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published in

Plastic and Reconstructive Surgery
2002

DOI (link to publisher)

[10.1097/00006534-200201000-00003](https://doi.org/10.1097/00006534-200201000-00003)

[Link to publication in VU Research Portal](#)

citation for published version (APA)

Simis, K. J., Hovius, S. E. R., De Beaufort, I. D., Verhulst, F. C., & Koot, H. M. (2002). After plastic surgery: Adolescent-reported appearance ratings and appearance-related burdens in patient and general population groups. *Plastic and Reconstructive Surgery*, 109(1), 9-17. <https://doi.org/10.1097/00006534-200201000-00003>

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After Plastic Surgery: Adolescent-Reported Appearance Ratings and Appearance-Related Burdens in Patient and General Population Groups

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The aim of this study was to determine the effects of appearance-related surgery on psychosocial functioning during adolescence. To this end, changes in bodily attitudes and appearance-related burdens in adolescents undergoing corrective (for aesthetic deformities) and reconstructive (for congenital or acquired deformities) surgery were compared with those in a general population sample.

A group of 184 adolescent plastic surgery patients (corrective, $n = 100$; reconstructive, $n = 84$), and a comparison group of 83 adolescents at random selected from three municipalities (corrective, $n = 67$; reconstructive, $n = 16$), aged 12 to 22 years, were studied at two time points with a 6-month interval. The plastic surgical patients were studied presurgically and postsurgically. Using fully structured telephone interviews and postal questionnaires, adolescents' ratings of their appearance, bodily satisfaction and attitudes, and appearance-related burdens were obtained.

All patients reported a significant decrease in burdens after surgery compared with the comparison group, indicating a much more prominent improvement in the patient sample compared with the developmental changes that may be expected to occur in adolescence. The corrective patient group reported least burdens after the operation. More specifically, the "breasts" group benefited most from the operation, indicating that breast corrections are rewarding interventions.

The findings of this study imply that adolescents can be regarded as good candidates for plastic surgery. They gain bodily satisfaction, and they are relieved of many appearance-related burdens. Physical, social, and psychological burdens related to appearance satisfaction improve con-

siderably in both corrective and reconstructive adolescent patients. (*Plast. Reconstr. Surg.* 109: 9, 2002.)

Appearance-enhancing plastic surgery on adolescents has become accepted; however, one may question its appropriateness. A minimal requirement should be that this kind of surgery benefits, or at least does not harm, the adolescent.¹ To determine if this minimal condition is satisfied, we must know if adolescents who undergo plastic surgery become more satisfied and less bothered by their appearance. We also need to know whether such changes exceed "natural changes" in bodily attitudes that are common in adolescence. This is an important issue, because the adolescent's body image is subject to enormous developmental change up to young adulthood.²

Several studies report improvement of bodily satisfaction and psychosocial functioning after various plastic surgical interventions for both children and adolescents.³⁻⁷ However, these studies are limited in three ways. First, they did not use comparison groups that were studied with the same time interval, which makes it uncertain whether reported improvement in

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From 1995 to 1997, the Adolescence Plastic Surgical Research Group consisted of the following plastic and ear/nose/throat surgeons: A. C. J. Ackermans-Swart, Capelle aan den IJssel, Spijkenisse; R. F. Cohen, Rotterdam; A. B. van Doorn, Dordrecht; D. B. van Egmond, Nieuwegein; A. de Greef, Rotterdam; C. M. A. M. van der Horst, Amsterdam; Dr. S. E. R. Hovius, Rotterdam; R. E. F. Huygen, Den Haag; C. M. van Leeuwen, Dordrecht; Dr. G. J. Nolst Trenité, Amsterdam; R. H. L. Paping, Schiedam; Dr. R. Schoorl, Amsterdam; J. E. Sluimers, Den Haag; T. F. J. M. C. Specken, Utrecht; F. P. Stook, Dordrecht; E. J. F. Timmenga, Delft; A. H. Trenning, Capelle aan den IJssel, Spijkenisse; J. M. Vaandrager, Rotterdam, Goes, Vlissingen; and S. J. M. Wijthoff, Delft.

satisfaction and functioning can be attributed to the intervention. Second, the studied groups were homogeneous regarding diagnostic features, which prohibits comparison of effect size across diagnostic groups that typically are operated on during adolescence. Third, no studies compared the results of interventions that were performed for corrective versus reconstructive reasons. Therefore, it is unknown whether effects of interventions depend on the reason for applying for plastic surgery. In this study, "reconstructive" interventions refer to reconstructions of congenital deformities, or deformities caused by disease or trauma. "Corrective" interventions refer to all other interventions with an aesthetic nature. Furthermore, studies often focus only on parts of the body image.

