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Evaluating the Burden of Amblyopia Treatment from the Parent and Child's Perspective

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Abstract

Purpose—To evaluate the psychometric properties of the original Parent and new Child Amblyopia Treatment Index (ATI), questionnaires that assess the burden of amblyopia treatment in children and families, and to compare scores between children treated with atropine or patching.

Methods—Parent ATI and Child ATI were administered to 233 children 7 to <13 years old and their parents as part of a randomized trial comparing patching and atropine for amblyopia treatment. For each ATI version, construct validity was assessed using factor analysis; internal consistency reliability was assessed using Cronbach's alpha. Data from the Parent ATI and Child ATI were correlated and scores for each version were compared between treatment groups.

Results—We analyzed the three subscales found in prior Parent ATI studies in younger children and confirmed subscales for adverse effects and treatment compliance, but not for social stigma, in both parent and child versions. Overall and subscale scores on the Parent ATI and Child ATI were moderately to well correlated except for the social stigma subscale. For both the Parent ATI and Child ATI, children treated with atropine had better scores than those treated with patching, both overall and on treatment compliance and social stigma subscales (all p-values ≤ 0.01).

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Conclusions—When used for children 7 to <13 years old, the Parent ATI and Child ATI have similar factor structures to each other and to the Parent ATI for children 3 to <7 years old. Atropine treatment was found to have less negative impact than patching.

Introduction

The Amblyopia Treatment Index (ATI) was developed by the Pediatric Eye Disease Investigator Group to measure the impact or burden of amblyopia treatment on the child and the family.[1] Briefly, a list of potential questionnaire items had been created based on the literature and clinical experience and was reviewed by pediatric eye specialists, a pediatric psychologist, and parents of children aged 3 to <7 years old who were undergoing amblyopia treatment.[1] The list was then reduced to the 20 items that were felt to best address various aspects of the psychological impact of amblyopia treatment.[1] In children age 3 to <7 years, the original ATI demonstrated a three-factor structure, leading to the definition of three subscales referred to as “adverse effects,” “treatment compliance,” and “social stigma,” each with good internal consistency and reliability.[1-3] Parallel versions of the ATI were developed for patching treatment and for atropine treatment.[1]

Previous studies using the original ATI, all of which have been in patients 3 to <7 years old, have involved questionnaire completion by the parent,[1-7] which is typical when evaluating treatment in young children. For children aged 7 years and older, we developed a child version of the ATI (the Child ATI) to allow assessment of the impact of treatment from the child’s perspective.

In the present study we administered both the new Child ATI and the original ATI (henceforth referred to as the Parent ATI) as part of a randomized clinical trial comparing amblyopia treatments in children aged 7 to <13 years.[8] Herein we evaluate the ATI results from that trial to determine whether the Parent ATI shows a similar factor structure in older children, to assess the psychometric properties of the Child ATI, to correlate Parent ATI and Child ATI results, and to compare ATI results between the treatment groups.

Methods

This study was conducted by the Pediatric Eye Disease Investigator Group (PEDIG). The respective institutional review boards approved the protocol and the Health Insurance Portability and Accountability Act–compliant informed consent forms. The parent or guardian of each participant gave written informed consent and each participant gave assent as required.

The ATI was completed as part of a randomized trial comparing atropine to patching for treatment of amblyopia in children aged 7 to <13 years. The details of the protocol have been published in a previous report,[8] but are briefly summarized herein. Patients with moderate or severe amblyopia (amblyopic eye visual acuity 20/40 to 20/400) were randomized to either 2 hours of daily patching or atropine 1% once each weekend day in the sound eye and had follow-up visits 5 weeks and 17 weeks after randomization. Each child and accompanying parent completed the ATI at each follow-up visit, prior to the child’s examination. If the child was not accompanied by a parent who was responsible for administering the treatment at least half of the time, the parent questionnaire was not completed. The parent version of the questionnaire was self-administered whereas the child version of the questionnaire was verbally administered by clinic staff.

