

## CHAPTER NINE

### **THE SUBJECT SAMPLE GROUP**

The subject group surveyed in this thesis comprised 321 schoolchildren from the New England Health Region of New South Wales.

The New England Health Region was judged to be a suitable area in which to conduct this study for a number of reasons.

Firstly, it is a health region serviced by the State Orthodontic Service of New South Wales, therefore the subjects surveyed and the results thereby obtained were seen as appropriate and relevant to the aim of this thesis.

Secondly, a DMFT and enamel fluorosis survey of schoolchildren in the New England was already planned by New England dental personnel, and it was a straightforward matter to accompany this pre-organised survey team.

Thirdly, the survey involved assessment of children from both small country towns and rural cities, a factor which enabled a randomly assembled, broadly based and representative subject sample group to be surveyed.

#### Geography of New England

The New England Health Area is situated in the northern part of New South Wales, and covers an area of 108, 616 sq. km. with a population of 252,000, approximately 20% of whom are Health Care Card holders or their dependents (Department of Community Services, Tamworth 1990) . Tamworth is located some 450 km north of Sydney, and is the administrative centre for the New England Health Region.

## MAP OF NEW SOUTH WALES

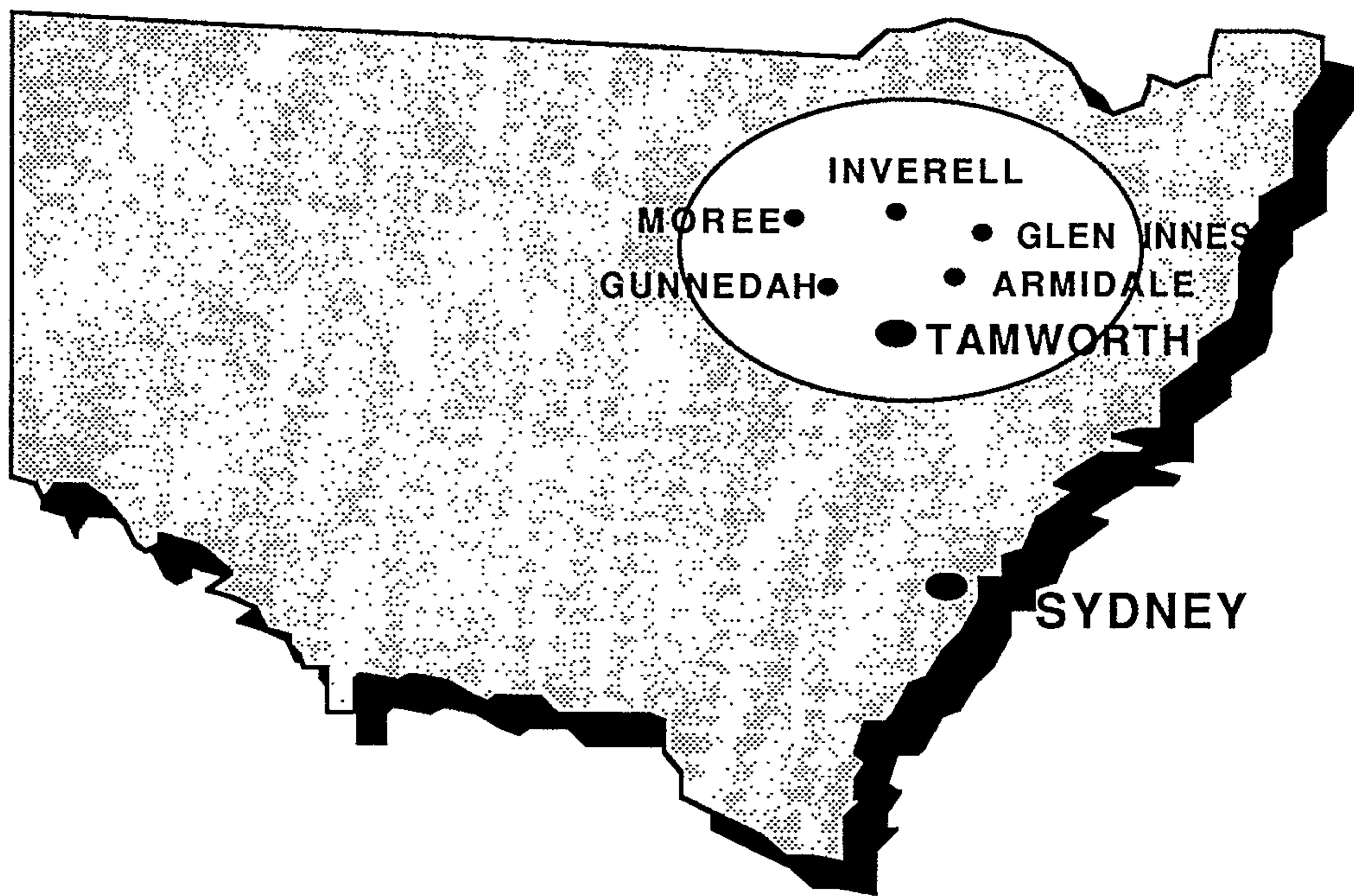


Figure 9.1 Map indicating survey area.

This New South Wales map displays the area within which the survey subject group reside. The bulk of the patients surveyed were from Moree (population 10,000) and Tamworth (population 32,000), with fairly equal numbers of patients surveyed from each of these two main centres. Subjects from the small country towns of Boggabilla, Toomalleh, and Mungindi, which were also surveyed, are all located within 100 km of Moree.

### Age Group of Subjects

The subject age group of 10 to 12 years was targeted for survey as the bulk of the patients referred to the Tamworth State Orthodontic Clinic for consultation are from this age group. Therefore, the subject group can be

seen as appropriate to the thesis aim of testing an orthodontic screening method relevant to the patients being treated at the Tamworth State Orthodontic Clinic.

Age Breakdown

As is evident from the following table and pie graph, approximately 50% of the subjects surveyed were aged 11 years of age at the time of the Survey, with approximately 30% of the subject group aged 12 years, and 15% aged 10 years at the time of the survey.

**AGE BREAKDOWN**

<b>AGE</b>	10	11	12
<b>COUNT</b>	50	176	95
<b>PERCENT</b>	15.6	54.8	29.6

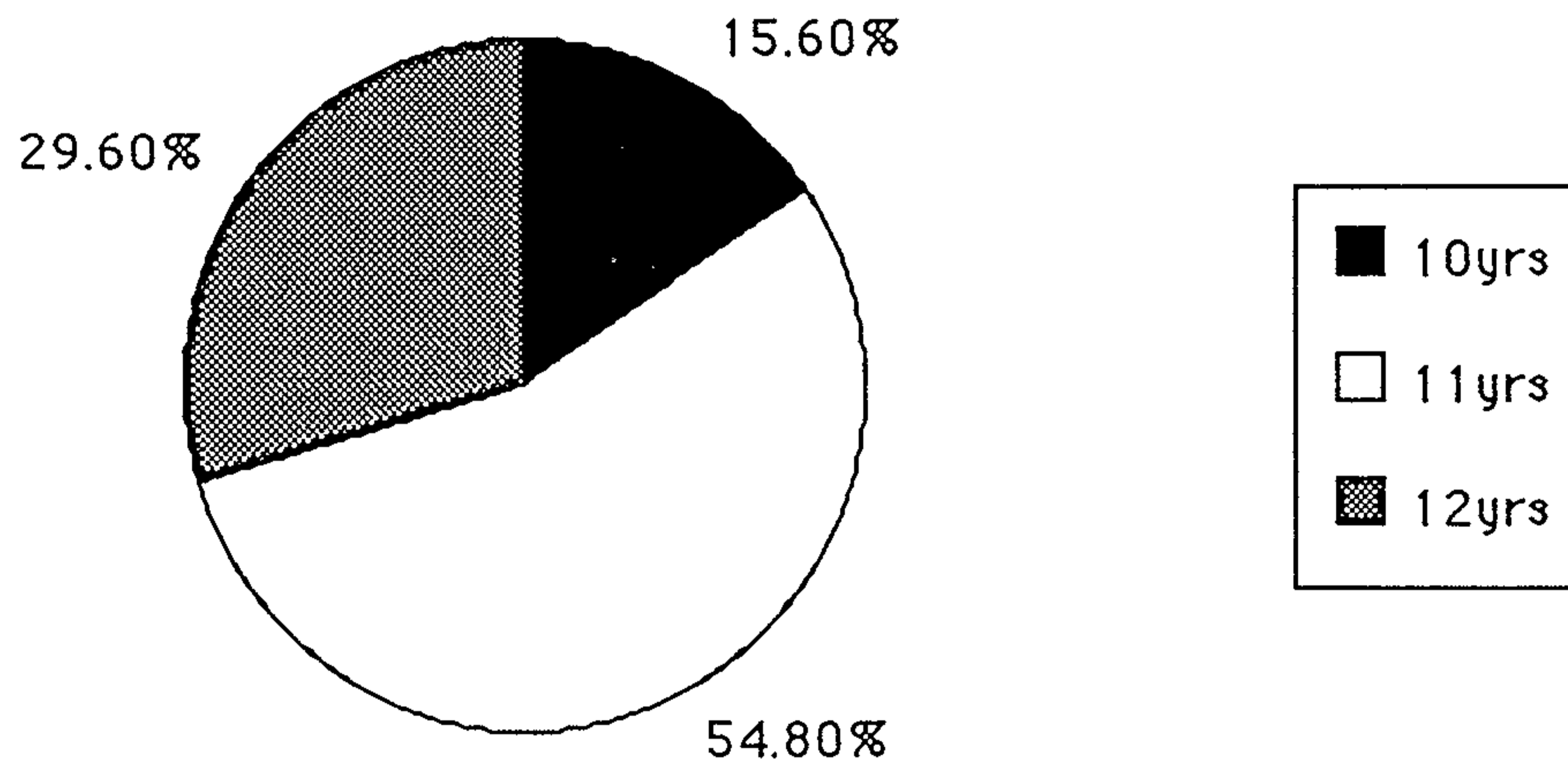


Figure 9.2 Age breakdown of sample group.

Sex Breakdown of The Sample Group.

The survey group of 321 subjects consisted of an almost equal sex distribution, with 159 male and 162 female subjects, with each age group having fairly equal sex distribution.

**SEX BREAKDOWN OF SAMPLE GROUP**

<b>MALE</b>	<b>162</b>
<b>FEMALE</b>	<b>159</b>

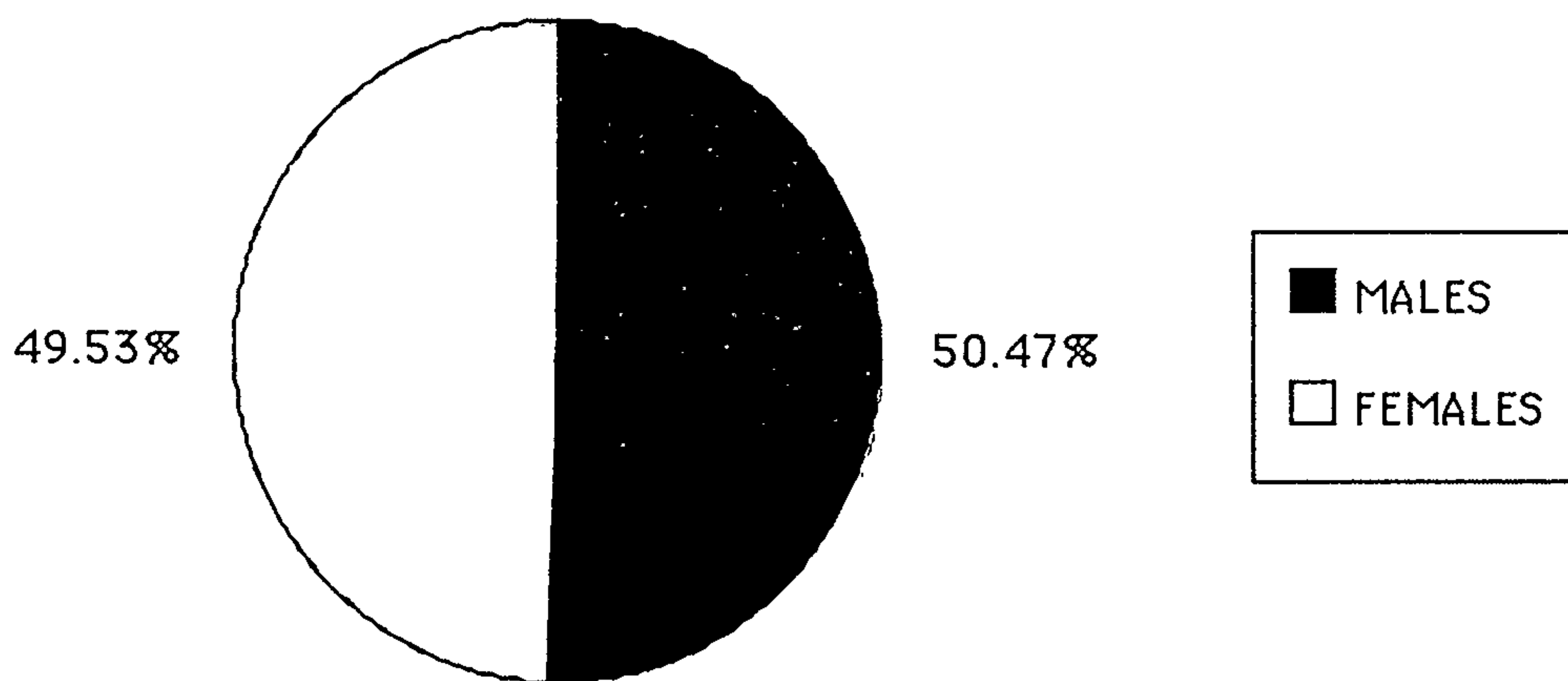


Figure 9.3 Sex breakdown of sample group.

### Race Breakdown of The Sample Group

For statistical purposes the subject survey group was divided into Aboriginal and non-Aboriginal groups as judged subjectively by the two examiners, with any subject obviously part-Aboriginal being placed in the Aboriginal group. The non-Aboriginal group seemed subjectively to consist almost entirely of Australian caucasian background, with a very small number of subjects of Asian origin.

#### **RACE BREAKDOWN OF SAMPLE GROUP**

<b>NON-ABORIGINAL</b>	<b>304</b>
<b>ABORIGINAL</b>	<b>17</b>

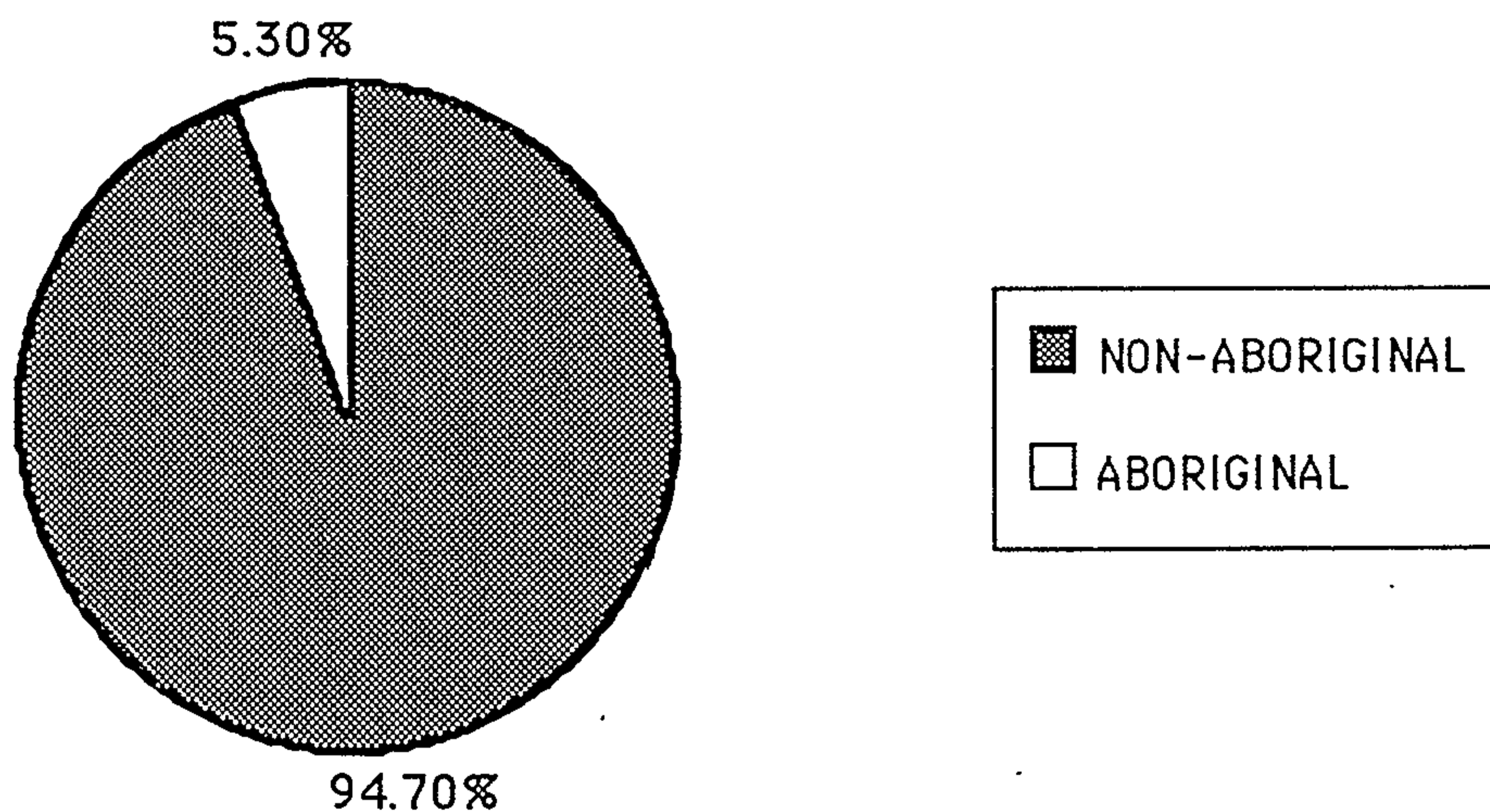


Figure 9.4 Racial breakdown of sample group.

#### Summary.

The subject sample group of 321 children was a broadly based sample group representative of the orthodontic patients seen for consultation by the Tamworth Clinic of the State Orthodontic Clinic.

## CHAPTER TEN

### **RESULTS**

The Results Chapter of this thesis is divided into three sections:

Section 1. Results of the Dental Aesthetic Index assessments.

Section 2. Results of the questionnaires.

Section 3. Comparison of the results obtained from the Dental Aesthetic Index assessment and the questionnaire results.

#### Section 1

#### RESULTS OF THE DENTAL AESTHETIC INDEX ASSESSMENTS.

Missing incisor, canine, or premolar:

<b>Missing Tooth</b>					
Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.1	.44	.024	.19	440	321
Minimum:	Maximum:	Range:	Median:	Mode:	
0	4	4	0	0	

Table 10.1 Breakdown of DAI scores of missing teeth.

Of the 321 sample group, 5% (15 subjects) were recorded as having a missing incisor, canine, or premolar. The two examiners recalled that these were generally second premolar teeth.

Segments crowded:

Segments Crowded					
Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1.3	.82	0.046	0.67	63	321
Minimum:	Maximum:	Range:	Median:	Mode:	
0	2	2	1	2	

Table 10.2 Breakdown of DAI scores of segments crowded.

Of the subject group of 321, the assessment of crowded segments gave a mean value of 1.3 with a standard deviation of 0.82. Only 22% of subjects were assessed as having no crowding in the incisal segments, with 31% having crowding in one segment and 48% having crowding in two segments.

