Thresholds for Clinically Significant Tooth-Size Discrepancy

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ABSTRACT

Objective: To determine an appropriate threshold for clinically significant tooth-size discrepancy using both a Bolton standard deviation (SD) definition and a millimetric definition.

Materials and Methods: Mesiodistal tooth widths were measured in 250 pretreatment dental casts of patients with Class I, Class II, and Class III malocclusions. The anterior and overall ratios and the required amount of maxillary and mandibular corrections were calculated. The casts were divided into small, normal, and large groups according to the anterior and overall ratios categorized by the Bolton SD definition, and into small, normal, and large groups according to the required amount of maxillary and mandibular corrections expressed in millimeters.

Results: The small and large anterior ratio groups which fell under the category of the 2 SD threshold did not always need maxillary or mandibular corrections greater than 2 mm, while the small and large overall ratio groups always needed maxillary and mandibular corrections greater than 2 mm. The small and large maxillary correction groups in the 2 mm threshold category did not always have anterior or overall ratios greater than 2 SDs from the Bolton mean. However, the small and large mandibular correction groups always had anterior ratios greater than 2 SDs and did not always have overall ratios greater than 2 SDs.

Conclusions: The tooth-size discrepancies could be better expressed in terms of both percentage and actual amount of millimeters required for correction. The ratios outside 2 SDs from the Bolton mean and the discrepancies requiring more than 2 mm of maxillary and/or mandibular corrections are recommendable as the appropriate thresholds for clinical significance. (*Angle Orthod.* 2009; 79:740–746.)

KEY WORDS: Tooth-size discrepancy; Anterior ratio; Overall ratio; Maxillary correction; Mandibular correction

INTRODUCTION

A tooth-size discrepancy is defined as a disproportion among the sizes of maxillary and mandibular teeth.[1] An estimation of the tooth-size discrepancy has been commonly made based on Bolton anterior and overall ratios.[2,3] The Bolton anterior ratio, which was defined as the ratio of the summed mesiodistal widths of six mandibular anterior teeth to the summed mesiodistal widths of six maxillary anterior teeth, from canine to canine, was 77.2 with a standard deviation (SD) of 1.65.[2,3] The Bolton overall ratio, which was defined as the ratio of the summed mesiodistal widths of 12 mandibular teeth to those of 12 maxillary teeth, from one first permanent molar to the other first permanent molar, was 91.3 with a SD of 1.91.[2,3]

Some pieces of evidence point to sex and racial/ethnic differences in tooth-size ratios.[4,5] Some researchers reported no significant differences in either anterior or overall ratios among different malocclusion groups.[6–9] Others indicated statistically significant associations between tooth-size ratios and malocclusion types.[10,11] Still other studies reported that the overall ratios decreased after extraction of any combination of premolars and that the decreases were especially noteworthy in combina-

Table 1. Anterior and Overall Ratios in Each Malocclusion Group and Each Sex

	Anterior Ratio						Overall Ratio					
	Male		Female		ANOVA		Male		Female		ANOVA	
Malocclusion Group	Mean	SD	Mean	SD	Source	P Value	Mean	SD	Mean	SD	Source	P Value
Class I	77.97	2.55	77.74	2.39	Sexes	.54	91.14	2.33	91.15	1.99	Sexes	.38
Class II	78.22	2.25	78.07	2.41	Malocclusion types	.67	91.47	1.91	91.66	2.65	Malocclusion types	.34
Class III	77.39	1.93	78.31	2.29	Interaction	.23	91.28	1.53	91.81	2.12	Interaction	.73

tions of all second premolars and of the maxillary second and mandibular first premolars.[9,12]

The amount of SD from the Bolton mean of any measured ratio and the millimetric amount of maxillary and mandibular corrections are used as indicators of clinically significant tooth-size discrepancy. Several studies defined the ratios outside 2 SDs from the Bolton mean as values indicating clinically significant tooth-size discrepancies,[6–8,10,11,13–15] while some other studies defined the ratios outside 1 SD from Bolton mean[11,16] because Bolton[3] suggested that a value greater than 1 SD from his mean indicated a possible treatment need. From a clinical perspective, the actual amount of discrepancy expressed in millimeters provides more useful information on the correction for clinically significant tooth-size discrepancy than the ratio in percentage terms.[8,17] In practice, maxillary and mandibular corrections are mostly made after working out the amount of discrepancy in millimeters to give the Bolton mean. Some investigators[8,9,17,18] selected 1.5 mm as an appropriate threshold for clinical significance of discrepancy, quoting Proffit and Ackerman[1] as stating that the tooth-size discrepancies less than 1.5 mm were rarely significant. Othman and Harradine[17] stated that the tooth-size discrepancy of 1.5 mm was only 0.75 mm per side, and this might be consid-