The Parent ATI consists of 20 items and the Child ATI consists of 19 items reworded to address the impact of treatment from the child’s perspective. Items in the atropine treatment

versions of the Parent ATI and Child ATI are shown in Table 1; items in the patching treatment versions are shown in e-Supplement 2 (available at jaapos.org). Both questionnaires are scored on a 5-point Likert scale, but the parent questionnaire uses a strength of agreement scale with responses of "strongly agree" (5), "agree" (4), "neither agree nor disagree" (3), "disagree" (2), "strongly disagree" (1), and "not applicable," whereas the child questionnaire uses a frequency scale with responses of "always" (5), "a lot" (4), "sometimes" (3), "a little" (2), "never" (1), and "not applicable." On both questionnaires the majority of items are negative statements; therefore a higher score indicates higher negative impact or higher burden. Reverse scoring was applied to the few items that are positive statements.

Three subscales were predefined based on the past reports of the Parent ATI in younger children and the corollary questions on the Child ATI (Table 1a).

Statistical Analysis

Questionnaires with 3 or more missing or not-applicable responses were excluded from the analyses. For the remaining questionnaires, the missing or not-applicable responses were imputed using the average score for all completed items.

We examined the psychometric properties of the Parent ATI and Child ATI separately, using data pooled across treatment groups from the 5-week visit only because the 17-week data might have been affected by knowledge of whether visual acuity had improved at the 5-week visit. We assessed construct validity by performing factor analysis,[9,10] a statistical procedure that attempts to describe a battery of questionnaire items in terms of a smaller number of underlying factors. An orthogonal varimax rotation[11] was used for the factor analysis to simplify the interpretation of the results by determining factors whereby each individual item is strongly correlated with only one factor (or a small number of factors) and each factor is strongly correlated with only a few items.[12]

Item loadings, an estimate of the correlation between the item and an underlying factor, were considered to have "loaded" on a particular factor if they were at least 0.50. Eigenvalues, representing the amount of combined item variance accounted for by each factor, were examined. Factor analysis was first performed using a three-factor solution in accordance with previous studies of the Parent ATI, which had yielded three subscales.[1-3] Additional factor analysis was performed using a solution based on the number of factors for which eigenvalues exceeded 1.00. Internal consistency reliability of the overall score and of previously defined subscale[1-3] scores was assessed using Cronbach's alpha.[13]

The correlation between the Parent ATI and the Child ATI at 5 weeks was assessed using Spearman rank correlations on data pooled across treatment groups. Spearman rank correlations were calculated between overall scores, between subscale scores, and between each Parent ATI item and its parallel Child ATI item. Based on published guidelines (as cited in Upton and colleagues[14]) correlations >0.50 were considered good, between 0.30 and 0.50 were considered moderate, and <0.30 were considered poor.

Overall scores and subscale scores were compared between treatment groups using the Wilcoxon rank sum test with computation of exact *p*-values. The subscales were defined according to the three a priori subscales based on previous factor analyses of the Parent ATI in younger children.[1-7] For this analysis, data from the 5-week visit and the 17-week visit were analyzed separately. Results were evaluated both overall and stratified according to amblyopia severity at baseline.

Analyses were conducted using SAS version 9.1 (SAS Institute, Cary, NC) and StatXact version 6.0 (Cytel, Cambridge, MA).

Results

ATI Completion and Demographics

At the 5-week visit, of the 233 patients in the randomized trial, 188 (81%) had both parent and child questionnaires completed; 29 (12%) had only the child questionnaire completed, and 16 (7%) had neither completed. At the 17-week visit, 157 (67%) patients had both parent and child questionnaires completed, 39 (17%) had only the child questionnaire completed, and 37 (16%) had neither completed. Across both visits, for the Parent ATI and Child ATI respectively, 246 (71%) and 280 (68%) questionnaires had no missing or not applicable items, 49 (14%) and 92 (22%) had 1, 25 (7%) and 19 (5%) had 2, and 25 (7%) and 22 (5%) had 3 or more. Overall, 1.7% of item responses were marked not applicable and 0.02% were missing. Responses of not applicable were more likely to occur in the patching group than in the atropine group (mean number of items not applicable = 0.82, vs 0.31 for the Parent ATI and 0.78 vs 0.41 in the Child ATI).