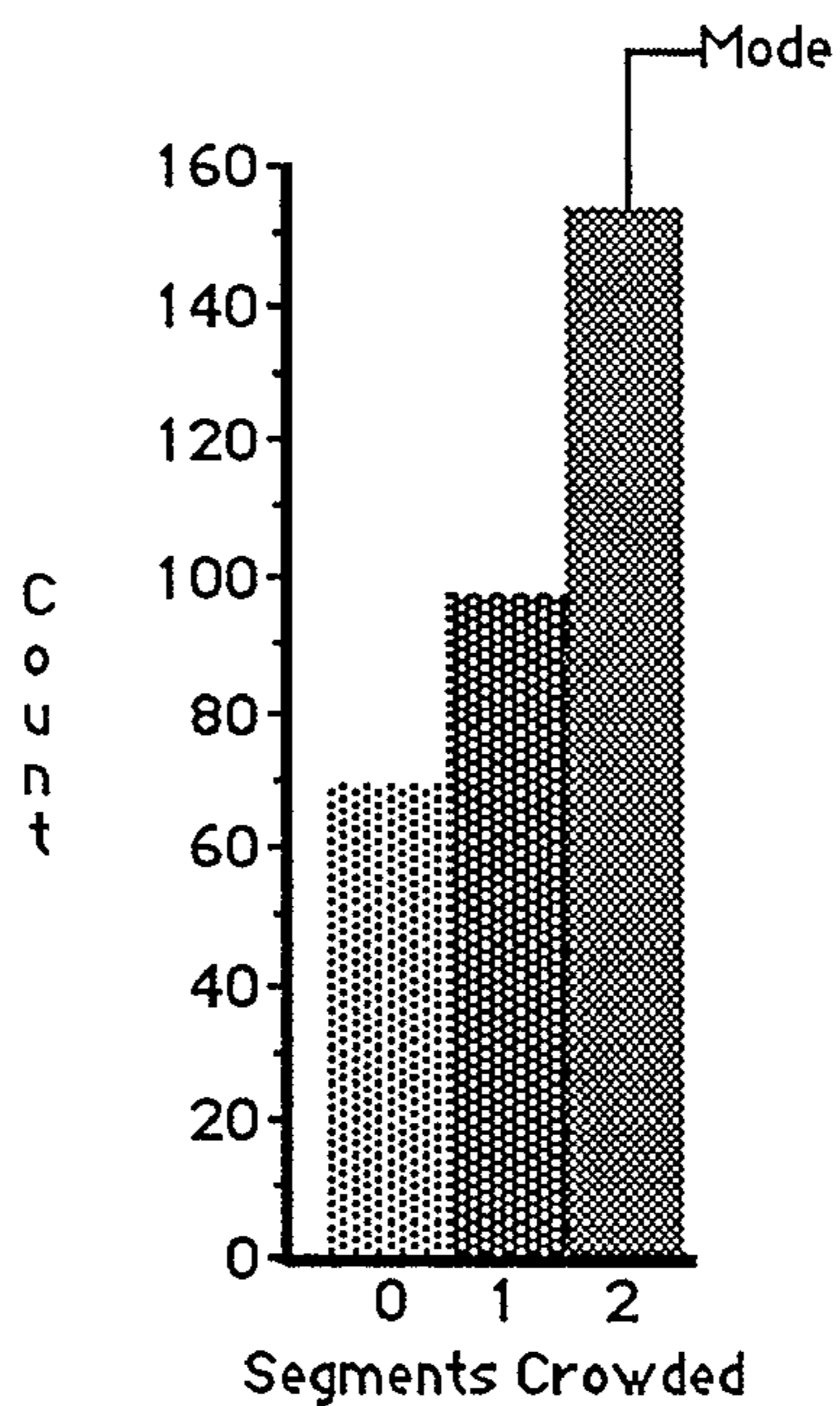


Figure 10.1 Bar chart of number of subjects with segments crowded.

Segments spaced:

Segments Spaced					
Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.3	.51	.04	.26	170	321
Minimum:	Maximum:	Range:	Median:	Mode:	
0	2	2	0	0	

Table 10.3 Breakdown of DAI scores of segments spaced.

As shown in Table 10.4, the median score obtained in assessment of segments spaced was 0, with a range allowable with the DAI assessment of 0 to 2.

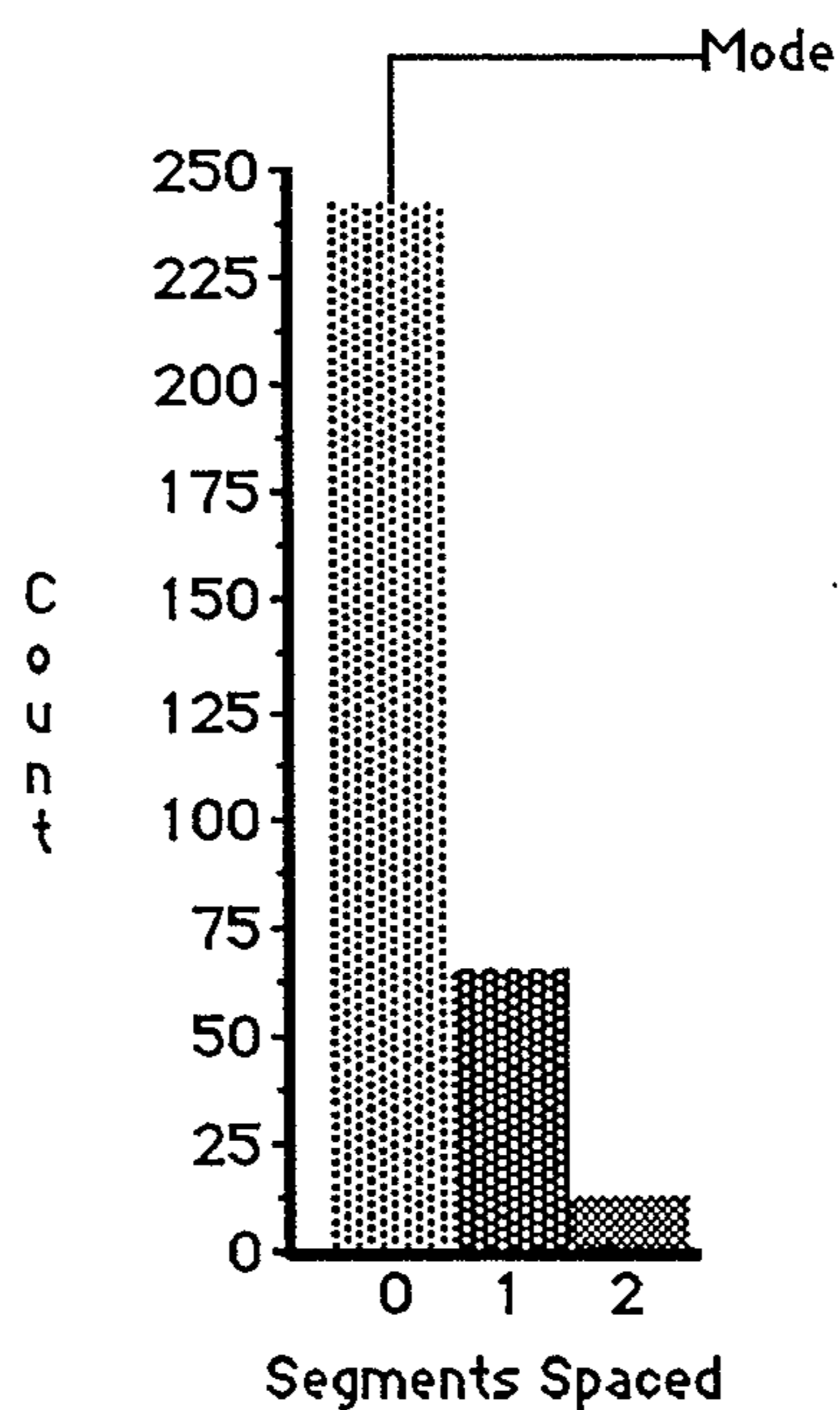


Figure 10.2 Bar chart of number of subjects with segments spaced.

Of the subject group of 321, 76% were recorded as having no segments spaced, 20% had one segment spaced, and only 4% had two segments spaced.

Diastema:

Diastema (mm)					
Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.5	.81	.045	.66	162	321
Minimum:	Maximum:	Range:	Median:	Mode:	
0	4	4	0	0	

Table 10.4 Breakdown of DAI scores of diastema.

The largest diastema recorded in the DAI assessment was 4mm, with the mean diastema measurement of 0.5mm. The median score was 0mm.

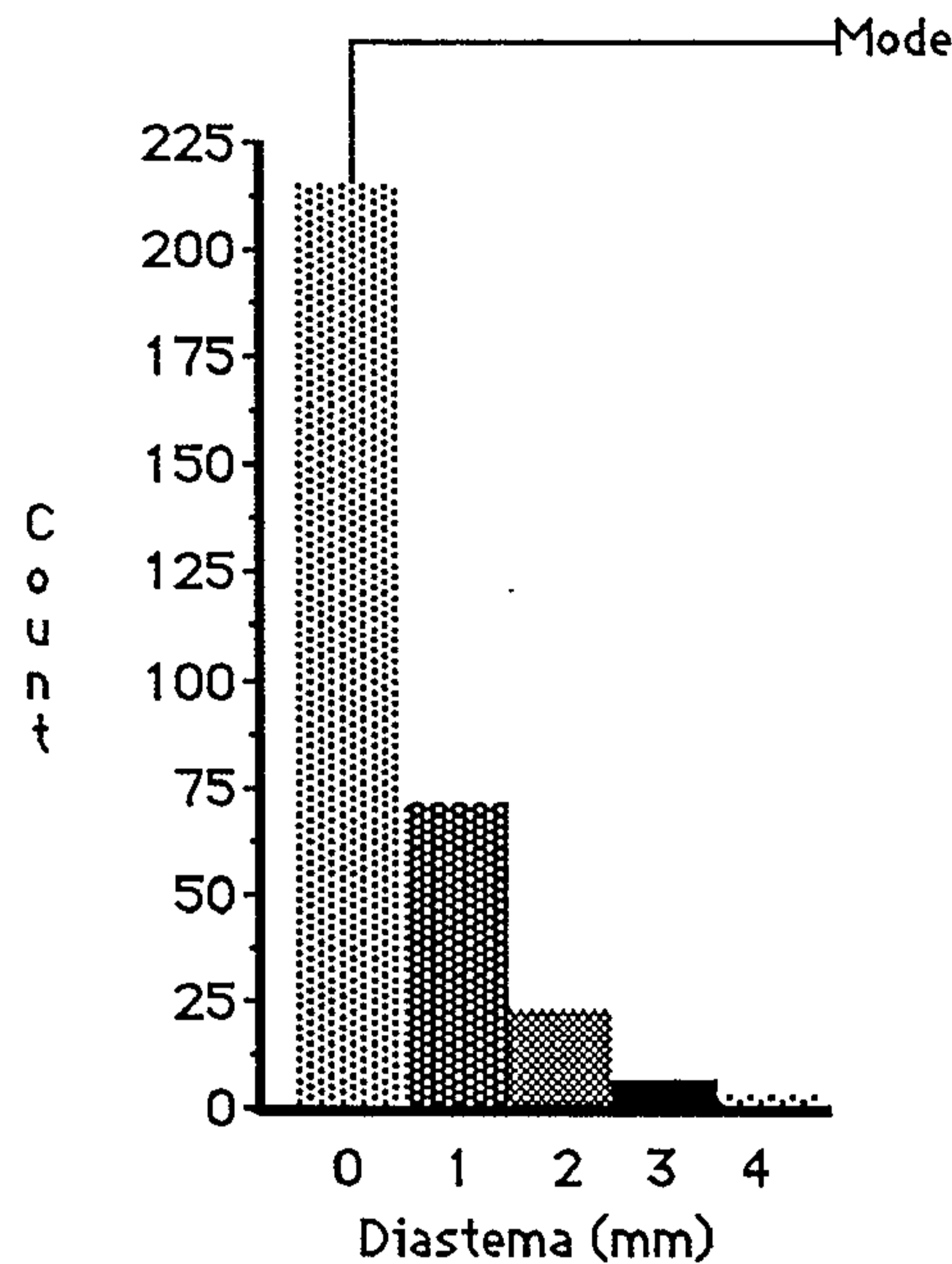


Figure 10.3 Bar chart of number of subjects versus diastema assessment(mm)

As evident from Table 10.4 and Figure 10.3 approximately 67% of the subject group of 321 were assessed as having no diastema. Of the remaining subjects, 22% had a diastema of 1mm, 7% had a diastema of 2mm, 2% had a diastema of 3mm, and 1% (3 subjects) had a diastema measurement assessed as 4mm.

Maxillary largest irregularity:

Max. Largest Irreg					
Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1.6	1.32	.07	1.69	82.5	321
Minimum:	Maximum:	Range:	Median:	Mode:	
0	7	7	2	2	

Table 10.5 Breakdown of DAI scores of maxillary largest irregularity.

Table 10.5 shows that the largest maxillary irregularity recorded in the DAI assessment was 7mm, with the mean displacement being 1.6 mm, and a median score of 2mm.

Only 25% of the subject group of 321 were assessed as having no maxillary irregularity. The mode maxillary irregularity measurement obtained was 2mm , seen in 33% of the subjects.

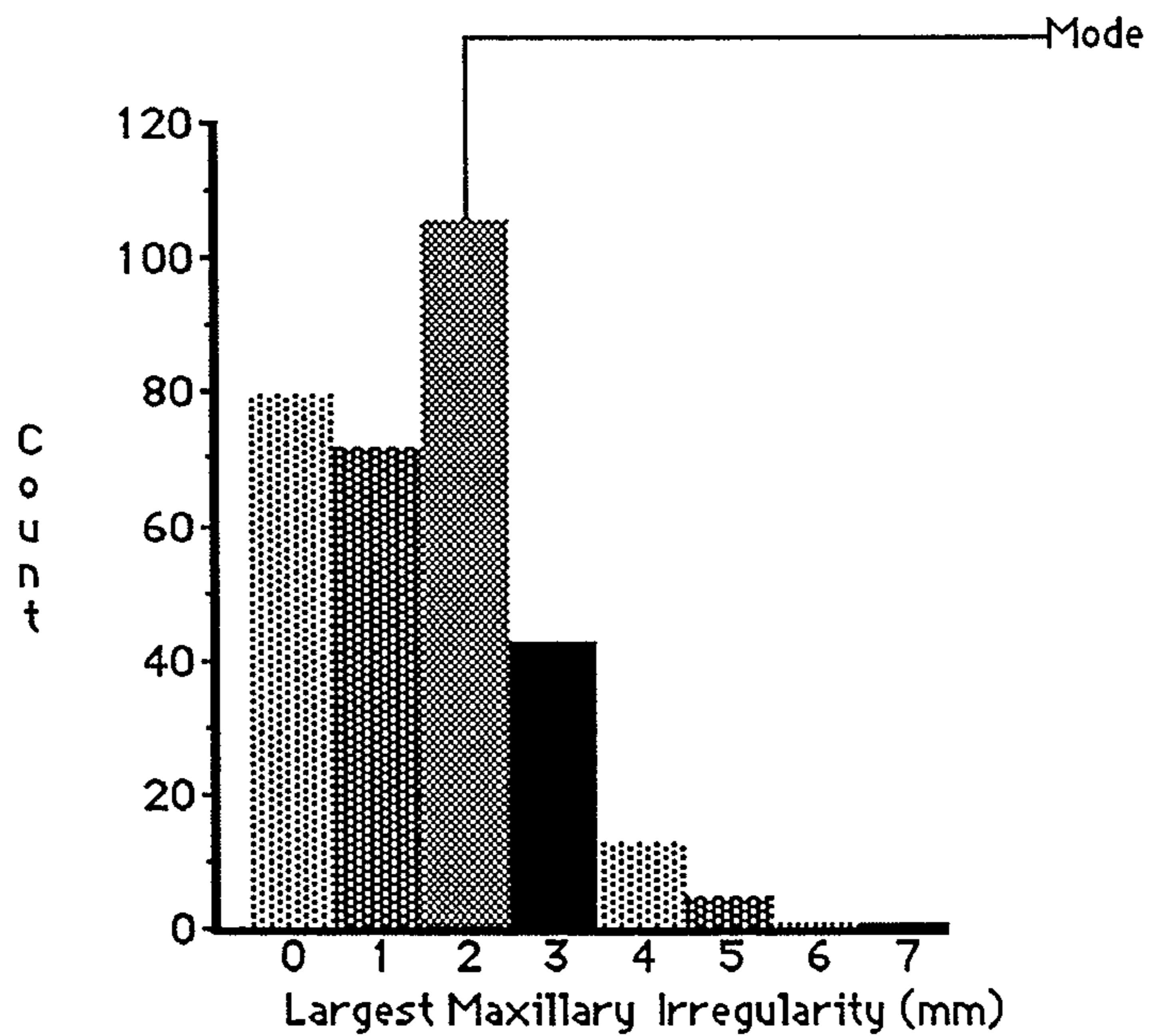


Figure 10.4 Bar chart of number of subjects versus their largest maxillary irregularity(mm).

Figure 10.4 shows clearly the relatively small number of subjects with a maxillary irregularity of 5mm or more.

Mandibular largest irregularity:

Mand. Largest Irreg					
Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
1.2	1.11	.06	1.23	92.5	321
Minimum:	Maximum:	Range:	Median:	Mode:	
0	6	6	1	0	

Table 10.6 Breakdown of DAI scores of mandibular largest irregularity.

The largest mandibular irregularity recorded in the DAI assessments was 6mm. The mean recording was 1.2mm, and the median score 1mm.

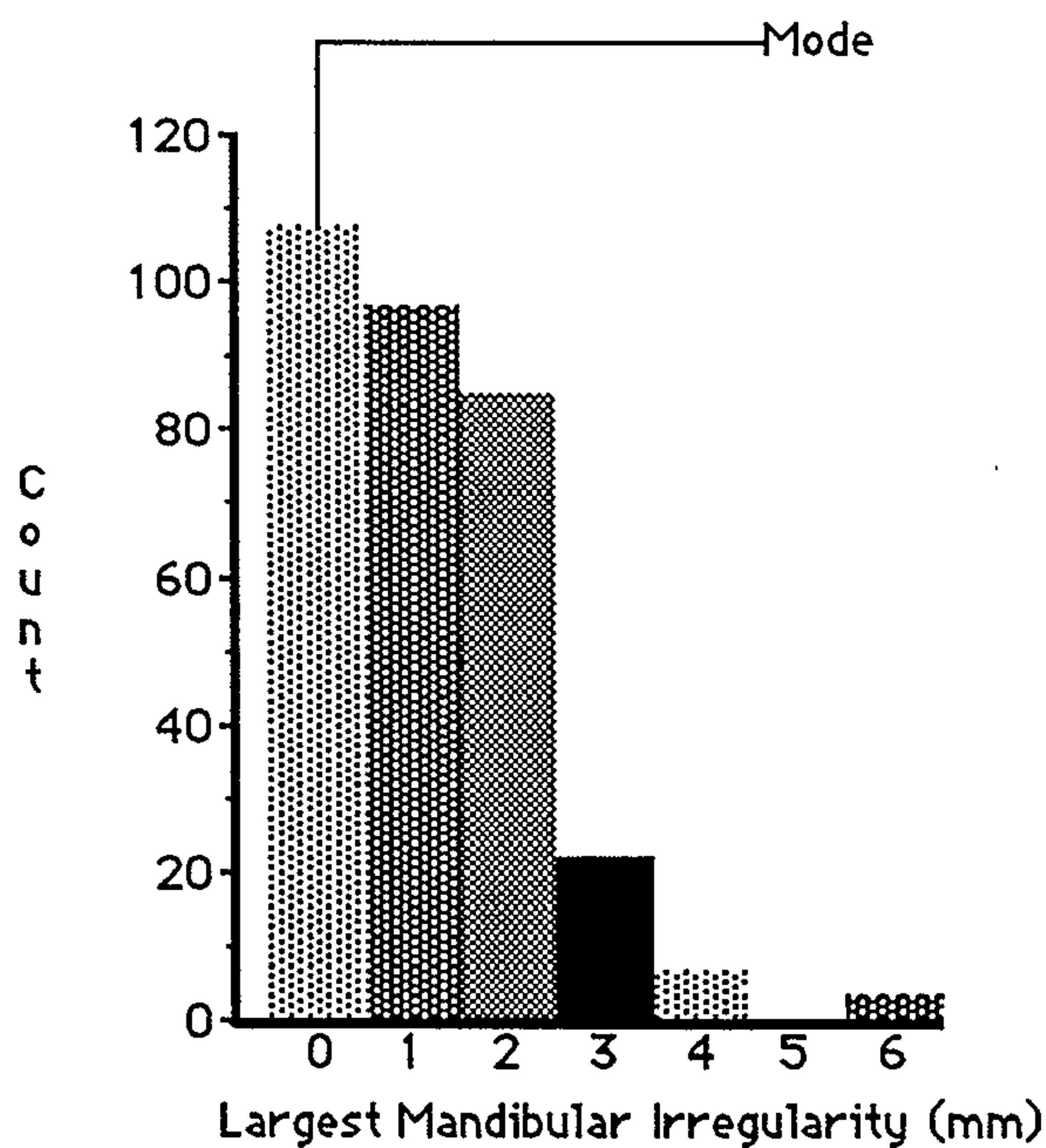


Figure 10.5 Bar chart of number of subjects versus their largest mandibular irregularity (mm).

