

PSYCHOLOGICAL CORRELATES OF ACCOMMODATIVE SQUINT

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Abstract

The aim of this study was to determine whether certain psychological variables are distinct characteristics of children suffering from accommodative squints. Thirty children who have been diagnosed as suffering from accommodative squint, thirty other orthoptic patients and thirty control children were tested with psychological and physiological tests.

On the Rosenzweig Picture Frustration Study, children with accommodative squint showed greatest tendency to turn their aggression onto the environment and they showed least tendency to gloss over frustration.

On the Bristol Social Adjustment Guide, it was found that they had to a statistically significant degree a readiness to overreact to everyday situations.

Heartrate measures were taken under slightly stressful conditions. Only children with accommodative squint showed a consistent, statistically significant increase in their heartrate.

The influence of the above findings is tentatively offered as an implicating factor in the aetiology, prognosis and treatment of accommodative squint.

Key words: Psychological tests, physiological test.

INTRODUCTION

Squint is present in 3% of children.¹ Convergent squint is the most common type of squint. One third of these are accommodative squints. The investigator reviewed the case histories of all the children with convergent squint who have been seen by her over a number of years. It has been found that, of those who had been discharged as apparently cured following successful treatment, 20% sought further help at a later date. This was provoked by periodic loss of control over their deviation. On further analysis, this group proved to be entirely composed of those children who clinically were classified as suffering from an accommodative type of squint.

The investigator's 30 years subjective clinical impression was that these children presented the picture of an emotional, nervous, fidgety, extroverted, overreactive, cooperative youngster who welcomed a challenge and appeared to live in a more frequently stressful environment, with strict, more demanding parents than other patients. This suggested the possibility that psychological correlates contribute to the prognosis and aetiology of accommodative squint. This notion is supported by numerous statements of authorities without any empirical research to support the premises.

The aim of this study was to determine whether certain psychological variables are distinctive correlates of children diagnosed as

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having accommodative squint. Well recognised and previously documented aetiological factors, such as refractive error, AC/A ratio, heredity, anatomical factors (of central nervous origin), and developmental deficits, are not considered in this paper.

The possibility of psychological factors being related to squint has been specifically considered in a number of published articles. Many are concerned with psychological effects of squint on a child, but very little on the reverse which is the primary concern of this paper, that is that psychological factors may play a part in the aetiology and prognosis of squint. References to emotional or psychological factors in the ophthalmic literature, are mostly statements of the authors' casual observations. There is no precise explanation of the nature of these factors and how they exert their influence.

Gesell's (1949)² observations about the age accommodative squint usually develops are relevant. Describing the visual development of the normal infant he states:

"It is an extraordinary fact, that as a child approaches the 2½ year level of maturity, he may sometimes look with such overpowering intensity, that his legs collapse under him."

In this statement the significant word is intensity, because, depending on the child's incentive motivation this intensity can have varying levels.

Parson (1947)³ mentions a tendency to selfconscious mannerism and precocious interest in the minute, even before accommodative convergence relationships have been established.

Clement and Jackson (1972)⁴ found that accommodative factors are much more important as a causative factor in children of higher social class parents.

PREDICTIONS AND INVESTIGATION

The extent to which there is professional agreement regarding the hypothesis, that there are psychological correlates in the aetiology and prognosis of accommodative squint, was examined. A questionnaire containing a list of descriptive characteristics that might be typical of children suffering from accommodative squint

was sent to orthoptists throughout Australia. The somewhat arbitrary nature of selection of these characteristics was a practical necessity.

Based on the data from these questionnaires (36 returned), on the literature reviewed and the investigator's clinical observations, predictions were made which also provided the rationale for selecting the following tests:

1. *Junior Eysenck personality inventory*: chosen because it purports to measure extroversion/introversion, a characteristic attributed to children with accommodative squint. The specific prediction was that children with accommodative squint will score higher on extroversion compared with other children because they are more sociable, lively, impulsive and talkative.

2. *The children's form of The Rosenzweig Picture-frustration study*: represents a limited projective procedure, and was chosen because it claims to disclose certain patterns of responses of children to every day stress.⁵ The technique is derived conceptually from the principles of frustration theory⁶ (Rosenzweig, 1976) and has been standardised world wide.

