Music
universal language
♪♫♪♫♪♫

Smile
universal language
communication

"The smile is a way of expressing on the outside our feelings on the inside."

Communication: Success

Congratulations,
You're hired!

Communication: Perception

Excessive gingival display negatively affected how attractive a person's smile is judged to be. In addition, how friendly, trustworthy, intelligent, and self-confident a person was perceived to be was inversely related to the amount of gingival display. Laypeople were just as sensitive to these differences as dental students.

Plain looking individuals made 5-10% less per year; attractive persons made 4-8% more per year (based on their own personal opinion of their appearance).

In 2014:
Median US household yearly salary was $53,891*


Why Do People Seek Cosmetic Dentistry?

Smile

Dr. Guillaume Duchenne

1840's Paris physician
Muscles contract into facial expressions
First to demonstrate mechanism of smiling

What is a Smile?

"Smiling constitutes a universal language which neither fashions nor whims can change ... and is the same in all people..."

Dr. Guillaume Duchenne

Smile Muscles

- Zygomatic
- Buccinator
- Obicularis Oris
- Triangularis

Muscles of Facial Expression

Plastic Surgery without a Scalpel

"The muscles of facial expression must be supported to allow proper smiling."

Dr. Irwin Smigel
What is a Smile?

"...The smile offers a convenient shorthand for far-reaching assessments of character, behavior, and temperament."

Angus Trimble

2004 Angus Trimble "A Brief History of the Smile"

What is a Smile?

"Our facial expressions, and especially the smile, constitute a system of unconscious communication that got built into our biology long before language itself."

Richard Conniff

Smithsonian 2007 "What's behind a Smile?"

What is a Smile?

"Smiles in fact are the most visible part of an intimate melding between two minds"

New York Times 2011

Smiles are part of the FACE

FACIAL TRIANGLE

Facially Generated Dental Esthetics

Multi-disciplinary Approach
- Orthodontics
- Periodontics
- Prosthodontics
- Facial Plastic Surgeon

Introduction to Smile Design

- There are rules
- Rules are made to be broken
- No one smile ever follows all the rules

Dr. David Sarver

Facial Plastic Surgeon

Dr. David Sarver
Let's start with a blank canvas.
Where do we begin?

Incisal edge is starting point!

Incisal plane parallel to the interpupillary line.

Incisal Placement

Canted Incisal Plane

Rule of Thirds

Rule of Thirds
- Divide subnasale and menton into equal thirds
- Incisal edge at junction of Superior and Middle Thirds

Incisal Plane too inferior
Incisal Plane too superior

Determinants of Incisal Edge Placement:

• Appearance

Determinants of Incisal Edge Placement:

• Appearance
• Phonetics
Use words like “these, those, fifty five, very fine”

Incisal Edge Position: Phonetics

Pound- JPD 1970
“Using speech to simplify denture service”

“When the patient pronounces ‘f’ and ‘v’ sounds, the length and labiolingual position of the incisal edges of the maxillary teeth... can be determined.”

Determinants of Incisal Plane Placement:

• Appearance
• Phonetics
• Occlusion

Incisal Placement

• Vertical midline in the center of the face perpendicular to the interpupillary line
• Vertical midline centered with the philtrum
**Reverse Smile Curve**

- Incisal edges follow curvature of the lower lip

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**Incisal Placement**

- Incisal edges follow curvature of the lower lip

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**Curve of Spee**

The anterior-posterior curvature of the occlusal plane superiorly as you move distally

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**Curve of Spee-Flat**

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**Tooth Display**

- Clinical crown outlined by the upper and lower lip
- Marginal gingiva display confined to interdental papilla

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**Excess Gingival Display**

- Altered Passive Eruption
Altered Passive Eruption

• Prevalence
  - 12%-15% of patients exhibit altered passive eruption
  - May persist into the late teens and mid 20’s
  - A predisposing factor to ANUG

• Role of Orthodontics
  - Prevalence of Altered Passive Eruption (APE) is higher after Orthodontic Treatment
  - APE is more common in individuals with a thick-flat gingival biotype

• Diagnostic Type
  - Type Ia: Excessive keratinized tissue & normal CEJ-alveolar crest relationship - Gingivectomy
  - Type Ib: Excessive keratinized tissue & alveolar crest at CEJ - Flap Periodontal Surgery
  - Type IIa: Normal keratinized tissue & normal CEJ-alveolar crest relationship - Orthognathic Surgery or Orthodontics
  - Type IIb: Normal keratinized tissue & alveolar crest at CEJ - Flap Periodontal Surgery