ered too small a potential occlusal error to be clinically significant, and concluded that 2 mm of required tooth-size correction is an appropriate threshold for clinically significant tooth-size discrepancy. It remains an open question how the clinically significant tooth-size discrepancy values determined by the Bolton SD definition are compatible with those expressed by the use of the millimetric definition and what amount of tooth-size discrepancy is of clinical importance.

The purpose of this study is to investigate the appropriate threshold for clinically significant tooth-size discrepancy using both the Bolton SD definition and the millimetric definition.

MATERIALS AND METHODS

A total of 250 pretreatment dental casts were used. They were derived from Japanese subjects with different malocclusions who had been retrospectively selected from among orthodontic patients at our clinics in The Nippon Dental University Niigata Hospital (Niigata, Japan). They fell into any one of three malocclusion groups—Angle Class I, Class II, and Class III. The selection criteria of the casts were (1) a fully erupted permanent dentition with only the third molars unerupted, (2) good-quality pretreatment casts, (3) no

Table 2. Numbers and Percentages of Subjects With Different Maxillary and Mandibular Corrections in Each Anterior Ratio Group

Anterior Ratio Group	Anterior Ratio (%)	N	Maxillary Correction, mm[a]					Mandibular Correction, mm[a]				
			≤−2.01	−2.00– −1.51	−1.50– 1.50	1.51– 2.00	≥2.01	≤−2.01	−2.00– −1.51	−1.50– 1.50	1.51– 2.00	≥2.01
1 SD Threshold												
Small group	≤75.54	31	13 (41.9)	9 (29.0)	9 (29.0)	0	0	0	0	18 (58.1)	6 (19.4)	7 (22.5)
Normal group	75.55–78.85	130	0	0	130 (100.0)	0	0	0	0	130 (100.0)	0	0
Large group	≥78.86	89	0	0	33 (37.1)	21 (23.6)	35 (39.3)	11 (12.4)	24 (27.0)	54 (60.7)	0	0
2 SD Threshold												
Small group	≤73.89	10	10 (100.0)	0	0	0	0	0	0	0	3 (30.0)	7 (70.0)
Normal group	73.9–80.5	207	3 (1.4)	9 (4.3)	172 (83.4)	19 (9.2)	4 (1.9)	0	4 (1.9)	200 (96.6)	3 (1.4)	0
Large group	≥80.51	33	0	0	0	2 (6.1)	31 (93.9)	11 (33.3)	20 (60.6)	2 (6.1)	0	0

[a] Percentage in parentheses.

Table 3. Anterior Correction in Each Anterior Ratio Group

Anterior Ratio Group	Maxillary Correction		Mandibular Correction	
	Mean, mm	SD	Mean, mm	SD
1 SD Threshold				
Small group	−2.01	0.74	1.55	0.57
Normal group	0.04	0.59	−0.03	0.45
Large group	1.89	0.83	−1.46	0.64
2 SD Threshold				
Small group	−2.93	0.50	2.26	0.38
Normal group	0.25	0.99	−0.19	0.77
Large group	2.68	0.85	−2.07	0.66

Table 5. Overall Correction in Each Overall Ratio Group

Overall ratio group	Maxillary Correction		Mandibular Correction	
	Mean, mm	SD	Mean, mm	SD
1 SD Threshold				
Small group	−3.39	1.00	3.10	0.91
Normal group	0.10	1.13	−0.09	1.03
Large group	3.46	1.48	−3.16	1.35
2 SD Threshold				
Small group	−4.84	0.56	4.42	0.51
Normal group	0.11	1.84	−0.10	1.68
Large group	6.16	1.62	−5.63	1.48

tooth agenesis or extractions, (4) no mesiodistal restorations or abrasion, and (5) no tooth anomalies. Class I, Class II, and Class III malocclusion groups consisted of 101 (42 male and 59 female), 78 (36 male and 42 female), and 71 (36 male and 35 female) casts, respectively.