Orthoptists found, according to the questionnaire sent to them, that children with accommodative squint seemed to be tense, worrying about everything, persevering, and hyperactive. Rosenzweig (1976) writes that:

... he conceives of frustration whenever an organism meets a more or less unsurmountable obstacle or obstruction to its route to satisfaction of vital needs.

The investigator feels that blurred vision would be conceived by children as such an obstacle. The more so, as Rosenzweig points out, that when such stress occurs, aggression of some type ensues. The experimenter feels that over-accommodation and over-convergence could be regarded as expressions of "aggression". Rosenzweig conceives of aggression in a broader sense than most other writers. Significantly, he does not see it as just a negative or destructive quality.⁷

The specific prediction was that children with accommodative squint will score higher on extra-punitiveness (the frustrated individual shows aggression towards the source of frustration) than other subjects. That is, they will turn their aggression onto the environment. Equally they will score higher on Obstacle-Dominance than other subjects, because they will be very concerned with the barrier occasioning the frustration and they will face up to obstacles and react upon them. However, they will score lower on impunitiveness (the individual denies the frustration) than other subjects, because they do not choose to gloss over frustration or evade it.

3. *Heartrate measures:* under slightly stressful situations have been included on the assumption that they reflect degrees of tension produced by situations perceived as stressful or frustrating. They are physiological indicators of autonomous nervous system activity and as such, have often been used as clues of transitory anxiety. Heartrate measures are objective and easy to quantify.

To create a stressful situation, that would be acceptable to the hospital setting, and applicable to the age range from five to 13 years, it was decided to ask mental arithmetic questions in ascending difficulty, from the subjects. The questions were fired at the child starting with one level below their respective classroom requirements and continued up the grade till three consecutive questions were failed. To standardise the procedure, questions from the "DUX"⁸ Series Mental Arithmetic, were used. This book is a standard textbook in many New South Wales primary schools.

It was predicted that under the above conditions children with accommodative squint will show a more marked increase of their heartrate per second than the other subjects, because they show more exaggerated responses to stressful situations than other children.

4. *The Bristol Social Adjustment Guide:* represents an instrument which purports to give an all-round picture of a child's personality. It offered firstly a method of assessing a wide range of the child's behaviour (in comparison with normal children in a non-hospital setting), and attitudes as they are seen over a period of time by their teachers. Secondly, it furnished some data for the assessment of the relationship between the child and his family; and it was felt that this would provide an adjunct to the information obtainable from the Parental Attitude Research Instrument.

The special prediction was that children with accommodative squint will be coming from a more unstable family than other children, therefore they will score higher on the F (family) scale than other subjects. As they appeared to be more impulsive, aggressive, emotional, excitable, children with accommodative squint will tend to overreact to situations more often than other subjects, hence will score high on the overreaction component.

5. *The Parental Attitude Research Instrument:* In this the investigator was mostly interested in the Achievement pressure component. Before this study was undertaken, the author was under the impression that children with accommodative squint were under more unfavourable family circumstances (not economically speaking) and especially that they were under greater pressure from their parents to excel in all their intellectual activities. Therefore, the specific prediction was that children with accommodative squint will have parents who score higher on this component than other parents, because these parents appeared to demand high standards — they showed a "no nonsense attitude" towards the child. Secondly, this impression seemed to be supported by Clement and Jackson's (1972) study, who concluded that children with accommodative squint were under greater pressure from their parents to excel in reading and writing, than other children. Thirdly, orthoptists tended to confirm this view, on the questionnaire.

SUBJECTS

A total of 196 eye patients were contacted by telephone or letter. The final number of participants was elected to be 90 children (30 in each group). The choice of equal numbers in each group was made on statistical grounds.

The age of the children ranged from five to 13. (This age limit was dictated by the Junior Eysenck Personality Inventory and the Rosenzweig Picture Frustration Tests, which are designed for this age range.) The eye patients were randomly selected from the orthoptic department of Sydney Eye Hospital (University of Sydney) and Prince of Wales Hospital (University of New South Wales) and the experimenter's private practice.

