences further emphasize the importance of exercising caution in generalizing findings from one sample to another.

Although social adjustment of girls versus boys was not initially a concern of this study, the results suggest that the social adjustment of deaf girls is more influenced by educational setting than that of deaf boys. These results suggest that gender effects are worthy of further investigation and may represent an important intervening variable. For example, the greater intensity and exclusiveness of girls' peer relationships (Daniels-Beirness, 1989) may increase the necessity for a shared communication system. It is also possible that the sample size and less than optimal reliabilities for the social adjustment measure limited the power of our analysis, as a number of trends were observed among boys that did not attain conventional levels of significance.

The results of this study confirm the previously reported relationships between communicative competence and social adjustment (Leigh & Stinson, 1991). ASL skill predicted aspects of adjustment with deaf peers, and spoken English skill predicted aspects of adjustment with hearing peers. Competency in simultaneous communication was not significantly related to any measure of adjustment perhaps because, as a contrived language (Stokoe, 1975), it is less effective in supporting social interaction. The effect of communicative competence was also evident in the particular pattern of adjustment seen within the segregated group. These students reported less in-class participation with deaf students than did partially integrated students, a finding that is consistent with their poorer English language skills. Consistent with their good ASL skills, however, they enjoyed social participation with deaf peers equal to that of other deaf students.

The relationships between communicative competence and social adjustment were not present consistently, nor did they consistently account for large proportions of the variance. This may reflect the nature of our communication measures, which assessed the ability to converse one-to-one with an adult rather than to interact with peers, which may require different repertoires of linguistic, cognitive, and pragmatic skills.

The results of this study suggest that deaf students can benefit from placement with both deaf and hearing peers. They show that partially integrated students were able to be actively bilingual/bicultural, studying and interacting in both deaf and hearing settings, an experience that was associated with a strong sense of personal competency. The spoken English skills of these students were still considerably below those of mainstreamed students, and most used educational interpreters in some or all of their regular classes, a factor that contributed to their lower adjustment with hearing peers. It is noteworthy that the ASL skills of partially integrated students equaled those of the segregated groups and were not compromised by decreased opportunity to interact with deaf peers.

The findings also support the contention that relationships with deaf peers are essential to the social and emotional health of deaf persons (Carver & Doe, 1990; Padden & Humphreys, 1988). Thus, mainstreamed students, while generally well adjusted with hearing peers, maintained ties with deaf peers that contributed to their overall sense of social competency. Relationships with deaf peers may have been hampered by their poorer ASL skills, and it is possible that increased opportunities to learn sign language might further enhance their overall adjustment.

Further investigation of ways to maximize the op-
portunity for all deaf students to participate in both
dead and hearing settings is needed. While many stu-
dents will be limited by their lower speech and English
language skills, it may be possible to facilitate inter-
action through activities that make fewer linguistic
demands. Most research on the communicative com-
petence of deaf students has focused on skills relevant to
education. Research on how deaf students communicate
with one another and how deaf and hearing students
communicate in the absence of a fluent, shared com-
munication system would also help in understanding
the processes of social development within this group.

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