Body image is considered to be the most important construct to study when estimating effects of appearance changes. Sarwer et al. suggested the assessment of four central elements that contribute to the conceptional construct of body image when studying the effects of corrective (cosmetic) surgery: (1) the physical reality of appearance, (2) perceptions of appearance, (3) the importance of appearance, and (4) the degree of satisfaction with appearance.⁸

This study aims to determine whether changes in body image and well-being 6 months after surgery are larger than the natural changes occurring in adolescents from the general population. To this end, postsurgical changes in bodily satisfaction and appearance-related burdens in adolescents and young adults (henceforward, adolescents) undergoing plastic surgery were compared with changes reported by adolescents from the general population who were dissatisfied about an appearance deformity but who did not undergo surgery. These burdens can be defined as daily hassles, troubles, or problems that the adolescent experiences and relates to his or her appearance. We studied the participants' perception of improvement of their appearance in terms of severity and visibility of the deformity, the increase in appearance satisfaction, changes in bodily attitudes, and improvement in appearance-related burdens.

Corresponding with recent findings on adult patients undergoing corrective interventions⁹ and child and adolescent patients undergoing reconstructive operations,^{6,10,11} the adolescents in this study were expected to improve after

plastic surgery concerning appearance perception, bodily satisfaction, appearance-related burdens, and self-confidence. Although comparisons between corrective and reconstructive plastic surgery have never been made, patients undergoing corrective surgery may be expected to profit most, because attaining normal appearance through reconstructive plastic surgery is very difficult.

PATIENTS AND METHODS

Participants

Patient sample. From 1995 to 1997, 184 adolescents and young adults aged 12 to 22 years who were to undergo any elective appearance-correcting operation were recruited from 12 hospitals covering virtually the southwestern region of The Netherlands and four hospitals in the northwestern region. Exclusion criteria were cognitive and physical handicaps. Acquired deformities had to exist for at least 1 year. Of the 240 eligible patients, 184 (77 percent response rate: 71 percent girls, mean age 17.3, boys 16.2 years) and 172 of their parents (72 percent) agreed to participate.

Diagnostic features included breast deformities (hypertrophy or hypotrophy, and asymmetry), nose and lip deformities (sequelae of cleft surgery, hump noses), protruding and otherwise deformed ears, sequelae of craniofacial surgery, eye deformities, nevi, port wine stains, scars, contour defects, and benign tumors on body/extremities and face (Table I; for further details, see Simis et al.¹²). For further analyses, the diagnostic information was grouped according to the targeted deformity: breasts ($n = 62$; reconstructive, $n = 5$), ears ($n = 39$; reconstructive, $n = 7$), nose/lips (including clefts) ($n = 44$; reconstructive, $n = 38$), face (including eye, facial, and craniofacial deformities) ($n = 25$; reconstructive, $n = 22$), and body (containing all other deformities) ($n = 14$; reconstructive, $n = 12$). The distribution of diagnostic groups differed slightly across responders and nonresponders (responding/nonresponding: breasts, 34 percent/21 percent; ears, 21 percent/34 percent; nose/lip, 24 percent/13 percent; face, 14 percent/14 percent; and body, 8 percent/18 percent). Patients refusing participation did not differ across gender, age, and corrective/reconstructive distribution (see below) from those who participated.

Comparison group. The comparison group consisted of adolescents from the general pop-

TABLE I
Numbers of Corrective and Reconstructive Deformities

Type of Deformity	Patients		Comparison Group	
	Girls	Boys	Girls	Boys
Corrective				
Breast hypertrophy, hypoplasia	53	4	22	1
Nose and lip deformities	4	2	13	5
Protruding ears	19	13	6	3
Lipodystrophy	1		7	
"Other" (e.g., sequelae or acne vulgaris)	2	2	3	7
TOTAL	79	21	51	16
Reconstructive				
Scars	8	2	3	2
Benign tumors	11	3	3	1
Sequelae of craniofacial and cleft lip corrections	25	22		
Congenital ear deformities	2	5		
Congenital breast deformities (e.g., tubular breasts)	5		2	1
"Other" (e.g., alopecia areata)	1		1	3
TOTAL	52	32	9	7

