

Difference of Self-identity Levels between Strabismus Patients and Normal Controls

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Purpose: To evaluate differences in self-identity in patients diagnosed with strabismus, patients who underwent strabismus surgery, and healthy control individuals.

Methods: Self-identity testing was done during a military service physical examination. There were three subject groups: subjects with strabismus (group 1), subjects who had undergone corrective strabismus surgery (group 2), and subjects free of strabismus (group 3). The self-identity test was comprised of six sub-sections (subjectivity, self-acceptance, future confidence, goal orientation, initiative, and familiarity). Statistical significance of the sub-sections was compared across the three groups. Correlations in age at the time of surgery and across the six sub-sections were investigated in group 2.

Results: A total of 351 subjects were enrolled in the study; 96 subjects were in group 1, 108 subjects were in group 2, and 147 subjects were in group 3. Significant differences were evident in subjectivity, self-acceptance, initiative and familiarity between groups 1 and 3. No significant differences were found between groups 2 and 3. In group 2, statistical significance was evident between age at surgery and initiative and familiarity ($r = -0.333$, $p < 0.001$; $r = -0.433$, $p < 0.001$, respectively).

Conclusions: Self-identity is greater in non-strabismus subjects than strabismus subjects. Correction of strabismus may increase self-identity levels.

Key Words: Adolescent, Self-identity, Strabismus

Ocular orthotropia plays an important part in normal social life. It has been reported that patients with strabismus experience negative effects on their life, such as phobic anxiety [1]. A negative attitude toward strabismus appears

to emerge at approximately 6 years of age and from this age, ocular misalignment is recognized. Children with noticeable strabismus are viewed negatively by teachers [2,3].

In fact, it takes just 150 ms to judge a stranger's facial attractiveness. When doing so, the center of the eyes, mouth, and nose are the targets of the gaze [4,5]. Because the presence of strabismus is recognized within a short period of time, the effect of childhood strabismus on interpersonal relationships and self-identity is subject to investigation.

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Strabismus surgery may provide not only a correction of ocular misalignment, but also improvement in visual acuity, stereopsis, diplopia and visual preference. Increased self-esteem and improvements in social, emotional and functional measures of children's health are afforded by these improvements [6].

The purpose of this study was to evaluate differences in self-identity in subjects with diagnosed strabismus and strabismus corrected with surgery during a military service physical examination and a self-identity test (subjectivity, self-acceptance, future confidence, goal orientation, initiative, and familiarity). An additional purpose of this study was to investigate the relationship between the age of strabismus surgery and six sub-items among subjects with corrected strabismus by surgery.

Materials and Methods

This study was performed for those examinees aged 19 years and who visited the regional Military Manpower Administration for a military service physical examination from August 2014 to November 2014. This study was approved by the institutional review board at Gyeongsang National University Hospital and adhered to the Declaration of Helsinki. Subjects with diagnosed or known strabismus (group 1) and subjects who received strabismus surgery (group 2) were selected for the study. Subjects in group 2 were presented with a straight or under 8 prism diopter (PD) esotropia or 10 PD exotropia on a prism cover

test. The socioeconomic status of subjects was assessed based on educational background, gross household income, and the presence of parents. Educational background was categorized as a high school diploma or current college students. Gross household monthly income was categorized as less than 3 million Korean won (KRW), 3 to 5 million KRW, or more than 5 million KRW. The presence of parents was classified as presence of both parents, single father, or single mother. The control group (group 3) consisted of selected subjects who had no strabismus and who matched the socioeconomic status of the other groups. A strabismus test was conducted with an alternate cover test and cover-uncover test. For those with strabismus, the angle of strabismus was quantified using the alternate prism cover test. Ocular disorders in the anterior segment of the eye, retina and optic nerve were detected with a slit lamp biomicroscopy. Subjects with other ocular disorders or surgery for these disorders were excluded from this study. Subjects with a psychiatric disorder were excluded using a psychiatric interview and psychotherapeutic counseling. We also excluded subjects who reported that they had been diagnosed with a psychiatric disease.

