Brief Report: Cleft Lip and Palate: Longitudinal Behavior and Relationships of Cleft Conditions to Behavior and Achievement

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Analyzed longitudinal behavior ratings (ANOVAs) for 44 children (ages 4–12) with cleft lip and palate and cleft palate only (CLP) and examined the relationship of speech, hearing, and facial disfigurement at age 9 in predicting behavioral characteristics and school achievement (multiple regression). Results indicate increasing levels of social inhibition over age for girls with CLP, but less so for boys. There were also increasing levels of conduct problems for older girls with CLP with variable age fluctuation for boys. Attempts to relate speech, hearing, or facial disfigurement to prediction of behavior or achievement at age 9 were not revealing and further analysis with larger samples is indicated.

KEY WORDS: cleft lip and palate; behavioral ratings; facial disfigurement; speech defectiveness; hearing loss.

Factors directly affecting the psychological development of a child born with a cleft lip and palate include possible speech and language disorders, facial disfigurement, and hearing loss. Studies on cleft have shown relationships between (a) facial appearance and teacher perception, (b) behavioral inhibition and lower school achievement, and (c) speech defectiveness and self-esteem (Richman & Eliason, 1993). Few studies have investigated the relationships of these multiple variables to behavior problems and learning. Also, most studies of behavior are cross-sectional, do not always clearly hypothesize relationships between depen-
dent and independent variables, and rarely control for other conditions (e.g., age, IQ, SES) that could affect behavior or learning.

The results of self-report and behavioral studies show inconsistent results. Some self-report studies indicate dissatisfaction with physical appearance (Kapp, 1979) and others find no differences in adjustment from control groups (Leonard, Boust, Abrahams, & Sielaff, 1991). Other studies have suggested that children with cleft show less adequate adjustment than control groups (Broder & Strauss, 1989; Pertschuk & Whitaker, 1985). Most behavioral studies of elementary school age children with cleft have found that these children tend to be more inhibited than noncleft children (Harper, Richman, & Snider, 1980; Richman, 1976, 1983). However, studies of younger and older children with cleft (e.g., preschool or later adolescents) have reported more externalizing behaviors (Pertschuk & Whitaker, 1985; Speltz, Morton, Goodell, & Clarren, 1993; Tobiasen & Hiebert, 1984). Thus, it appears that any study of the effects of cleft-related conditions on behavior should examine both internalizing and externalizing dimensions of behavior and consider that there may be subgroups of children showing these different behaviors across different age levels.

A high incidence of underachievement (Broder & Strauss, 1993; Richman, Eliason, & Lindgren, 1988) has been demonstrated in children with cleft. It has also been suggested that school achievement problems may be related to behavioral inhibition and less competitiveness in the classroom (Richman & Eliason, 1993). Other factors that have been suggested to affect school performance include speech difficulties (McWilliams & Musgrave, 1972; Richman, 1976) and hearing loss (Richman & Eliason, 1993).

This report comprises two parts. The first is an examination of 8-year longitudinal behavioral characteristics of 44 children with cleft. The second is an analysis of relationships of speech, hearing, and facial variables to behavior and achievement at age 9 for these same 44 children.

METHOD

Participants

The sample included 44 children with cleft lip and palate or cleft palate only, who were managed by a University interdisciplinary cleft palate team. No children were included if they showed other cleft-related syndromes (e.g., Crouzans) or other medical conditions. All children had to receive a behavior rating from age 4 through 12. Based on these criteria, complete data were obtained for 51 of 354 enrolled children and 44 children (86%) were included. Those excluded had below average intelligence (4 cases) or voluntary withdrawal (3 cases).
Measures

The Behavior Problem Checklist (Quay & Peterson, 1975) is a factor analytically derived rating scale. In numerous factor analytic studies this scale has consistently yielded these two factors which accounted for almost all the significant variance: Conduct Disorder or externalizing behavior problems and Personality Disorder or internalizing behavior problems. Correlations between parents ratings have been reported as .78 for conduct problems and .67 for personality problems (Quay, Sprague, Shulman, & Miller, 1966). The unweighted scoring system was used which considers the number of problems for each dimension. The Behavior Problem Checklist (BPC) has been utilized previously with cleft populations (Richman, 1976, 1978; Richman, Holmes, & Eliason, 1985; Tobiasen & Hiebert, 1984).

The speech rating was a 7-point interval scale (1 = normal, 7 = severe) of connected speech made at age 9 by the speech clinician. Interrater reliability of this scale is reported at .91 and .90 (Peterson-Falzone, 1990). The hearing level was the average decibels for the pure tones of 500, 1,000, 2,000 cycles per second. Facial rating at age 9 was a 5-category scale (1 = normal, 5 = severe disfigurement) made by three examiners (psychologist, speech clinician, one other clinic professional) on the same clinic day. The intraclass reliability for the mean rating scores of the three ratings was .79. Socioeconomic status (SES) was based on the Hollingshead Two-Factor Index of Social Position (Hollingshead & Redlich, 1961) and the intelligence test was the WISC or WISC-R Full-Scale IQ.