• Diagnostic Tools
  - Radiographs
  - Anesthetize and sound to CEJ
  - Determine if osseous contouring needed (biologic width=3mm)
  - Flap vs flapless

• Surgical Armamentarium
  - Diode Laser vs Erbium-based Laser
  - Scalpel
  - Electrosurgery

Altered Passive Eruption Case Presentation

• Post-Orthodontics
  - Type Ib

• Post-Perio Surgery
  - Final Treatment after Tooth Whitening
• Buccal Corridor
• Negative Space
• Display of posterior buccal teeth

Black Triangles
Opaque Crowns—margins
Centrals slightly too long

Smile Display
Filling the Buccal Corridor

• Teeth Prepared
• Provisionals fabricated
• Creating desired shape in provisionals
• Patient acceptance

Smile Template

• Black Triangles
• Opaque Crowns—margins
• Centrals slightly too long
• Build out posterior teeth
• Curve of Spee

Smile Display
Filling the Buccal Corridor

Send photos and impressions of provisionals to lab
Try in and seat crowns

Roots diverge apically as you move distally-antlers
Roots converge apically as you move distally - anteriors

Incisal embrasures become larger as you move distally

Contact points move apically as you move distally

Connector Area

- Connector area is the perceived area where the two teeth appear to touch
- Percentage is of height of tooth
- Contact point is usually 2mm or less

Morley J – Prac Perio Aesth Dent 2000

“A multidisciplinary approach to complex aesthetic restoration with diagnostic planning”

Apical Zenith located distal to the long axis midline

Cervical of Central Incisors and Cuspids are parallel
Incisal and cervical length of laterals may be 0.5-1mm shorter than Central Incisor

Factors affecting each tooth in the smile

- Central Incisor: DOMINANCE
- Lateral Incisor: VARIABILITY
- Cuspid: AGGRESSIVENESS

Central Incisors

SPA factor-Age

Brush & Fisher PD 1957
"The Age Factor in Dentogenics"

Compensate for Discrepancies by Creating Illusions-Width

Morley - Dentistry Today 1990
"Design Theory of Central Incisor"

Frush & Fisher - JPD 1957
"The Age Factor in Dentogenics"
Compensate for Discrepancies by Creating Illusions-Height

- Curved (Short)
- Flat (Tall)

Lateral Incisors-Diversity

- SPA Factor Sex
  - Feminine
  - Masculine

Masculine vs feminine

- Feminine
  - Rounded facial profile
  - Shorter lateral incisor
  - Apical zenith-lateral centered
  - Narrow gingival width of LI
  - Rounded incisal forms

- Research show no difference in extracted teeth from male to female; However

- Lombardi - JPD 1973
  "The principles of visual perception and their clinical application to denture esthetics"

Masculine vs feminine

- Masculine
- Feminine

Cuspids-Aggressiveness

- SPA Factor-Personality
  - Passive
  - Aggressive

Smile Design BENDING the rules

- Age
- Face Form
- Personality
- Proportions
Every smile looks the same (dentist, orthodontist or dental lab “trademark smile”
• May not be age appropriate
• May not coincide with the physical and emotional makeup of the patient
• Size may not match size and shape of face

Creating a Younger Smile

Natural Aging of the Face

Natural Aging of a Smile

Relationship of Face Form and Tooth Form

Smile Shapes

Denture teeth often recommend tooth form to mimic face form
**Smile Shapes**

**From "The Smile Catalog"**

**TM The Ultimate Practice Inc**

**Dr. Galip Gurel**

**Correlating Face and Personality**
- Dynamic
- Delicate
- Stabile

**Smile Design Dynamic**
- V-Shaped incisal plane
- Large square tapering central incisors
- Smaller lateral incisors
- Cervical of aggressive canines out
- Ascending apical zeniths
- Normal Curve of Spee

**Golden Proportion**
- 78% W/L Ratio

**Smile Design Bold**
- Flat incisal plane
- Rectangular central incisors - square FGM
- Larger masculine lateral incisors
- Straight canine profile
- Straight across apical zeniths
- Flattened Curve of Spee

**70% RED Proportion**
- 78% W/L Ratio

**Smile Design Serene**
- Curved incisal plane
- Oval central incisors
- Oval feminine lateral incisors
- Oval canine profile
- Oval apical zeniths
- Normal Curve of Spee

