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ORIGINAL ARTICLE

Validity and Reliability of the Revised Convergence Insufficiency Symptom Survey in Children Aged 9 to 18 Years

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ABSTRACT: *Purpose.* To assess the validity and reliability of the Convergence Insufficiency Symptom Survey (CISS) in children aged 9 to 18 years. The CISS is the primary outcome measure for a pilot study evaluating two different treatments for convergence insufficiency (CI). *Methods.* Children with CI were given the CISS twice to assess reliability. CISS scores for the first administration were also compared with scores from children with normal binocular vision to assess the validity of the CISS. *Results.* Forty-seven children with CI and 56 children with normal binocular vision participated in the study. Reliability was assessed using intraclass correlation and 95% limits of agreement for the children with CI. For children with CI, the intraclass correlation was 0.77 (95% confidence interval, 0.613 to 0.873), and the 95% limits of agreement were −10.2 to +12.1. The mean (±SD) CISS score was 30.8 ± 8.4 for the children with CI and 8.4 ± 6.4 for the children with normal binocular vision. These means were significantly different ($p < 0.0001$). Good discrimination (sensitivity, 96%; specificity, 88%) was obtained using a score of ≥16. *Conclusions.* Children with CI showed a significantly higher CISS symptom score than children with normal binocular vision. The results of the study indicate that the CISS is a valid and reliable instrument to use as an outcome measure for children aged 9 to 18 who are enrolled in clinical research concerning CI. (Optom Vis Sci 2003;80:832–838)

Key Words: convergence insufficiency, symptom survey, reliability, validity, children

The Convergence Insufficiency Treatment Trial (CITT) group has been conducting a series of pilot studies in preparation for a randomized clinical trial comparing two treatment modalities for convergence insufficiency (CI). One critical issue faced by the group was developing a method to assess the effect of treatment on a patient's symptoms. With nonstrabismic binocular vision disorders such as CI, the success or failure of treatment is determined by changes in clinical signs as well as changes in patient symptoms (i.e., does the patient have an improvement in visual comfort and performance after the therapeutic intervention). Although scaled symptom surveys have been developed and used in the past,[1–3] there is no standardized instrument that is designed for assessing changes in symptoms associated with treatments for CI or other nonstrabismic binocular vision disorders. Developing such a survey is essential for determining the success of treatment for nonstrabismic binocular disorders.

CI is a common binocular vision disorder[4–9] and has been associated with symptoms such as visual fatigue, headaches, and double vision primarily in adults.[10–12] The association of CI and symptoms in children has recently been assessed in clinical[13] and population-based[14] samples of children using a 13-item Convergence Insufficiency Symptom Survey (CISS) developed by the Convergence Insufficiency and Reading Study (CIRS) Group. The CISS allows a two-factor analysis of symptoms: first, whether the symptom is present and second, how frequently the symptom occurs. To test the validity of the CISS, a case comparison method[13] was used to compare 14 school-aged children (aged 8 to 13 years) with CI and 14 children with normal binocular vision

(NBV) of the same age recruited from a clinic population. Borsting and colleagues[13] found that the children with CI scored significantly higher (i.e., were more symptomatic) than the children with NBV. In a subsequent study,[14] a modified version of the CISS was administered to 392 children, aged 8 to 15 years, who passed a vision screening of visual acuity and refractive status. Eighteen of the children (4.6%) had three signs of CI, and this group had symptom scores that were significantly higher than the NBV group. The results of these two studies indicate that the CISS can discriminate between children with CI and children with NBV in both clinic- and population-based groups of school-aged children aged 8 to 15 years. Borsting and coworkers[15] also investigated the reliability of the CISS by administering the survey twice over a 1- to 2-week period to a group of children with two or three signs of CI. The between-session reliability was found to be excellent (intraclass correlation coefficient of 0.93).