Of the subject group of 321 approximately 34 % were assessed as having no mandibular irregularity, with only 3% (7 subjects) having an irregularity of 4mm or more.

Positive overjet:

Overjet +					
Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
2.8	1.83	.10	3.34	65.35	321
Minimum:	Maximum:	Range:	Median:	Mode:	
0	14	14	2	2	

Table 10.7 Breakdown DAI scores of positive overjet.

The largest positive overjet recorded in the DAI assessments was 14 mm, with a mean overjet recorded of 2.8mm and a median score of 2mm.

Almost 40% of the subject group were assessed as having an overjet of 2mm. Of the full subject group (321 ) 76% had an overjet of 4mm or less.

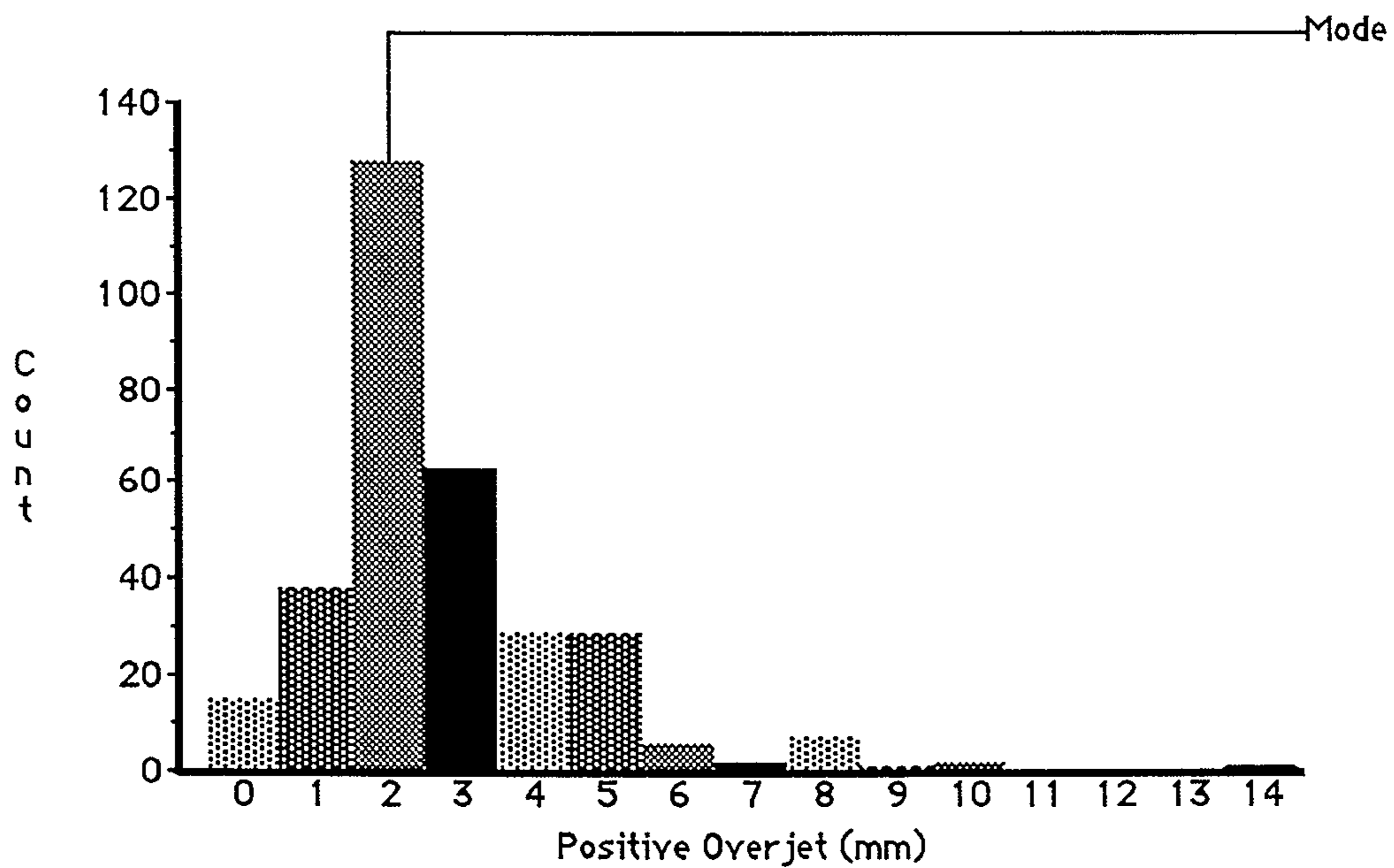


Figure 10.6 Bar chart of number of subjects versus their positive overjet(mm).

Figure 10.6 demonstrates the spread of scores of positive overjets recorded, and shows the relatively small proportion of subjects (4%) with an overjet of 7mm or more.

Negative overjet:

<b>Overjet -</b>					
Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.044	.28	.016	.078	636.36	321
Minimum:	Maximum:	Range:	Median:	Mode:	
0	3	3	0	0	

Table 10.8 Breakdown of DAI scores of negative overjet.

Approximately 97% of the subject group of 321 were assessed as having no negative overjet, with only 3% (9 subjects) having a negative overjet.

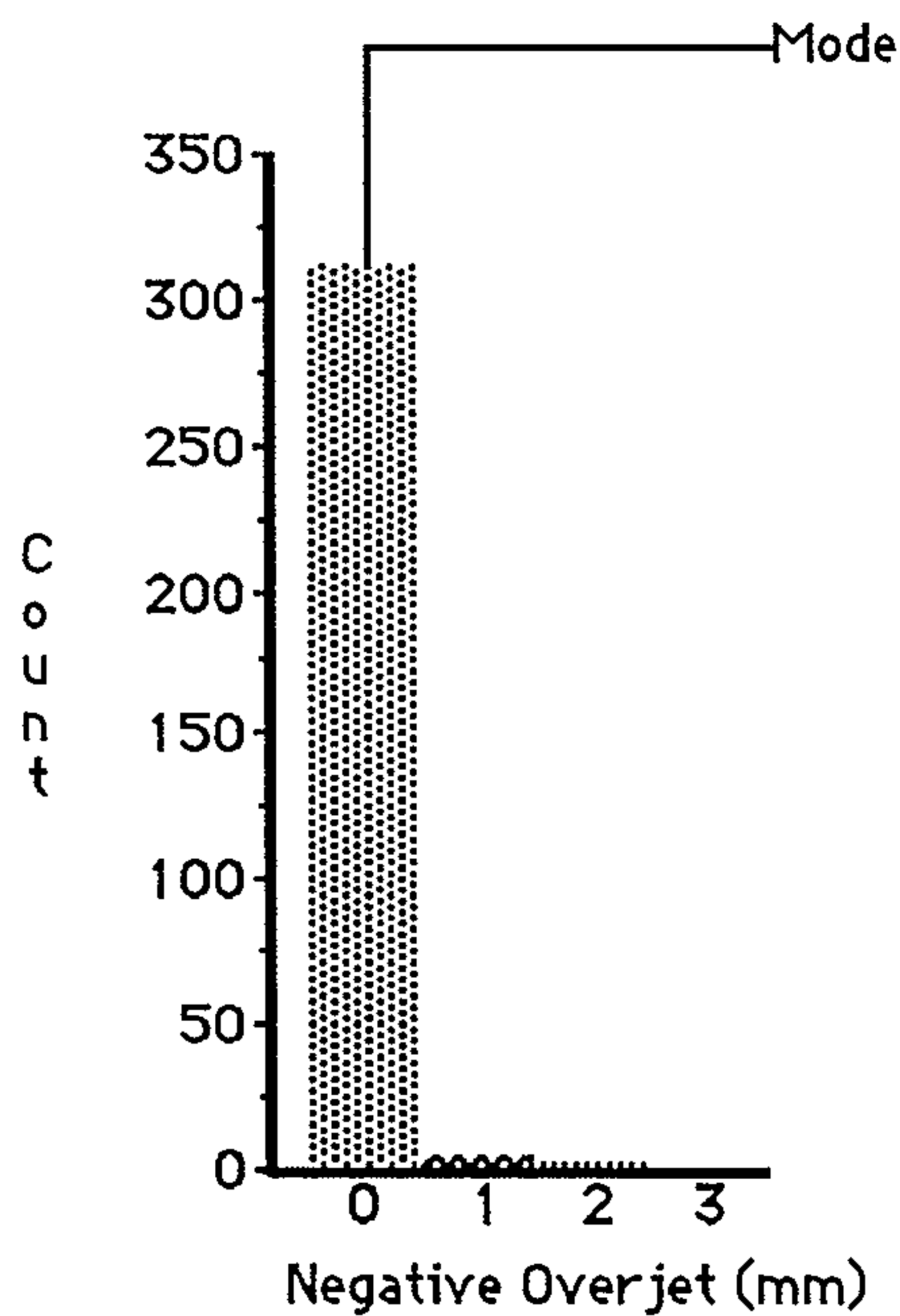


Figure 10.7 Bar chart of number of subjects versus their negative overjet(mm).

Vertical anterior openbite:

<b>Vert Ant. Openbite</b>					
Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
.019	.193	.011	.037	1015.79	321
Minimum:	Maximum:	Range:	Median:	Mode:	
0	3	3	0	0	

Table 10.9 Breakdown of DAI scores of vertical anterior openbite.

Almost 99% of the subject group of 321 were assessed as having no anterior open-bite. Only 3 subjects were assessed as having an anterior open-bite of 1mm, and one subject was assessed as having an anterior open-bite of 3mm.

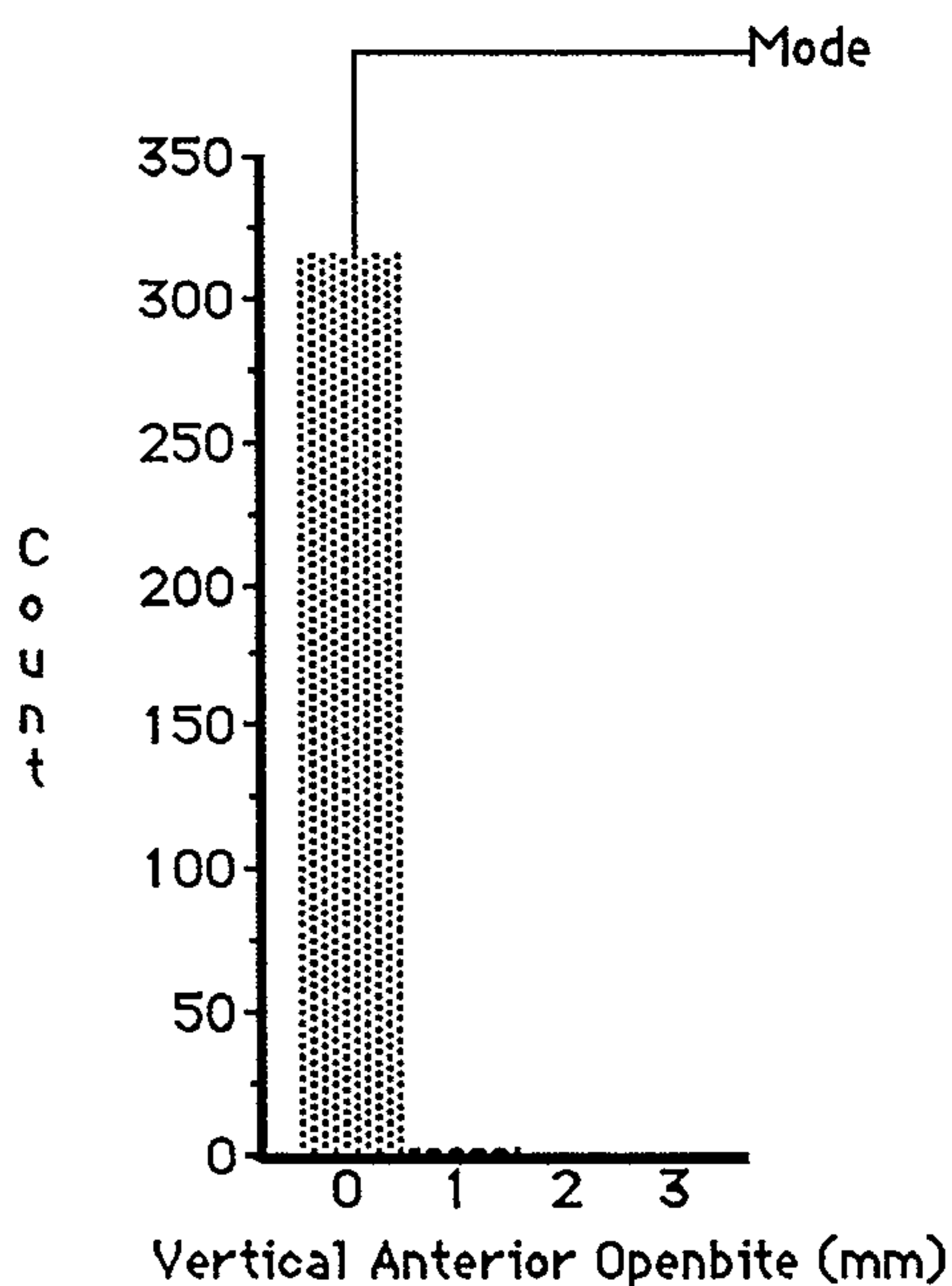


Figure 10.8 Bar chart of number of subjects versus vertical anterior open-bite.

Molar relationship:

**Molar Relationship**

	Total	%
0	175	55
1	102	32
2	44	13

Table 10.10 Breakdown of scores of DAI molar relationships of subject group.

Of the subject group of 321, 55% were assessed as having a normal molar relationship as defined by the DAI protocol. The sample group had 32% assessed as having one posterior segment in a half-unit relationship, and 13% of the sample group were assessed as having a full-unit molar

relationship on at least the left or the right-hand-side as defined by the DAI protocol.

## Section 2

### RESULTS OF THE QUESTIONNAIRES

#### Question Responses.

The complete answers to the 11 Questions asked in the thesis questionnaire can be found in Appendix 2.

Questions 1,6,8,9,and 11 were answered with either a 'yes' or a 'no' response with the response breakdown for the subject group as follows.

	'YES'	'NO'	TOTAL
QUESTION 1	120	201	321
QUESTION 6	84	237	321
QUESTION 8	116	205	321
QUESTION 9	78	243	321
QUESTION 11	63	258	321

Table 10.11 Response breakdown of subjects for Questions 1,6,8,9, and 11.

## QUESTION RESPONSE BREAKDOWN

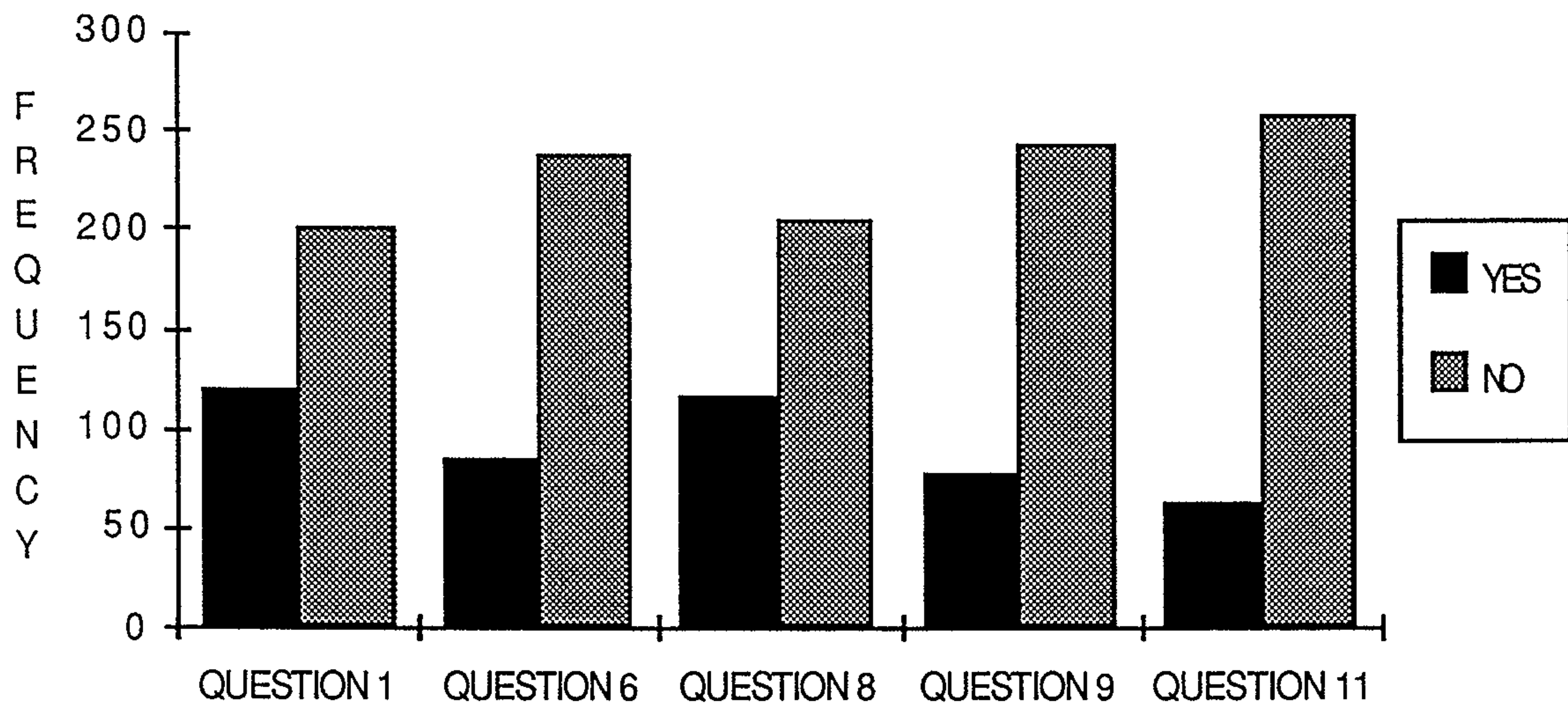


Figure 10.9 Bar chart of question response breakdown of sample group.

The pattern of the 'yes' or 'no' responses over all of Questions 1,6,8,9, and 11, was examined using chi-squared analysis.

<b>Chi-Square</b>		
Observed: Yes	Expected: No	
DF:	Chi-Square:	Significance:
4	429.5	$p \leq .001$

Table 10.12 Chi-squared analysis of question response breakdown (Figure 10.9)

Chi-squared analysis showed there was a significant difference in the yes/no answer sets to Questions 1,6,8,9, and 11.

It was noted from Figure 10.9 that Question 1 and Question 8 had a higher 'yes' response than did Question 6, Question 9, and Question 11.

As a mechanical exercise, further chi-squared analysis was carried out between these apparent sub-sets of questions to test the extent to which the responses to the individual questions overlapped. This is discussed more fully in the Discussion of these results in Chapter Eleven.