**75% RED Proportion**
- 78% W/L Ratio
**Smile Design Passive**

- Flat incisal plane
- Square central incisor
- Lateral incisor more similar in size to central
- Perpendicular passive canines with curved profile
- Slightly curved apical zeniths
- Flattened Curve of Spee

80% RED Proportion
86% W/L Ratio

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**Smile Design Perfect**

- Curved incisal plane
- Rectangular central incisors
- 70% RED lateral incisors
- Straight canine profile
- Straight across apical zeniths
- Curve of Spee

70% RED Proportion
78% W/L Ratio

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**Smile Design Natural**

- Straight incisal plane
- Natural-looking central incisors
- 66% RED lateral incisors
- Canine cervicals out
- Shorter lateral apical zeniths
- Slight Curve of Spee

Natural width Proportion
78% W/L Ratio

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**Smile Design Bold**

- Flat incisal plane
- Rectangular central incisors
- Larger masculine lateral incisors
- Straight canine profile
- Straight across apical zeniths
- Flattened Curve of Spee

70% RED Proportion
78% W/L Ratio

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**Smile Design Dynamic**

- V-Shaped incisal plane
- Large square tapering central incisors
- Smaller lateral incisors
- Cervical of aggressive canines out
- Ascending apical zeniths
- Steep Curve of Spee

Golden Proportion
78% W/L Ratio

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**Smile Design Serene**

- Curved incisal plane
- Oval central incisors
- Oval feminine lateral incisors
- Oval canine profile
- Oval apical zeniths
- Normal Curve of Spee

75% RED Proportion
78% W/L Ratio
Smile Design
Passive

- Flat incisal plane
- Square central incisor
- Lateral incisor more similar in size to central
- Perpendicular passive canines with curved profile
- Slightly curved apical zeniths
- Flattened Curve of Spee

80% RED Proportion
86% W/L Ratio

Smile Design
Imperfect/Passive

- Uneven incisal plane
- Shovel-shaped central incisors
- Twisted lateral incisor
- Cervical in and cervical out canine profiles
- Ascending apical zeniths
- Flat Curve of Spee

70% RED Proportion
86% W/L Ratio

Angelina Jolie

Traditional Dentistry

- Teeth
- Periodontium
- Occlusion
- Periodontal Architecture

Objective Tooth Evaluation

- Visual Exam
- Tactile Exam
- Diagnostic Casts
- Radiographs

DISEASE
Cosmetic Dentistry Components

- Teeth
- Periodontium
- Occlusion
- Periodontal Architecture
- Lips
- Facial Muscles
- Skeletal structure
- Soul

Cosmetic Dentistry Components

Evaluation Methods

- TLAR Principle
- Proportional Smile Design

Evaluation Methods

- Subjective Smile Evaluation
- Objective Smile Evaluation

Evaluation Methods

- Chair-side Smile Evaluation
- Objective Smile Evaluation

Evaluate this smile
Evaluation Methods

- Lips
- Facial Muscles
- Skeletal structure
- Soul

Diagnostic Casts?

Objective Smile Evaluation

- Evaluate all smile components
- Unlimited Time Factor
- Measure relative tooth dimensions
- Predictable Results

Objective Smile Evaluation

Predictable Cosmetic Dentistry
Cannot be achieved without the use of:

PHTOGRAPHY

Using Photography to Design Smiles

“My wife wants me to do a smile makeover”

Using Photography to Design Smiles

“I just don’t like the gray spots. I want whiter teeth!”

Using Photography to Design Smiles

High Occlusion
"I just don’t like the gray spots. I want whiter teeth!"

- **Implant #10**
- **Lingual composites #9 & #11**

**Challenges**
- Replace missing tooth
- Change cant
- Whiten smile

**Ideal Design**
- All-porcelain bridge #9-11
- Porcelain laminate veneers #5, 6-8, 12

**Recommended Treatment**
- All-porcelain bridge #9-11
- Porcelain laminate veneers #5, 6-8, 12

**Treatment Options**
- Crowns #9 & #11
Using Photography to Design Smiles

- All-porcelain bridge #9-11
- Porcelain laminate veneers #6-8

Accepted Treatment

Using Photography to Design Smiles

Preparations

Using Photography to Design Smiles

Seating

Soft Tissue Model

Using Photography to Design Smiles

Completed Case