Although our initial studies with the CISS were promising, several issues needed to be addressed before the survey could be used in a clinical trial. The original CISS ranked severity of symptoms using three or four response categories, which is adequate for discriminating between the CI and NBV groups, but may not be sensitive enough to track changes observed during therapeutic interventions.[16] In addition, the reliability of the CISS has not been established with the proposed five response categories. Finally, data on children with NBV are necessary to establish the normal variance of symptom scores in a school-aged population. To address these issues, the CISS was modified and then administered to two groups of 9- to 18-year-old children, one group of children with CI and the other with NBV.

METHODS

Survey Development

The original CISS[13] was modified to broaden the type of near work activities and track changes in symptoms during treatment (See Table 1 for revised CISS). Instead of asking about symptoms during reading and studying, subjects were asked about symptoms present when reading and performing close work because we felt that this included a broader range of activities (e.g., video games, hobbies, and pleasure reading) than only asking about reading and studying. Two items on the original CISS were divided into two separate questions to better clarify the specific symptoms. For example, one question on the original CISS asked whether the child's eyes were tired or uncomfortable when reading or studying. This was changed to two separate questions, one related to tired eyes and the other to uncomfortable eyes. We also changed the scale for classifying frequency from four to five choices. The new version used the following response choices: never, infrequently, sometimes, fairly often, and always. Increasing the number of response choices to five makes tracking changes during therapeutic intervention more sensitive.[16] In addition, the response option labels were chosen in such a manner as to have equal perceived spacing. The labels were chosen using data on the numeric rating of frequency terms from 20 studies in the social science literature.[17]

Subjects

Children, aged 9 to 18 years, were recruited from five optometric teaching clinics as part of a pilot study evaluating the efficacy of

TABLE 1.
Distribution of responses on each item of the Convergence Insufficiency Symptom Survey (CISS) for children with convergence insufficiency (CI) and children with normal binocular vision (NBV)

Symptom	Never		Infrequently		Sometimes		Fairly Often		Always	
	CI	NBV	CI	NBV	CI	NBV	CI	NBV	CI	NBV
1. Do your eyes feel tired when reading or doing close work?	4.3	50.0	12.8	25.0	42.6	19.6	21.3	0.0	19.2	5.4
2. Do your eyes feel uncomfortable when reading or doing close work?	12.8	78.6	8.5	12.5	36.2	5.4	27.7	1.8	14.9	1.8
3. Do you have headaches when reading or doing close work?	25.5	76.8	12.8	12.5	36.2	10.7	19.2	0.0	6.4	0.0
4. Do you feel sleepy when reading or doing close work?	10.9	57.1	8.7	19.6	32.6	17.9	30.4	5.4	17.4	0.0
5. Do you lose concentration when reading or doing close work?	10.6	57.1	8.5	21.4	38.3	14.3	21.3	1.8	21.3	5.4
6. Do you have trouble remembering what you have read?	21.3	48.2	14.9	23.2	29.8	19.6	10.6	8.9	23.4	0.0
7. Do you have double vision when reading or doing close work?	12.8	89.3	4.3	7.1	46.8	3.6	23.4	0.0	12.8	0.0
8. Do you see the words move, jump, swim or appear to float on the page when reading or doing close work?	46.8	92.9	4.3	3.6	23.4	3.6	17.0	0.0	8.5	0.0
9. Do you feel like you read slowly?	19.2	58.2	6.4	10.9	27.7	21.8	17.0	5.5	29.8	3.6
10. Do your eyes ever hurt when reading or doing close work?	23.4	66.1	6.4	25.0	34.0	8.9	25.5	0.0	10.6	0.0
11. Do your eyes ever feel sore when reading or doing close work?	38.3	89.3	8.5	10.7	27.7	0.0	23.4	0.0	2.1	0.0
12. Do you feel a "pulling" feeling around your eyes when reading or doing close work?	42.6	96.4	10.6	1.8	23.4	1.8	19.2	0.0	4.3	0.0
13. Do you notice the words blurring or coming in and out of focus when reading or doing close work?	10.6	67.9	14.9	19.6	34.0	8.9	19.2	1.8	21.3	1.8
14. Do you lose your place while reading or doing close work?	4.3	39.3	12.8	19.6	25.5	30.4	25.5	7.1	31.9	3.6
15. Do you have to re-read the same line of words when reading?	4.3	46.4	12.8	28.6	40.4	19.6	25.5	3.6	17.0	1.8