ulation with a self-reported deformity who were not planning to undergo surgery. To compose this group, in 1996 a sample of 1579 adolescents aged 12 to 22 years was randomly selected from three municipalities from the general population of Zuid-Holland,¹³ using community registers. Twenty-three subjects (1.5 percent) were excluded from the sample because they were involved in plastic surgery ($n = 15$), because of a cognitive handicap ($n = 2$), or because of language problems ($n = 6$), and 347 subjects (22 percent) could not be reached by phone, leaving an eligible sample of 1209 subjects.¹⁴ Of these adolescents, 344 refused participation (29 percent), and 182 did not respond after initial consent and subsequent repeated reminders (15 percent). Data were collected from 684 adolescents (57 percent of the sample of 1209 subjects; 60 percent girls; mean age of girls, 16.7 years; mean age of boys, 16.5 years). Those who refused or did not respond after initial contact or consent were somewhat but significantly older

than those who participated (16.9 years versus 16.5 years), and were mostly boys (59 percent).

From this general population sample, a comparison group of 83 adolescents was selected, consisting of 60 girls (72 percent; mean age, 16.0 years) and 23 boys (mean age, 16.3 years). The selection was determined on the basis of an appearance-related questionnaire designed for the comparison group. If adolescents reported at least a slight deformity, which fell into the range of targeted deformities, they were included in the comparison group. This implies that all adolescents in the comparison group had a self-reported deformity (Table II). Those who were selected on the basis of completed questionnaires, but who refused the interview, did not differ from those who participated in the interview across gender, age, diagnostic features, and corrective/reconstructive distribution. The patient and comparison group did not differ regarding gender, age, educational level, or socioeconomic status.

TABLE II
Percentages of Adolescents Rating Their Appearance to Be Deformed and Visibly Deformed at T1 and T2^a

	<i>n</i>	Deformity (%)		Visibility (%)	
		T1	T2	T1	T2
Patient group	163	38.0	12.2**	88.8	50.3**
Comparison group	56	100	53.6**	95.5	50.0**
Diagnostic patient groups					
Breasts	58	32.5	6.8**	77.0	17.2**
Ears	32	45.9	9.4*	89.2	46.9**
Nose/lip	40	28.6	10.0**	97.6	85.0
Face	22	52.0	36.4	100	81.8*
Body	11	42.9	9.1*	92.9	45.5*

^a T1, time 1; T2, time 2. Wilcoxon signed-rank tests. Significant time differences are displayed in the T2 columns: * $p < 0.05$; ** $p < 0.001$.

Both patient and comparison groups were divided into a corrective group (patients, $n = 100$; comparison group, $n = 67$) and a reconstructive group (patients, $n = 84$; comparison group, $n = 16$) (Table III). The comparison group was too small to be divided into diagnostic subgroups. The corrective and reconstructive groups did not differ regarding age, educational level, or socioeconomic status, but gender differed: the corrective group contained more girls (patients, 79 percent; comparison group, 76 percent) than the reconstructive group (patients, 62 percent; comparison group, 56 percent).

Procedure

Approval for the research was obtained from the medical ethical committee of each participating hospital. At time 1 (T1), plastic surgeons provided patient information, by filling in a checklist. Patients, adolescents from the comparison group, and parents received standardized questionnaires on demographics, appearance, and psychological and social functioning, and were contacted for a structured telephone interview (patients within a month before the operation). Patient interviews were performed by the first author; comparison group interviews were performed by the first author and trained interviewers. Patients were contacted again 6 months after the operation, and adolescents in the comparison group 6 months after the first measurement [time 2 (T2)]. All adolescents and their parents received the same questionnaires and an appointment was made for the second telephone interview.

T2 response rates were 92 percent for the patients and 76 percent for the comparison group (Table III). Reasons for dropout were: moved without leaving address/phone number (patients/comparison group, 14 percent/15 percent), no response after sending question-

naires and telephone contact (7 percent/30 percent), objections to the questionnaires (4 percent/5 percent), lack of time (21 percent/15 percent) or motivation (29 percent/35 percent), moved abroad (one patient; 7 percent), and bad experiences with a hospital (one patient; 7 percent). The adolescents who dropped out at T2 did not differ from the remaining group regarding distribution of gender, age, educational level, or socioeconomic status. Because of varying response rates to the interviews and the questionnaires, respectively, sample sizes may vary slightly throughout the article.

Instruments

General information. Both parental and adolescent questionnaires provided data on occupational and educational level and on nationality. Surgeons completed a recruitment checklist about every patient to inform the researcher about personal and clinical patient data.