Digital calipers were used to measure the mesiodistal widths from first molar to first molar to the nearest 0.01 mm on each cast. The mesiodistal width of each tooth was measured at the greatest distance between the contact points on the proximal surfaces. All measurements were performed by one investigator. The anterior and overall ratios and the required amounts of maxillary and mandibular corrections were calculated.

Thirty pairs of dental casts were randomly selected 1 month later, and the mesiodistal tooth widths were again measured by the same investigator. The anterior and overall ratios and the amounts of maxillary and mandibular corrections were calculated by the same method. A paired *t*-test showed that no statistically significant differences were found between the first and second measurements of 30 pairs of dental casts (P

$> .05$). Random errors, which were assessed by calculating the standard deviation of the differences between the first and second measurements, were found to be less than 0.65% and 0.72% for the anterior and overall ratios, respectively, and less than 0.8 mm and 0.73 mm for the maxillary and mandibular corrections, respectively, which are regarded as unlikely to spoil the significant results in this study.[17]

As a two-way analysis of variance (ANOVA) indicated no significant differences in anterior and overall ratios between sexes ($P = .54$ and $P = .38$, respectively) or between malocclusion types ($P = .67$ and $P = .34$, respectively), and no significant interaction between two variables ($P = .23$ and $P = .73$, respectively), all malocclusion groups were combined for the rest of the analyses (Table 1).

Calculations were made to determine the distributions of those subjects with the anterior and overall tooth size discrepancies outside 1 SD and 2 SDs from the Bolton mean (anterior ratio 77.2 $\pm$ 1.65; overall ratio 91.3% $\pm$ 1.91) and of those requiring more than 1.5 mm and 2.0 mm of maxillary or mandibular correction to give the Bolton mean anterior and overall

Table 4. Numbers and Percentages of Subjects With Different Maxillary and Mandibular Corrections in Each Overall Ratio Group

Overall Ratio Group	Overall Ratio (%)	N	Maxillary Correction, mm[a]					Mandibular Correction, mm[a]				
			≤−2.01	−2.00– −1.51	−1.50– 1.50	1.51– 2.00	≥2.01	≤−2.01	−2.00– −1.51	−1.50– 1.50	1.51– 2.00	≥2.01
1 SD Threshold												
Small group	≤89.38	41	41 (100.0)	0	0	0	0	0	0	0	2 (4.9)	39 (95.1)
Normal group	89.39–93.21	168	3 (1.8)	14 (8.3)	131 (78.0)	17 (10.1)	3 (1.8)	0	14 (8.3)	141 (83.9)	13 (7.7)	0
Large group	≥93.22	41	0	0	0	0	41 (100.0)	38 (92.7)	3 (7.3)	0	0	0
2 SD Threshold												
Small group	≤87.47	10	10 (100.0)	0	0	0	0	0	0	0	0	10 (100.0)
Normal group	87.48–95.12	233	34 (14.6)	14 (6.0)	131 (56.2)	17 (7.3)	37 (15.9)	31 (13.3)	17 (7.3)	141 (60.5)	15 (6.4)	29 (12.5)
Large group	≥95.13	7	0	0	0	0	7 (100.0)	7 (100.0)	0	0	0	0

[a] Percentage in parentheses.

ratios. Then, all of the subjects were subdivided by the Bolton SD definition (anterior and overall ratios) and the millimetric definition (mm) into two, each consisting of three groups. Three anterior ratio groups with the threshold of 1 SD or 2 SDs were: (1) small anterior ratio group (<75.55% or <73.90%, respectively), (2) normal anterior ratio group (between 75.55% and 78.85% or between 73.90% and 80.50%, respectively), and (3) large anterior ratio group (>78.85% or >80.50%, respectively). Three overall ratio groups with the threshold of 1 SD or 2 SDs were: (1) small overall ratio group (<89.39% or <87.48%, respectively), (2) normal overall ratio group (between 89.39% and 93.21% or between 87.48% and 95.12%, respectively), and (3) large overall ratio group (>93.21% or >95.12%, respectively). Both maxillary and mandibular correction groups with the threshold of 1.5 mm or 2 mm were: (1) small correction group (less than −1.5 mm or less than −2 mm, respectively), (2) normal correction group (between ±1.5 mm or between ±2 mm, respectively), and (3) large correction group (greater than +1.5 mm or greater than +2 mm, respectively).