Procedure

A parent completed the BPC during a clinic visit or it was obtained via mail (8 instances). Iowa Test of Basic Skills (ITBS) composite scores were obtained at age 9, the time closest to the intelligence test score.

Cleft type identified by agreement of the clinic staff was cleft lip only (n = 21) and cleft of the lip and palate (n = 23). The data for each gender by cleft type for speech and facial ratings hearing level, IQ, SES, and achievement for the 44 children are presented in Table I.

RESULTS

All data were treated separately for boys and girls for the longitudinal behavioral analysis. Since initial comparisons revealed no cleft type differences in behavior at any of the age levels, cleft types were pooled for the longitudinal analysis. For the correlational analysis at age 9, gender was included as a control variable.
Table I. Means of Speech and Facial Ratings, Hearing Levels, and IQ for Boys and Girls by Cleft Time

<table>
<thead>
<tr>
<th></th>
<th>Boys (n = 25)</th>
<th></th>
<th>Girls (n = 19)</th>
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<tr>
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<tr>
<td></td>
<td>Cleft palate only</td>
<td>Cleft lip &amp; palate</td>
<td>Cleft palate only</td>
<td>Cleft lip &amp; palate</td>
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<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Speech rating&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.43</td>
<td>1.25</td>
<td>2.21</td>
<td>1.28</td>
</tr>
<tr>
<td>Facial rating&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.23</td>
<td>0.58</td>
<td>2.18</td>
<td>0.46</td>
</tr>
<tr>
<td>Hearing Sensitivity&lt;sup&gt;c&lt;/sup&gt;</td>
<td>23</td>
<td>8.2</td>
<td>27</td>
<td>6.5</td>
</tr>
<tr>
<td>IQ&lt;sup&gt;d&lt;/sup&gt;</td>
<td>103.6</td>
<td>13.7</td>
<td>104.0</td>
<td>13.8</td>
</tr>
<tr>
<td>SES&lt;sup&gt;e&lt;/sup&gt;</td>
<td>2.13</td>
<td>0.33</td>
<td>2.21</td>
<td>0.47</td>
</tr>
<tr>
<td>Achievement&lt;sup&gt;f&lt;/sup&gt;</td>
<td>2.9</td>
<td>0.61</td>
<td>3.1</td>
<td>0.52</td>
</tr>
</tbody>
</table>

<sup>a</sup>Internal scale ranging from 1 (normal speech) to 7 (severe speech defectiveness).
<sup>b</sup>Scale ranging from 1 (normal facial rating) to 5 (severe facial disfigurement).
<sup>c</sup>Pure tone average in decibels of 500, 1,000, and 2,000 Hz (worst ear).
<sup>d</sup>WISC Full Scale.
<sup>e</sup>Hollingshead Two-Facts Index.
<sup>f</sup>Iowa Tests of Basic Skills Composite Grade Equivalent.

The BPC has very little normative data from parents. Therefore, control data from earlier cross sectional studies was used as a point for contrast (Richman, 1976, 1978; Richman et al., 1985). These data were obtained by solicitation of parents through public schools. Data were not available for the exact return rate, but based on school sizes, an estimate is approximately 70%. Since these data were cross-sectional, no statistical comparisons were made between the data and the children with cleft, but these results are available in Table II for inspection.

A one-way repeated measures ANOVA was used to examine age differences in behavior. The means and standard deviations for behavior scores are presented in Table II.

A one-way ANOVA for the Personality Scale across age for the boys indicated no significant effect, \( F(8, 192) = 0.76, p > .05 \). Although not statistically analyzed, boys with cleft were slightly higher than the contrast data (1.5−1 SDs) across all age levels. A one-way ANOVA of the Personality Scale across age for the girls indicated a significant effect for age, \( F(8, 144) = 9.87, p < .05 \). Girls showed significantly greater internalizing behavior at ages 8–12 than at ages 4–6. Although not statistically analyzed, the girls with cleft were considerably higher (1.5−2 SDs) than the contrast group after the age of 7. A one-way
Table II. Means for Personality Disorder and Conduct Disorder for Boys and Girls at Each Level from Age 4–12

<table>
<thead>
<tr>
<th>Age</th>
<th>Personality disorder</th>
<th>Conduct Disorder</th>
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<tbody>
<tr>
<td></td>
<td>Boys (n = 25)</td>
<td>Girls (n = 19)</td>
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<td></td>
<td>M</td>
<td>SD</td>
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<tr>
<td>4</td>
<td>5.01</td>
<td>3.22</td>
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<tr>
<td>5</td>
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<td>2.03</td>
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<td>5.51</td>
<td>3.06</td>
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<td>7</td>
<td>5.85</td>
<td>2.72</td>
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<td>8</td>
<td>6.05</td>
<td>1.95</td>
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<td>9</td>
<td>6.08</td>
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<td>10</td>
<td>6.11</td>
<td>2.41</td>
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<tr>
<td>11</td>
<td>6.02</td>
<td>1.76</td>
</tr>
<tr>
<td>12</td>
<td>6.12</td>
<td>1.74</td>
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</tbody>
</table>