Severity and visibility ratings. Severity of the deformity was rated on a six-point self-rating scale, ranging from 1 = "more attractive than others" to 6 = "severely deformed." For analyses of proportions, these scores were dichotomized into "deformed," including "slightly deformed" through "severely deformed," and "not deformed," including "more attractive than others" through "not deformed." Visibility of the deformity was rated on a five-point scale, ranging from 1 = "invisible" to 5 = "immediately visible." For analyses of proportions, these scores were dichotomized into "invisible" and "visible," including "hardly visible" through "immediately visible."

Telephone interview. A fully structured telephone interview with the adolescent was developed for this study, providing information on appearance, appearance-related burdens, and expectations of the operation. All questions were read to the respondent.

Bodily satisfaction. The Body Cathexis Scale^{15,16} was used to measure dissatisfaction or satisfaction with one's body. This scale contains 53 five-point Likert items (1 = "very dissatisfied," 5 = "very satisfied") to indicate satisfaction on most body parts and bodily functions. Exploratory factor analysis with VARIMAX rotation on the scores from the combined patient and general population samples ($n = 809$) produced five factors that were labeled as follows: "facial features" (19 items, $\alpha = 0.91$), "figure"

TABLE III
Counts of Corrective and Reconstructive Surgical and Comparison Groups at T1 and T2*

Group	T1	T2	Response (%)
Corrective			
Surgery	100	90	90
Comparison	67	50	75
Reconstructive			
Surgery	84	79	94
Comparison	16	13	81

* T1, time 1; T2, time 2.

(10 items, $\alpha = 0.93$), "torso" (seven items, $\alpha = 0.84$), "bodily functions" (10 items, $\alpha = 0.83$), and "extremities" (five items, $\alpha = 0.75$). Scales were constructed from the items included in the factors, with higher scores indicating more satisfaction. To determine postsurgical changes in satisfaction specifically about the body parts considered deformed, deformity cluster scores were calculated concerning Body Cathexis Scale items of the deformity to be operated on, or reported to be deformed in the comparison group. Item scores relating to these identified deformities were summed. Items included breast, nipples, and breasts for the "breasts" group; ears for the "ears" group; nose, lips and mouth, and teeth for the "nose/lip" group; chin, form of head, eyes, forehead, face, and back of the head for the "face" group; and waist, skin, belly, navel, and rump for the "body" group.

Bodily attitudes were measured with the Bodily Attitudes Scale,¹⁷ including three scales regarding "appraisal," "projection," and "attribution." Because the original scales were derived from small samples of adults, we analyzed the data from our combined patient and general population samples ($n = 716$) to develop age-appropriate scales. Exploratory factor analysis with VARIMAX rotation yielded an "appraisal" factor (22 items, $\alpha = 0.94$), an "attribution" factor (13 items, $\alpha = 0.88$), and a "physical contact" factor (7 items, $\alpha = 0.77$). Scales were constructed from the items included in the factors, with high scores indicating positive bodily attitudes.

Eight appearance-related burdens were asked for in the telephone interview. Respondents were asked to what extent they experienced burdens on the items "sports," "joining clubs," "leisure time," "making friends," "romantic relationships," "mood," "self-confidence," and "future plans" such as building a career or finding a mate. The items were rated by the adolescents on a three-point scale ranging from 0 = "not at all a burden" to 2 = "very much or often a burden."

Statistical Methods

Repeated measures multivariate analyses of variance, with patient/comparison group and gender as factors, and age as covariate to adjust for age differences in these groups, were used to analyze group-wise T1 to T2 changes in mean appearance ratings, the Body Cathexis Scale scores, and the Bodily Attitudes Scale

scores. Significant time by group interactions indicate group differences in mean change over time. Differences between diagnostic groups were only studied within the patient group, because numbers of subjects were too small to test differences in the comparison group. Time differences in deformity cluster scores and sum scores of the remaining items were compared by means of repeated measures analyses of variance in both patient and comparison groups. When comparing diagnostic groups and corrective/reconstructive groups, only patient/comparison and corrective/reconstructive groups were used as a factor, with gender and age as a covariate. Post hoc tests, to test differences within multivariate interaction effects, were performed using paired *t* tests, and one-way analyses of variance. Because the covariates age and gender did not have appreciable effects (only one significant time by age interaction effect was found), and slope coefficients were not significantly influenced by covariates, actual means (i.e., not adjusted for effects of covariates) are displayed in the tables. Wilcoxon signed rank tests were applied to analyze univariate changes in proportions of reported appearance ratings and appearance-related burdens.