Statistical Analysis

Statistical analyses were performed with the software StatMate (ATMS, Tokyo, Japan). The mean and SD of the anterior and overall ratios were calculated in each group with the threshold for clinical significant tooth-size discrepancy categorized on the basis of the Bolton SD definition and the millimetric definition. A two-way ANOVA was performed to test the main effects of malocclusion types and sexes on the anterior and overall ratios.

RESULTS

As shown in Table 2, some of the subjects in the small and large anterior ratio groups under the 1 SD threshold category needed normal maxillary or mandibular correction within ±1.5 mm or ±2 mm, while almost all of those groups under the 2 SD threshold category needed maxillary correction greater than 2 mm but not mandibular correction greater than 2 mm. Table 2 also shows that a few of the subjects in the normal anterior ratio group under the same threshold category were in need of maxillary correction greater than 2 mm.

Table 3 shows that apart from the normal anterior ratio groups, every small and large anterior group needed mean maxillary and mandibular correction greater than 1.5 mm except the mean mandibular correction in the large anterior ratio group under the 1 SD threshold category.

Table 4 shows that all or almost all of the subjects in the small and large overall ratio groups under the category of either 1 SD or 2 SD threshold required maxillary and mandibular corrections greater than 2 mm. Table 4 also shows that some of the subjects in the normal overall ratio groups needed maxillary or mandibular correction greater than 2 mm.

Table 5 shows that the small and large overall ratio groups required both maxillary and mandibular corrections greater than 2 mm.

As shown in Table 6, most of the subjects in the small and large maxillary correction groups under both threshold categories had anterior ratios greater than 2 SDs from the Bolton mean; some had overall ratios greater than 2 SDs from the Bolton mean, but none of those had normal anterior ratios within ±1 SD from the Bolton mean. Table 6 also shows that only a few subjects in the normal maxillary correction group under the 2 mm threshold category had anterior ratios greater than 2 SDs from the Bolton mean.

Table 7 shows that none of the subjects in the small and large mandibular correction groups under either category had anterior ratios within ±1 SD from the Bolton mean, and all of those under the 2 mm threshold had anterior ratios greater than 2 SDs. Table 7 also shows that some of the subjects in the small and large mandibular correction groups under the 1.5 mm threshold category had the normal overall ratios within ±1 SD from the Bolton mean; most of the subjects under both categories had normal overall ratios within 2 SDs from the Bolton mean. Moreover, the table shows that some of the subjects in the normal mandibular correction groups had anterior ratios greater than 2 SDs from the Bolton mean.

Tables 8 and 9 show that every small and large maxillary and mandibular correction group had mean anterior ratios more than 2 SDs from the Bolton mean and mean overall ratios between 1 SD and 2 SDs.

DISCUSSION

As shown in Table 2, the small and large anterior ratio groups belonging under the 1 SD threshold category did not always have clinically significant discrepancies requiring maxillary or mandibular correction greater than 1.5 mm or 2 mm, whereas those under the 2 SD threshold almost always had clinically significant discrepancies requiring maxillary correction greater than 2 mm but not always requiring mandibular correction. These findings were also confirmed by the present study that found the small and large anterior ratio groups under the same threshold category had disharmony requiring mean maxillary corrections much greater than 2 mm (−2.93 mm and 2.68 mm, respectively; Table 3). On the other hand, regardless of the threshold of 1.5 mm or 2 mm, none of the subjects in the small and large groups in the maxillary or

Table 6. Numbers and Percentages of Subjects With Different Anterior and Overall Ratios in Each Maxillary Correction Group

Maxillary Correction Group	Maxillary Correction (mm)	N	Anterior Ratio, %[a]				
			<−2SD ≤73.89	−2SD to −1SD 73.9–75.54	−1SD to 1SD 75.55–78.85	1SD to 2SD 78.86–80.5	>2SD ≥80.51
1.5 mm Threshold							
Small group	≤−1.51	22	10 (45.5)	12 (54.5)	0	0	0
Normal group	−1.50 to 1.50	172	0	9 (5.2)	130 (75.6)	33 (19.2)	0
Large group	≥1.51	56	0	0	0	23 (41.1)	33 (58.9)
2 mm Threshold							
Small group	≤−2.01	13	10 (76.9)	3 (23.1)	0	0	0
Normal group	−2.00 to 2.00	202	0	18 (8.9)	130 (64.4)	52 (25.7)	2 (1.0)
Large group	≥2.01	35	0	0	0	4 (11.4)	31 (88.6)

