Common Visual Defects and Peer Victimization in Children

Jeremy Horwood,1 Andrea Waylen,¹ David Herrick,1 Cathy Williams,1,2 Dieter Wolke,1,3 and the Avon Longitudinal Study of Parents and Children Study Team1

PURPOSE. To investigate whether wearing glasses, having manifest strabismus, or having a history of wearing an eye patch predisposes preadolescent children to being victimized more frequently at school and whether the impact may be different on boys than on girls.

METHODS. Data were examined on 6536 children from the Avon Longitudinal Study of Parents and Children (ALSPAC) based in the United Kingdom. At 7.5 years, the children undertook a detailed eye examination by orthoptists, including a cover test and visual acuity assessment. At 8.5 years, trained psychologists assessed the children’s bullying involvement as either victim or perpetrator for overt and relational bullying, in a standard interview.

RESULTS. Children currently wearing glasses or with a history of wearing eye patches were 35% to 37% more likely to be victims of physical or verbal bullying, even after adjustment for social class and maternal education. No interactions were found between sex and visual problems in the prediction of bullying.

CONCLUSIONS. For those children who require glasses, opticians should be aware of the risks of bullying, and strategies should be developed and discussed that help reduce their vulnerability. (Invest Ophthalmol Vis Sci. 2005;46:1177–1181) DOI:10.1167/iovs.04-0597

Bullying victimization occurs when a student is repeatedly exposed to negative actions from other students with the intention to hurt, and it usually involves an imbalance in strength, either real or perceived.1 It can be overt physical (e.g., hitting), verbal (e.g., name calling) or relational (e.g., social exclusion)2,3 abuse; becomes moderately stable by early childhood4; and has been found to be associated with psychosocial maladjustment in the victimized, including increased anxiety, depressive feelings, loneliness, lowered self-esteem, and behavioral problems.5–7 Boys experience victimization more often than girls,8 in particular if they are physically weaker than other boys.9 For girls, appearance and the lack of close friendships may expose them more to victimization.2 Physical characteristics, such as exceptional height or weight, facial disfigurement (e.g., cleft lip and palate), hemiplegic10–15 illnesses such as cancer and epilepsy, have all been found to be associated with teasing16,17 or persistent victimization in the form of bullying. Visual defects such as strabismus or amblyopia18 have been suggested to relate to poorer psychosocial functioning,19,20 poorer interpersonal relationships, and lower self-esteem,21,22 although these difficulties may improve after correction of strabismus. However, there have been few systematic studies of the adverse psychosocial effects of wearing glasses, although both peers and teachers are reported to attribute more negative characteristics to children with glasses, especially those who are female.23,24 It is unknown whether negative attitudes toward children who require vision correction or who suffer strabismus result in their more frequent exposure to serious peer rejection such as bullying.25

This prospective whole-population study investigated whether wearing glasses, having ever worn an eye patch, or having manifest strabismus predisposes preadolescent children to more frequent victimization and, in particular, whether the impact may be different for boys and girls.

METHODS

Design

We examined data from children of the Avon Longitudinal Study of Parents and Children (ALSPAC)26 (www.alspac.bris.ac.uk). The cohort consists of children born to residents of the former Avon Health Authority area who had an expected date of delivery between April 1, 1991, and December 31, 1992. Avon includes urban and rural areas, and the population is broadly representative of children in the United Kingdom.26 The parents have completed regular postal questionnaires about all aspects of their child’s health and development since birth, and, since they were 7.5 years of age, the children have attended annual assessment clinics where they are interviewed and tested. The present study examines data obtained from the children at 7.5 and 8.5 years of age.

Sample

The ALSPAC sample consists of 14,541 pregnancies that resulted in 14,062 live births, with 13,988 infants still alive at 1 year. Of these, 7,841 children attended the 7.5-year clinic, with 7,599 completing the vision testing session, and 7,171 of the children attended the 8.5-year clinic, with 6,815 returning usable data on bullying victimization. Of the children, 6,536 attended both the 7.5- and 8.5-year clinics. It is recognized that, due to selective withdrawal, this is a biased subsample of the whole cohort (13.4% manual social class compared with 19.5% in the whole cohort). Usable vision and overt victimization data were available for 6,036 of the children and usable vision and relational victimization data for 5,913.