RESULTS

Intervention Effects

Across patient and comparison groups, adolescent-reported severity (T1: mean = 2.81, SD = 1.01; T2: mean = 2.29, SD = 0.71; $p = 0.04$) and visibility ratings of the deformity (T1: mean = 3.17, SD = 1.29; T2: mean = 2.04, SD = 1.29; $p = 0.008$) decreased significantly over time, as indicated by the significant main effect of the factor "time" (T in Table IV). However, as indicated by the significant interaction effect $T \times G$ (Table IV) and the differences in means, visibility ratings of the deformity showed a stronger mean decrease across time for the patients than for the comparison group, most notably the patients in the corrective reconstruction group (CR) ($T \times CR$ interaction effect).

Mean Body Cathexis Scale and Bodily Attitudes Scale scores did not differ across patient and comparison groups or change over time. However, the patient and comparison corrective groups became more satisfied at T2 on the "figure" domain ($T \times G \times CR$ effect), whereas the reconstructive group's satisfaction remained

TABLE IV
Average Appearance Ratings and BCS and BAS Scores at T1 and T2^a

Effect ^b		Post Hoc ^c			Patients					
		T1	T2	T1-T2 ^d	Total		Corrective		Reconstructive	
					T1	T2	T1	T2	T1	T2
Ratings					(n = 163)		(n = 88)		(n = 75)	
Deformity	T*	-	-	-	2.63 ± 1.02	2.14 ± 0.54	2.63 ± 1.00	2.73 ± 0.96	2.63 ± 1.06	2.25 ± 0.74
Visibility	T**, T × G**, T × CR**	-	1 < 2, 3, 4; 3 < 4	1-3 ↓	3.22 ± 1.36	1.98 ± 1.24	3.11 ± 1.41	1.49 ± 0.86	3.35 ± 1.30	2.56 ± 1.37
BCS scores					(n = 135)		(n = 71)		(n = 64)	
Figure	T × G*, T × G × CR*	1 < 2; 2 > 3, 4	2 > 3	1 ↑	3.54 ± 0.90	3.62 ± 0.78	3.21 ± 0.94	3.45 ± 0.88	3.90 ± 0.70	3.80 ± 0.62
Face	T × G*	1, 2 > 3	-	3 ↑	4.01 ± 0.52	3.98 ± 0.53	3.98 ± 0.51	3.98 ± 0.56	4.04 ± 0.54	3.98 ± 0.50
Health	-	-	-	-	3.88 ± 0.55	3.90 ± 0.61	3.73 ± 0.56	3.81 ± 0.67	4.06 ± 0.49	4.00 ± 0.53
Torso	T × G*, T × CR**	1 < 2; 2 > 3	1, 2 > 3	1 ↑	3.65 ± 0.75	3.94 ± 0.57	3.35 ± 0.77	3.93 ± 0.62	3.78 ± 0.59	3.94 ± 0.51
Extremities	T × G*, T × CR*	1, 2 > 3	-	-	3.99 ± 0.61	3.87 ± 0.60	3.87 ± 0.54	3.77 ± 0.60	4.12 ± 0.65	3.98 ± 0.59
BAS scores					(n = 136)		(n = 72)		(n = 64)	
Appraisal	T × A*, T × CR*	1 < 2; 2 > 3	1, 2 > 3	1,3 ↑	3.69 ± 0.75	3.98 ± 0.63	3.44 ± 0.78	3.89 ± 0.72	3.97 ± 0.60	4.09 ± 0.50
Attribution	-	-	-	-	4.34 ± 0.57	4.48 ± 0.47	4.34 ± 0.58	4.54 ± 0.44	4.33 ± 0.57	4.41 ± 0.51
Touch	-	-	-	-	3.43 ± 0.57	3.64 ± 0.58	3.50 ± 0.53	3.69 ± 0.55	3.36 ± 0.60	3.58 ± 0.62

^a BCS, Body Cachexis Scale; BAS, Bodily Attributes Scale; T1, time 1; T2, time 2; ANOVA, analyses of variance; MANOVA, multivariate ANOVA.

^b Effects of repeated measures MANOVAs: T, time; G, patient/comparison group; CR, corrective/reconstructive group; A, age; * $p < 0.05$; ** $p < 0.01$. A single T indicates a significant main effect of time; all other effects (e.g., T × G) indicate significant interaction effects (e.g., Huck, S.W. *Reading Statistics and Research*, 3rd Ed. New York: Longman, 2000).