two different treatments for CI. The inclusion and exclusion criteria for CI subjects are listed in Tables 2 and 3. The diagnosis of CI was made when the child presented with the following three signs: exophoria at near that was at least 4 Δ greater than far,[5] failure of Sheard's criterion[18] or minimum normative positive fusional vergence (break <15 Δ),[19] and a receded nearpoint of convergence (≥6 cm).[20] Additionally, potential CI subjects were given the original 13-item CISS to determine whether their symptom score met the inclusion criteria of ≥9.[13] Subjects with attention deficit disorder, learning disability, or currently taking a medication that could affect accommodation or vergence were excluded. Children identified as having CI were scheduled for an eligibility examination, which included administration of the revised CISS along with other tests for diagnosing CI.

Children in the age range of 9 to18 years with NBV were recruited from each of the five optometric teaching clinics. The inclusion criteria are listed in Table 4, and the exclusion criteria, which were essentially the same as for children with CI, are listed in Table 3.

Each CITT study site received approval from its affiliated institutional review board (Southern California College of Optometry, Pennsylvania College of Optometry, The Ohio State University College of Optometry, State University of New York College of Optometry, and Pacific University College of Optometry). Centralized human subjects approval was obtained from the Biomedical Sciences Institutional Review Board at The Ohio State University, including approval of the individual informed consent documents. A parent or guardian provided consent, and each child provided assent before any testing was done.

Procedure

The CISS (Table 1) was administered to each of the children with either CI or NBV. To assess reliability, CI subjects were given the CISS a second time when they returned for their initial treatment visit. Subjects with NBV were given the CISS at the eligibility examination, but did not participate in the reliability portion of the study.

Questions from the CISS were read to each subject while he or she looked at a printed copy of the response options. The questions were read, in order, exactly as written and were repeated if the subject did not respond or requested to hear the question again. After each question, the examiner recorded the subject's response. The survey was scored as follows: never (0), infrequently (1), sometimes (2), fairly often (3), and always (4). The total score was then

TABLE 2.
Inclusion criteria for children with convergence insufficiency (CI)

Age 9 to 18 years
Best-corrected visual acuity ≥20/25 in both eyes at distance and near
Appropriate distance refractive correction worn for ≥2 weeks
Willing to continue to wear eyeglasses/contact lens to correct refractive error
Exophoria at near ≥4 Δ greater than at far[5]
Failed Sheard's criterion[18] or minimum normative positive fusional vergence of 15 Δ BO break[19]
Receded nearpoint of convergence of ≥6 cm[20]
Passed stereoacuity (500 sec Randot forms)
Original Convergence Insufficiency Symptom Survey score ≥9 points[13]
No previous CI treatment (any office-based vergence therapy or completed pencil push-up therapy)
Has not used plus add at near or base-in prisms for at least the past 4 weeks
Had cycloplegia refraction within past 12 months

TABLE 3.
Exclusion criteria for children with convergence insufficiency (CI) or children with normal binocular vision

Amblyopia (two-line difference in best corrected visual acuity between the two eyes)
Constant strabismus
History of strabismus or refractive surgery
Anisometropia >1.50D difference between the two eyes
Monocular estimate method (MEM): with motion with +1.75D or accommodative amplitude <5D[a]
Vertical heterophoria >1 Δ
Diagnosed with multiple sclerosis, Graves thyroid disease, myasthenia gravis, diabetes, or Parkinson's disease
Chronic use of any medication that might affect accommodation or vergence or use of any of these medications in previous 24 hours
Manifest or latent nystagmus
Currently diagnosed with learning disability for which school was providing intervention
Diagnosed by physician with Attention Deficit Hyperactivity Disorder and currently taking medication for this disorder
Regular use of medications for asthma
Household member or sibling already enrolled in Convergence Insufficiency Treatment Trial[a]

[a] Exclusion for only potential CI subjects.