Excluding the 47 questionnaires which had 3 or more items either missing or not applicable, there were 172 parent and 206 child questionnaires for analysis at 5 weeks and 148 parent and 185 child questionnaires for analysis at 17 weeks.

Of the 220 patients (92%) who completed at least one questionnaire during the study, 109 (51%) were female and 179 (83%) were white. Their mean age was 9.0 ± 1.6 years, with 120 patients (56%) 7 to <9 years, 63 patients (29%) 9 to <11 years, and 34 patients (15%) 11 to <13 years. Amblyopic eye visual acuity was between 20/40 to 20/100 in 179 patients (83%) and between 20/125 to 20/400 in 37 (17%). Sixty (27%) had been previously treated for amblyopia, most with patching. Baseline demographic and clinical characteristics were similar comparing the 220 patients who had at least one questionnaire completed and the 13 patients who had no questionnaires completed (data not shown).

Distribution of Responses

Frequency distributions of item responses were visually inspected and a limited response range was found for items 6b, 6c and 15 on the parent ATI (for items 6b and 6c, 94% of responses were either “strongly disagree” or “disagree”; for item 15, 92% of responses were either “strongly agree” or “agree”); and for items 6 and 7 on the Child ATI (for both items 94% of responses were “never”).

Factor Analysis and Internal Consistency Reliability

Parent ATI 5-Week Data—For the factor analysis of the Parent ATI, using a three-factor solution, 15 of the 20 items had factor loadings ≥0.50 (Table 2). For the Parent ATI, two of three factors (factors 1 and 2 respectively) appeared similar to previously described subscales,[1-3] with common themes of adverse effects and treatment compliance (eigenvalues of 11.6 and 2.8) but the social stigma subscale did not appear to be present. Items 6b and 6c alone, items which had been excluded from previous analyses, loaded (≥0.50) on a third factor (0.84 and 0.70, respectively; eigenvalue, 2.0) possibly representing tension/conflict with others. Given that four factors had eigenvalues greater than 1.00 (e-Supplement 3, available at jaapos.org), we repeated the factor analysis using a four-factor solution (Table 2). The results were largely similar except that loading on “adverse effects” in the three-factor analysis were now divided into two factors.

Internal consistency reliability of the Parent ATI as measured by Cronbach's alpha was 0.88 overall, and was 0.84, 0.84, 0.65, for the previously defined[1-3] adverse effect, treatment compliance, and social stigma subscales respectively, and was 0.81 for the new factor comprised of items 6b and 6c.

Child ATI 5-Week Data—For the factor analysis of the child questionnaire data, using a three factor solution, 10 of the 19 items had factor loadings ≥0.50 (Table 3). The first and second factors appeared similar to the previously described[1-3] adverse effects and treatment compliance subscales on the Parent ATI. Similar to the Parent ATI, the previously described[1-3] social stigma subscale did not emerge. Given that only 3 factors had eigenvalues greater than 1.00 (ie, 8.0, 1.7 and 1.3 for factors 1, 2, and 3, respectively) (e-Supplement 4, available at jaapos.org), no additional factor analysis was performed.

Internal consistency reliability for the Child ATI as measured by Cronbach's alpha was 0.84 overall, and was 0.79, 0.70, 0.54 for the previously defined[1-3] adverse effect, treatment compliance, and social stigma subscales, respectively, and was 0.60 for the new factor found in the Parent ATI data (items 6 and 7 on the Child ATI corresponding to items 6b and 6c on the Parent ATI).

Correlation between Parent ATI and Child ATI Data at 5 Weeks

Spearman rank correlations between the Parent ATI and the Child ATI are shown in Table 4. The overall score and subscale scores for adverse effects and treatment compliance were moderately correlated between the Parent ATI and the Child ATI, whereas subscale scores for social stigma was poorly correlated. All correlations between parent items and parallel child items were either moderate or poor.