All subjects completed Korean self-identity questionnaires. The Korean self-identity scale is a standardized instrument used to measure self-identity and consists of six sub-sections assessing subjectivity, self-acceptance, future confidence, goal orientation, initiative, and familiarity. Each section consists of 10 questions (Table 1). Each item asks respondents to rate their response on a scale from 1 to 5 with 1-point intervals. A total sum of scores of all 10

Table 1. Subsections of the Korean self-identity scale

	Outline of questions	Question number
Subjectivity	Feeling of ability, that is, level of feeling of subjective role or ability to dominate actively and influence environment Do you know your continuity and who you are?	1,7,13,19,25,31,37,43,49,55
Self-acceptance	Do you accept your ability and talent as you are? Level of self-confidence and self-reliability	2,8,14,20,26,32,38,44,50,56
Future confidence	Do you have confidence on your plan for future occupation? Level of hope over elapsed time	3,9,15,21,27,33,39,45,51,57
Goal orientation	Do you understand future image of identity and trust your self-direction of goal orientation? Level of willingness to perform or achieve the given task	4,10,16,22,28,34,40,46,52,58
Initiative	Do you try to carry out surrounding work in a self-initiative manner? Level of recognition ability of self-role.	5,11,17,23,29,35,41,47,53,59
Familiarity	Do you have flexibility to maintain intimacy with others and maintain independent relationship?	6,12,18,24,30,36,42,48,54

items for each sub-section is calculated, with higher scores indicating stronger self-identity. This instrument has been widely used in studies related to self-identity [7-9].

The differences across the six sub-sections were statistically analyzed between subjects with strabismus (group 1) and no strabismus (group 3). The differences across the six sub-sections between subjects with corrected strabismus after surgery (group 2) and healthy controls (group 3) were analyzed using independent *t*-tests. In the cases of surgery, the correlations between age of surgery and the six sub-sections were investigated. For statistical analysis, SPSS ver. 21.0 (IBM Co., Armonk, NY, USA) was used. A *p*-value less than 0.05 indicates a statistically significant difference.

Results

A total of 354 subjects were enrolled in the study; 96 subjects were in group 1, 108 subjects were in group 2, and

147 subjects were in group 3. There were no statistical differences in educational background, gross household income, and the presence of parents (Table 2). Of the subjects with current strabismus, exotropia was the most common, found in 87 subjects, with the mean angle of strabismus of 23.3 ± 7.2 PD. A total of six subjects had esotropia with a mean of 15.2 ± 6.5 PD, and three subjects had hypertropia with 6.7 ± 3.1 PD. In group 2, the mean age of surgery was 8.3 ± 2.5 years.

Statistically significant differences were observed between groups 1 and 3 on mean scores for subjectivity, self-acceptance, initiative and, familiarity with scores of 37.0 ± 6.9 , 40.1 ± 7.3 , 40.1 ± 7.3 , and 35.1 ± 8.7 , respectively in group 1 and 40.3 ± 4.8 , 43.0 ± 4.2 , 37.9 ± 5.4 , and 38.7 ± 4.7 in group 3 (Table 3). Statistically significant differences were also observed on all sub-sections of the self-identity measure between groups 2 and 3 (Table 4). In group 2, correlations between age at surgery and initiative ($r = -0.333$, $p < 0.001$; Pearson's correlation test) and familiarity

Table 2. Demographics

	Group 1 (n = 96)	Group 2 (n = 108)	Group 3 (n = 147)	<i>p</i> -value
Education				0.615
High school graduated	9	12	24	
In university	87	96	123	
Income (Korean won)				0.955
<3 million	27	24	36	
3-5 million	21	24	39	
>5 million	48	60	72	
Parents				0.982
Father and mother	85	96	133	
Single father	4	5	6	
Single mother	7	7	8	

Statistical significance was tested using Fisher's exact test.

Table 3. Comparison of self-identity levels between group 1 and group 3

	Group 1	Group 3	<i>p</i> -value
Subjectivity	37.0 ± 6.9	40.3 ± 4.8	0.023*
Self-acceptance	40.1 ± 7.3	43.0 ± 4.2	0.045*
Future confidence	36.6 ± 8.3	39.0 ± 5.7	0.105
Goal orientation	33.9 ± 8.5	35.9 ± 6.1	0.214
Initiative	33.9 ± 8.4	37.9 ± 5.4	0.021*
Familiarity	35.1 ± 8.7	38.7 ± 4.7	0.038*

Values are presented as mean \pm standard deviation.