TABLE 4.
Inclusion criteria for children with normal binocular vision

Age 9 to 18 years
Best corrected visual acuity ≥20/20 in both eyes at distance and near
Appropriate refractive correction worn for ≥2 weeks
Willing to continue to wear eyeglasses/contact lens to correct refractive error
Heterophoria at near between 2 Δ esophoria and 8 Δ exophoria[21]
Negative fusional vergence at near >7 Δ BI-break/5 Δ BI-recovery[22]
Positive fusional vergence at near >10 Δ BO-break/7 Δ BO-recovery[22]
Nearpoint of convergence closer than 6.0 cm break[20]
Monocular amplitude of accommodation >15 − 0.25 · age[23]
Passed stereoacuity (500 sec Randot forms)
No previous convergence insufficiency treatment (any office-based vergence therapy or completed pencil push-up therapy)
Has not used plus add at near or base-in prisms
Had cycloplegia refraction within past 12 months

obtained by summing the points for all 15 items, which could range from 0 to 60.

RESULTS

Subjects

Forty-seven children with CI and 56 children with NBV were enrolled in the study. The mean (±SD) age was 11.5 ± 2.2 years for the CI group and 11.4 ± 2.2 years for the NBV group. In the CI group, 57.5% of the subjects were female, and in the NBV group, 45.5% were female. The distribution of children by center is listed in Table 5. The Pennsylvania College of Optometry center recruited the most CI and NBV subjects, but the symptom score was not significantly different when comparing the Pennsylvania College of Optometry to the other centers (mean at Pennsylvania College of Optometry, 31.56; mean at other sites, 30.79; $p = 0.124$). The values for near heterophoria, positive fusional vergence, nearpoint of convergence, and accommodative amplitude are shown in Table 6. The CI group had significantly different values than the NBV group on all three signs of CI ($p < 0.0001$).

The internal consistency of the survey was assessed using Cronbach's alpha coefficients. The coefficient was 0.92, and no item was negatively correlated with the total. This indicates that the internal consistency of the CISS was good to excellent and that the items within the survey were not redundant.

Reliability of the CISS for the children with CI was assessed using the intraclass correlation coefficient (ICC)[24] and 95% limits of agreement.[25] The mean time between administration was 14.6 ± 14.7 days. The mean difference between the first and second administration was 0.98 ± 5.7 points, indicating minimum bias between the two administrations (one-sample t-test, 1.14; $p = 0.2607$). The ICC was 0.77 (95% confidence interval, 0.613 to 0.873), and the 95% limits of agreement were −10.2 to +12.1 (Fig. 1).

The mean score on the CISS at the eligibility visit was 30.8 ± 8.4 for the children with CI and 8.4 ± 6.4 for the NBV children. The children with CI scored significantly higher than the NBV group ($t = 15.4$, $p < 0.0001$). In addition, the age of the child did not correlate with the symptom score ($r = 0.052$, $p = 0.728$). The distribution of response option on each item for children with CI and children with NBV is shown in Table 1. We have also graphically presented the distribution of the percentage of children with CI and children with NBV responding "fairly often" or "always" on the CISS (Fig. 2).

To assess the ability of the CISS to correctly classify subjects as CI or NBV, sensitivity and specificity values were calculated using various cutoff values for the CISS score. A cutoff value of 16 (i.e., CISS ≥16) yielded a sensitivity of 95.7% and a specificity of 87.5%. This value was also 1 SD above the mean for the NBV group. A list of cutoff values and corresponding sensitivity and specificity values are shown in Table 7. We have also graphically shown the distribution of CISS scores for the CI and NBV groups (Fig. 3).

TABLE 5.
Number of subjects enrolled at each site

Site	CI[a]	NBV
Pennsylvania College of Optometry	28	28
Southern California College of Optometry	8	15
State University of New York, College of Optometry	7	5
The Ohio State University	3	7
Pacific University College of Optometry	1	1
Total	47	56

[a] CI, convergence insufficiency; NBV, normal binocular vision.