The 'yes' and 'no' answer responses to Question 9 and Question 11 were analysed by chi-squared test. It was found that there was no significant difference between the way these two questions were answered, as shown by the results in Table 10.13.

<b>Chi-Square Observed: Quest.9 Expected: Quest.11</b>		
DF:	Chi-Square:	Significance:
1	4.4	.02 < p ≤ .05

Table 10.13 Chi-squared analysis of 'yes' and 'no' question responses of Questions 9 and 11.

The chi-squared value showed that with one degree of freedom there was no statistical significance.

<b>Chi-Square Observed: Quest.9 Expected: Quest.6</b>		
DF:	Chi-Square:	Significance:
1	.6	.30 < p ≤ .50

Table 10.14 Chi-squared analysis of Question response of questions 9 and 11 vs question 6.

An advising statistician (Dr A. Kirby) suggested, as a mechanical exercise, that the question responses from questions 9 and 11 be pooled, and these pooled responses then be compared with the responses obtained from Question 6 in an attempt to determine possible patterns of response to the possible question sub-sets. No significant difference between the way these questions were answered was found .

Similar chi square analysis was carried out on questions 1 and question 8. No significant difference was found in the 'yes' or 'no' answering responses obtained between Questions 1 and 8, as shown by the results in Table 10.15.

<b>Chi-Square Observed: Quest.1 Expected: Quest.8</b>		
DF:	Chi-Square:	Significance:
1	.2	.50 < p ≤ .70

Table 10.15 Chi-squared analysis of Question responses of questions 1 and 8.

The 'yes' and 'no' responses to Questions 9,11, and 6 were then compared to the 'yes' and 'no' responses resulting from Questions 1 and 8 using a chi squared test. There was a significant difference (  $p < 0.001$ ) between the 'yes' and 'no' answer sets obtained through these two question sets, as shown in Table 10.16.

<b>Chi-Square Observed: Quest.6,9,11 Expected: Quest.1,8</b>		
DF:	Chi-Square:	Significance:
1	272	$p \leq .001$

Table 10.16 Chi-squared analysis of question responses of Questions 6,9, and 11 vs Questions 1, and 8.

The 'yes' and 'no' answer responses to Question 9 ( 'Are you interested in having braces?') were examined by sex breakdown.

	'YES'	'NO'	TOTAL
MALE	39	123	162
FEMALE	42	117	159

Table 10.17 Sex breakdown of 'yes' and 'no' responses to Question 9.

<b>Chi-Square Observed: Male Expected: Female</b>		
DF:	Chi-Square:	Significance:
1	.5	.30 < p ≤ .50

Table 10.18 Chi-squared analysis of Question 9 answer responses by sex breakdown.

Chi squared analysis of this sex breakdown shows no significance between the sexes in their expressed interest in treatment. Of interest is that of the subject group of 321 approximately 25% chose the 'very interested' answer option when asked how interested they were in having braces.

The 'yes' and 'no' answer responses to Question 11 ( Table 10.19) were examined by sex breakdown using the chi squared test, with the results as displayed in Table 10.20

	'YES'	'NO'	TOTAL
MALE	37	125	162
FEMALE	43	116	159

Table 10.19 Sex breakdown of 'yes' and 'no' responses to Question 11.

Chi-Square	Observed: Male	Expected: Female
DF:	Chi-Square:	Significance:
1	.2	.50 < p ≤ .70

Table 10.20 Chi-squared analysis of Question 11 answer responses by sex breakdown.

There was no significant difference between the sexes in the way Question 11 was answered.

The calculation of the Question Index (QI).

Question 2, Question 3, Question 4, Question 5, Question 7, and Question 10 of the Questionnaire were answered with graded answer options and not with simply a 'yes' or a 'no' answer option.

Numerical values were assigned to the graded responses after all the questionnaires had been answered and collected so that the response options could be analysed.

The numerical representation of the graded answer responses from Questions 2,3,4,5,7,and 10 were then added and then multiplied by a factor of 2, with this numerical result termed the 'Question Index'.

The Question Index was so calculated for the following reasons:

1. Assigning a numerical value to each graded answer option within a question enabled an objective measurement to represent a subject's answer response.

The numerical values were assigned so that the more negative a subject's answer response to an answer was, the higher would be the numerical value reflecting that response.

3. The numerical values for any one subject's questionnaire were then added to give a numerical indication of that subject's self-assessment of

their dental appearance. The higher the score obtained the more negative one would expect that subject's self-perception to be.

4. The total numerical score for any one subject's answer responses was then multiplied by a factor of 2 to give a wider spread of scores. This was suggested by an advising statistician (Dr A. Kirby, PhD) to enhance interpretation and analysis of the Question Index.

The raw numerical scores assigned to the answer responses to Questions 2,3,4,5,7,and 10 and the resulting Question Index are as displayed in Appendix 2.

### Answer results for Question 2.

Question 2. "How do you think your front teeth look?"

The answer options were:

1. very good
2. quite good
3. average
4. not very good
5. bad

The responses obtained from Question 2 are as shown in Figure 10.10.

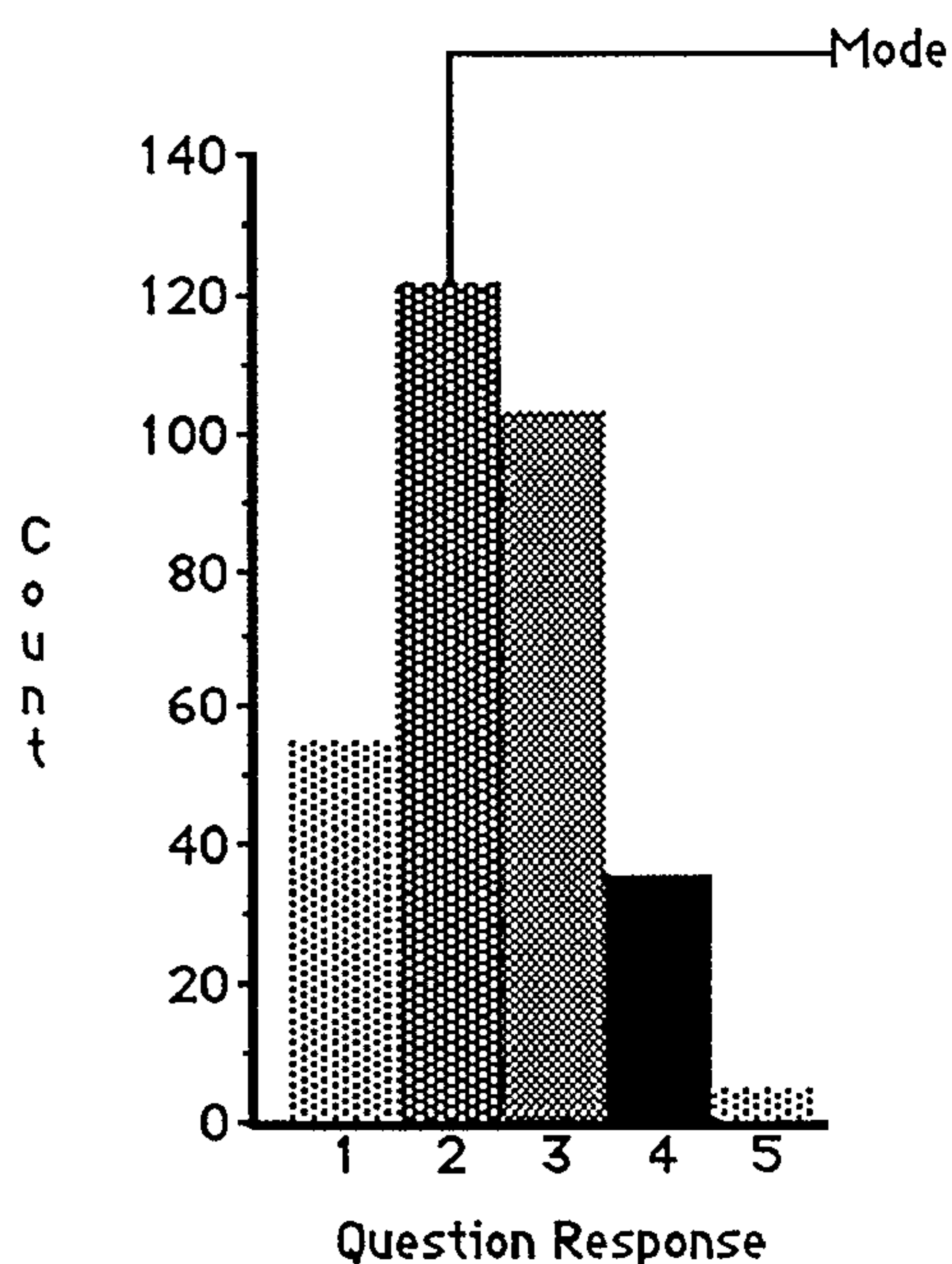


Figure 10.10 Bar chart of frequency of subject responses to Question 2.

Of the subject group of 321, approximately 70% chose answer option 2 or answer option 3. The mode response, with 5 response options available, was response 2 (Answer-'quite good') chosen by 38% of the subject group of 321. Only 5 subjects chose response 5 ( Answer-'bad') to this question.

### Answer results for Question 3

Question 3. ' How happy are you with the appearance of your teeth?

The responses options available were:

1. very happy
2. quite happy
3. just happy
4. not happy
5. very unhappy

The responses obtained to Question 3 are as shown in Figure 10.11.

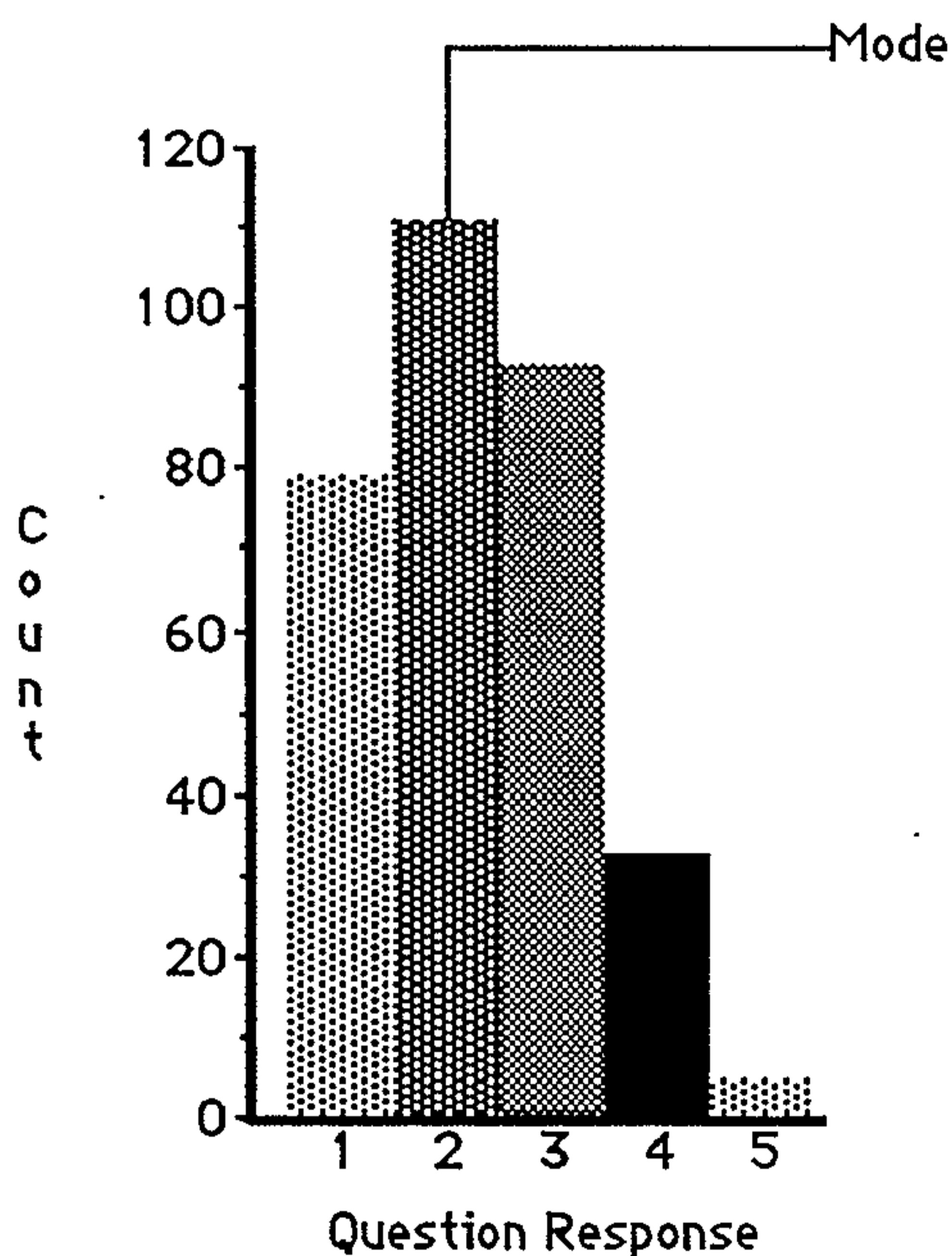


Figure 10.11 Bar chart of frequency responses of subjects to Question 3.

Again, the mode response, with 5 answer options available, was response 2 (Answer-'quite happy'), chosen by 35% of the subject group. Again, only 5

subjects chose answer response option 5 (Answer-'very unhappy') in responding to this question.

Answer results for Question 4.

Question 4. 'Compared to your classmates, how do you think your teeth look?'

The response options available were:

- 1. very good
- 2. reasonably good
- 3. average
- 4. not very good
- 5. bad

The responses obtained to Question 4, with 5 answer options available, are as shown in Figure 10.12.

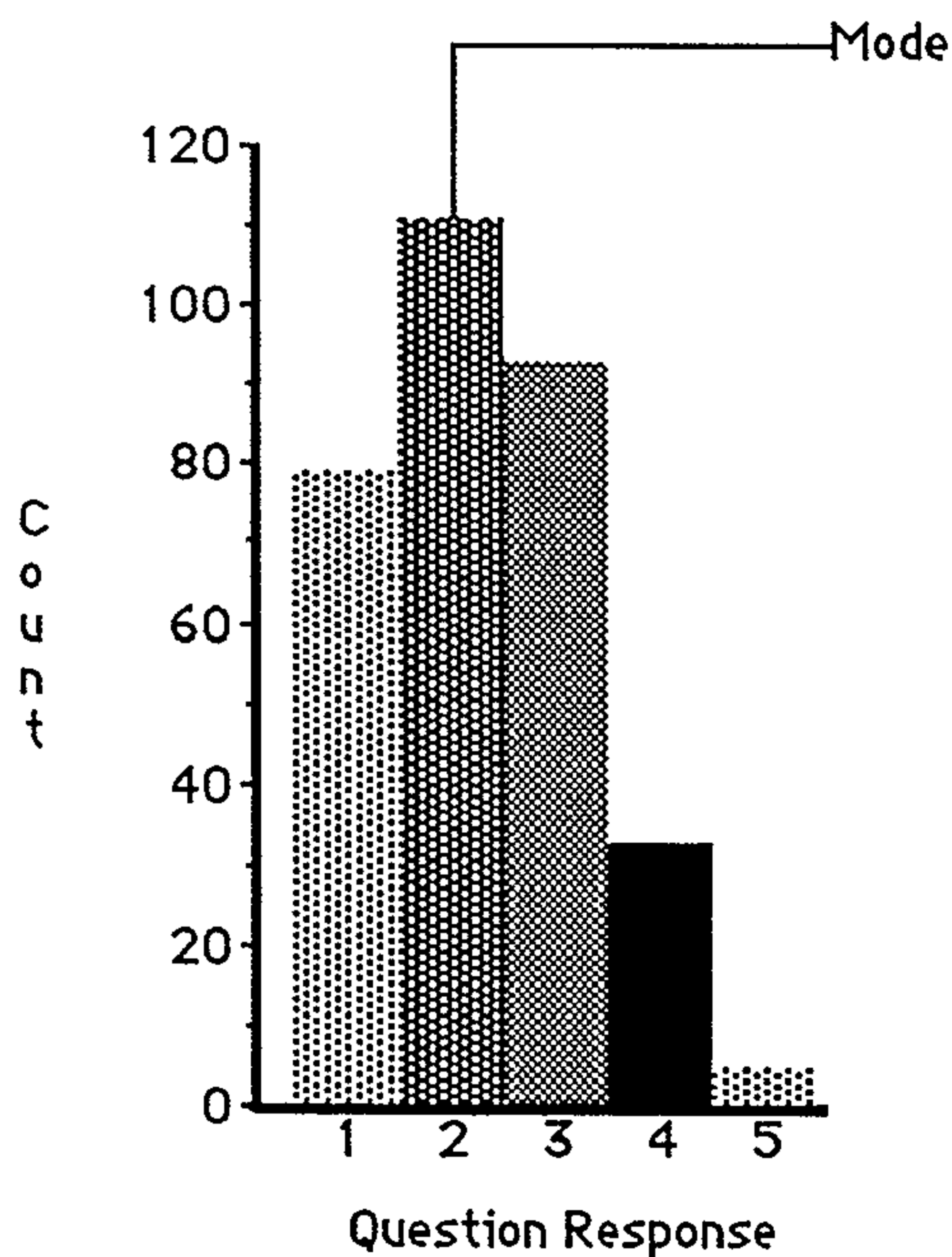


Figure 10.12 Bar chart of frequency of subject responses to Question 4.

The mode response was response 2 (Answer-'reasonably good'), answered by 40% of the subject group. Only 6 subjects out of 321 chose response 5 (Answer-'bad') as an answer option.

Answer results for Question 5.

Question 5.'How do you classmates make you feel about your teeth and your smile?'

The response options were:

1. very good
2. quite good
3. average
4. not very good
5. bad

The responses obtained to Question 5 are as shown in Figure 10.13.

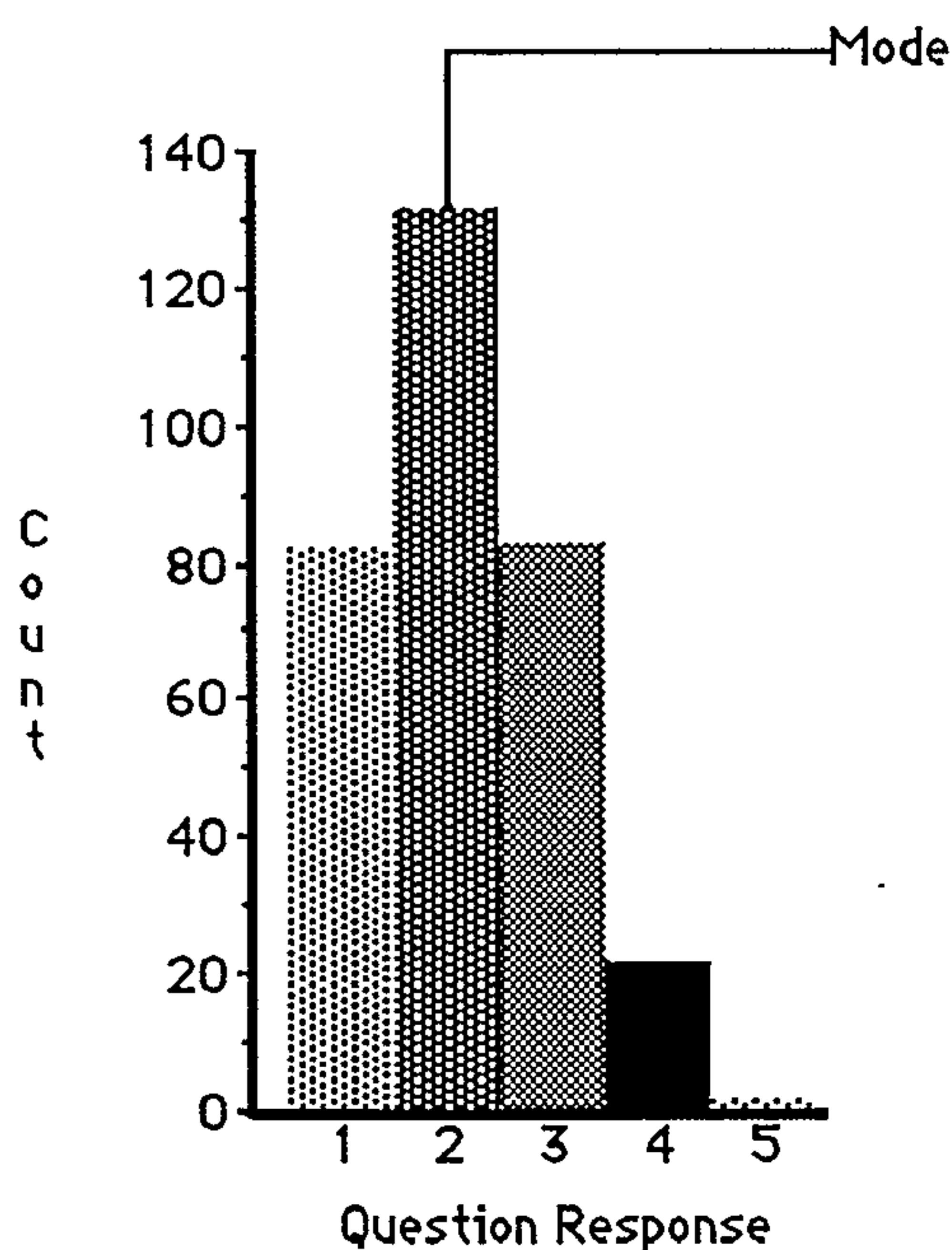


Figure 10.13 Bar chart of frequency of responses to Question 5.