^c Post hoc one-way ANOVAs and paired *t* tests of significant interaction effects ($p < 0.01$): 1 = patients, corrective group; 2 = patients, reconstructive group; 3 = comparison group, corrective group; 4 = comparison group, reconstructive group.

^d Subgroups 1-4 showing significant T1-T2 difference ($p < 0.01$); ↑, increase; ↓, decrease.

Deformity ratings range from 1 (more attractive than others) to 6 (severely deformed); visibility ratings range from 1 (invisible) to 5 (immediately visible); BCS and BAS scores range from 1 (very dissatisfied) to 5 (very satisfied). Values are expressed as mean ± SD.

unchanged. On the “face” domain, only adolescents in the comparison group gained satisfaction (T × G effect). Only corrective patients gained more satisfaction than all other groups on “torso” at T2 (T × CR effect). Patients became less satisfied after the operation, whereas the comparison group remained equally satisfied on the domain “extremities” (T × G effect), most notably the “corrective” subjects in the comparison group (T × CR effect).

A time by age interaction effect (T × A effect) indicated a more positive appraisal over time with increasing age (from age 18 and up) across both patient and comparison groups. All corrective groups seemed to gain a more positive appraisal at T2 than the reconstructive groups (T × CR effect). Across patient and comparison groups, significantly fewer adolescents reported their appearance to be deformed and the deformity to be visible at T2 than at T1 (Table II).

Appearance-related burdens showed a significant drop from T1 to T2 for patients on all domains, but for the comparison group only on “sports” and “joining clubs.” A significant decrease in burdens was reported on all domains by the corrective patients, whereas reconstructive patients showed only a decrease in burdens on “sports,” “making friends,” and mood.” The corrective comparison group reported a significant decrease in burdens only on “sports” and “mood,” and the reconstructive

comparison group on “joining clubs” (Table V).

Differences between Diagnostic Groups

Proportions of reported appearance deformity and visibility ratings decreased significantly over time for all diagnostic groups, except for the “face” (on severity) and the “nose” groups (on visibility) (Table II). When analyzing Body Cathexis Scale scores for deformity clusters (mean clustered scores of items, related to the deformity to be operated on, or reported to be deformed in the comparison group), a significant time by patient/comparison group interaction effect indicated that bodily satisfaction increased (from “dissatisfied” to “satisfied”) only for the patient “breasts” group (Table VI). Mean scores for all rest items remained unchanged over time across all (patient and comparison) groups.

DISCUSSION

The aim of this study was to explore the question of whether adolescents undergoing plastic surgery for a broad range of deformities benefit from plastic surgery. All patients reported a significant decrease in burdens after surgery compared with a comparison group composed of adolescents from a general population sample who reported an appearance deformity, indicating a much more prominent improvement in the patient sample compared with the developmental changes that were ex-

TABLE IV
(continued)

Comparison Group					
Total		Corrective		Reconstructive	
T1	T2	T1	T2	T1	T2
(n = 50)		(n = 40)		(n = 10)	
3.42 ± 0.67	2.78 ± 0.95	3.45 ± 0.71	2.73 ± 0.96	3.30 ± 0.48	3.00 ± 0.94
3.00 ± 1.00	2.26 ± 1.45	2.95 ± 1.01	2.05 ± 1.33	3.22 ± 0.97	3.11 ± 1.69
(n = 55)		(n = 44)		(n = 11)	
3.01 ± 0.94	3.22 ± 0.98	2.97 ± 0.96	3.17 ± 1.00	3.15 ± 0.87	3.43 ± 0.92
3.63 ± 0.52	3.78 ± 0.44	3.57 ± 0.50	3.73 ± 0.42	3.87 ± 0.56	3.98 ± 0.42
3.51 ± 0.68	3.62 ± 0.58	3.44 ± 0.65	3.57 ± 0.58	3.79 ± 0.78	3.84 ± 0.56
3.48 ± 0.62	3.53 ± 0.70	3.39 ± 0.56	3.49 ± 0.73	3.82 ± 0.72	3.69 ± 0.58
3.69 ± 0.60	3.80 ± 0.49	3.60 ± 0.58	3.78 ± 0.49	4.04 ± 0.53	3.86 ± 0.53
(n = 54)		(n = 43)		(n = 11)	
3.28 ± 0.80	3.42 ± 0.92	3.21 ± 0.80	3.39 ± 0.91	3.55 ± 0.78	3.56 ± 0.97
4.10 ± 0.60	4.17 ± 0.67	4.07 ± 0.62	4.15 ± 0.72	4.22 ± 0.53	4.28 ± 0.42
3.24 ± 0.48	3.36 ± 0.49	3.22 ± 0.49	3.41 ± 0.49	3.34 ± 0.44	3.14 ± 0.45