TABLE 6.
Mean ± SD CI-related measures and CISS symptom score[a]

Test	CI Subjects	NBV Subjects
Heterophoria at far (Δ)	0.5 ± 1.1 XP	0.6 ± 1.3 XP
Heterophoria at near (Δ)	9.1 ± 4.4 XP	1.7 ± 2.3 XP
PFV break (Δ)	12.0 ± 3.6	26.7 ± 8.4
PFV recovery (Δ)	8.0 ± 3.6	20.2 ± 8.0
NPC break (cm)	14.9 ± 8.0	3.7 ± 1.1
NPC recovery (cm)	18.2 ± 8.8	5.4 ± 1.4
Accommodative amplitude (cm, OD)	14.9 ± 4.7	6.3 ± 2.3
CISS score	30.8 ± 8.4	8.1 ± 6.2

[a] CI, convergence insufficiency; CISS, Convergence Insufficiency Symptom Survey; NBV, normal binocular vision; NPC, near point of convergence; PFV, positive fusional vergence.

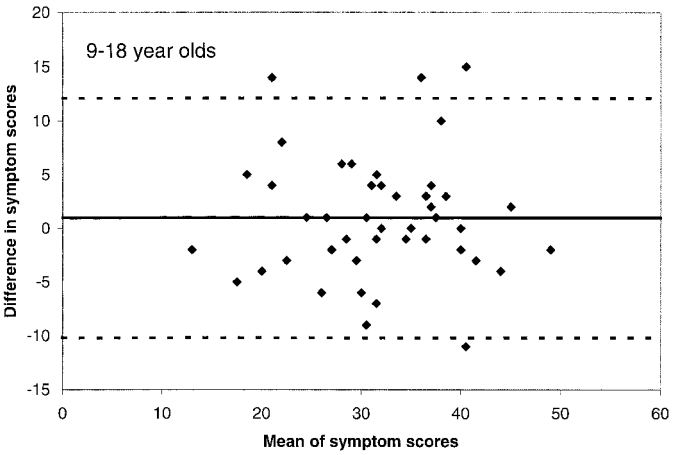

FIGURE 1.
A plot of 95% limits of agreement showing the individual differences between repeat administrations of the Convergence Insufficiency Symptom Survey. The solid line shows the mean bias, and the dashed lines show the 95% limits of agreement.

DISCUSSION

The results of this study indicate that the CISS is a valid and reliable instrument for use as a primary outcome measure for 9- to18-year-old children enrolling in the CITT. Children with CI scored significantly higher than the NBV group on the CISS, suggesting that the survey is valid. In addition, an ICC of approximately 0.8 indicates that the CISS has good reliability.

The results of this study are similar to those found by Borsting and colleagues.[13, 14] Both studies found that children with CI had significantly higher symptom scores than children with NBV. The