From the 1Department of Community Medicine, Avon Longitudinal Study of Parents and Children, University of Bristol, Bristol, United Kingdom; the 2Bristol Eye Hospital, Bristol, United Kingdom; and the 3Jacobs Foundation, Zurich, Switzerland.

The views expressed in this article are those of the authors, not necessarily those of the Home Office (nor do they reflect government policy).

Supported by the Wellcome Trust, the Medical Research Council, the University of Bristol, the Department of Health, the Department of the Environment, and other funders. The ALSPAC study is part of the World Health Organization-initiated European Longitudinal Study of Pregnancy and Childhood. The Bullying and Friendship Interview Schedule was funded by the Home Office, London.

Submitted for publication May 26, 2004; revised October 21 and December 21, 2004; accepted January 2, 2005.

Disclosure: J. Horwood, None; A. Waylen, None; D. Herrick, None; C. Williams, None; D. Wolke, None.

The publication costs of this article were defrayed in part by page charge payment. This article must therefore be marked ‘advertisement’ in accordance with 18 U.S.C. §1734 solely to indicate this fact.

Corresponding author: Jeremy Horwood, University of Bristol, 24 Tyndall Avenue, Bristol BS8 1TQ, UK; j.horwood@bristol.ac.uk.

Copyright © Association for Research in Vision and Ophthalmology

1177
Procedures

A questionnaire was sent to the parents at the same time as the invitation to attend the ALSPAC 7.5-year assessment clinic. The questionnaire asked whether the child had ever been given patches to wear on one eye (yes/no) and if so, for how many months in total they had worn them.

At the ALSPAC clinic, an orthoptist asked directly about the child’s wearing glasses and duration of use and performed a detailed examination of each child’s visual status, according to a standard protocol.27–29 Bullying behavior was assessed by trained psychologists at the 8.5-year testing clinic, by a standard interview.7 Parental social class was assessed from parent questionnaires administered at the birth of each child.30 Ethical approval was obtained from ALSPAC’s own Ethics Advisory Committee and the three Avon Medical Ethics Committees. Informed consent was obtained from the parents of the children after explanation of the nature of the study. The research adhered to the tenets of the Declaration of Helsinki.

Measures

Vision. The wearing of glasses was recorded from direct questioning at the 7.5-year assessment and was categorized as follows: no glasses; yes, and brought with them; yes, but not brought with them; yes, previously, but no longer; and not known. If glasses were worn, the amount of time they were worn daily was recorded as either constant (>8 hours); at school (4–8 hours); occasional (2–4 hours); and rarely (0–2 hours). For the statistical analysis, a three-level factor for current frequency of wearing glasses was constructed with levels never, occasionally (occasional or rarely), and frequently (constant wearing or at school). Parents were also asked how many months had passed since the prescription was checked.

The protocol included a prism cover test at near (33 cm) and far (6 m), both with and without glasses: monocular visual acuity with Early Treatment Diabetic Retinopathy Study (ETDRS) 2000 series LogMAR (logarithm of the minimum angle of resolution) charts (with glasses if worn) and also with a pinhole; and autorefracation, again with and without glasses. Any strabismus was noted as being convergent, divergent, or vertical, and either intermittent or constant. The previously completed questionnaire was checked through with the parents by the orthoptists at the end of the vision-testing session, and any omissions were filled in and areas of uncertainty clarified. Children were classified as strabismic if they had any manifest strabismus in their habitual state (i.e., with glasses, if worn >8 hours a day; otherwise, without glasses) during the clinic visit. The degree of strabismus was described as “small” if the deviation was <20 prism diopters or “large” if >20 prism diopters.

Children were grouped as having worn patches if their parents reported any history of previous patching at any age. An index of the number of vision problems ranging from 0 (no vision problems) to 3 (eye patching, strabismus and wearing glasses) was constructed. For the statistical analyses, levels 2 and 3 were combined because of the small number of children within individual bullying categories who had all three problems.

