

# Assessing the Influence of Chin-Throat Length on Perceived Profile Attractiveness

MAJ Raquel Brentson, Lt Col Erin M. Speier

Tri-Service Orthodontic Residency Program, Air Force Postgraduate Dental School, JBSA-Lackland Air Force Base, TX  
Uniformed Services University of the Health Sciences Postgraduate Dental College

## INTRODUCTION

Extensive studies have shown facial attractiveness is complex with a range of acceptable facial forms and traits across diverse cultures. Orthodontists plan treatment that can alter a patient's facial appearance and are therefore trained to identify dentofacial deformities, risk factors for obstructive sleep apnea, and a thorough understanding of facial esthetics. The submental-cervical angle is often considered an important esthetic parameter when evaluating lower profile morphology. Conversely, the chin-throat length (C-T length) has not traditionally been considered despite the fact it is altered with mandibular orthognathic surgery.

## OBJECTIVE

The purpose of this study was to evaluate the perception of facial attractiveness ratings of convex profiles with different C-T lengths. Additionally, questions on the perceived need or desire to improve the profiles with jaw surgery were also assessed.

## MATERIALS & METHODS

This investigation was a questionnaire-based study with a series of digitally manipulated profile photos presented to a target audience of orthodontic clinicians, orthodontic patients, and laypersons. The images were of a Caucasian female and male subject altered to a skeletal class II profile 4 standard deviations (SD) from the accepted norm. The C-T length, as measured from soft tissue menton to throat point, was then adjusted in 5mm increments from 8 – 43mm to generate eight images of each subject (Fig.1). Survey participants were asked to rate profiles on a 100mm visual analogue scale (VAS) and choose if they would elect a surgical option to improve the profile, if it was theirs (Fig.2). The photos presented were all calibrated for resizing and magnification by using the subjects lateral cephalograms with embedded 100mm rulers to ensure the measurements could be clinically applicable.



Figure.1 All eight male images generated, ranged sequentially from the longest C-T length (E=43mm), to the shortest (H=8mm).



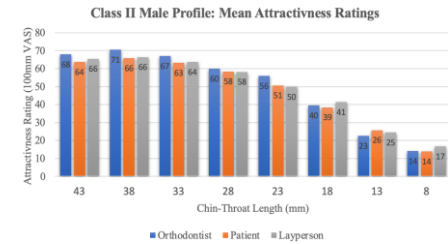
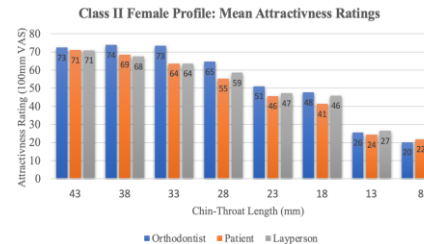
Figure.2 Survey question examples, which repeated for each female and male profile, presented in random order.

## RESULTS

There was an overall direct linear relationship with the mean attractiveness rankings and C-T lengths. Participants in all groups (total n=261) gave significantly higher rankings for the longer C-T lengths (33-43mm) compared to the shorter C-T length profiles (8-23mm), and rankings were significantly different ( $p < 0.001$ ). In regards to surgical intervention, all three observer groups expressed a significantly increased desire to elect surgical correction of both the female and male profiles with the shortest C-T lengths (8-13mm).

Female Profile	Chin-Throat Length (mm)	Orthodontists (n=98)		Patients (n=77)		Layperson (n=86)	
		Mean Rank	Surgical Desire % Yes	Mean Rank	Surgical Desire % Yes	Mean Rank	Surgical Desire % Yes
F8	43	72.5	1.0%	71	1.3%	70.9	4.7%
F7	38	73.9	0.0%	68.6	2.6%	67.5	3.5%
F6	33	73.4	0.0%	63.6	3.9%	63.6	4.7%
F5	28	64.6	1.0%	55.4	7.8%	58.5	4.7%
F4	23	51.1	7.1%	45.7	26.0%	47.2	16.3%
F3	18	47.7	14.3%	41.3	23.4%	45.9	18.6%
F2	13	25.5	65.3%	24.3	67.5%	26.5	53.5%
F1	8	20.2	71.4%	21.9	68.8%	21.1	59.3%

Male Profile	Chin-Throat Length (mm)	Orthodontists (n=98)		Patients (n=77)		Layperson (n=86)	
		Mean Rank	Surgical Desire %Yes	Mean Rank	Surgical Desire %Yes	Mean Rank	Surgical Desire % Yes
M8	43	67.9	1.0%	63.7	2.6%	65.5	1.2%
M7	38	70.6	1.0%	65.9	0.0%	66.4	2.3%
M6	33	67.0	2.0%	63.3	2.6%	63.7	4.7%
M5	28	59.9	2.0%	58.4	7.8%	58.2	1.2%
M4	23	55.9	8.2%	50.7	16.9%	49.8	9.3%
M3	18	39.5	40.8%	38.5	36.4%	41.4	20.9%
M2	13	22.6	75.5%	25.8	61.0%	24.5	50.0%
M1	8	14.2	90.8%	13.9	85.7%	16.7	73.3%



## CONCLUSIONS

- The results of this study demonstrate that longer chin-throat lengths (33-43mm) were perceived as more esthetically acceptable for both the female and male skeletal class II retrognathic profiles.
- C-T lengths  $\leq 23$ mm were generally rated as below average (mean rankings 14 - 56mm on 100mm VAS) by observers across all groups and may represent a borderline esthetically acceptable C-T length.
- C-T lengths  $\leq 13$ mm for both females and males suggest a surgical treatment plan should be considered.
- When evaluating patients for a surgical vs. non-surgical correction of a skeletal class II malocclusion, C-T length should be evaluated in addition to other routine facial angles during assessment of the lower profile morphology.
- All orthognathic surgery treatment plans should consider the chin-throat length and how treatment may impact the esthetics of this area.