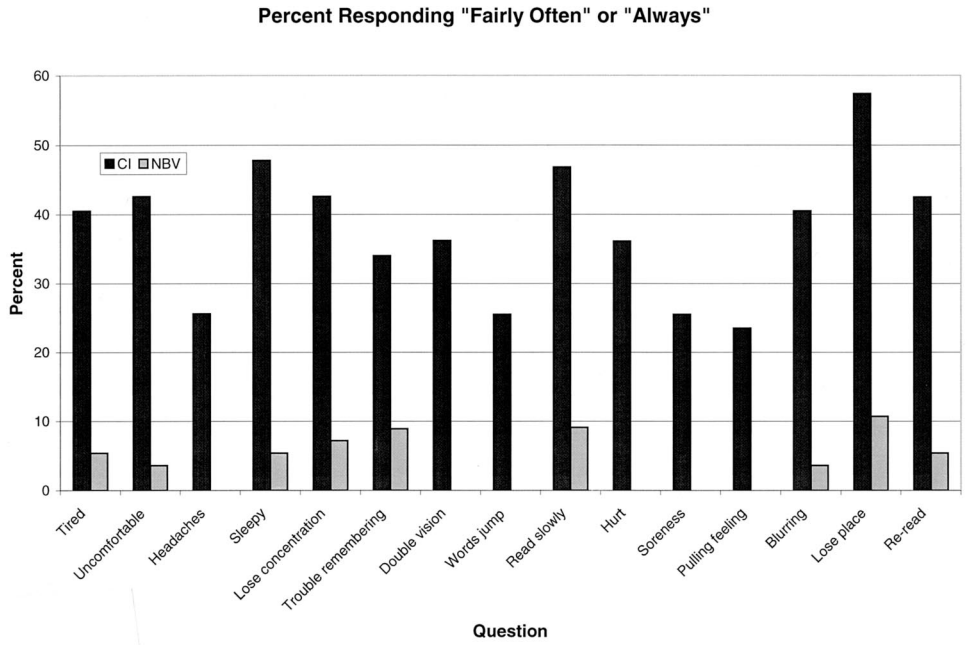

FIGURE 2.
Distribution of the percentage of children with convergence insufficiency (CI) and children with normal binocular vision (NBV) responding "fairly often" or "always" on the Convergence Insufficiency Symptom Survey.

TABLE 7.
Sensitivity and specificity values for various cutoff values for the CISS[a]

Cutpoint	9–18-Year Olds	
	Sensitivity	Specificity
≥14	100.0	82.1
≥15	95.7	83.9
≥16	95.7	87.5
≥17	93.6	89.3
≥18	93.6	89.3
≥19	91.5	91.1
≥20	89.4	92.9
≥21	85.1	92.9
≥22	85.1	96.4
≥23	83.0	96.4
≥24	83.0	96.4

[a] CISS, Convergence Insufficiency Symptom Survey.

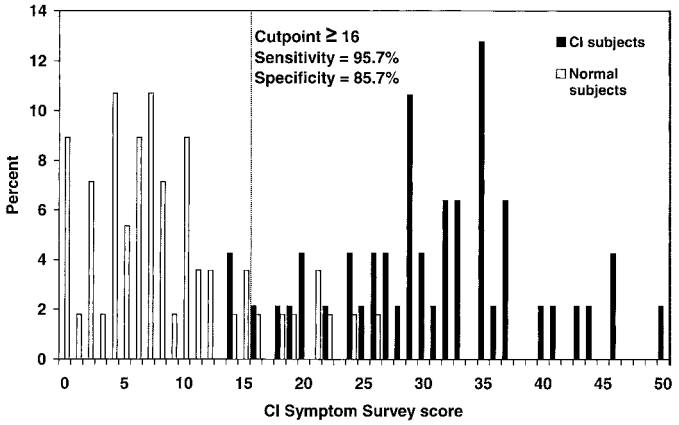

FIGURE 3.
Distribution of Convergence Insufficiency Symptom Survey scores for children with convergence insufficiency (CI) and children with normal binocular vision (NBV). The suggested symptomatic score of ≥16 is also shown.

total symptom score in this study is higher than that found in both of our previous studies[13, 14]; this is primarily because of the increased number of questions (13 to 15) and the expanded response categories (3 or 4 to 5) in the modified CISS. Our results are also consistent with those of McKeon and colleagues,[26] who used the Vision Function Scale in patients with intermittent exotropia. The Vision Function Scale has many items that are similar to the revised CISS (e.g., How often do you lose your place?). The intermittent exotropia group was found to have a higher symptom score than the visually normal group.

This study assessed the test-retest reliability of the CISS, which is important for evaluating changes in symptoms occurring before and after a specific treatment. The 95% limits of agreement were −10.2 to +12.1 with a mean bias of 0.98. This means that a change of more than 10 points would be considered clinically meaningful and outside the range of normal variability. For example, a child with CI who scored 32 on the CISS before treatment would have to score ≤21 after treatment for the change to be considered significant. These data allow both the practitioner and the researcher to determine whether a treatment had a clinically meaningful effect on the patient's symptoms.