The mode response, with 5 answer options available, again was response 2 (Answer-'quite good') chosen by 41% of the subject group. Only 4 subjects chose response option 5 (Answer-'bad') to the question.

Answer results for Question 7.

Question 7.'How does your family make you feel about your teeth and your smile?'

The answer options were:

1. very happy
2. reasonably happy
3. just OK
4. a bit unhappy
5. very unhappy

The answer responses to this question are as shown in Figure 10.14

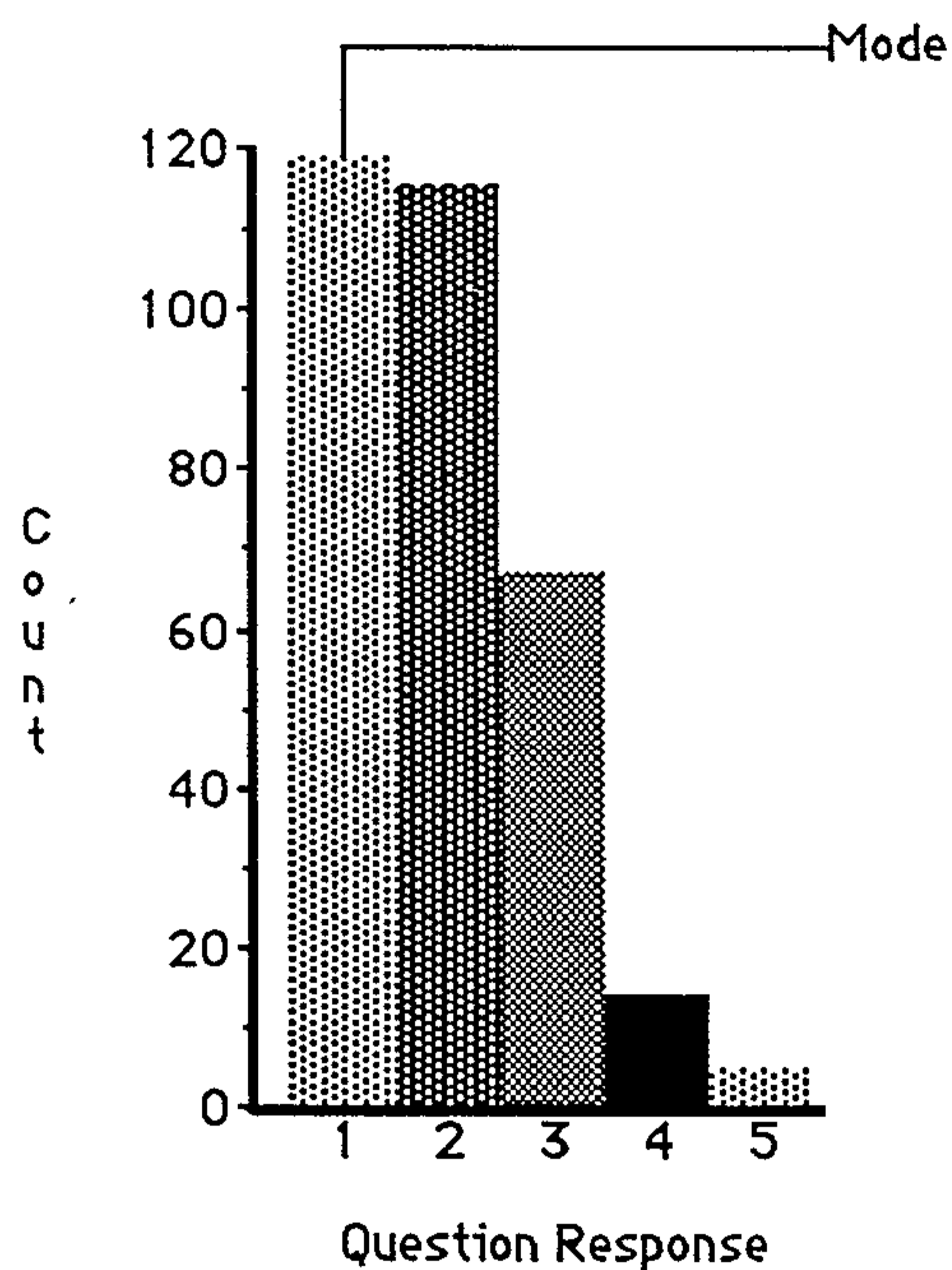


Figure 10.14 Bar chart of frequency of subject responses to Question 7.

The mode response, with 5 answer responses available, was response 1 (Answer 'very happy'), with 37% of all subjects choosing this option. This was closely followed by response 2 (Answer-'reasonably happy'), chosen by 36% of the subject group. Only 5 subjects chose answer option 5 (Answer-'very unhappy') in response to this question.

Answer results for Question 10.

Question 10.'If you are interested in having braces, how interested are you?'

The answer options were:

1. very interested
2. reasonably interested
3. not very interested
4. not at all interested

The answer responses to this question are shown in Figure 10.15.

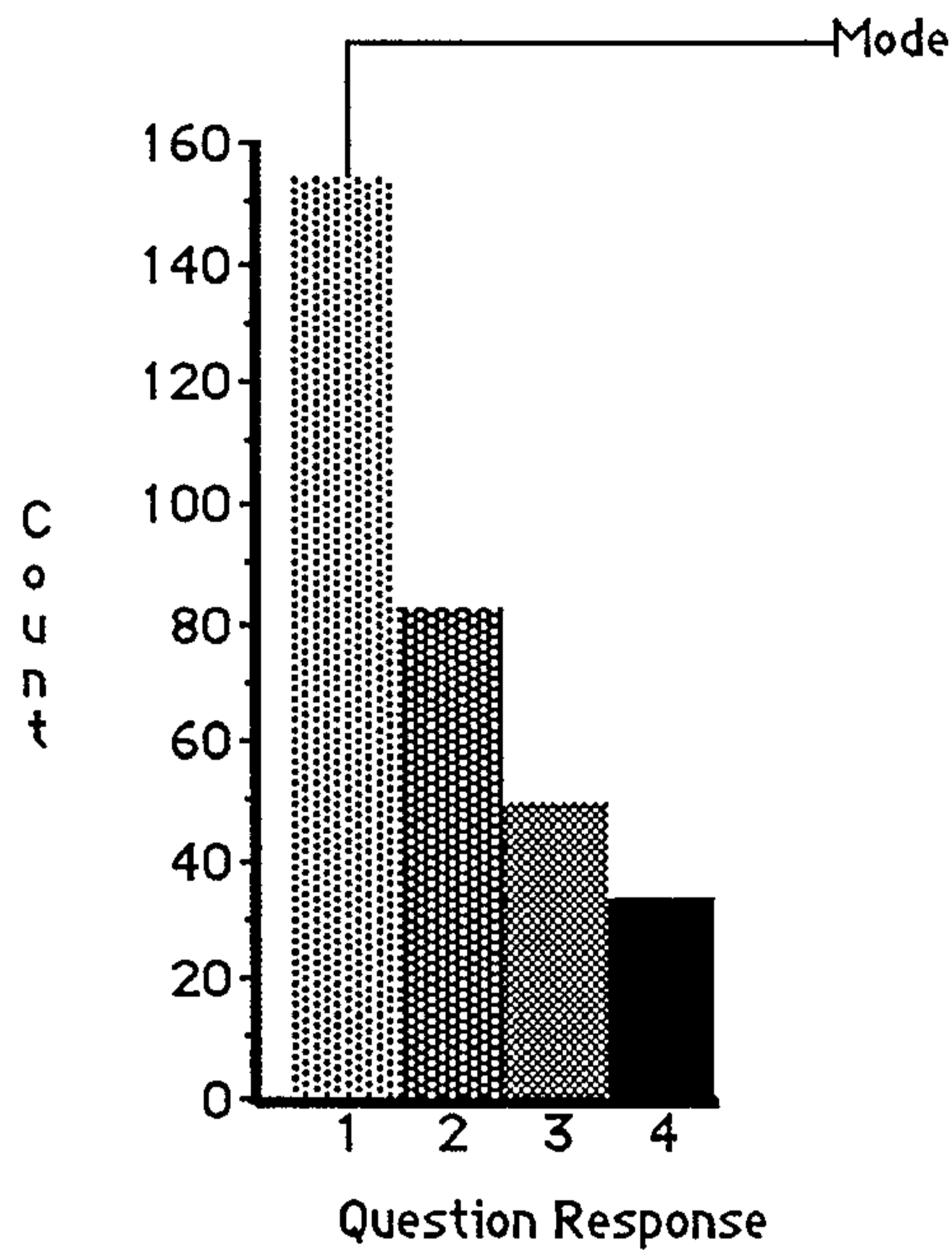


Figure 10.15 Bar chart of frequency of subject responses to Question 10.

The mode answer response was response 1 (Answer-'very interested'), with 4 answer responses available. The mode response was chosen by 48% of the subject group.

### Section 3

## COMPARISON OF THE RESULTS OBTAINED FROM THE DENTAL AESTHETIC INDEX ASSESSMENT AND THE QUESTION INDEX.

### Comparison of DAI to QI:

Data from both the DAI scores and the Questionnaire Index scores was continuous data with a linear relationship expected. A regression analysis was carried out to test the relationship between the DAI scores and the QI scores.

Simple - Y : Q.INDEX    X : DAI

DF:	R-squared:	Std. Err.:	Coef. Var.:
320	.281	7.422	28.573

Beta Coefficient Table

Parameter:	Value:	Std. Err.:	Variance:	T-Value:
INTERCEPT	7.681	1.69	2.856	4.545
SLOPE	.701	.063	.004	11.167

Analysis of Variance Table

Source	DF:	Sum Squares:	Mean Square:	F-test:
REGRESSION	1	6868.494	6868.494	124.695
RESIDUAL	319	17571.306	55.082	$p \leq .0001$
TOTAL	320	24439.801		

Residual Information Table

SS[e(i)-e(i-1)]:	e ≥ 0:	e < 0:	DW test:
32748.501	159	162	1.864

Table 10.21 Regression analysis of the Dental Aesthetic Index (independent variable) and the Question Index (dependent variable).

The correlation is as shown in Figure 10.16.

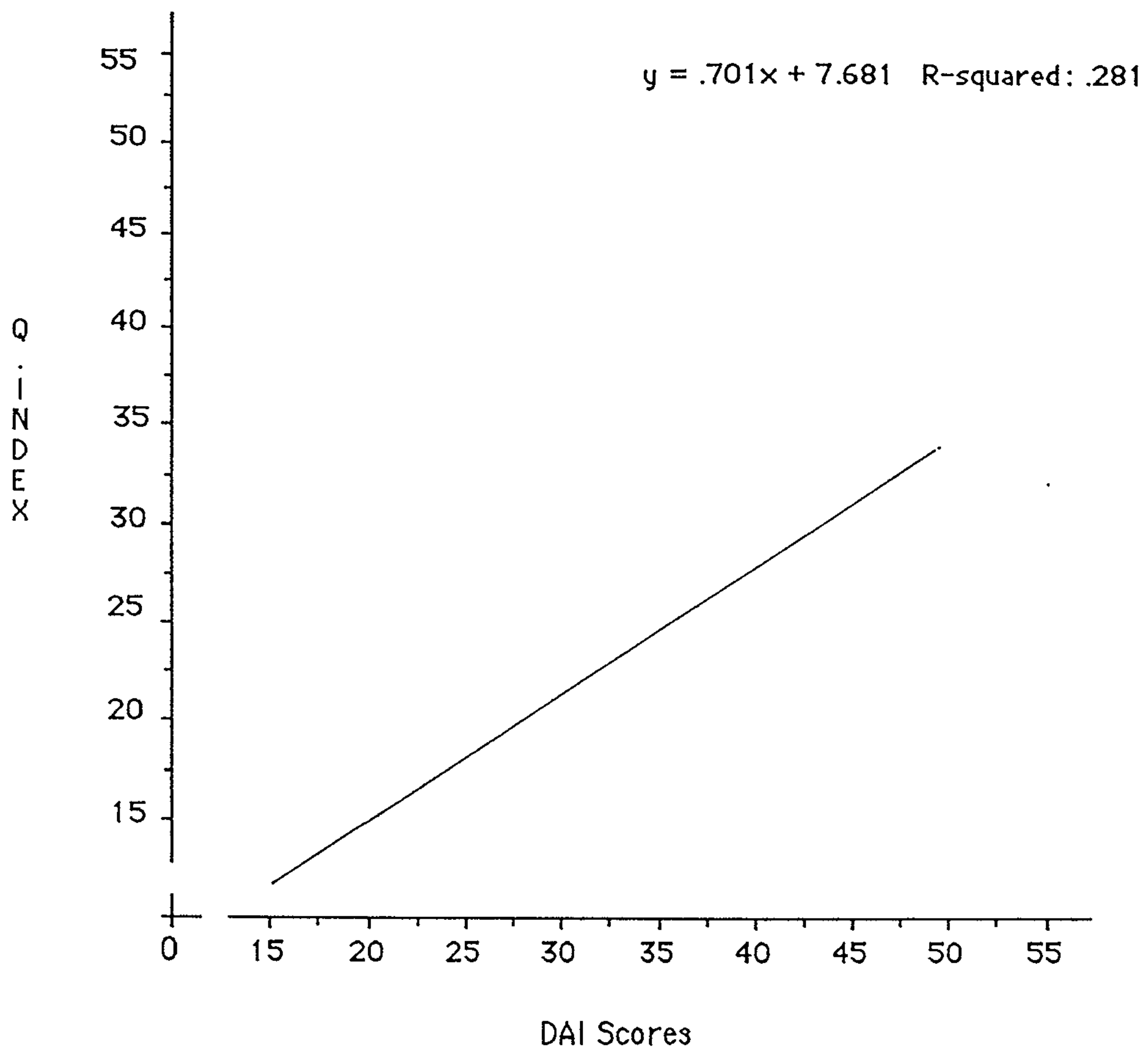


Figure 10.16 Sample regression of QI varying with DAI.

Regression analysis of the DAI versus the QI showed the relationship to be significant with  $p < 0.01$ . Plotting of the DAI versus the QI (Figure 10.16) shows a line of best fit with a slope of 0.7 crossing the y-axis at a value of 7.7 .

Q.INDEX					
Bar:	From: ( $\geq$ )	To: ( $<$ )	Count:	Percent:	
1	12	16.7	48	14.953	
2	16.7	21.4	56	17.445	
3	21.4	26.1	92	28.66	-Mode
4	26.1	30.8	48	14.953	
5	30.8	35.5	29	9.034	
6	35.5	40.2	27	8.411	
7	40.2	44.9	13	4.05	
8	44.9	49.6	4	1.246	
9	49.6	54.3	2	.623	
10	54.3	59	2	.623	

Table 10.22 Breakdown of the Question Index scores of the sample group (see following figure 10.17).

Each bar number in Table 10.22 represents a range of Question Index scores obtained from the subject group, and these range of scores are represented in Figure 10.17. As evident in Table 10.22 the mode Question Index score was in the range of approximately 21 to 26, a range containing 29% of the subject scores.

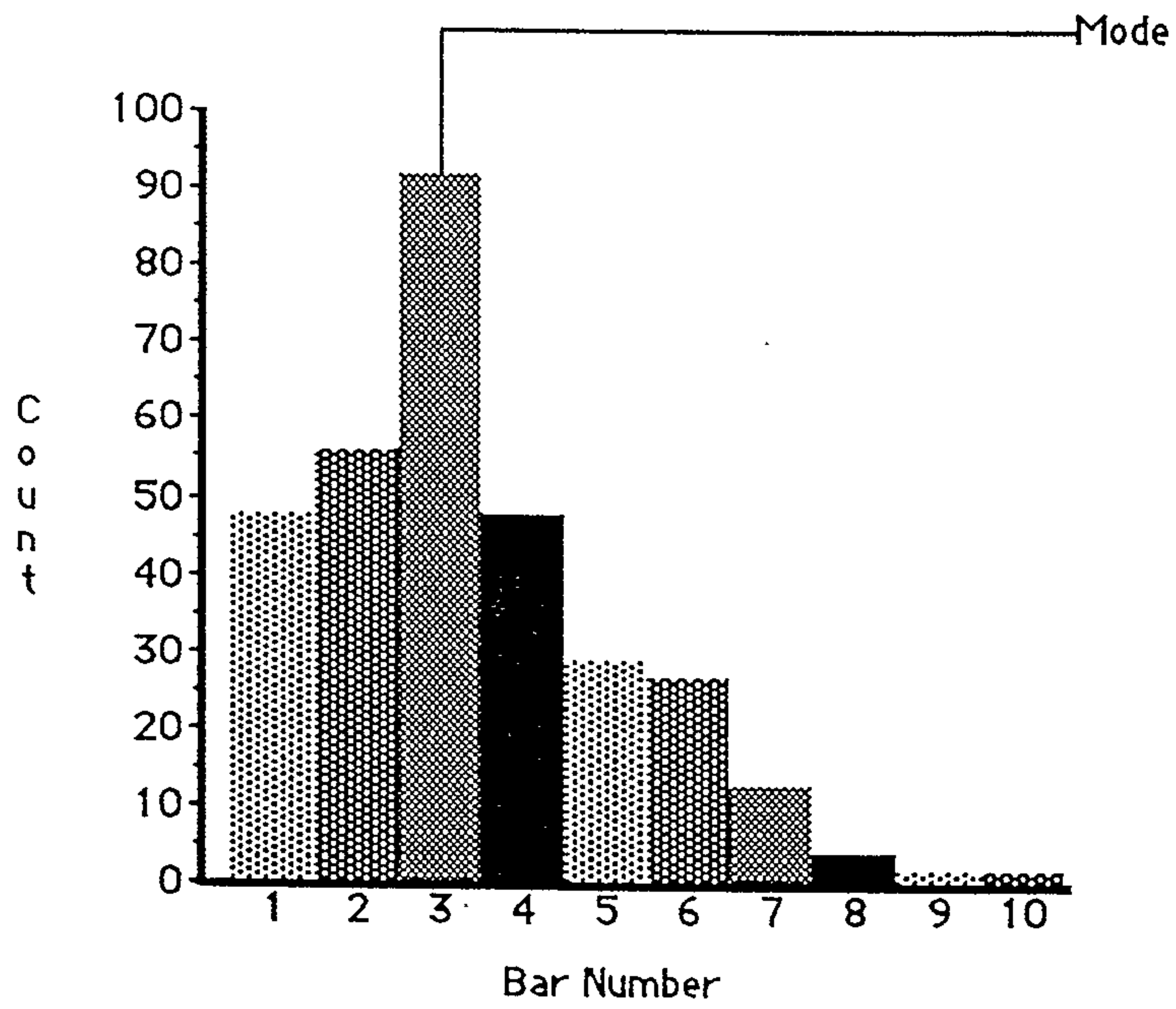


Figure 10.17 Bar chart Question Index scores obtained for the subject group of 321.