One group comprised children who have been diagnosed as having accommodative squint (14 boys, 16 girls, including five pairs of siblings). Another group comprised children who attended the clinics for eye-complaints other than accommodative squint (15 boys, 15 girls). This group was included in the design to eliminate any effect which eye treatment, wearing of glasses, occlusion or eyedrops might have and so could confound the test results on the accommodative squint group. The third group (control) were children without any medical problem and who did not attend any clinic for treatment (16 boys, of whom eight were siblings of patients and eight were children of friends; and 14 girls, of whom six were siblings of patients and eight were children of friends). Each child was tested individually, with the accompanying parent.

PROCEDURE

For each subject an individual appointment was made, at the orthoptic clinic. It was explained that they would be doing two paper and pencil tasks; and one mental arithmetic task while their heartrate would be recorded. It was strongly emphasised that the paper and pencil tests were only to be seen by the experimenter, that the mental arithmetic questions were quite unrelated to their school marks. As an incentive to ensure cooperation each child was promised a small present at the end of the test if they did their best. All of them were rewarded. The ones who could

not read and write were helped, by the examiner reading out the questions and writing down the responses.

For the heartrate measures two disposable electrodes (DRACARD) with neptic electrode gel were used. One electrode was placed at the center of the manubrium section of the sternum, and the other directly below the nipple, at the same level as the xiphoid process on the sixth rib. A bio-telemetry FM transmitter (Devices Model SNR 102F) was attached to the electrode leads. Transmission of the heartbeat was picked up, and recorded by an FM radio cassette recorder (National FM/AM radio cassette recorder 444). This sound recording was later transposed to a graph paper, by courtesy of OPSM hearing aid department, to facilitate accurate counting of the heartbeat recordings. The recording was commenced after the experimenter was satisfied that the heartbeat was coming through satisfactorily. As soon as this was established the mental arithmetic questions were fired at the children. While the experimenter attached the electrodes to the children, she explained to each subject that she will be asking them some mental arithmetic questions, that were not too hard, that children their age could all easily answer them, and that they should answer as fast as possible, to see how many questions they could answer correctly in the shortest possible time. When they began to miss questions, they were spurred on by remarks such as: "I am sure you can do this, just try a bit harder, come on hurry up", etc. The questioning was continued till three consecutive questions were beyond the scope of the subject.

The length of time recordings were taken depended on the time an individual subject reached his level of three wrongly answered questions, therefore the individual recorded times were not uniform. By this time some parents had the Parental Attitude Research Instrument completed. The Bristol Social Adjustment Guide Form for the family was then discussed and completed. The Bristol Social Adjustment Guide's School form was handed to the escort of the child, together with a stamped envelope, with the request to deliver it to the

child's teacher. By asking the parent to hand the questionnaire to the teacher the problem of "consent" was solved.

ANALYSIS OF DATA

For all the reported measures, the procedure was to apply an analysis of variance, then if the null hypothesis was rejected planned contrast was done. All the data treatment was orthogonal, except the heartrate data. On the heartrate data the experimenter was looking for increase in heartrate, per second within subjects as compared to between subjects.

DISCUSSION

On the basis of this research, it is found, that children with accommodative squint are not more extroverted and nervous; they do not live under more stressful situations and they do not have stricter parents than other children. However statistical evidence confirmed that children with accommodative squint are more extrapunitive, less impunitive and have a marked tendency to overreact to every day situations and they do increase their heartrate more than other subjects under stressful situations.

This revised "picture" of the child with accommodative squint is based on the following findings:

- (1) Although some extroversion characteristics seemed to apply to children with accommodative squint (sociability, activity, out-going behaviour, etc.) this was not confirmed. Statistical findings on the Junior Eysenck Personality Inventory indicate that the three groups of children tested, did not differ on these measures. This negative result of the measure of neuroticism is further supported by the results of the BSAG's neuroticism component.
- (2) On the Picture-Frustration study statistical results led to the acceptance of the null hypothesis on Obstacle-Dominance. Prior to these findings, the investigator expected that children with accommodative squint will score highly on Obstacle-Dominance. This line of reasoning derived from the statements

made in the ophthalmic literature, where these children are described as having precarious interest in the minute and are persevering, nervous, etc.