The practitioner can use the results of this study to distinguish between children with normal and abnormal levels of symptoms associated with CI by using a symptom score of ≥16. This score is more than 1 SD from the mean of the children with NBV and has high sensitivity (95.7) and specificity (87.5). Using this value, only one CI subject was considered asymptomatic, and seven NBV

subjects were considered symptomatic. We can only speculate on why seven NBV subjects were symptomatic given our current data. The NBV subjects may have had a binocular dysfunction that we did not assess (e.g., vergence facility) or an undiagnosed learning disorder.

Although it is has been suggested that CI is not common in children, and the associated symptoms, such as blur and diplopia, can be the result of the child's interpretation of normal physiological phenomenon,[27] no data have been presented to support this position. However, we can indirectly investigate this claim by looking at our data and comparing the occurrence of blur and diplopia as reported by children with CI and NBV. If blur and diplopia were the result of the child's interpretation of normal physiological phenomenon, one would expect both groups to report these symptoms with equal frequency. However, we found that the children with CI reported blur as fairly often or always in 40.5% of cases, whereas only 4.4% of NBV children reported blur this frequently. For diplopia, we found that the children with CI reported diplopia as fairly often or always in 36.5% of cases, whereas no child with NBV reported diplopia in the fairly often or always categories. Children with NBV may report blur or diplopia as Wright and Boger[27] suggest, but the occurrence tends to fall into the "infrequently" category (19.6% for blur and 7.1% for diplopia). Thus, in our study, children with CI had a significantly greater occurrence of blur and diplopia as well as all other symptoms on the CISS than children with NBV (Fig. 2).

The CISS appears appropriate to use in children presenting with symptoms associated with convergence insufficiency. Even though this study did not address the use of CISS for other nonstrabismic disorders of accommodation and vergence, the symptoms described in the literature tend to be similar across these vision conditions.[28] For example, headaches and eyestrain are reported in both CI and accommodative dysfunction. This hypothesis is also supported by recent research conducted by Borsting et al.,[14] who found that the CISS was able to discriminate between children with accommodative insufficiency and NBV. As a result, future studies should look at the use of the CISS in other disorders of accommodation and vergence.

In conclusion, children with all three signs of CI showed a significantly higher CISS symptom score than children with NBV. This study adds further evidence to support previous research[7, 13, 14] indicating that CI has a significant number of associated symptoms. In addition, the results of this study demonstrate that the CISS is a valid and reliable instrument for evaluating symptoms in 9- to 18-year-old children. Future studies should evaluate the CISS in adults and also evaluate the use of the CISS in other binocular vision disorders.

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United States Postal Service

Statement of Ownership, Management, and Circulation

1. Publication Title	2. Publication Number	3. Filing Date
Optometry and Vision Science	**1 0 4 0 – 5 4 8 8**	**10/1/03**
4. Issue Frequency	5. Number of Issues Published Annually	6. Annual Subscription Price
Monthly	**12**	**$232.00**

7. Complete Mailing Address of Known Office of Publication *(Not Printer) (Street, City, County, state, and ZIP+4)*
Lippincott Williams & Wilkins
16522 Hunters Green Parkway
Hagerstown, MD 21740-2116
Contact Person
Telephone

8. Complete Mailing Address of Headquarters or General Business Office of Publisher *(Not printer)*
Lippincott Williams & Wilkins, 530 Walnut Street, Philadelphia, PA 19106

9. Full Names and Complete Mailing Address of Publisher, Editor, and Managing Editor *(do not leave blank)*
Publisher *(Names and Complete mailing address)*
Lippincott Williams & Wilkins, 530 Walnut Street, Philadelphia, PA 19106
Editor *(Names and Complete mailing address)*
Dr. Mark A. Bullimore, PhD, Ohio State University - College of Optometry, 338 West 10th Street, Columbus, OH 43210
Managing editor *(Names and Complete mailing address)*
Kurt Zadnik, Ohio State University - College of Optometry, 338 West 10th Street, Columbus, OH 43210