DAI				
Bar:	From: ( $\geq$ )	To: ( $<$ )	Count:	Percent:
1	13	17.5	14	4.361
2	17.5	22	65	20.249
3	22	26.5	113	35.202
4	26.5	31	62	19.315
5	31	35.5	41	12.773
6	35.5	40	8	2.492
7	40	44.5	12	3.738
8	44.5	49	4	1.246
9	49	53.5	1	.312
10	53.5	58	1	.312

-Mode

Table 10.23 Breakdown of the DAI scores of the sample group(see following figure 10.18).

Each bar number in Table 10.23 contains a range of DAI scores obtained by some of the subjects surveyed, for example, the mode DAI score was between 22 and 27, and was obtained by 35% of the sample group of 321. The data in Table 10.23 is further represented in Figure 10.18.

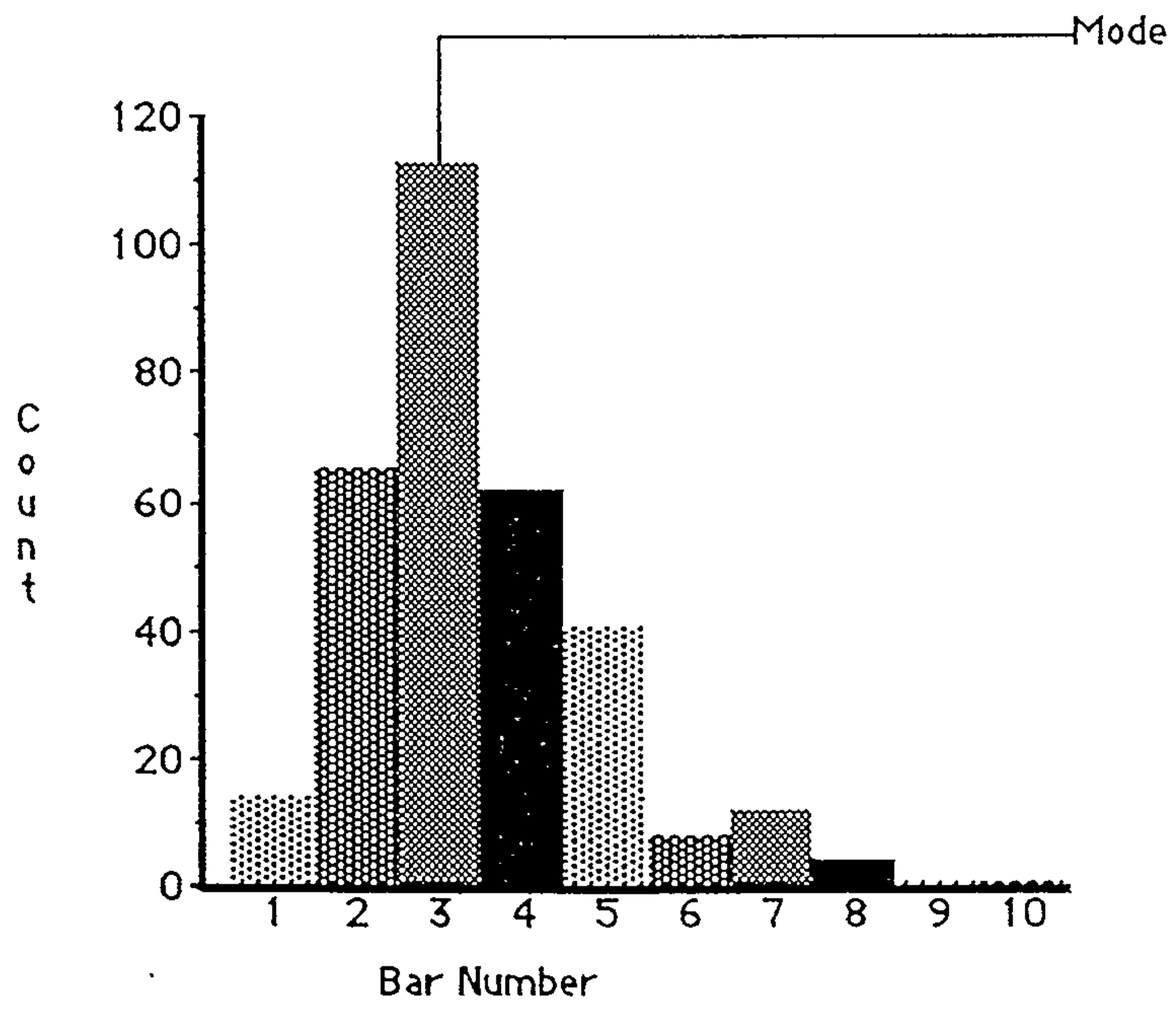


Figure 10.18 Bar chart of DAI scores obtained for the subject group of 321.

## CHAPTER ELEVEN

### **DISCUSSION**

#### Discussion of the sample group.

The sample group of 321 schoolchildren consisted of 162 males and 159 females aged either 10, 11, or 12 years of age at the time of the survey. This author feels that the subject group was from a sufficiently broad demographic background to enable the survey results obtained to be representative of this particular age group of children in the New England Health Region as a whole. The subject group was randomly chosen from an area of the Health Region not previously visited by this author, and the group was of sufficient size to enable a considerable data base of information to be collected. The almost equal sex breakdown of the subject sample group, as shown in Table 9.2, was both accidental and fortunate in that it avoided any possible sex bias in the overall results.

The age breakdown, as displayed in Table 9.1, showed that 55% of the subjects surveyed were aged 11 years at the time of the survey. Despite the majority of subjects therefore being from this one age group this author feels the results obtained from the survey would not be markedly different if the age groups of 10, 11, and 12 years of age were more equally represented, as a number of subjects offered to the examiners the information that they were close to a birthday. Had the survey been carried out, for example, one month later this author surmises that the proportion of 11 year olds in the survey group may have been noticeably smaller and the proportion of 10 and 12 year old subjects noticeably larger.

As mentioned on page 56, Chapter Five, the Dental Aesthetic Index was designed to be used on subjects with a full permanent dentition, and some subjects surveyed were still in the late mixed dentition stage of dental development. No formal count of the number of subjects in late mixed dentition was kept, although their number was estimated by the two examiners to be about 20% (about 60 subjects).

If a subject was in the stage of late mixed dentition, assessment of possible missing canines or premolars was made more difficult, as no radiographs were available. The examiners made allowance for the expected times of tooth eruption e.g. *"11 to 12 years of age for canines, with teeth usually expected to erupt earlier in girls than boys"* (Scott and Dixon 1972, p357) in the DAI assessment of each subject. This author does not feel that the number of subjects in late mixed dentition affected the overall DAI results markedly, as the DAI protocol was strictly followed by the examiners in scoring the DAI in that if there was any doubt as to whether or not, for example, a tooth was missing, the tooth was not recorded as missing.

In Chapter Five (The Dental Aesthetic Index) it was clearly stated that in DAI scoring the lesser score was always assigned if the assessment was doubtful (Cons et al 1986). It follows, therefore, that subjects who may have actually had, for example, missing teeth did not have those missing teeth recorded as part of their DAI assessment because of their developmental stage, and that if these subjects were assessed with the DAI at a later developmental stage their DAI could well be increased.

This author was aware of these types of problems in choosing the DAI as the occlusal index to be used for the subject age groups of this survey, but felt that strict adherence by examiners to the DAI scoring protocol minimised bias towards inflating DAI scores.

The racial breakdown of the sample group was unremarkable, as shown in Table 9.3 and discussed in Chapter Nine, and this author feels that no further discussion of this is required other than to note that there may well be different proportions of subjects of Aboriginal background in other areas of the New England Health Region.

#### The Dental Aesthetic Index Assessments.

The Dental Aesthetic Index protocol was strictly followed in examiner calibration before the survey was undertaken, and as the inter-examiner reliability was shown to be within the guidelines of the DAI requirements this author feels confident to pool the DAI data from the two examiners for analysis.

Some individual discussion is warranted for the separate occlusal parameters which contribute to the DAI.

#### Missing incisors, canines, and premolars:

Of the 321 subject group 5% (25) were recorded as having a missing tooth, as shown in Table 10.1, but whether these teeth were congenitally absent, unerupted due to impaction, or extracted, is indeterminable as no radiographs were available. Some subjects offered the information that a front tooth was missing due to trauma. The examiners recalled subjectively that most of the missing teeth were second premolars.

#### Crowded or spaced segments:

As shown in Figure 10.1, only 21% (69) of the subjects were assessed as having no crowding in the incisal segments, leading to the conclusion that for this subject group a crowded dentition is the norm. Consistent with

this finding , 76% (243) of the subject group had no spaced segments, as shown in Figure 10.2.

#### Diastema:

As evident in Figure 10.3, 67% of the subjects (216) had no diastema. It is possible that some of the subjects recorded as having a diastema could have this either reduce in size or close altogether with further growth and development of the dentition, particularly if the upper canines were not fully erupted at the time of the DAI assessment.

#### Maxillary and Mandibular Largest Irregularities:

As shown in Figure 10.4 of the full subject group only 25% (80) were assessed as having no maxillary irregularity, and 34% (108) of the subjects were assessed as having no mandibular irregularity (Figure 10.5). These results are consistent with the previous DAI occlusal parameters discussed in that the majority of subjects had some degree of dental crowding.

#### Positive and negative overjet:

As shown in Figure 10.6 the majority of subjects (76%, or 244 subjects ) had a positive overjet of 4mm or less, with the mean positive overjet of 2mm. The 4% (13) of subjects with a positive overjet of 7mm or more were regarded by this author as having a severe aesthetic problem. The raw data obtained in the survey as displayed in Appendix II shows that when a positive overjet was assessed as 6mm or more the subject often experienced teasing , although the small number of subjects seen in this study with overjets of this order prevents useful statistical comparison of positive overjet to incidence of teasing, as a much larger group of subjects would need to be surveyed to produce significance in this regard.

However, the subjective assessment of both examiners was that most positive overjets of 6mm, or more, attracted teasing from a majority of the subject's peer group.

Only 3% (11) of the subject group were assessed as having a negative overjet. This author would anticipate that an older age group may possibly reflect a greater number of subjects with greater negative overjet due to the generally later expression of Class III skeletal growth.

#### Anterior openbite:

Table 10.9 shows that only 3 subjects were assessed as having an anterior openbite. One could possibly conclude that habits causative of open-bites, such as sucking habits, were not so prevalent in this subject group, although this is conjecture by this author.

#### Molar relationship.

The assessed molar relationship of this subject group is as shown in Table 10.10, with 55% (175) of the subject group having a normal molar relationship as assessed by the DAI protocol. A total of 32% (102) of the subjects were assessed as having one posterior segment in a half-unit relationship, with 13% (44) of the subjects having a full-unit relationship on either the left-hand-side or the right-hand-side. The molar relationship was found by both examiners to be the most difficult occlusal parameter to assess, as the molar positions were sometimes borderline. When in doubt the DAI protocol was always followed in assigning the lesser score.

### Summary of discussion of DAI assessments.

Overall, both examiners found the DAI assessment to be fairly straightforward, quick to use, and extremely well tolerated by subjects due to its speed and lack of invasiveness. The DAI recording forms were easy to use, and the DAI calculations for each subject proved to be equally simple.

### Discussion of the Questionnaire and its Results.

Before discussing the results of the analyses between the Dental Aesthetic Index and the 11 Questions of the oral self-image Questionnaire, comment is required on the questionnaire content itself and on the relationship of each of the questions to the others.

#### Questionnaire discussion:

The questionnaire was designed to be as simple as possible for the subject group of 10 to 12 years of age, but was still intended to be comprehensive enough to measure and assess the psychosocial aspects of a subject's self-image of their teeth and smile.

Overall the subjects seemed to find the questionnaires simple to comprehend and answer. Having a separate question on each page of the questionnaire seemed to be effective in creating the desired sense of discipline this author thought to be necessary to guide the subjects through the Questionnaire in an orderly manner.

The supervision of the answering of the questionnaire was also thought by this author to be vital in ensuring no copying of answers or collusion by the subjects of this particular age group. Some schools had subjects who displayed admirable self-discipline and co-operative behaviour, whereas some schools required the Questionnaire supervisors to firmly and quickly

establish and then maintain an orderly and quiet atmosphere from the outset of the distribution of the questionnaire .

The answer form was apparently easy for the subjects to follow and use, and overall the format of the questionnaire seemed to be quite user friendly and well accepted.

The content of the questionnaire requires discussion. Any questionnaire consisting of only 11 questions cannot realistically be expected to assess psychosocial aspects of a subject's self-image of their teeth or smile on anything other than a superficial basis. The questions, however, were intended to be relevant to the aim of assessing how the subjects felt about the appearance of their teeth or their smile. The questions sought information from the subjects in the areas of possible peer group pressure related to a subject's dental appearance (Questions 4,5,6, and 11), or possible parental or family pressure or influence concerning a subject's dental appearance (Questions 7 and 8). The questions also sought information on a subject's self-assessment of the appearance of their teeth or smile (Questions 1,2,3,and 6) and additionally sought information on a subject's interest in having orthodontic treatment (Question 9 and Question 10).

The questions, therefore, examined a number of related areas of interest, and gathered information by either having a 'yes' or 'no' answer option, or by giving the subject the option of a graded answer response.

Questions 1,6,8,9, and 11 were answered by either a 'yes' or a 'no' response. Various pairings of these questions were investigated, the results showing significant differences with regard to the pattern of 'yes' or 'no' answers within each pairing.

These particular questions (answered with either a 'yes' or a 'no' answer response ) were designed so that consistent 'yes' answers would indicate a possible desire for orthodontic treatment (e.g. 'yes' to worries about their teeth, 'yes' to hiding their teeth when they smile, 'yes' to parents wanting them to have braces, 'yes' to have you ever been teased about your teeth or your smile) compared to the no responses to the same questions.

Question 1: " Do you have any worries about your teeth, even a small worry?" and Question 8 "Do you think your parents would like you to have braces to straighten your teeth" were to some extent unrelated but were answered quite similarly with respect to the number of 'yes' or 'no' responses.

This author feels that Question 1 is too general to be of much use in this type of questionnaire in that it was specifically seeking information to aid in orthodontic screening. Diverse concerns related to the subject having "any worries" about their teeth or their smile may have included a possible threat of dental injury from sport, or possible subject concerns about whether or not they may have had dental decay, or possible concerns for the subjects as to whether or not they were brushing their teeth properly, or a myriad of other problems could have been detected by Question 1 that were not relevant to the information this author was seeking. Any of these concerns mentioned, or even a possible combination of these concerns, could have been registered as a 'yes' response to this question.

Question 2: "How do you think your front teeth look?" was answered by one of the following five response options:

1. very good
2. quite good
3. average
4. not very good
5. bad

The results from Question 2 show that the 88% ( 280) of subjects thought their teeth looked 'average' or better than average. The subjects generally seemed to have a positive attitude about their own teeth and smile.

Question 3: "How happy are you with the appearance of your teeth?" was answered by the following five response options:

1. very happy
2. quite happy
3. just happy
4. not happy
5. very unhappy

As with Question 2, 87% (283) of the subjects indicated that they felt the appearance of their teeth was average or better than average.

Questions 2 and 3 obtained responses that were somewhat repetitive and one of these Questions could, in this author's view, be deleted without losing much information-gathering ability of the questionnaire.

Question 3 is, in this author's view, more relevant to the stated aims of the questionnaire than is Question 2 and, if necessary, Question 3 could be the one deleted in an abbreviated questionnaire.

Question 4: "Compared to your classmates, how do you think your teeth look?" was answered by one of the following five response options:

1. very good
2. reasonably good
3. average
4. not very good
5. bad

Again, this question was answered with a response pattern similar to those of Question 2 and Question 3, with 88% (267) of the subject group indicating they thought their teeth looked 'average' to 'very good', with a small number choosing the 'bad' answer option. Subject response options were consistently chosen from one graded question to the next, as shown in Tables 10.10; 10.11; and 10.12.

Question 5: "How do your classmates make you feel about your teeth or your smile?" was answered by one of five answer options:

1. very good
2. quite good
3. average
4. not very good
5. bad

Overall, slightly more subjects ( 92%, or 296 subjects ) chose responses 1,2, or 3 (average or better than average) showing strong consistency with the previous graded questions answered.

Question 6: "Do you ever try to hide your teeth when you smile?" was answered by either a 'yes' or a 'no' option.

Of the full subject group 26% (83) chose the 'yes' option and 74% (238) the 'no' option. It is of interest here to note that 25% (81) of the full subject group also chose to answer Question 9 "Are you interested in having braces?" with the 'yes' option. Examination of the raw data in Appendix II

shows that the 'yes' and 'no' responses obtained to Question 6 and Question 9 appeared to show a more consistent answering pattern than was obtained from the other questions answered by a 'yes' or a 'no' response, therefore further analysis of the responses to these questions was carried out. It was found that 59% (222) of the full subject group of 321 chose the 'no' response to both Question 6 and Question 9, 11% (35) of the subjects chose both 'yes' answer options, and 30% (64) of the subjects chose different answer options to Questions 6 and 9. i.e. both a 'yes' and a 'no' answer option, showing some consistency in the answering pattern between these two questions. However, as a third of the subjects answered these two questions differently, this author feels that the overall pattern of the answers to the Questionnaire needs to be analysed rather than attempting to reach an overall conclusion to the results obtained from any one single question.

Question 7: "How does your family make you feel about your teeth or your smile?" was answered by one of the following answer options:

1. very happy
2. reasonably happy
3. just OK
4. a bit unhappy
5. very unhappy

Of the subject group 94% (302) chose options 1, 2, or 3. This result differs only slightly from those from Question 5 and Question 4, indicating consistency in these answer patterns.

Question 8: "Do you think your parents would like you to have braces to straighten your teeth?" was answered with either a 'yes' or a 'no' response. Of the full subject group 36% (115) chose the 'yes' answer option.

Question 9: "Are you interested in having braces ?" was answered with either a 'yes' or a 'no' response, with 24% (78) choosing the 'yes' response. The difference in 'yes' response to Question 8 and Question 9 indicates to this author that the subjects may be aware of their parents' possible desire for them to have orthodontic treatment, but that there may have been different views on the matter.

There was no difference in the sex breakdown to the responses to this question, indicating that just as many males of this age group as females were interested in having braces.

Question 10: "If you are interested in having braces, how interested are you?" was answered by one of four answer responses:

1. very interested
2. reasonably interested
3. not very interested
4. not at all interested

Of the subject group of 321, 11% (36) stated that they were very interested , with a further 16% (51) choosing the reasonably interested option.

#### General comments on the questionnaire results.

Given that a single question that asks the subject to assess his or her satisfaction with their oral appearance was perhaps impossible to formulate, the questions on the oral self-image questionnaire represented an attempt by this author to ask a series of questions to assess one overall concept.

Therefore, if it is to be assumed that interpretation of the replies was more soundly justified when based on a pattern of replies rather than on a single reply to any one question it became necessary to document that the

questions did in fact deal with a single concept.

Due to the fact that a strong answering pattern existed between the Questions answered by the 'yes' or 'no' options, and also between those Questions answered by the graded responses, this author felt justified in supporting the assumption that the Questions of this questionnaire dealt with a single concept, the concept of a subject's self-image of their teeth and smile. Therefore it seemed justifiable to base further interpretations of the Questionnaire results on the patterns of replies across all 11 questions rather than upon each question separately.