[a] Percentage in parentheses.

mandibular correction group had normal anterior ratios within ±1 SD from the Bolton mean as shown in Tables 6 and 7. Moreover, none of the subjects in the small and large mandibular correction groups in the 2 mm threshold category had normal anterior ratios within ±2 SDs (Table 7). These results as to the anterior ratio supported the results of some investigators,[8,9,17,18] who showed that the prevalence rates of subjects with clinically significant tooth-size discrepancy by the Bolton definition were lower than those by the millimetric definition.

Our results showed that the small and large overall ratio groups in the 1 SD threshold category were not always in need of mandibular corrections greater than 2 mm, although those in the 2 SD threshold category always needed maxillary and mandibular corrections greater than 2 mm, thus indicating that in Japanese orthodontic patients, 2 SDs may be taken as an appropriate threshold for significant overall tooth-size discrepancy. However, the mean amount of maxillary and mandibular corrections required was greater than 2 mm in each small and large overall ratio group as shown in Table 5, because only a few subjects existed in ranges within ±2 mm for the mandibular correction.

The knowledge that some of the subjects in the normal anterior ratio group in the 2 SD threshold category and in the normal overall ratio groups in each thresh-

old category needed maxillary or mandibular correction greater than 2 mm might help orthodontists to aptly deal with treatment problems arising from tooth-size discrepancy.

In this study, approximately half of the subjects in the small and large maxillary correction groups in the 1.5 mm threshold category and most of those in the 2 mm threshold category had anterior ratios greater than 2 SDs from the Bolton mean (Table 6), although most of the subjects in the small and large mandibular correction groups in the 1.5 mm threshold category and all of those for the 2 mm threshold had anterior ratios greater than 2 SDs (Table 7). These results may be consistent with the findings by some investigators, who indicated that the maxillary and mandibular corrections created reversible, unequal and opposite signed discrepancies between the maxillary and mandibular arches.[9,18] Also, these results may indicate that mandibular correction expresses clinically significant anterior tooth-size discrepancy more seriously than maxillary correction.

As shown in Tables 6 and 7, some of the subjects in the small and large groups under the heading of maxillary correction in each threshold and in those under the heading of mandibular correction in the 1.5 mm threshold category had normal overall ratios within ±1

Table 7. Numbers and Percentages of Subjects With Different Anterior and Overall Ratios in Each Mandibular Correction Group

Mandibular Correction Group	Mandibular Correction (mm)	N	Anterior Ratio, %[a]				
			<−2SD ≤73.89	−2SD to −1SD 73.9–75.54	−1SD to 1SD 75.55–78.85	1SD to 2SD 78.86–80.5	>2SD ≥80.51
1.5 mm Threshold							
Small group	≤−1.51	35	0	0	0	4 (11.4)	31 (88.6)
Normal group	−1.50 to 1.50	202	0	18 (8.9)	130 (64.4)	52 (25.7)	2 (1.0)
Large group	≥1.51	13	10 (76.9)	3 (23.1)	0	0	0
2 mm Threshold							
Small group	≤−2.01	11	0	0	0	0	11 (100.0)
Normal group	−2.00 to 2.00	232	3 (1.3)	21 (9.1)	130 (56.0)	56 (24.1)	22 (9.5)
Large group	≥2.01	7	7 (100.0)	0	0	0	0

[a] Percentage in parentheses.

Table 6. Extended

Maxillary Correction Group	Maxillary Correction (mm)	N	Overall Ratio, %[a]				
			<−2SD ≤87.47	−2SD to −1SD 87.48–89.38	−1SD to 1SD 89.39–93.21	1SD to 2SD 93.22–95.12	>2SD ≥95.13
1.5 mm Threshold							
Small group	≤−1.51	58	10 (17.2)	31 (53.5)	17 (29.3)	0	0
Normal group	−1.50 to 1.50	131	0	0	131 (100.0)	0	0
Large group	≥1.51	61	0	0	20 (32.8)	34 (55.7)	7 (11.5)
2 mm Threshold							
Small group	≤−2.01	44	10 (22.7)	31 (70.5)	3 (6.8)	0	0
Normal group	−2.00 to 2.00	162	0	0	162 (100.0)	0	0
Large group	≥2.01	44	0	0	3 (6.8)	34 (77.3)	7 (15.9)