*Statistical significance was tested with independent *t*-tests.

Table 4. Comparison of self-identity levels between group 2 and group 3

	Group 2	Group 3	<i>p</i> -value
Subjectivity	39.0 ± 4.8	40.3 ± 4.8	0.219
Self-acceptance	41.3 ± 4.6	43.0 ± 4.2	0.072
Future confidence	37.3 ± 7.2	39.0 ± 5.7	0.219
Goal orientation	34.6 ± 8.5	35.9 ± 6.1	0.421
Initiative	36.8 ± 7.5	37.9 ± 5.4	0.466
Familiarity	38.1 ± 5.8	38.7 ± 4.7	0.568

Values are presented as mean ± standard deviation.

Statistical significance was tested by independent *t*-tests.

Table 5. Correlations between age at surgery and subsections on the Korean self-identity scale

	Value	Correlation coefficient	<i>p</i> -value
Subjectivity	39.0 ± 4.8	-0.083	0.391
Self-acceptance	41.3 ± 4.6	0.014	0.887
Future confidence	37.3 ± 7.2	-0.127	0.190
Goal orientation	34.6 ± 8.5	-0.154	0.112
Initiative	36.8 ± 7.5	-0.333	<0.001*
Familiarity	38.1 ± 5.8	-0.433	<0.001*

Values are presented as mean ± standard deviation.

*Statistical significance was tested by the Pearson's correlation test.

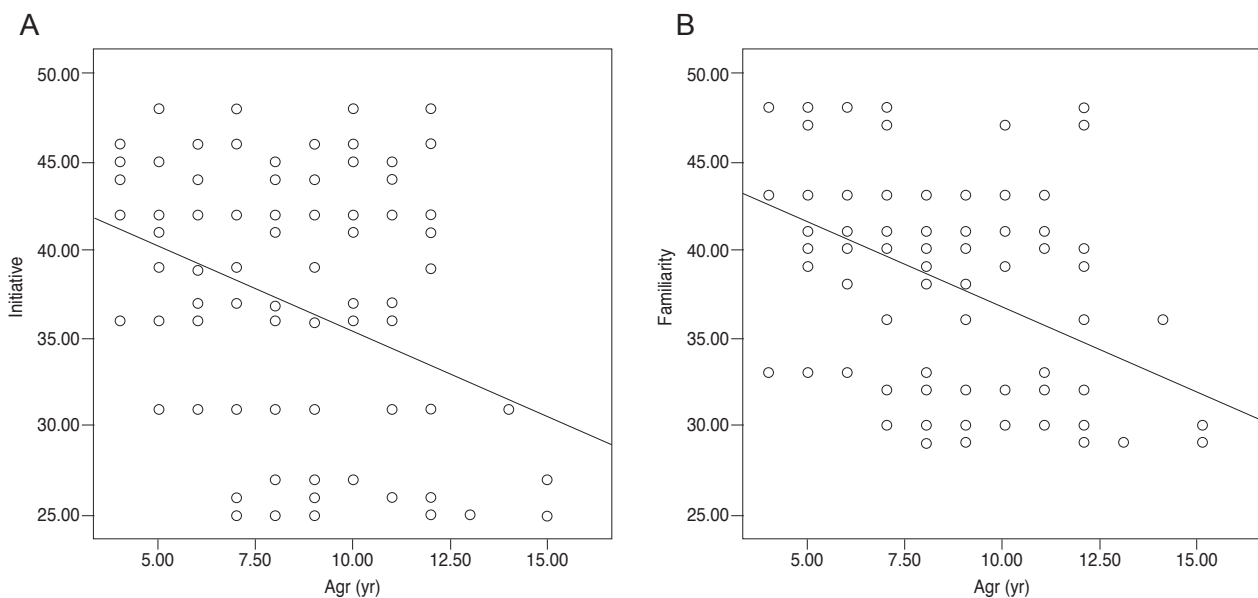


Fig. 1. (A) Scatterplot of the correlation between age at surgery and the scores of initiative subsection scores ($r = -0.333$, $p < 0.001$). (B) Scatterplot of the correlation between age at surgery and familiarity subsection scores ($r = -0.433$, $p < 0.001$).