As indicated in the results, Questions 1 and 8 were answered somewhat differently from Questions 6, 9, and 11, although overall these questions were investigating slightly different aspects of the subjects' self-assessment of their teeth and smile. However, as previously discussed, Question 1 was thought by this author to be of less value than the other questions asked.

This author took it to be encouraging that, even at the relatively young age of 10 to 12 years, the subjects surveyed indicated through the questionnaire responses that their desire for orthodontic treatment was more accurately a reflection of their own self-image of their teeth and smile rather than that from possible parental pressure, even though this parental pressure may still have been a factor in a subject's expressed desire for orthodontic treatment.

The statistically significant correlation between the DAI scores and the Question Index scores is a strong indication to this author that a measurable psychosocial aesthetic component exists with the dentitions of this particular subject group.

### Teasing.

Approximately 20% of the subjects indicated that they were teased about their teeth or their smile. The percentage of subjects teased almost coincided with the percentage of subjects indicating a desire for orthodontic treatment. Examination of the raw data in Appendix II shows that 13 subjects surveyed had a positive overjet of 8mm or more, and all indicated through the Questionnaire that they were teased. Examination of the raw data in Appendix II indicated that not all those teased wanted orthodontic treatment but there seemed to this author to be a strong association between teasing of a subject and their desire for orthodontic treatment, although a larger data base would be required to enable appropriate statistical investigation which could show significance.

It appeared from the raw data that when a subject's overjet was greater than 6-7mm the rate of teasing increased, with this degree of positive overjet being an arbitrary 'cut-off' point for social acceptability.

Other than positive overjet, no single occlusal factor appeared to have a strong relationship to a subject's self-image as indicated through the Question Index , and it appeared that the overall assessment of a subject's occlusion needed to be considered in assessing treatment 'need'. This author felt that no single occlusal measurement could present a strong relationship with a psychological assessment of a subject's dentition or appearance.

The results obtained from this survey, therefore, generally support the findings reported in the literature review of this thesis.

The results in this thesis, in particular, support the findings of Helm et

al (1985) in that teasing was directed much more often towards those children who have an obvious malocclusion, particularly when the positive overjet was greater than 9mm (when all children in Helm's study recalled being teased) whereas this study showed that all 13 subjects with a positive over-jet of 8mm or more were teased.

The results obtained in this thesis also support the findings of Haynes (1973), Bowden and Davis (1975) and Ingervall (1974) that the majority of subjects have some degree of malocclusion, if the description of an ideal occlusion as given by Angle (1899) is to be accepted. In this sense, some degree of malocclusion is the norm, and any third party attempting to assess an individual's priority for orthodontic treatment should concur with the view expressed by Locker (1988) that "*behavioural and subjective consequences of dental and oral conditions need to be considered.*"

The significant relationship obtained between the DAI assessment of the subjects (in this thesis) and the Question Index of this study supports the findings of Howitt et al (1967) in showing that there is a measurable degree of social disadvantage to most individuals resulting from an obvious malocclusion.

Darsey and Karabite (1977) indicated that the mother was the primary motive behind orthodontic treatment for a child. This may well be the case. However, the results from this thesis indicate that the subjects of the age group surveyed have fairly firm opinions concerning their own desire or lack of desire for orthodontic treatment, and this needs to be carefully evaluated and considered before any practitioner contemplates providing orthodontic treatment in an effort to minimize the number of non-compliant orthodontic patients.

### A Revised Questionnaire.

Although some questions within the Questionnaire are somewhat repetitive, they each examine a slightly different aspect of a subject's self-image of their teeth and smile. The Questionnaire was so simple and quick to use it seems unnecessary to this author to abbreviate it even further, as to do so would prevent some relevant information being gathered and possibly reduce the checks on the consistency of the information gathered.

However, if an abbreviated Questionnaire was desired, those Questions (Questions 1,2,6 and 7), which appeared to provide the more repetitive information, could be eliminated.

An abbreviated questionnaire, which still gathered sufficient information to aid in orthodontic screening of subjects aged 10 to 12 years of age, could consist of Questions 3,4,5,8,9,10, and 11 from the Questionnaire developed and used in this thesis.

In view of the encouraging results obtained from the combined use of the questionnaire with the Dental Aesthetic Index in this survey, this author feels that further development of their combined use is worthy of consideration in aiming to develop an orthodontic screening tool suitable for use by the State Orthodontic Service of New South Wales.

## CHAPTER TWELVE

### CONCLUSIONS

1. The Dental Aesthetic Index was tested for its use as a simple speedily applied Malocclusion Index suitable for use in orthodontic screening in New South Wales country areas serviced by the State Orthodontic Service.
2. In order to test the validity of the Index as well as to enhance its application a self-assessment questionnaire was also employed. In general, there was a direct relationship of the subject's DAI scores to their self-assessment questionnaire. Thus it was considered that the DAI is a valid measuring tool for assessing need/priority for orthodontic care.
3. The calibration exercises carried out before and during the field study showed encouraging agreement between the two examiners in employing the DAI.
4. The questionnaire revealed that approximately 24% of patients in the age group of 10 to 12 years of age in the New England Health Area were interested in having orthodontic treatment, with just less than half of these having expressed a very strong interest in treatment.
5. There was no sex difference found in the self-expressed desire for orthodontic treatment in subjects aged 10 to 12 years of age.
6. There was no sex difference found in the incidence of teasing in relation to the dento-facial appearance of the subject group tested.

7. The DAI, combined with a self-image assessment questionnaire, appears to have potential as a primary screening tool for determining referral of patients for further assessment by Orthodontic Service personnel. It would be necessary to provide a small amount of prior instruction for such screening as well as to set DAI scores for ongoing referral or not. The DAI would not preclude self-referral by patients.

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# APPENDIX I

1. PATIENT QUESTIONNAIRE
2. DAI SCORING FORM

Q 1.

Do you have any worries about your teeth, even a small worry ?

(put a circle around your answer)

*yes / no*

Q 2.

How do you think your front teeth look?

(put a circle around your answer)

*very good*

*quite good*

*average*

*not very good*

*bad*

Q 3.

How happy are you with the appearance of your teeth?

(put a circle around your answer)

*very happy*

*quite happy*

*just happy*

*not happy*

*very unhappy*

Q 4.

Compared to your classmates, how do you think  
your teeth look?

(put a circle around your answer)

*very good*

*reasonably good*

*average*

*not very good*

*bad*

Q 5.

How do your classmates make you feel about your teeth and your smile?

(put a circle around your answer)

*very good*

*quite good*

*average*

*not very good*

*bad*

Q 6

Do you ever try to hide your teeth when you smile?

(put a circle around your answer)

*yes / no*

Q 7.

How does your family make you feel about your teeth and your smile?

(put a circle around your answer)

*very happy*

*reasonably happy*

*just OK*

*a bit unhappy*

*very unhappy*

Q 8.

Do you think your parents would like you to have  
braces to straighten your teeth?

(put a circle around your answer)

*yes / no*

Q 9.

Are you interested in having braces?

(put a circle around your answer)

*yes / no*

Q 10.

If you are interested in having braces, how interested are you?

(put a circle around your answer)

*very interested*

*reasonably interested*

*not very interested*

*not at all interested*

Q 11

Have you ever been teased about your teeth or your smile?

(put a circle around your answer)

*yes / no.*

DENTAL AESTHETIC INDEX (DAI)  
RECORDING FORM

ID: \_\_\_\_\_ DATE: \_\_\_\_\_

NAME: \_\_\_\_\_ MALE: \_\_\_\_\_ FEMALE: \_\_\_\_\_ DATE OF BIRTH: \_\_\_\_\_

GEOGRAPHIC LOCATION: \_\_\_\_\_ ETHNIC GROUP: \_\_\_\_\_ EXAMINER: \_\_\_\_\_

CASES NEEDING REFERRAL FOR FURTHER EVALUATION

Gross Anomaly  \_\_\_\_\_ Describe \_\_\_\_\_

Cleft Lip or Palate  \_\_\_\_\_ Describe \_\_\_\_\_

Traumatic or Surgical Defect  \_\_\_\_\_ Describe \_\_\_\_\_

Deep Overbite Impinging on Gingival Tissue  \_\_\_\_\_ Describe \_\_\_\_\_

Have you ever had orthodontic treatment?  yes  no

Has any of your teeth been extracted to improve appearance?  yes  no

If yes, which teeth? \_\_\_\_\_  
Names of teeth

	A No or Score	B Wt	C
0 CONSTANT			13
1 Missing incisor, canine and premolar teeth-- Maxillary and Mandibular Enter total		4	
2 Crowding in the incisal segments 0 = no segment crowded 1 = segment crowded 2 = 2 segments crowded		1	
3 Spacing in the incisal segments 0 = no spacing 1 = 1 segment spaced 2 = 2 segment spaced		1	
4 Diastema in mm		3	
5 Largest anterior irregularity -- Maxilla (upper) in mm		1	
6 Largest anterior irregularity -- Mandible (lower) in mm		1	
7 Anterior Maxillary Overjet (upper) in mm		2	
8 Anterior Mandibular Overjet (lower) in mm		4	
9 Vertical anterior openbite in mm		4	
10 Antero-posterior molar relation Normal = 0 cusp = 1 Full cusp = 2		2	
11 TOTAL (add lines 0 through 11)			

DIRECTIONS FOR CALCULATION A DAI SCORE

For lines 1 - 10 multiply Column A by Column B and enter the result in Column C.  
Then add Column C including Line 0 to obtain DAI score.

COMMENTS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Please put a circle around your answer for each question.      Number.

---

**Question 1.**

*yes / no*

---

**Question 2.**

*very good      quite good      average      not very good      bad*

---

**Question 3.**

*very happy      quite happy      just happy      not very happy      very unhappy*

---

**Question 4.**

*very good      reasonably good      average      not very good      bad*

---

**Question 5**

*very good      quite good      average      not very good      bad*

---

**Question 6.**

*yes      no*

---

**Question 7.**

*very happy      reasonably happy      just OK      a bit unhappy      very unhappy*

---

**Question 8.**

*yes      no*

---

**Question 9.**

*yes      no*

---

**Question 10.**

*very interested      reasonably interested      not very interested      not at all interested*

---

**Question 11.**

*yes      no*

---

THANK YOU.

# APPENDIX II

## DAI RAW DATA



	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	
1	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	
2	12	12	12	12	12	12	12	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
3	M	M	M	M	M	M	M	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
5																												
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	
7	2	1	0	2	2	0	1	2	0	2	2	0	2	2	1	0	1	1	2	0	2	1	1	1	1	2	2	
8	0	0	1	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	1	0	0	2	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	1	0	0	
10	3	2	0	3	2	0	1	2	0	2	3	0	1	1	0	0	0	0	2	0	2	2	4	2	1	2	2	
11	3	0	2	2	2	0	0	1	0	2	2	0	1	1	2	0	2	2	0	0	2	0	0	0	2	4	2	
12	8	1	2	2	3	5	3	2	3	4	4	1	2	2	4	4	6	3	14	1	2	2	8	5	1	1	2	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
15	1	0	0	1	1	2	1	1	1	1	1	0	0	1	1	2	2	1	2	0	1	1	2	1	0	1	0	
16	39	18	23	26	27	34	26	24	25	27	30	16	21	24	29	25	32	24	49	15	25	33	42	31	20	25	23	
17																												
18	yes	no	no	no	no	no	yes	no	yes	no	no	no	no	no	yes	no	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	
19	4	2	2	3	1	2	4	4	3	2	1	1	2	2	2	1	3	3	4	3	3	4	4	3	3	3	2	
20	4	2	1	3	2	3	5	3	2	1	1	1	2	2	1	1	3	3	4	1	2	4	3	2	4	2	1	
21	4	1	1	2	2	4	3	2	1	1	1	1	2	1	1	1	3	3	4	2	3	4	3	2	4	2	2	
22	4	2	2	3	2	3	3	2	2	1	1	1	2	2	3	1	2	2	3	1	2	3	3	2	4	2	2	
23	yes	no	no	no	yes	no	no	yes	yes	no	no	no	no	yes	no	no	no	no	no	no	no	yes	no	yes	yes	yes	yes	
24	4	2	2	3	1	2	3	2	2	2	1	1	2	1	1	1	2	2	3	2	2	5	2	1	2	4	2	
25	yes	no	no	no	yes	no	yes	no	yes	yes	no	no	no	no	no	yes	no	no	no	no	no	yes	yes	no	yes	no	no	
26	yes	no	no	no	yes	no	yes	no	no	no	no	no	no	no	yes	no	no	no	yes	no	no	yes	yes	no	no	no	no	
27	3	1	3	3	3	1	4	2	1	1	1	4	1	2	3	1	1	1	4	1	1	4	4	1	3	2	2	
28	yes	no	no	yes	no	yes	no	no	no	no	no	no	no	no	no	no	yes	no	yes	no	no	yes	yes	no	no	no	no	
29	46	20	22	34	22	30	44	30	22	16	12	18	22	20	22	12	28	28	44	20	24	48	38	22	40	30	22	

	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU
1	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
5																											
6	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	0	0	1	0	0	0	1	1	2	0	2	0	2	0	2	1	2	1	1	0	1	2	2	2	1	0
8	0	0	2	0	1	0	1	0	1	0	2	0	2	0	1	0	0	0	0	0	1	0	0	0	0	0	2
9	0	0	2	0	2	0	1	0	2	0	2	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	1
10	2	0	0	2	0	0	0	2	3	2	0	0	0	2	0	3	0	1	2	2	0	2	2	2	1	2	0
11	0	0	0	0	0	0	0	1	3	1	0	2	0	2	0	1	2	3	0	0	0	0	1	1	1	0	0
12	2	0	2	2	2	3	2	3	3	0	5	2	5	1	2	4	8	3	0	5	3	2	2	2	2	2	2
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	1	0	0	1	0	0	1	0	2	0	2	0	0	1	2	1	1	1	1	0	1	0	0	0	1
16	20	13	27	20	24	21	21	23	35	18	35	25	32	21	21	29	40	27	33	28	25	20	24	22	21	20	24
17																											
18	yes	yes	yes	no	no	yes	yes	yes	yes	no	yes	yes	no	no	no	no	no	no	no	no	yes	no	no	yes	yes	no	no
19	2	2	3	2	1	3	2	2	3	3	4	3	3	2	2	3	4	3	3	3	1	3	4	4	2	2	2
20	1	1	3	1	1	2	3	2	3	2	4	2	3	2	1	3	3	3	2	2	2	2	3	3	2	2	2
21	2	1	2	2	1	2	2	3	3	2	4	3	4	2	2	2	4	3	3	3	1	2	2	4	2	2	2
22	2	3	2	1	1	3	2	2	3	2	3	2	3	2	1	4	4	3	3	3	1	2	2	1	3	2	3
23	no	yes	no	no	no	yes	no	yes	no	no	yes	yes	no	yes	no	no	no	no	no	no	no	no	no	yes	no	no	no
24	3	2	2	2	1	2	2	2	2	1	3	1	4	2	2	3	3	3	2	2	1	1	2	1	2	2	1
25	no	no	no	no	no	yes	no	yes	no	no	yes	no	no	yes	no	no	no	yes	no	no	no	no	yes	no	no	no	no
26	no	no	no	no	no	no	no	no	no	no	yes	no	no	yes	no	no	yes	no	no	no	no	no	yes	no	no	no	no
27	1	1	1	1	1	2	1	1	2	2	4	2	2	2	1	2	3	2	2	3	1	1	2	1	1	2	1
28	no	no	no	no	no	yes	no	no	no	no	yes	no	no	no	no	yes	yes	no	yes	no	no	no	no	yes	yes	no	no
29	22	20	26	18	12	28	24	24	32	24	44	26	38	24	18	34	42	34	30	32	14	22	28	24	24	24	22

	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV
1	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
5																											
6	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	1	2	2	2	2	1	2	1	0	2	2	2	1	1	2	1	1	2	0	2	2	1	2	1	1	0
8	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	1	0	0	1	0
9	0	0	0	0	0	0	2	2	1	2	2	0	2	0	1	0	0	0	0	1	0	0	1	3	0	0	1
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11	0	1	2	1	0	0	1	3	1	1	2	2	1	2	1	2	0	2	2	0	2	2	1	1	0	1	1
12	3	2	2	3	5	1	2	2	0	2	6	6	4	2	1	3	2	2	5	2	2	5	2	2	3	3	3
13	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	1	1	0	2	0	2	1	1	0	2	0	0	1	1	1	0	0	1	0	0	1	0	1	2	1	0
16	26	23	25	24	29	20	31	35	28	25	42	39	32	28	24	26	19	20	32	21	23	31	23	32	28	25	23
17																											
18	no	no	yes	no	no	no	yes	no	yes	yes	no	yes	yes	yes	no	yes	yes	no	no	no	no	yes	yes	no	yes	yes	no
19	3	2	3	2	3	3	3	2	2	2	3	4	3	3	1	2	3	2	2	2	3	4	3	2	1	3	2
20	2	2	2	2	3	3	4	3	2	3	1	4	3	2	2	2	2	1	2	2	3	4	3	3	3	3	1
21	2	1	2	2	2	2	3	3	3	4	2	3	2	2	2	2	1	2	2	2	3	3	1	1	1	2	
22	2	2	1	3	2	3	2	3	1	2	1	3	2	2	1	3	1	3	2	2	3	2	2	2	1	3	2
23	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	yes	no	no	no	no	yes	yes	no	no	no	no	no
24	2	3	2	3	3	2	2	3	2	2	1	2	2	1	1	2	2	2	1	2	1	4	3	1	1	5	1
25	no	no	yes	no	no	no	no	no	no	no	no	yes	no	no	yes	yes	no	no	no	no	no	yes	no	no	no	no	no
26	no	no	yes	no	no	no	no	no	no	no	no	yes	no	no	yes	yes	no	no	no	no	no	yes	no	no	no	no	no
27	2	1	2	2	2	2	1	1	1	2	1	4	2	1	2	3	1	1	1	1	1	4	1	1	3	2	3
28	no	no	no	no	yes	no	no	yes	yes	no	yes	no	no	no	no	no	no	no	no	no	no	no	no	no	yes	no	no
29	26	22	24	28	30	30	30	30	22	30	18	40	28	22	18	28	20	22	20	22	28	42	20	20	20	34	22

	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW
1	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126
2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	Ab	Ab	A	A
5																											
6	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
7	2	2	2	2	1	2	2	2	0	2	1	0	1	2	2	2	1	0	2	2	0	2	0	2	0	2	2
8	0	0	0	0	0	0	0	0	2	1	1	1	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0
9	1	0	0	1	2	3	0	2	4	1	1	1	2	4	2	3	1	2	2	2	0	1	0	0	0	0	0
10	1	1	2	2	3	3	3	1	2	2	0	0	2	4	2	3	1	2	2	2	0	1	0	1	0	3	2
11	2	3	1	2	0	1	2	2	0	0	2	0	1	3	1	1	0	0	1	1	0	1	0	1	0	2	1
12	1	2	2	3	2	4	6	5	2	3	3	3	2	4	2	1	0	2	2	3	4	2	2	2	2	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	0	0	1	1	0	1	0	1	1	0	1	1	1	0	0	0	0	0	1	1	0	0	0	0	0	1
16	25	23	22	30	29	31	34	34	57	29	26	25	27	35	22	29	19	20	22	26	24	22	17	21	17	24	20
17																											
18	no	no	no	yes	no	no	yes	no	yes	no	yes	yes	no	yes	no	no	no	no	no	no	no	yes	no	yes	no	no	no
19	3	3	3	2	3	2	3	3	4	2	4	3	2	3	3	3	1	1	2	2	3	2	2	2	1	3	1
20	3	3	2	3	3	3	2	2	3	2	4	2	2	3	1	3	1	1	1	1	2	2	2	2	1	2	1
21	2	2	3	2	3	2	3	1	4	2	3	3	2	3	2	3	1	1	1	1	2	2	2	1	1	2	1
22	3	3	1	2	4	3	3	2	4	3	1	1	2	3	2	3	1	1	2	2	1	2	2	1	1	1	3
23	no	no	no	no	yes	yes	no	no	no	no	no	no	no	yes	no	no	no	no	no	no	no	yes	no	no	no	no	no
24	3	2	1	2	3	2	2	3	3	2	1	2	2	4	1	3	1	2	1	1	1	1	2	1	1	1	1
25	yes	yes	yes	no	no	yes	no	yes	yes	no	no	no	no	yes	yes	yes	no	no	no	no	no	no	no	no	no	yes	no
26	no	no	yes	no	no	yes	yes	no	yes	no	no	yes	no	no	yes	no	no	no	no	no	no	no	yes	no	no	yes	no
27	1	1	3	1	1	4	3	1	4	2	1	3	1	3	3	1	1	1	1	1	1	1	3	1	2	4	1
28	no	yes	no	yes	no	yes	no	no	yes	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	yes
29	30	28	26	24	34	32	30	24	44	26	28	28	22	38	24	32	12	14	16	16	20	20	26	16	14	26	16