Treatment Group Comparison

Patients in the atropine group had better (ie, lower) median overall scores at 17 weeks than patients in the patching group on the Parent ATI (2.10 vs 2.30, $p = 0.005$) and on the Child ATI (1.63 vs 2.00, $p < 0.001$). At 17 weeks, the atropine group had better median scores on the treatment compliance (2.00 vs 2.60, $p < 0.001$ for the Parent ATI; 1.75 vs 2.75, $p < 0.001$ for the Child ATI) and social stigma (2.00 vs 2.33, $p < 0.001$ for the Parent ATI; 1.11 vs 1.67, $p = 0.001$ for the Child ATI) subscales, but not on the adverse effects subscale (2.25 vs 2.31, $p = 0.45$ for the Parent ATI; 1.75 vs 2.00, $p = 0.05$ for the Child ATI). Treatment group scores stratified by baseline amblyopia eye acuity level are in online e-Supplement 5 (available at jaapos.org). Findings were similar at 5 weeks (data not shown). Results were largely similar when the analysis was restricted to cases with no missing data.

Discussion

Previously we had developed a parent version of the ATI and evaluated it in parents of children 3 to <7 years of age. In the current study, we administered the parent version and a new child version to patients ages 7 to <13 years old and their parents as part of a randomized trial comparing patching and atropine for the treatment of amblyopia.

For the Parent ATI, the similarity of factor structure in the present study of children 7 to <13 years old and in previous studies of of children 3 to <7 years old, with consistency of adverse effects and treatment compliance subscales, suggest a robustness of the instrument across 3 to <13-year-olds. The absence of a social stigma subscale in the present study might be because the treatment regimens in the present study were less intense than those used in previous studies of younger children (2 hours vs 6 hours to full-time patching),[2, 4-6] and could be completed while at home, away from friends and peers. Interestingly, the current

analysis suggests a potential new factor on the Parent ATI consisting of two items that relate to tension and conflict with others (6b and 6c), items which had been included in our present analysis but excluded from the earlier reports.[2-7]

Although the evidence for the existence of subscales in the new Child ATI was less strong than in the Parent ATI, we did find evidence of adverse effects and treatment compliance subscales previously described in the Parent ATI, suggesting that both instruments are measuring similar constructs. The third factor emerging in the analysis of the Child ATI is comprised of items that are part of the previously defined adverse effects subscale but seem to specifically relate to functioning at near.

The correlation between Parent ATI and Child ATI scores overall and on adverse effects and treatment compliance subscale was moderate to good, however many individual items showed poor correlation. Several factors may have negatively impacted affected the correlation. First, the two questionnaires are on different response scales. Responses on the Parent ATI are on a strength of agreement scale (“strongly agree” to “strongly disagree”) whereas the responses on the Child ATI are on a frequency scale (“always” to “never”) because we felt that a frequency scale might be more easily understandable to chidren. Second, the child and parent versions might not be considered strictly parallel on the item level. For example, several items developed with the intent of targeting parental worries correlated poorly with their corresponding child ATI items. Also, the two Parent ATI items relating to tension or conflict in relationships with the spouse or the child’s teacher do not have a corresponding item on the Child ATI. Third, some individual items had only a limited range of responses on the parent and/or child versions. Lastly, parents and children may simply have different perspectives on the impact and burden of treatment.

The comparison of ATI scores between atropine treatment and patching treatment in these 7 to <13-year-olds yielded largely similar results to those found previously in 3 to <7-year-olds.[2-7] Overall ATI scores, treatment compliance subscale scores, and social stigma subscale scores were more favorable in the children treated with atropine. Contrary to results from previous studies of 3 to <7-year-olds, adverse effects subscale scores did not differ by treatment group.[2, 4] Our failure to find such a difference may be due to the lower intensity treatment regimens in the present study.[2,4] Most median treatment group differences were less than a half a point, with the largest treatment group difference being 1.00 point. From a relative perspective, an ATI score of 1 would be no treatment burden (0%) and a score of 5 would be maximum treatment burden (100%), therefore a half point difference in score would represent a 12.5% difference in treatment burden if response categories are equidistant. Median scores were between 1.63 and 2.31 for both treatment groups, indicating that treatment was generally well-tolerated. To put a score into a meaningful context, a median score of 2.00 on the Child ATI, for example, indicates that half of the group experienced treatment-related difficulties less than “a little” of the time.