pected in adolescents in general. This improvement was largest for the corrective patient group. More specifically, the “breasts” group benefited most from the operation, indicating that breast corrections are rewarding interventions. Corrective patients became more satisfied on the domain “torso” (containing items such as “breast,” “breasts,” and “nipples”), and patients undergoing corrective breast operations became most satisfied of all patients afterward. This confirms the existing literature about positive changes in patients undergoing breast corrections.^{18,19}

Yet, the fact that *across* patient and comparison groups, the corrective group gained more satisfaction about their figure and a more positive appraisal of their body at T2 than the reconstructive group raises the question of to what extent the increase in satisfaction in the corrective group can be attributed to natural change. This is further suggested by the fact that *across* patient and comparison groups, body appraisal increased over time with increasing age, suggesting a “natural” increase,

raising the question of whether adolescents would not also improve in time, without surgery. In our study, this was not the case. The corrective group consisted largely of female patients undergoing corrective breast operations (Table I). The patients in the “breasts” group were significantly older (18.5 years) than those in all other diagnostic groups (ages ranging from 15.3 to 16.7 years). Therefore, the improved bodily appraisal was mainly accounted for by the girls undergoing corrective breast surgery. Multivariate analyses of variance showed no other age effects in this study.

We did not find the expected positive changes concerning appearance ratings, satisfaction, and appearance-related burdens for adolescent cleft lip and craniofacial patients, as reported by others.^{3,4,6,7,20} Because patients can be considered to have a realistic view on their appearance,¹² and because most facial and nose/lip interventions were reconstructive (Table I), this may indicate that these adolescents, who underwent primary surgery during infancy and early childhood, managed to gain, and maintained, a relatively high level of satisfaction, whereas their appearance remained relatively unchanged after the operation. This confirms findings from previous studies on craniofacial and cleft lip patients who seemed to be psychologically well adjusted and satisfied about their appearance before surgical intervention.^{11,21,22}

It must be noted that patient appearance ratings could not be compared with those in the comparison group, because comparison group adolescents were selected for a self-reported appearance deformity at T1. For the same reason, we could not compare adolescents’ and their parents’ appearance ratings in the comparison group, whereas adolescent, pa-

TABLE V
Percentages of Adolescents Reporting Burdens across Groups and Time^a

Domain	Patients (%)						Comparison Group (%)					
	Total (n = 164)		Corrective (n = 89)		Reconstructive (n = 75)		Total (n = 55)		Corrective (n = 44)		Reconstructive (n = 11)	
			T1	T2	T1	T2			T1	T2	T1	T2
Sports	47.9	12.3**	65.2	12.4**	27.0	12.2*	45.5	29.1*	45.5	29.5*	45.5	27.3
Joining clubs	18.3	6.1**	20.2	2.2**	16.0	10.7	20.0	5.5*	15.9	6.8	36.4	0.0*
Leisure time	23.8	4.9**	34.8	5.6**	10.7	4.0	12.7	7.3	13.6	6.8	9.1	9.1
Making friends	25.6	11.6**	23.6	7.9*	28.0	16.0*	29.1	23.6	29.5	20.5	27.3	36.4
Romantic relationships	36.5	25.2**	35.2	21.6*	38.0	29.6	47.3	40.0	47.7	38.6	45.5	45.5
Mood	55.5	27.4**	67.4	27.0**	41.3	28.0*	54.5	43.6	61.4	43.2*	27.3	45.5
Self-confidence	55.8	39.3**	64.8	34.1**	45.3	45.3	65.5	61.8	65.9	65.9	63.6	45.5
Future	26.4	16.0*	23.6	10.1*	29.7	23.0	16.4	12.7	15.9	13.6	18.2	9.1

^a T1, time 1; T2, time 2. Wilcoxon signed rank tests. Significant time differences are displayed in the T2 columns: * $p < 0.05$; ** $p < 0.001$.