SD from the Bolton mean; most of these subjects had normal overall ratios within ±2 SDs from the Bolton mean. Some of the subjects in the small and large mandibular correction groups in the 2 mm threshold category had overall ratios greater than 2 SDs from the Bolton mean. Moreover, some normal maxillary and mandibular correction groups had a few or some of the subjects with anterior ratio greater than 2 SDs from the Bolton mean. These results strongly support the findings by Bernabe et al,[18] who observed that the prevalence rate of clinically significant tooth-size discrepancy in any sample would differ depending on the method of expressing the tooth-size discrepancy and that this could have clinical implications. Their findings may be also supported by our results that the small and large groups in maxillary and mandibular correction groups had mean anterior ratios greater than 2 SDs from the Bolton mean and mean overall ratios between 1 SD and 2 SDs.

Proffit and Ackerman[1] stated that tooth-size discrepancies less than 1.5 mm are rarely significant but suggested that larger discrepancies than this figure create treatment problems. He did not mention whether this figure could be applied to anterior or overall ratio or both, or to maxillary or mandibular correction. Both small and large groups of maxillary and mandibular corrections under the category of the 2 mm threshold had a high incidence of tooth-size discrepancy with anterior and overall ratios greater than 2 SDs from the Bolton mean than those under the category of the 1.5 mm threshold (Tables 6 and 7). Our results suggest that if clinicians use the 2 mm threshold for maxillary and mandibular corrections with the Bolton SD definition in view, chances of misdiagnosing the case of clinically significant discrepancy would become slim.

CONCLUSIONS

- Tooth-size discrepancies can be better expressed both in terms of the Bolton ratios and the actual amount in millimeters required for correction.
- The ratios outside 2 SDs from the Bolton mean and the millimetric discrepancies outside 2 mm of maxillary and mandibular corrections are recommendable as the appropriate thresholds for clinically significant tooth-size discrepancy.

Table 7. Extended

Mandibular Correction Group	Mandibular Correction (mm)	N	Overall Ratio, %[a]				
			<−2SD ≤87.47	−2SD to −1SD 87.48–89.38	−1SD to 1SD 89.39–93.21	1SD to 2SD 93.22–95.12	>2SD ≥95.13
1.5 mm Threshold							
Small group	≤−1.51	55	0	0	14 (22.5)	34 (61.8)	7 (12.7)
Normal group	−1.50 to 1.50	141	0	0	141 (100.0)	0	0
Large group	≥1.51	54	10 (18.5)	31 (57.4)	13 (24.1)	0	0
2 mm Threshold							
Small group	≤−2.01	38	0	0	0	31 (81.6)	7 (18.4)
Normal group	−2.00 to 2.00	173	0	2 (1.2)	168 (97.1)	3 (1.7)	0
Large group	≥2.01	39	10 (25.6)	29 (74.4)	0	0	0

Table 8. Anterior and Overall Ratios in Each Maxillary Correction Group

Maxillary Correction Group	Anterior Ratio			Overall Ratio		
	N	Mean, %	SD	N	Mean, %	SD
1.5 mm Threshold						
Small group	22	73.54	1.09	58	88.65	1.02
Normal group	172	77.52	1.22	131	91.38	0.78
Large group	56	80.93	1.41	61	94.04	1.42
2 mm Threshold						
Small group	13	72.86	0.90	44	88.31	0.94
Normal group	202	77.63	1.51	162	91.40	0.99
Large group	35	81.52	1.48	44	94.46	1.46

Table 9. Anterior and Overall Ratios in Each Mandibular Correction Group

Mandibular Correction Group	Anterior Ratio			Overall Ratio		
	N	Mean, %	SD	N	Mean, %	SD
1.5 mm Threshold						
Small group	35	81.52	1.48	55	94.17	1.43
Normal group	202	77.64	1.51	141	91.39	0.85
Large group	13	72.86	0.90	54	88.56	1.00
2 mm Threshold						
Small group	11	83.06	1.86	38	94.65	1.49
Normal group	232	77.86	1.85	173	91.40	1.08
Large group	7	72.21	0.61	39	88.17	0.91

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