There are some limitations to our study. First, we are assuming that the previously-established content validity of the Parent ATI in younger children would generalize to its use in older children and to the analogous Child ATI. Second, although our Likert-type scales were assigned numerical values for analysis, they are are technically ordinal, therefore we do not know whether the distance between successive categories is the same—that is, whether “strongly agree” and “agree” are the same distance apart as “agree” and “neither agree or disagree.” In averaging item scores to calculate overall and subscale scores, we are making the assumption that the response categories are equidistant.

By assessing the burden of treatment, the Parent ATI and the Child ATI provide useful additional information for parents and clinicians to consider when making management decisions, particularly when treatments are equally effective.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Amblyopia Treatment Index (ATI) items: Atropine Treatment Version[a]

PARENT ATI						Previously described Parent ATI subscale[b]	CHILD ATI					
Strongly agree (5)	Agree (4)	Neither agree nor disagree (3)	Disagree (2)	Strongly disagree (1)	N/A		Always (5)	A lot (4)	Sometimes (3)	A little (2)	Never (1)	N/A
#	Item						#	Item				
1	My child does not seem to mind using the drops.					Compliance	1	It bothers me to use the drops.				
2	I worry that by using the drops, my child may miss out on fun activities (such as games, sports, and parties).					Adverse	2	I can't do fun things (such as games and sports) because of the drops.				
3	Using the drops affects my child's learning.					Adverse	3	The drops make my school work harder.				
4	Using the drops makes it hard for my child to play outside, such as riding a bike.					Adverse	4	The drops make it hard for me to play outside.				
5	I have trouble putting the drops in my child's eye.					Compliance	5	It's hard to get drops put in my eye.				
6a	Using the drops is a source of tension or conflict in my relationship with my child.					Compliance						
6b	Using the drops is a source of tension or conflict in my relationship with another family member.					N/A[c]	6 7	The drops make my parents argue. The drops make others in my family argue.				
6c	Using the drops is a source of tension or conflict in my relationship with my child's teacher.					N/A[c]						
7	Using the drops makes it difficult for my child to read or write.[d]					Adverse	8	The drops make it hard to read and write.				
8	I worry that my child will become injured when using the drops.					Adverse	9	I worry that I will run into things because of the drops.				
9	My child can see well when using the drops.					Adverse	10	I can see well when the drops are in.				
10	My child complains when it is time to put in the drops.					Compliance	11	I don't like it when it's time for the drops.				
11	Using the drops makes my child's eye or eyelids red or irritated.					Stigma	12	The drops make my eyes or eyelids red.				
12	I worry that my child does not get the drops often enough.					Compliance	13	I worry that I don't get enough drops.				
13	My child is more clumsy and uncoordinated than usual when using the drops.					Adverse	14	The drops make me clumsy.				
14	I notice that other children stare at my child when the drops are in.					Stigma	15	My friends stare at my eye when the drops are in.				
15	I believe that using the drops will improve my child's vision.					None[e]	16	I think the drops will help me see better.				
16	Using the drops makes it difficult for my child to play with small toys or hand held videogames.					Adverse	17	The drops make it hard to play with small toys or handheld videogames.				
17	I sometimes forget to put the drops in my child's eye.					None[e]	18	My parents forget to put the drops in.				
18	I worry that using the drops will make my child feel different from					Stigma	19	The drops make me feel different from my friends.				

PARENT ATI						Previously described Parent ATI subscale[b]	CHILD ATI					
Strongly agree (5)	Agree (4)	Neither agree nor disagree (3)	Disagree (2)	Strongly disagree (1)	N/A		Always (5)	A lot (4)	Sometimes (3)	A little (2)	Never (1)	N/A
#	Item						#	Item				
	other children.											

[a] Items listed are from the **atropine version** of the Parent ATI and Child ATI—treatment wording is slightly modified for the patching version in e-Supplement 2.