10. Owner (Do not leave blank. If the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and address of all stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, give the names and address of the individual owners. If owned by a partnership or other unincorporated firm, give its name and address as well as those of each individual owner. If the publication is published by a nonprofit organization, give its name and address

Full Name	Complete Mailing Address
The American Academy of Optometry	**c/o Lois Schoenbrun, Executive Director** **6110 Executive Boulevard** **Ste. 506** **Rockville, MD 20852**

11. Known Bondholders, Mortgages, and other Security Holders Owning or Holding 1 Percent or More Total Amount of Bonds, Mortgages, or Other Securities. If none, check box ☐ None

Full Name	Complete Mailing Address

12. Tax Status *(For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one)*
The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes:
☒ Has Not Changed During Preceding 12 Months
☐ Has Changed During Preceding 12 Months *(Publisher must submit explanation of change with this statement)*

(see Instructions on Reverse)

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13. Publication Title	14. Issue date for Circulation Data Below
Optometry and Vision Science	Volume 80, #8

15 Extent and Nature of Circulation			Average No. copies Each Issue During Preceding 12 Months	No. copies of Single issue Published Nearest to Filing Date
a.	Total No. copies *(Net Press Run)*		5,416	5,254
b.	Paid and/or Requested Circulation	(1) Paid/Requested Outside-County Mail Subscription Stated on Form 3541.*(Include advertiser's proof and exchange copies)*	4,372	4,085
		(2) Paid In-county Subscriptions *(Include advertiser's proof and exchange copies)*		
		(3) Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Non-USPS Paid Distribution	335	341
		(4) Other Classes Mailed Through the USPS		
c.	Total Paid and/or requested Circulation *(Sum of 15b, (1), (2), (3), and (4))*		4,707	4,426
d.	Free Distribution by Mail (Samples, complimentary, and other free)	(1) Outside-county as Stated on form 3541	0	0
		(2) In-County as Stated on Form 3541		
		(3) Other Classes Mailed Through the USPS		
e.	Free Distribution Outside the Mail *(Carriers or other means)*		12	11
f.	Total Free distribution *(Sum of 15d and 15e)*		12	11
g.	Total Distribution *(Sum of 15c and 15f)*		4,719	4,437
h.	Copies Not Distributed		697	817
i.	Total (Sum of 15g, and h.)		5,416	5,254
j.	Percent Paid and/or Requested Circulation (15c. Divided by 15g. Times 100)		99.75%	99.75%

16. Publication of Statement of Ownership
☒ Publication required. Will be printed in the Volume 80, #12 issue of this publication. ☐ Publication not required.

17. Signature and Title of Editor, Business Manager, or Owner — Date

I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).

Instructions to Publishers

1. Complete and file copy of this form with your postmaster annually on or before October 1. Keep a copy of the completed form for your records.
2. In cases where the stockholder or security holder is a trustee, include in items 10 and 11 the name of the person or corporation for whom the trustee is action. Also include the names and addresses of individuals who are stockholders who own or hold 1 percent or more of the total amount of bonds, mortgages, or other securities of the publishing corporation. In item 11, if none, check the box. Use blank sheets if more space is required.
3. Be sure to furnish all circulation information called for in item 15. Free circulation must be shown in items 15d, e, f.
4. Item 15h., Copies not Distributed, must include (1) newsstand copies originally stated on Form 3541, and returned to the publisher, (2) estimated returns from news agents, and (3), copies for office use, leftovers, spoiled, and all other copies not distributed.
5. If the publication had Periodicals authorization as general or requester publication, this Statement of Ownership, Management, and Circulation must be published; it must be printed in any issue in October or, if the publication is not published during October, the first issue printed after October.
6. In item 16, indicate the date of the issue in which this Statement of Ownership will be published.
7. Item 17 must be signed.

Failure to file or publish a statement of Ownership may lead to suspension of Periodicals authorization.

PS Forms **3526**, September 1998 (*Reverse*)