Bullying. Bullying was assessed with a structured face-to-face interview at the 8.5 year testing clinic, using the Bullying and Friendship Interview Schedule.7 Researchers explained to children that they were interested in things that had happened in school, or on the way to or from school, during the past 6 months. Children were asked if they had experienced any forms of received overt or relational bullying or if they had used any forms of overt or relational bullying to upset other children (Table 1). If children had been bullied or had perpetrators themselves, they were asked how frequently it had occurred. At no time during the interview was the word bullying mentioned. Only behavioral descriptions were used, so as not to prompt the child. All interviewers were fully trained in the measure, and regular checks were made to ensure reliability and avoid any bias. The current paper is concerned solely with the information received about

<table>
<thead>
<tr>
<th>Table 1. Forms of Overt and Relational Victimization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overt victimization</td>
</tr>
<tr>
<td>Having had belongings stolen; having been</td>
</tr>
<tr>
<td>threatened or blackmailed; having been hit</td>
</tr>
<tr>
<td>or beaten up; having been called</td>
</tr>
<tr>
<td>bad/nasty names; having had nasty tricks</td>
</tr>
<tr>
<td>played on them.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

‘no bullying involvement’ and ‘victimization’ due to overt and relational bullying.

Parental Social Class and Maternal Education. Data were obtained on the employment situation of the mother and her partner during pregnancy. This enabled social class categorizations to be derived for the mother and her partner using the 1991 Classification of Operative Procedures (OPCS).30 Family social class was derived as the higher of the mother’s and partner’s social classes; this was then dichotomized into manual versus nonmanual occupations.

Information was also obtained during pregnancy on the mother’s educational qualifications31 and dichotomized into O-level/GCSE (General Certificate of Education; 11 years of education or less) versus A-level or higher (12 or more years of education).

Family social class and maternal education measures were available for 5621 of the children with usable vision and overt victimization data and 5507 of the children with usable vision and relational victimization data.

Statistical Analysis

Multiple logistic regression analysis was used to build models to predict (1) overt victimization based on vision category (wearing glasses, having a strabismus, wearing eye patches, and number of defects) and (2) relational victimization based on vision category. Unadjusted and adjusted analyses were performed with child’s sex, maternal education, and family social class corrected for in the latter. The adjusted analyses were repeated excluding those children with other disabilities, including identification of ocular disease, Down syndrome, severe developmental delay, cerebral palsy, known systemic syndrome, illness, or learning difficulties at the 7.5-year vision testing session or because they were reported as having a statement for special educational needs at 7 to 8 years. All statistical analyses were conducted on computer (SPSS, ver. 10.1; SPSS, Chicago, IL).

Results

Of the 7599 children who completed the vision-testing session, 491 (6.5%) wore glasses frequently, and 185 (2.4%) wore glasses only occasionally. Fifty-seven (0.8%) children had a “large” angle of strabismus and 96 (1.3%) had a “small” angle. Some children (n = 264; 3.5%) had received occlusion treatment for amblyopia. Figure 1 shows the overlaps between binary versions of these three vision outcomes in which frequent/occasional glasses wearers were grouped together as were children with large/small angles of strabismus. Of the 6815 children with usable victimization data, 2348 (34.5%) were overt victims. One hundred fifty-two children failed to make sufficient responses in the relational section of the interview to be classified. Of the remainder, 1106 (16.6%) were relational victims. Seven hundred sixteen children were victims of both overt and relational bullying.

Table 2 shows the uncorrected prevalences of victimization due to either overt or relational according to each individual visual category: wearing glasses, strabismus, and having worn
an eye patch and also according to number of defects. Unad-
justed and adjusted odds ratios (ORs) are shown in Table 3. It
can be seen that, in all visual categories and also for the
number of defects, children are most often victims of overt as
opposed to relational bullying. There is some evidence for an
association between glasses-wearing and overt victimization
\( (P = 0.016) \) that is not substantially altered on adjustment for
sex and socioeconomic status \( (P = 0.017) \). Children wearing
glasses were more likely to be victimized, with a larger effect
for frequent \( (\text{adjusted OR}: 1.35; 95\% \text{ CI}: 1.09\text{--}1.69) \) than oc-
casional \( (\text{adjusted OR}: 1.26; 95\% \text{ CI}: 0.86\text{--}1.84) \) glasses wear-
ers. Similarly, there is some evidence for an association be-
tween the number of visual defects and overt victimization
\( (P = 0.006 \) both with and without adjustment), with children
with defects being more likely to be victimized. However, no
dose-response relationship was found, the effect size being
larger for children with one defect than for those with two or
two more defects. This is probably due to the construction of the
number of defects variable, which is dominated by glasses
wearers and children who wore patches (see Fig. 1). As an
alternative to this approach, strabismus and patching were
fitted separately in the model for overt victimization after