- (3) The null hypothesis is rejected on measures of extrapuniveness and impunitiveness. The results of the planned contrast showed that children with accommodative squint showed least tendency for impunitiveness and greatest tendency for extrapuniveness. Consequently, the predictions on these two scores have been confirmed because both scores showed a statistically reliable difference, in the predicted directions, between children with accommodative squint and other subjects. That children with accommodative squint were least ready to gloss over frustration in an attempt to evade aggression, and showed the greatest readiness to turn their aggression onto the environment, means in more specific terms, according to Rosenzweig's interpretation, that the high extrapunitive score and the low impunitive score of children with accommodative squint is consistent with their uninhibited extrapunitive aggression; that is, they express aggression against the environment and are unwilling to gloss over frustration without apparent aggression; they do not elect to rest at the stage of ego defense.

In line with Rosenzweig's interpretation the investigator is tempted to deduce that children with accommodative squint, by not being resigned to a blurred environment, search for ways to solve their dilemma with means available to them. By not being prepared to gloss over this frustration they exert accommodation and convergence. In other words, children with accommodative squint are not prepared to give up clear vision for binocular, single vision "without a fight". This, partly brings the problem back to the classical dilemma of the hypermetrope: "If he accommodates sufficiently to see clearly, he will overconverge; if he converges normally, he will accommodate insufficiently" (Huggonier).⁹

- (4) As predicted, children with accommodative squint showed a consistent, statistically significant increase in their heartrate per second throughout the testing period. This is interpreted, therefore, as showing an overall change to a higher level of physiological measure of frustration in children with accommodative squint. This may imply that the threshold of what appears to be stressful is much lower in children with accommodative squint than in other children. If that is so, then it can be argued that they react to threats to the clarity of their vision at a level where other children, under comparable situations, do not feel disadvantaged or threatened yet.
- (5) As predicted, a statistically significant difference, as seen by their teachers, was found between children with accommodative squint and children with eye disorders, in relation to their reaction to every day situations. Children with other eye disorders showed greatest tendency to underreact, and children with accommodative squint, to overreact. This finding, that children with accommodative squint showed a most pronounced tendency to overreact to every day situations, seems to be supported by the finding on the Rosenzweig Picture-Frustration study.
- (6) A surprisingly unexpected result of the study was the finding that the three groups did not differ either on the Parental Attitude Research Instrument nor were children with accommodative squint affected by more adverse factors in the family than other children, as indicated by the results of the Bristol Social Adjustment Guide. This is contrary to the expectation, that children with accommodative squint are under greater pressure from their parents to excel in all their activities, which was fuelled by the Clement and Jackson⁴ finding, by the response to the orthoptists' questionnaire and by the experimenter's subjective observations.

An interesting by-product of the research were two findings:

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- (a) The heartrate chart of the children with no eye disorders showed no change under slightly stressful conditions.
- (b) Children with eye disorders showed a statistically significant underreaction to every day situations.

The question arises, could this be due to the seven (23½%) intermittent divergent squint cases included in the eye patient group? The literature frequently refers to these children as "day dreamers", easy going, placid children. Are they in some way the opposite to children with accommodative squint? Perhaps a future study will shed some light on this.

RESULTS

The stimulus to accommodate in hypermetropic accommodative squint is initiated by blurred vision. It is the individual child's own accommodative effort, made to overcome the blurred vision, which determines the convergence response. The important point demonstrated here is that the more easily frustrated child will have greater motivation to seek a solution to his problem within his repertoire in order to improve his optical resolution.

The most significant results of this study, from a practical point of view are:

- (a) that children with accommodative squint react to stress more readily and more vehemently than their peers as confirmed by the heartrate measures, compared with other children.
- (b) that children with accommodative squint showed greater readiness to overreact to every day situations as compared to other children, as confirmed by the Picture-Frustration study and BSAG.
- (c) that children with accommodative squint are not under more stressful family circumstances and are not under more achievement pressure compared with other children, as found by the PARI and BSAG.

It is realised that due to limitations this study touched only on a few possible psychological variables and further studies, with a wider scope, will probably identify more correlates of accommodative squint.

CONCLUSION

The present study was carried out to support with empirical evidence the premises that certain

psychological variables are distinct correlates of children suffering from accommodative squint. Statistical evidence confirms that in this study children with accommodative squint are more extropunitive, less impunitive, overreact to every day situations and increase their heartrate under mild stress more than other subjects.

However, no difference was found on extroversion, neuroticism, family circumstances and achievement pressure.

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