[b] Subscales from previous analyses of Parent ATI data in younger children:[2-7] *Adverse*, adverse effect; *Compliance*, treatment compliance; *Stigma*, social stigma

[c] Items 6b and 6c of the Parent ATI were not included in prior studies' factor analyses as they were the only two items which had "not applicable" as a choice,[2-7] in contrast to the current study in which all items have a choice of "not applicable."

[d] Item 7 in previous studies of the Parent ATI in younger children[1-7] has related to treatment making it difficult for child to draw, color, or write.

[e] Items 15 and 17 in the Parent ATI had not been included in any subscale in the previous analyses of Parent ATI data in younger children.[1-3]

Table 2

Parent Amblyopia Treatment Index (ATI) data, 5-week examination: factor loadings for each item (N = 172)

		Factor loadings						
		Three-factor solution			Four-factor solution			
		Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3	Factor 4
Items composing previously defined adverse effects subscale[a]								
2	Worry that child on treatment may miss out on fun activities	**.54**	.21	.13	.47	.20	.25	.11
3	Treatment affects child's learning	**.58**	.01	.20	.46	.00	.35	.19
4	Treatment makes it hard for child to play outside	**.58**	.36	.17	**.57**	.34	.22	.14
7	Treatment makes it difficult for child to read or write[b]	**.73**	.01	−.05	.42	.02	**.74**	−.06
8	Worry that child on treatment will become injured	**.66**	.13	.17	**.78**	.08	.13	.11
9	Child can see well on treatment	**.52**	.17	−.02	.24	.17	**.55**	−.01
13	Child more clumsy on treatment	**.62**	.33	.10	**.64**	.30	.19	.06
16	Treatment makes difficult for child to play with small toys	**.55**	.22	.15	.30	.22	.54	.16
Items composing previously-defined treatment compliance subscale[a]								
1	Child does not seem to mind treatment	.19	**.66**	.00	.11	**.67**	.21	.00
5	Trouble applying treatment to child	.14	**.62**	.16	.11	**.62**	.13	.16
6a	Treatment is source of tension/conflict with child	.23	**.59**	.43	.24	**.58**	.12	.42
10	Child complains when it is time for treatment	.10	**.72**	−.07	.16	**.71**	−.00	−.09
12	Worry child not getting enough treatment	.11	.29	.10	.15	.29	−.03	.10
Items composing previously defined social stigma subscale[a]								
11	Treatment makes child's eye or eyelids red	.23	.39	.19	.22	.38	.14	.18
14	Other children stare at child	.47	.23	.20	**.52**	.21	.11	.17
18	Worry that child feels different from other children	**.61**	.22	.27	**.61**	.19	.24	.23
Items not included in previously-defined subscales[a]								
6b	Treatment is source of tension/conflict with another family member[c]	.19	.20	**.84**	.23	.19	.07	**.81**
6c	Treatment is source of tension/conflict with child's teacher[c]	.27	.21	**.70**	.23	.20	.19	**.71**

		Factor loadings						
		Three-factor solution			Four-factor solution			
		Factor 1	**Factor 2**	**Factor 3**	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**
15	Believe treatment will improve child's vision	.20	.03	.10	.02	.04	.32	.12
17	Sometimes forget to apply child's treatment	.07	.43	.22	.06	.44	.06	.22

Factor loadings shown in bold are those that are ≥0.50.

[a] Previously-defined subscales based on previous factor analysis of the Parent ATI data in studies of younger children aged 3 to <7 years.[1, 3]

[b] Item 7 in previous studies of the Parent ATI in younger children[1-7] has related to treatment making it difficult for child to draw, color, or write.

[c] Note: items 6b and 6c were not included in prior studies' factor analyses as they were the only two items which had "not applicable" as a choice,[2-7] in contrast to the current study in which all items have a choice of "not applicable."