\[ \frac{\text{Association between glasses-wearing and overt victimization (adjusted OR: 1.35; 95\% CI: 1.09-1.69) glasses wearers.}}{\text{Similarly, there is some evidence for an association between the number of visual defects and overt victimization (P = 0.006 both with and without adjustment), with children with defects being more likely to be victimized. However, no}} \]

\[ \frac{\text{dose-response relationship was found, the effect size being larger for children with one defect than for those with two or more defects. This is probably due to the construction of the number of defects variable, which is dominated by glasses wearers and children who wore patches (see Fig. 1). As an alternative to this approach, strabismus and patching were fitted separately in the model for overt victimization after}}}{\text{the adjustment in the previous model made little difference to the}} \]

\[ \frac{\text{logistic model was not repeated for the groups in Table 4, as due to differences in overt but not relational bullying. The}}}{\text{trends for those experiencing only overt or only relational are very similar to those in Table 2, which shows that the significant effects are due to differences in overt but not relational bullying. The logistic model was not repeated for the groups in Table 4, as adjustment in the previous model made little difference to the}} \]

\[ \frac{\text{estimates.}}}{\text{DISCUSSION}} \]

This prospective study of a large cohort in the United Kingdom
found that overall (in line with previous research), approxi-
mately a quarter to a third of children reported that they had
been the victims of overt bullying.\(^1\)\(^4\)\(^5\)\(^9\) Also in line with
previous research was the finding that there was substantial
overlap between overt and relational bullying (i.e., a consider-
able number of children were victims of both).\(^7\) Relatively

\[ \frac{\text{correction for glasses-wearing. In neither case was the effect}}}{\text{significant (P = 0.421 and 0.576, respectively), nor was there any evidence for interactions between the vision defects in predicting overt victimization. Although the uncorrected associa-
tion between wearing an eye patch and overt victimization was not significant at the 5\% level, after adjustment it was (P = 0.048), with patched children being more likely to be victims (adjusted OR: 1.37; 95\% CI: 1.01-1.86).}} \]

No significant evidence was found at the 5\% level for an
association between strabismus and overt victimization or for
any associations between the vision defect outcomes and ei-
ther relational victimization or being a victim of both forms of
bullying \( (P = 0.145) \). The analysis for strabismus was rerun
with only large versus small/no strabismus as an alternative but
there was still no statistically significant effect \( (P = 0.182) \).
Similarly, no evidence was found for interactions between
vision defects and sex in predicting overt victimization. The
results were not altered after excluding 82 children identified
with multiple disabilities from the models for overt victimiza-
tion and 76 from the models for relational victimization.

In this age group, when bullying occurs, it is most likely to
be overt bullying. However, because a considerable number of
children \( (n = 716) \) reported that they had experienced both
overt and relational bullying, uncorrected prevalences of vic-
timization are provided for orthogonal bullying groups in Table
4. It can be seen that, for those children who have experienced
two types of bullying, there is no suggestion of an increase in
bullying in line with more severe visual defects. The trends for
those experiencing only overt or only relational are very similar
to those in Table 2, which shows that the significant effects are
due to differences in overt but not relational bullying. The
logistic model was not repeated for the groups in Table 4, as
adjustment in the previous model made little difference to the
estimates.

\[ \text{TABLE 2. Uncorrected Prevalences of Victimization within Categories of Vision Defects} \]

<table>
<thead>
<tr>
<th></th>
<th>Overt Victimization, % (n)</th>
<th>Relational Victimization, % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No (n = 3730)</td>
<td>Yes (n = 1891)</td>
</tr>
<tr>
<td>Wears glasses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequently</td>
<td>59.8 (215)</td>
<td>40.2 (143)</td>
</tr>
<tr>
<td>Occasionally</td>
<td>62.1 (72)</td>
<td>37.9 (44)</td>
</tr>
<tr>
<td>Never</td>
<td>66.9 (3445)</td>
<td>33.1 (1704)</td>
</tr>
<tr>
<td>Strabismus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large (&gt;20 pd)</td>
<td>60.0 (24)</td>
<td>40.0 (16)</td>
</tr>
<tr>
<td>Small (&lt;20 pd)</td>
<td>67.2 (41)</td>
<td>32.8 (20)</td>
</tr>
<tr>
<td>None</td>
<td>66.4 (3665)</td>
<td>33.6 (1855)</td>
</tr>
<tr>
<td>Ever worn a patch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>59.6 (106)</td>
<td>40.4 (72)</td>
</tr>
<tr>
<td>No</td>
<td>66.6 (3624)</td>
<td>33.4 (1819)</td>
</tr>
<tr>
<td>Number of defects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two or more</td>
<td>61.5 (96)</td>
<td>38.5 (60)</td>
</tr>
<tr>
<td>One</td>
<td>59.8 (232)</td>
<td>40.2 (156)</td>
</tr>
<tr>
<td>None</td>
<td>67.0 (3402)</td>
<td>33.0 (1675)</td>
</tr>
</tbody>
</table>