	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX
1	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153
2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
3	M	M	M	M	M	M	M	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	Ab	A	A	A	A	A	A	A	A	A	A
5																											
6	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
7	2	2	1	0	0	2	1	2	2	2	2	0	0	2	1	1	2	1	1	2	1	1	2	2	0	2	1
8	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	1	0	1	0	0	1	0	1	0	1	0	1
9	0	0	0	1	1	0	0	1	0	0	1	0	1	1	0	1	0	0	0	0	0	0	2	0	0	0	1
10	3	3	1	1	0	4	2	6	5	3	3	2	1	3	0	1	4	1	2	5	2	2	4	1	0	2	1
11	2	2	1	0	1	2	0	4	3	2	2	1	0	2	2	1	1	1	0	4	1	0	1	1	0	1	1
12	4	0	2	2	4	8	2	4	3	1	2	3	1	4	1	2	1	2	1	1	2	9	1	3	1	2	1
13	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	0	0	0	1	2	0	1	1	0	1	0	0	1	1	1	0	1	0	1	0	2	2	0	0	0	0
16	30	24	20	22	28	41	20	42	31	22	29	24	20	33	20	26	26	23	18	28	22	41	33	23	16	22	21
17																											
18	no	no	no	no	no	yes	no	no	no	yes	no	no	no	no	no	no	no	no	no	yes	no	yes	no	no	no	no	no
19	3	3	2	2	1	4	3	3	3	3	2	2	2	2	1	1	3	3	2	4	2	3	4	2	2	3	1
20	3	2	1	1	4	3	1	4	3	4	1	2	2	2	1	1	2	3	2	3	2	3	4	2	1	2	3
21	3	2	2	1	2	4	2	4	3	4	1	2	2	1	2	1	2	3	2	3	3	1	4	3	1	2	1
22	3	1	3	3	3	4	3	4	2	3	1	3	3	4	1	1	2	3	2	2	2	3	3	1	2	1	1
23	no	no	no	no	yes	yes	no	no	yes	yes	no	no	yes	yes	no	no	no	no	no	yes	yes	no	no	no	no	no	yes
24	2	1	1	1	3	2	2	3	3	2	1	2	3	3	3	1	2	3	1	1	3	4	4	1	2	1	3
25	yes	yes	no	no	no	yes	yes	yes	no	yes	no	no	no	no	no	no	no	no	no	no	yes	yes	yes	no	no	yes	no
26	no	yes	no	no	yes	yes	yes	yes	no	no	no	no	no	no	no	no	no	no	no	yes	yes	yes	yes	no	no	no	no
27	3	4	1	1	3	4	3	4	2	2	1	1	2	1	2	2	1	1	1	4	1	3	3	1	2	2	1
28	no	no	no	no	no	yes	no	no	no	no	no	no	no	yes	no	no	no	no	no	no	no	yes	no	no	no	yes	no
29	34	26	20	18	32	42	28	44	32	36	14	20	28	26	20	14	24	32	20	34	26	34	44	20	20	22	20

	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY
1	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
3	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	Ab	Ab	A	A	A	A	A	A	A	A
5																											
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7	0	2	2	2	2	2	0	2	2	0	1	0	2	2	1	2	1	1	1	1	2	1	1	2	1	1	1
8	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
9	0	0	1	1	0	0	3	0	0	0	0	3	0	0	0	0	1	0	0	1	0	0	0	0	1	0	1
10	2	1	2	1	1	2	0	3	5	1	0	2	1	7	0	2	1	0	0	2	3	1	2	2	1	2	2
11	0	1	1	1	2	3	0	4	3	2	1	2	1	3	2	1	0	2	0	1	2	0	0	1	1	1	1
12	2	3	1	5	4	3	5	4	3	2	1	5	4	3	2	2	5	3	2	3	2	2	2	1	2	2	2
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	2	1	1	2	2	0	0	0	0	0	1	1	2	1	0	2	0	1	0	1	0	0	1	0	1	1
16	23	27	25	32	30	30	32	30	29	20	17	40	27	35	26	22	33	22	19	25	28	19	21	22	23	23	27
17																											
18	no	no	no	yes	no	yes	yes	yes	yes	yes	no	yes	no	yes	yes	no	yes	no	no	no	no	no	yes	no	yes	no	no
19	2	2	1	4	3	3	3	5	3	2	2	4	2	2	3	3	3	2	1	3	2	2	2	1	3	1	2
20	1	3	1	3	3	3	3	3	2	2	2	3	3	3	2	4	4	1	2	3	1	3	3	2	2	1	2
21	5	3	2	3	3	3	3	3	3	1	2	4	2	4	2	4	4	1	1	2	2	2	2	1	4	1	1
22	4	3	1	3	3	1	2	4	2	1	2	2	3	4	3	3	3	1	1	2	2	2	3	3	2	1	1
23	no	yes	no	yes	yes	yes	yes	yes	no	no	no	no	no	no	no	yes	no	no	no	yes	no	no	yes	yes	no	no	no
24	3	2	2	3	3	1	2	4	1	1	2	2	1	2	2	3	2	1	1	3	2	3	1	1	1	1	1
25	yes	yes	no	yes	no	no	yes	yes	yes	yes	no	yes	no	yes	no	yes	yes	yes	yes	no	no	no	no	no	no	no	no
26	no	no	no	yes	no	no	yes	yes	no	yes	no	no	no	yes	no	yes	no	no	no	no	no	no	no	no	no	no	no
27	2	2	1	3	2	2	4	4	1	2	1	2	1	4	2	3	2	2	1	1	2	2	1	1	1	1	1
28	no	yes	no	yes	no	no	yes	no	no	no	no	no	no	yes	no	no	yes	no	no	no	no	no	no	no	no	no	no
29	34	30	16	38	34	26	34	46	24	18	22	34	24	38	28	40	36	16	14	28	22	28	24	18	26	12	16

	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ
1	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	10
3	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	M	M	M	M	M	M
4	A	A	A	A	A	A	A	Ab	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
5																											
6	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	2	0	2	2	1	2	0	0	0	0	2	0	0	0	0	0	2	0	1	2	1	2	2	0	1	2	1
8	0	1	0	0	1	0	1	0	0	1	0	1	0	1	0	1	0	1	0	0	0	0	0	1	1	0	0
9	0	1	0	0	2	0	0	2	0	0	0	2	0	1	0	0	0	2	0	0	0	0	0	1	0	0	1
10	2	2	1	1	2	3	2	2	2	2	2	0	0	0	0	0	2	0	2	1	2	2	1	0	1	1	2
11	1	0	1	2	1	2	2	0	0	1	2	0	1	1	0	0	1	0	0	2	0	3	1	0	1	3	0
12	0	10	2	3	2	5	2	4	2	1	3	4	0	2	2	3	4	3	2	3	2	6	2	3	4	3	2
13	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
15	0	2	0	0	2	0	0	2	0	1	0	0	1	0	0	0	1	1	1	0	0	1	0	0	1	1	0
16	18	43	21	24	22	40	23	34	19	21	25	28	32	22	17	20	28	28	22	28	20	34	21	23	27	27	23
17																											
18	no	yes	no	no	yes	no	yes	no	no	no	yes	yes	no	no	no	no	yes	yes	yes	no	no	yes	no	yes	no	yes	yes
19	2	4	2	3	2	4	2	2	1	1	1	1	2	2	2	1	2	2	2	2	2	2	1	1	3	4	2
20	2	3	2	3	3	3	3	3	1	1	2	1	1	1	2	1	2	2	1	2	1	2	1	1	3	5	2
21	1	5	1	3	2	3	3	2	1	2	1	1	4	2	2	3	2	2	1	2	1	2	1	1	3	2	2
22	1	3	1	2	2	3	2	1	1	1	2	1	1	2	2	1	1	2	2	3	2	3	1	2	2	2	2
23	no	yes	no	yes	no	yes	no	no	no	no	no	no	no	no	no	no	yes	yes	no	no	no	yes	no	yes	no	yes	no
24	1	3	1	2	3	2	2	3	1	1	5	1	1	2	2	1	1	1	1	2	2	1	1	3	2	3	1
25	no	no	yes	yes	yes	yes	no	yes	no	yes	yes	no	no	no	no	no	no	yes	yes	no	yes	yes	no	n	no	yes	no
26	no	yes	no	no	yes	yes	no	no	no	no	yes	yes	no	no	no	no	yes	no	no	no	no	yes	no	n	no	no	no
27	1	4	2	4	2	4	1	1	2	2	4	4	2	1	1	1	3	1	1	2	1	2	1	1	1	2	1
28	no	yes	no	no	no	no	no	no	no	no	no	no	yes	no	no	no	no	no	no	no	no	no	no	no	no	no	no
29	16	44	18	34	28	38	26	24	14	16	30	20	22	20	22	16	22	16	14	26	18	24	12	18	28	36	20

	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA
1	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234
2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	12	12	12	12
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	F	F	F	F	F	F
4	Ab	A	A	A	A	A	A	A	A	A	A	A	Ab	A	Ab	A	A	A	A	A	A	A	A	A	A	A	A
5																											
6	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
7	2	0	2	2	2	1	1	2	2	1	1	2	0	1	0	0	0	1	1	1	0	2	2	1	2	0	1
8	1	1	0	0	1	1	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0
9	0	2	0	0	2	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
10	2	0	2	4	4	3	2	1	3	2	2	1	1	2	0	1	0	1	1	0	0	1	2	0	1	0	2
11	1	0	2	4	2	0	0	1	1	0	0	1	1	0	0	0	0	0	0	2	0	2	2	1	1	0	0
12	3	4	4	2	4	1	2	4	2	2	3	3	1	5	1	5	2	2	2	1	3	1	5	1	0	2	2
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	1	0	1	0	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	1	0	0	1
16	25	30	27	37	33	25	20	27	23	24	22	23	19	28	15	32	18	19	17	20	21	22	29	24	17	20	22
17																											
18	yes	no	no	yes	no	no	no	no	no	no	no	yes	no	no	no	yes	no	no	no	no	no	no	yes	yes	no	no	no
19	2	1	2	3	2	2	2	2	3	3	1	3	1	2	2	4	1	1	1	2	2	2	3	2	2	2	2
20	2	1	2	3	3	1	2	1	3	4	2	3	1	1	2	3	1	1	1	2	2	2	3	3	2	1	2
21	2	1	2	3	2	3	3	2	4	3	2	2	1	2	2	2	1	2	1	1	2	2	2	3	2	1	2
22	2	2	2	2	1	2	2	1	3	2	2	2	2	1	2	3	2	2	1	1	1	3	2	1	2	1	1
23	no	no	no	yes	yes	no	no	no	no	yes	no	no	no	no	yes	yes	no	no	no	no	no	yes	no	no	no	no	no
24	1	1	2	2	1	2	2	1	3	4	1	3	1	1	1	3	2	1	1	1	1	1	1	3	2	1	1
25	no	no	no	no	no	yes	no	yes	yes	yes	no	yes	no	no	no	no	no	no	no	yes	no	yes	no	no	no	no	yes
26	no	no	no	no	no	no	no	no	no	yes	no	yes	no	no	no	yes	no	no	no	no	no	yes	no	no	no	no	yes
27	1	1	2	3	3	1	2	1	3	4	1	3	2	1	1	2	1	1	1	2	1	3	2	1	1	1	1
28	no	no	no	no	no	no	no	no	no	yes	no	no	no	no	no	no	no	no	no	no	no	yes	no	no	no	no	no
29	20	14	24	32	24	22	26	16	38	40	18	32	16	16	20	34	16	16	12	18	18	26	26	26	22	14	18

	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	
1	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	0	1	2	3		
2	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12						
3	F	F	F	F	F	F	F	F	F	M	M	M	M	M	M	M						
4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A						
5																						
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
7	2	2	1	1	1	1	2	0	1	1	2	1	2	0	1	2						
8	0	0	0	0	1	0	0	2	0	1	0	0	0	1	0	0						
9	0	0	0	0	0	0	0	2	0	4	0	0	0	0	1	0						
10	2	2	1	0	2	1	3	4	0	0	4	0	1	0	0	3						
11	2	3	2	2	1	0	2	0	1	2	6	1	2	0	2	3						
12	3	5	2	4	5	3	5	8	3	4	4	3	3	2	2	3						
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
15	1	1	0	0	0	0	1	2	0	1	1	1	1	1	0	0						
16	27	32	21	24	28	21	32	45	22	39	38	23	26	20	23	27	13	13	13	13	13	13
17																						
18	yes	yes	yes	yes	no	no	no	yes	yes	yes	no	yes	no	no	no	yes						
19	3	3	2	5	1	1	1	4	3	3	3	2	2	1	1	2						
20	2	4	3	5	1	1	1	4	3	1	4	2	2	1	1	2						
21	3	3	2	5	1	1	1	4	2	1	3	2	2	1	1	1						
22	2	2	2	5	1	3	1	4	3	4	3	2	1	1	2	2						
23	no	yes	no	yes	no	no	no	yes	no	no	no	no	no	no	no	no						
24	3	1	1	5	1	1	1	3	2	3	3	2	1	1	3	2						
25	no	yes	yes	yes	no	yes	no	yes	no	yes	yes	no	yes	no	yes	yes						
26	no	no	yes	yes	yes	no	yes	yes	no	no	yes	no	yes	no	no	no						
27	2	3	3	4	2	1	2	3	2	3	3	2	3	1	1	3						
28	no	yes	no	yes	yes	no	no	yes	no	yes	yes	no	no	no	no	yes						
29	30	32	26	58	14	16	14	44	30	30	38	24	22	12	18	24						



	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
31	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295
32	10	10	10	10	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
33	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
34	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
35																											
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
37	2	2	2	2	2	0	2	2	2	2	2	2	2	0	2	0	1	1	2	2	2	1	2	1	2	2	2
38	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
39	1	1	0	0	0	0	0	1	0	0	0	1	0	0	1	1	1	1	0	0	0	0	0	0	1	0	0
40	2	3	1	3	3	0	1	3	2	2	2	2	3	0	3	0	2	1	2	3	1	3	1	2	3	3	1
41	2	4	1	3	2	0	1	2	2	2	1	2	2	0	2	0	0	0	1	2	0	4	2	0	3	3	1
42	5	2	1	4	5	2	2	6	4	2	2	2	3	2	5	5	7	2	2	2	2	0	1	2	7	5	2
43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0
45	1	1	1	1	1	0	1	2	1	2	0	0	1	0	2	2	2	0	0	0	0	0	0	0	2	1	1
46	34	31	21	34	32	18	23	39	29	27	22	26	28	17	37	31	37	22	22	24	19	30	28	20	46	45	23
47																											
48	no	yes	no	yes	no	yes	no	yes	no	no	no	no	yes	no	yes	no	yes	no	no	no	no	no	no	no	yes	no	no
49	2	1	2	2	3	3	1	5	4	1	3	4	3	2	4	2	5	2	2	2	2	2	1	2	4	2	3
50	1	1	3	2	3	4	1	5	4	2	3	4	4	1	4	2	4	3	2	3	2	2	3	2	4	3	4
51	1	1	2	2	3	3	2	5	3	2	2	3	2	1	4	2	5	2	2	3	1	2	3	1	3	2	2
52	1	3	3	2	3	2	3	5	3	3	2	4	1	2	2	1	4	2	3	2	2	3	2	3	3	1	1
53	no	no	no	no	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	no	no	no	no	no	no	no	no	no
54	1	1	2	2	2	1	3	5	3	1	2	2	2	1	3	1	3	2	2	2	2	2	2	2	3	1	1
55	yes	yes	no	yes	no	no	no	yes	no	no	no	yes	yes	no	yes	no	yes	no	no	no	no	no	no	no	yes	yes	no
56	no	yes	no	no	no	no	yes	yes	no	no	no	yes	yes	no	yes	no	yes	no	no	no	no	no	no	no	no	no	no
57	1	3	1	2	2	1	3	4	2	1	1	3	3	1	3	2	4	2	2	1	1	2	1	3	3	1	1
58	no	no	no	no	yes	no	no	yes	no	no	no	yes	no	no	yes	no	yes	no	no	no	no	no	no	no	yes	no	no
59	14	20	26	24	32	28	26	58	38	20	26	40	30	16	40	20	50	26	26	26	20	22	28	20	40	20	24

	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	
31	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	
32	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
33	F	F	F	F	F	F	F	F	F	F	F	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
34	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
35																												
36	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
37	2	0	2	2	1	2	2	1	2	2	2	0	2	0	1	1	1	2	1	2	0	2	1	0	1	0	2	
38	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	
39	1	1	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	
40	3	1	1	2	0	2	2	1	4	3	1	0	2	0	2	0	0	3	2	1	0	2	1	0	0	0	2	
41	1	1	1	1	1	1	2	0	2	3	1	0	1	0	0	1	2	2	1	1	0	3	0	0	2	2		
42	10	2	2	3	2	3	0	1	3	2	2	2	3	3	3	2	5	3	1	1	8	2	2	3	2	3		
43	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
45	2	0	1	0	0	0	1	0	1	2	0	0	1	0	1	1	1	2	1	1	2	0	0	0	0	0	2	
46	46	23	23	24	29	24	29	17	29	30	21	21	26	23	24	25	28	30	21	21	40	24	19	19	21	29		
47																												
48	yes	no	no	no	no	no	yes	no	yes	no	no	yes	yes	no	no	yes	no	no	no	yes	yes	yes	no	no	no	no	no	
49	3	2	3	3	3	1	4	3	5	2	3	3	1	1	2	1	2	3	4	2	3	3	1	4	1	4		
50	4	2	4	2	3	1	3	3	5	2	2	3	1	1	2	3	1	2	3	1	3	2	1	3	3	3		
51	4	2	2	2	3	1	2	3	5	1	2	3	1	1	1	3	1	3	4	2	4	3	1	4	2	4		
52	4	1	1	2	3	1	3	3	3	1	2	4	2	1	4	2	1	3	3	1	2	1	1	3	2	2		
53	yes	yes	no	no	no	no	yes	no	yes	no	no	no	yes	no	yes	no	no	no	no	no	yes	no	no	yes	no	yes	yes	
54	4	2	1	1	2	1	2	2	4	3	2	3	3	1	3	2	1	2	3	3	2	2	3	4	2	3		
55	yes	no	no	no	no	no	no	no	yes	yes	yes	no	yes	no	no	no	no	no	no	no	yes	no	no	yes	no	yes	yes	
56	yes	no	no	no	no	no	no	no	yes	yes	no	no	yes	no	no	yes	no	no	no	no	yes	yes	no	yes	no	yes	yes	
57	4	1	1	3	1	1	1	1	4	4	1	1	4	1	1	1	1	1	2	1	4	3	2	3	2	3		
58	yes	no	no	no	no	no	no	no	no	no	no	yes	yes	no	no	no	no	no	no	no	yes	no	no	yes	yes	yes	yes	
59	46	20	24	26	30	12	30	30	52	26	24	34	24	12	26	24	14	28	38	20	36	28	18	42	24	38		

**DEPARTMENT LIBRARY**  
 UNIVERSITY OF SYDNEY