TABLE VI
Deformity Cluster Scores on the BCS by Diagnostic Groups across Time and Groups*

	Patients			Comparison Group			T × G Interaction Effects
	<i>n</i>	T1	T2	<i>n</i>	T1	T2	<i>p</i>
Breasts	48	2.19 ± 0.80	3.80 ± 0.88	15	2.91 ± 0.50	2.84 ± 0.89	<0.001
Ears	27	2.04 ± 1.34	3.93 ± 1.17	7	1.14 ± 0.38	1.86 ± 0.69	0.102
Nose/lip	35	3.26 ± 1.06	3.66 ± 0.86	14	3.24 ± 0.76	3.49 ± 0.83	0.35
Face	15	3.88 ± 0.58	3.72 ± 0.73	10	3.58 ± 0.67	3.52 ± 0.48	0.88
Body	10	3.30 ± 0.66	3.68 ± 0.85	10	3.08 ± 0.79	3.36 ± 0.79	0.59

* T, time; G, group; BCS, Body Cachexis Scale; ANOVA, analyses of variance.

BCS scores may range from 1–5, with higher scores indication of more satisfaction. Repeated measures ANOVAs. The significant interaction effect indicates a significant increase in satisfaction on the “breasts” cluster score across time only for the patient group. Values are expressed as mean ± SD.

rental, and surgeons' appearance ratings could be compared in a previous study on the same patient sample.¹² Comparison of appearance ratings was not possible for adolescents in the general population. On the basis of the comparisons in the patient group, we concluded that these adolescents have a realistic view of their appearance.¹² However, it is uncertain whether this conclusion can be generalized to adolescents from the general population who do not apply for plastic surgery. Another limitation of this study is that some diagnostic clusters in the comparison group contained too few subjects to test differences between patients' and comparison adolescents' diagnostic groups. Furthermore, this presurgical/postsurgical study design was limited because it was not a randomized effect study, so that differences in satisfaction and burdens across time between the research groups should be interpreted with caution.

From a clinical point of view, the findings of this study imply that adolescents seem to be good candidates for plastic surgery. Nevertheless, some adolescents profit from surgery more than others (e.g., those undergoing breast corrections versus facial reconstructions). Adolescents undergoing corrective operations seem to benefit most. There seems to be a trend, however, for increasing body appraisal with age. However, this increase can be largely explained by the high age of girls undergoing breast corrections. Furthermore, adolescents at all ages benefit from corrective surgery. This justifies corrective operations in this age group. The lack of an obvious amelioration of satisfaction and appearance-related burdens in the reconstructive groups can well be explained by (1) the subtle improvement of the deformity, as major surgery had already been performed at a much earlier age; and (2) the high level of satisfaction and well-being

these adolescents had secured long before surgery, which they maintained after surgery. In most cases, adolescents gain bodily satisfaction, and they are relieved of many appearance-related burdens. Physical, social, and psychological burdens related to appearance satisfaction improve considerably in both corrective and reconstructive patients.

This research studied the core components of body image as described by Sarwer et al.⁸ We reported on the physical reality of appearance in an earlier article, comparing the intersubjective ratings of adolescents, parents, and plastic surgeons.¹² We assessed perceptions of appearance by using the Bodily Attitudes Scale, which contains questions about how adolescents judge their appearance to be viewed by others. The importance of appearance can be expressed as the individual's appearance-related self-confidence as assessed by one question in the telephone interview. Another important component of body image measured in this study is the degree of satisfaction of appearance. As all components described above showed improvement in the patient group after surgery, we may conclude that the adolescents' whole body image improved after surgery. The conceptual construct of body image proves to be extremely useful in designing studies about body image and bodily change.

From a medical ethical viewpoint, there is considerable reason to assume that adolescent patients benefit from corrective interventions. Nevertheless, we may question why adolescents are dissatisfied and experience appearance-related burdens in the first place. How autonomous are they to decide an intervention to ameliorate their appearance? From previous studies on the same patients, it seemed that they had a realistic view on their appearance. In this study, those who were dissatisfied and experienced problems before surgery seemed

to improve after surgery, indicating that they made a right choice to undergo surgery. However, is surgery the "right" way to teach adolescents to cope with daily hassles they experience? This question deserves further exploration in the future.

In summary, this study showed that adolescents benefit from plastic surgery, that this improvement is not accounted for by "natural" development, and that improvement is stronger in those undergoing corrective surgery. Further study on the patients' psychological and social functioning may answer the question *why* adolescents opt for plastic surgery and which psychological factors (such as self-esteem, personality, and social support) are related to the psychological outcome of the surgery (emotional and behavioral problems, bodily satisfaction, and attitudes).

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ACKNOWLEDGMENT

This study was supported by the Sophia Scientific Foundation grant 181.

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