Probabilities are derived by the Pearson \( \chi^2 \) statistic. pd, prism diopter.
common visual problems, which necessitated the wearing of glasses or eye patches, were found to increase the risk of overt bullying (either verbal or physical victimization) by ~35%, even after adjustment for socioeconomic status. Relational bullying did not increase accordingly and nor did combined overt and relational bullying. It may be, therefore, that the wearing of glasses or a patch implies physical weakness to others and so provokes an increase in physical overt bullying as opposed to nonphysical relational victimization.

Wearing glasses and strabismus were current conditions when the visual status was assessed (a year before the bullying questionnaire was administered), but patching could have occurred at any time previously, making it more difficult to determine mechanisms associated with bullying. It should be noted that usual practice in the local Hospital Eye Service (which provides care for the whole study area) is to terminate patching treatment by 7 to 8 years of age. However these findings indicate that peers not only have more negative attitudes toward children with visual defects, but that children with such defects are also more likely to be victimized. This is similar to the impact of other deviations in physical appearance reported in previous research. In our sample of prepubertal children, there were no sex differences in associations between bullying and visual defects (i.e., girls were no more likely to be bullied as a result of wearing glasses or being patched than were boys). There was also no evidence that children with common visual defects were at increased risk for (or indeed were likely to overreport) relational bullying—that is, they did not report that they had experienced more social exclusion than children without visual defects.

Previously, it has been suggested that interpersonal relationships may be negatively affected in children with strabismus and bullying has been considered a potential mechanism. We found no evidence that children with small strabismus were at increased risk of victimization by their peers. Children with large strabismus report a prevalence of 40% being victimized, which is higher than those without strabismus and is similar to the increased likelihood of victimization for those who wear glasses frequently (40%) or those with eyes patched for amblyopia (40%). However, even in this large sample, the number of children with large strabismus was far smaller than that of children with glasses or a history of

### Table 3. ORs for Victimization within Categories of Vision Defects

<table>
<thead>
<tr>
<th></th>
<th>Overt Victimization</th>
<th>Relational Victimization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted OR (95% CI)</td>
<td>Adjusted OR (95% CI)</td>
</tr>
<tr>
<td>Wears glasses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequently</td>
<td>1.36 (1.09–1.69)</td>
<td>1.35 (1.09–1.69)</td>
</tr>
<tr>
<td>Occasionally</td>
<td>1.24 (0.85–1.81)</td>
<td>1.26 (0.86–1.84)</td>
</tr>
<tr>
<td>Never</td>
<td>1.00 Reference</td>
<td>1.00 Reference</td>
</tr>
<tr>
<td>Strabismus</td>
<td>1.27 (0.91–1.76)</td>
<td>1.25 (0.90–1.75)</td>
</tr>
<tr>
<td>Ever worn a patch</td>
<td>1.00 Reference</td>
<td>1.00 Reference</td>
</tr>
<tr>
<td>Number of defects</td>
<td>1.27 (0.91–1.76)</td>
<td>1.25 (0.90–1.75)</td>
</tr>
<tr>
<td>Two or more</td>
<td>1.37 (1.11–1.69)</td>
<td>1.39 (1.12–1.71)</td>
</tr>
<tr>
<td>None</td>
<td>1.00 Reference</td>
<td>1.00 Reference</td>
</tr>
</tbody>
</table>

Data are both unadjusted and adjusted for sex and socioeconomic status (maternal education and family social class).