($r = -0.433$, $p < 0.001$) were statistically significant (Table 5 and Fig. 1).

Discussion

The subjects for this study were at least the age of 19 years and were going to enter university or already in university. At this stage, the individual tries to belong to a society and fit in in terms of social roles and trends. In addition, young adults at this age tend to pay an excessive amount of attention to the body image seen by others [10]. Because this time in young adulthood is the beginning of a social life and the first for various experiences, the degree of self-identity formation is an important factor as a social member in interpersonal relationships. This study aimed to investigate differences in the degree of self-identity formation between those who had presence or absence of correction for strabismus.

According to Erik Erikson, who formulated self-identity theory, self-identity is a developmental task that must be achieved throughout the entire human lifespan. For the most part, this identity is achieved in adolescence. Self-identity formation in adolescence is important because individual self-identity depends on how one accepts and overcomes social change during adolescence. The self-identity formed during this age remains stable and relatively unchangeable.

Paysse et al. [2] investigated the behaviors exhibited toward three identical dolls altered to be orthotropic, esotropic, and exotropic in children between 3 and 7 years of age. They reported that a negative attitude toward strabismus appeared to emerge at approximately 6 years of age and that children aged approximately 6 years hesitated to play with the strabismic dolls. Additionally, Uretmen et al. [3] performed a study in which elementary school teachers rated their perceptions of students' personal characteristics based on their responses to students' photographs. Photographs were digitally altered to make students appear to be in a strabismic state. Students with esotropia and exotropia were rated more negatively than students with orthotropic eyes on happiness, intelligence, reliability, and activity. These negative perceptions result in an alteration of behavior patterns in strabismic patients. Up to 80% of strabismic patients are ashamed or feel humiliated in various social settings and 89% of strabismus patients have reported

problems with maintaining eye contact [11]. In addition, 75% of strabismus patients adopt certain postures or behaviors to conceal their eyes [12]. As the altered behavior patterns continue through the adult period, social anxiety and social avoidance significantly increase compared to a normal population [13]. Mohny et al. [14] reported that a mental health disorder was diagnosed in 41.7% of the patients with a history of childhood strabismus. Noticeable strabismus negatively influences major concerns in adulthood such as finding a partner and finding a job [15,16]. Therefore, strabismus has both a direct and indirect impact on individual personality formation from childhood to adulthood. Our results regarding correlations between age and self-identity levels shows that earlier surgery is associated with a high self-identity level. This result suggests that an awareness of strabismus can affect self-identity.

In this study, strabismus subjects reported lower self-identity than non-strabismic subjects. These results showed statistically significant differences on subjectivity, self-acceptance, initiative and familiarity. In particular, this reduction in self-identity on the initiative and familiarity subsections is consistent with a general reduction in self-esteem and difficulties in interpersonal relationship and activity as reported in other studies [12,17].

There were no differences in levels of self-identity between subjects with corrected strabismus after surgery and subjects without strabismus. Jackson et al. [13] reported that strabismus surgery offered significant relief of social avoidance and physical functions. Menon et al. [17] concluded that substantial improvement in self-confidence and interpersonal relationships were noticed in 95% of strabismus patients after corrective surgery. The difference in psychosocial status at 3 months post-surgery versus pre-surgery was quite substantial [18]. Although this study was not designed as a prospective study, we still found no differences in psychosocial status between subjects with corrected strabismus after surgery and subjects without strabismus.

Lower self-identity in strabismus patients is considered to be a result of poor interpersonal relationships due to others' recognizing their ocular misalignment. It is believed that self-identity is restored after surgery because such subjects no longer are concerned that their strabismus will be recognized and they realize they are no longer different from others and adapt to social culture.

In this study, there were several potential limitations to

our study. First, although we investigated the socioeconomic status of subjects, other situations, such as the relationship between subject and parents, religions, culture activities and existence of girl-friend, could have affected self-identity levels. Second, only male subjects were enrolled in this study.

In conclusion, the need for corrective surgery for strabismus at an earlier age is supported by the difference in levels of self-identity attributable to the existence of strabismus during the critical period to develop a self-identity.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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