Table 3

Child Amblyopia Treatment Index (ATI), 5-week examination: factor loadings for each item (N = 206)

		Factor 1	Factor 2	Factor 3
Items composing previously hypothesized adverse effects subscale [a]				
2	I can't do fun things	**.56**	.19	.01
3	Treatment makes my school work harder	.32	.10	**.54**
4	Treatment makes it hard to play outside	**.65**	.23	.13
8	Treatment makes it hard to read and write[b]	.29	.06	**.76**
9	I worry that I will run into things	**.68**	.15	.20
10	I can see well on treatment	.02	.01	.49
14	Treatment makes me clumsy	**.52**	.27	.18
17	Treatment makes difficult for me to play with small toys, etc	**.53**	.11	.44
Items composing previously hypothesized treatment compliance subscale [a]				
1	Using treatment bothers me	.34	**.55**	.34
5	It's hard to use the treatment	.10	**.73**	.15
11	I don't like when it is time for treatment	.17	**.60**	.27
13	I worry I'm not getting enough treatment	.30	.32	−.01
Items composing previously hypothesized social stigma subscale [*]				
12	Treatment makes my eye or eyelids red	.26	.24	.18
15	My friends stare at me on treatment	.36	.19	.01
19	Treatment makes me feel different from other children	.38	.29	.13
Items not included in previously hypothesized subscales [a]				
6	Treatment makes my parents argue	.20	.26	−.01
7	Treatment makes others in my family argue	.22	.35	−.01
16	I think the patch will help me see better	−.06	.10	.35
18	My parents forget to apply my treatment	.14	.39	.02

Factor loadings shown in bold are those which are ≥0.50.

[a] Previously hypothesized subscales based on previous factor analysis of the parent questionnaire data in studies of younger children aged 3 to <7 years.[1,3]

[b] In previous studies of the Parent ATI in younger children[1-7] this item has related to treatment making it difficult for child to draw, color, or write.

Table 4

Spearman rank correlations between Parent ATI and Child ATI at 5 weeks

		Spearman Rank Correlation Between Parent and Corollary Child
Overall		.53
Subscales [a]		
Adverse effects[b]		.49
Treatment compliance[c]		.61
Social stigma[d]		.26
Individual items [e]		
1	Child does not seem to mind treatment	.46
2	Worry that child on treatment may miss out on fun activities	.26
3	Treatment affects child's learning	.28
4	Treatment makes it hard for child to play outside	.30
5	Trouble applying treatment to child	.38
6b	Treatment is source of tension/conflict with another family member	−.01/.02[f]
7	Treatment makes it difficult for child to read or write[g]	.50
8	Worry that child on treatment will become injured	.09
9	Child can see well on treatment	.19
10	Child complains when it is time for treatment	.49
11	Treatment makes child's eye or eyelids red	.36
12	Worry child not getting enough treatment	.32
13	Child more clumsy on treatment	.34
14	Other children stare at child	.23
15	Believe treatment will improve child's vision	.27
16	Treatment makes difficult for child to play with small toys or handheld videogames	.27
17	Sometimes forget to apply child's treatment	.37
18	Worry that child feels different from other children	.19

ATI, Amblyopia Treatment Index

[a] Previously hypothesized subscales based on previous factor analysis of the parent questionnaire data in studies of younger children aged 3 to <7 years.[1,3]

[b] Adverse effects subscale consists of items 2, 3, 4, 7, 8, 9, 13 and 16 on parent questionnaire, and items 2, 3, 4, 8, 9, 10, 14 and 17 on child questionnaire.

[c] Treatment compliance subscale consists of items 1, 5, 6a, 10 and 12 on parent questionnaire, and items 1, 5, 11, and 13 on child questionnaire.

[d] Social stigma subscale consists of items 11, 14, and 18 on parent questionnaire, and items 12, 14, and 17 on child questionnaire.

[e] Item numbers cited are those from the Parent ATI. Parent ATI items 6a and 6c have no parallel items on the child questionnaire.

[f] First number is from correlation of parent item 6b with child item 6. Second number is from correlation of parent item 6b with child item 7.

[g] Item 7 in previous studies of the Parent ATI in younger children[1-7] has related to treatment making it difficult for child to draw, color, or write.[1-3]