### Table 4. Uncorrected Prevalences of Orthogonal Victimization Groups within Categories of Vision Defects

<table>
<thead>
<tr>
<th>Victimization Status</th>
<th>None (n = 3356)</th>
<th>Overt Only (n = 1279)</th>
<th>Relational Only (n = 313)</th>
<th>Both (n = 559)</th>
<th>Total (N = 5507)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wears glasses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequently</td>
<td>53.9 (187)</td>
<td>31.7 (110)</td>
<td>5.8 (20)</td>
<td>8.6 (30)</td>
<td>347</td>
</tr>
<tr>
<td>Occasionally</td>
<td>57.9 (66)</td>
<td>27.2 (31)</td>
<td>4.4 (5)</td>
<td>10.5 (12)</td>
<td>114</td>
</tr>
<tr>
<td>Never</td>
<td>61.5 (3103)</td>
<td>22.6 (1138)</td>
<td>5.7 (288)</td>
<td>10.2 (517)</td>
<td>5046</td>
</tr>
<tr>
<td>Strabismus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large (≥20 pd)</td>
<td>51.4 (19)</td>
<td>27.0 (10)</td>
<td>10.8 (4)</td>
<td>10.8 (4)</td>
<td>37</td>
</tr>
<tr>
<td>Small (&lt;20 pd)</td>
<td>61.4 (35)</td>
<td>33.3 (19)</td>
<td>3.5 (2)</td>
<td>1.8 (1)</td>
<td>57</td>
</tr>
<tr>
<td>None</td>
<td>61.0 (3302)</td>
<td>23.1 (1250)</td>
<td>5.7 (307)</td>
<td>10.2 (554)</td>
<td>5413</td>
</tr>
<tr>
<td>Ever worn a patch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>52.9 (90)</td>
<td>30.6 (52)</td>
<td>7.1 (12)</td>
<td>9.4 (16)</td>
<td>170</td>
</tr>
<tr>
<td>No</td>
<td>61.2 (3266)</td>
<td>23.0 (1227)</td>
<td>5.6 (301)</td>
<td>10.2 (543)</td>
<td>5337</td>
</tr>
<tr>
<td>Number of defects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two or more</td>
<td>53.7 (79)</td>
<td>29.9 (44)</td>
<td>7.5 (11)</td>
<td>8.8 (13)</td>
<td>147</td>
</tr>
<tr>
<td>One</td>
<td>55.6 (213)</td>
<td>30.8 (118)</td>
<td>4.4 (17)</td>
<td>9.1 (35)</td>
<td>383</td>
</tr>
<tr>
<td>None</td>
<td>61.6 (3064)</td>
<td>22.4 (1117)</td>
<td>5.7 (285)</td>
<td>10.3 (511)</td>
<td>4977</td>
</tr>
</tbody>
</table>

Data are the percentage of total subjects in the group, with the number affected in parentheses. Probabilities are derived by the Pearson χ² statistic. pd, prism diopter.
patching. This reflects the reduced statistical power associated with smaller numbers and may explain why the relevant data are not statistically significant. An alternative explanation for the psychosocial disadvantages perceived by individuals with strabismus as opposed to other common visual defects may be that abnormalities in “eye contact” interfere with communication skills and the normal development of relationships.

It is acknowledged that there may be other social and physical factors associated with bullying involvement that have not been accounted for in the present study—for example, changes in social class between birth and later childhood, changes in visual status between 7.5 and 8.5 years, age at the end of patching, ethnicity, other physical characteristics, or intelligence. Future work is needed to investigate their potential influence further.

In summary, wearing glasses and having a history of eye patching at any time were both associated with a small increase in the perception of being bullied at the age of 8.5 years. These results may provide support for groups aiming to promote preschool screening as a way of diagnosing and treating children with glasses or patching before they start attending school so that, at the time when compliance is most crucial, they are less likely to be exposed to a large number of older children and the attendant risks of bullying.

However, for children who require glasses at this age to see clearly or to maintain their ocular alignment, strategies to reduce vulnerability to bullying (other than failure to comply with the treatment) should be devised and promoted, to maximize both visual health and the children’s well-being. Opticians should discuss these problems with parents and possibly provide written information about how to combat bullying victimization.

Acknowledgments

The authors thank all the mothers who took part and the midwives for their cooperation and help in recruitment; the whole ALSPAC study team, comprising interviewers, computer technicians, laboratory technicians, clerical workers, research scientists, volunteers, and managers who continue to make the study possible.

References