Contrast data was obtained from previous studies (see text) and was cross-sectional. It is included for a reference point only and was not analyzed. The Gender × Age cells ranged in sample size from 34–58 with a total of 711 children.
ANOVA for the Conduct Scale (across age) for the boys indicated a significant effect for age, $F(8, 192) = 16.31, p < .01$. The boys with cleft showed significantly higher externalizing behaviors at (ages 6 and 7) than at other ages and were significantly lower at ages 11 and 12. This pattern is not seen in the contrast group. The one-way ANOVA for the Conduct Scale across age for the girls showed a significant age effect, $F(8, 144) = 6.59, p < .05$. The girls with cleft showed significantly higher Conduct behaviors at ages 11 and 12 than at any of the younger ages, and although not analyzed, they are much higher than the contrast group at these ages ($2^{1/2}$–$3$ SDs).

The relationships of severity of cleft-related variables to behavior and achievement at age 9 were analyzed via multiple regression equations for the 44 children. The combined effects of gender, age, intelligence, and SES were first partialled out. There were no significant correlations between the combined control variables and the dependent variables. Each one of the three independent variables (Conduct, Personality, and Achievement) was then separately correlated with each the three dependent variables (speech, hearing, facial rating) via a multiple regression equation while partialling out the four control variables.

There was only one significant relationship (the correlation of speech defectiveness to Personality Disorder $= -.36, p < .05$). Children with more severe speech defectiveness ratings showed lower scores on internalizing behavior.

**DISCUSSION**

Due to the sample size and single informant regarding behavior (e.g., parent) these results should be considered tentative until replication or further exploration of the relationship of cleft factors to behavior with larger samples occurs. The longitudinal behavioral data are, in part, consistent with previous findings indicating that boys and girls with cleft tend to show higher than average levels of internalizing behavior (Richman & Eliason, 1993). The boys showed a consistent mild elevation in internalizing behavior over all ages; whereas, girls showed an increase in internalizing behavior over age with very high levels by adolescence. Although this sample may not be representative of the population of children with cleft, these findings are similar to several previous studies (Harper & Richman, 1978; Kapp-Simon, Simon, & Kristovich, 1992; Leonard et al., 1991; Richman, 1983) suggesting that many adolescent females with cleft show inhibition to a degree raising a risk for depression. A previous study of MMPI scores for adolescent females (Richman, 1983) suggested signs of self-doubt, depression, and social introversion. Kapp (1979) found anxiety and dissatisfaction on the Piers Harris for adolescent females. Further study of anxiety and depressive features in large groups of adolescents with cleft are needed to determine if there is a higher frequency of these problems than in the population.
Even though this sample may not be representative of children with cleft, there are similarities between the externalizing behaviors identified in this study and in several previous studies. The finding that boys show elevation in acting out at ages 6 and 7 is relatively consistent with similar findings in several studies of younger children with cleft (Speltz et al., 1993; Tobiasen & Hiebert, 1984). These boys may show some early signs of acting-out behaviors, related to parental protectiveness related to their condition (Tobiasen & Hiebert, 1984). This may be a transitory condition since low levels of acting out occur at adolescent ages in this and another study (Richman, 1983). The finding that girls showed high levels of acting out at ages 11 and 12 is consistent with only one other known report (Eliason & Richman, 1986). This finding may suggest a frustration-aggression dynamic, since inspection of the data reveals that the same girls were simultaneously rated as overinhibited. Mood variability is often invoked as a possible etiology for this type of finding and further investigation of this possibility appears warranted.

The fact that only one of nine correlations between cleft-related conditions (speech, facial disfigurement, and hearing) and behavior or achievement was significant, yields little explanatory information regarding the effects of cleft conditions on behavior. Even the one significant correlation of more defective speech and less withdrawal is counter to most interpretations. The lack of relationships are in contrast to previously reported associations between self-reported speech and facial concerns and adjustment (Richman, 1983). It is possible that cleft-related conditions alone are less important than the combined effect of cleft conditions and environmental variables, or other confounds in this study washed out possible true relationships. A study that longitudinally compares both cleft-related variables and behavioral changes simultaneously, along with academic progress, is needed. It would also be important to assess parenting variables, self-perception, and social relations in such a study to clarify primary etiologies and interactions.

Although this should be considered an exploratory study, since the sample was small \( n = 44 \) and there was only a single behavioral informant (the parent), the 8-year longitudinal design does provide some interesting data on age-related behavioral change. The analysis of behavioral change over time allows the within-subject aspect of the design to add statistical power beyond that of the sample size per se. Unfortunately, the sample size does limit the interpretation of findings from the regression analysis, especially since so many variables were controlled (e.g., removal of IQ, gender, SES, and age). The fact that only one significant correlation out of nine occurred in an unexpected direction may merely reflect the lack of statistical power. Also, the sample may be unrepresentative of the larger population of children with cleft, since these children were required to have continuous data for 8 years. Nevertheless, these longitudinal data do show a consistent pattern of internalizing behavior found in other cross-
sectional studies of children with cleft. These results also raise a significant concern for the need of further study of the adjustment of females with cleft.

REFERENCES


