

Making Faces

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CSC2529, Session 3

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FACS: The Facial Action Coding System

Created by Paul Ekman and Wallace Friesen in 1976

Based on the distinct muscles in the human face

Each muscle produces one or more distinct changes in the face's appearance, called Action Units (AU's)

Think of these AU's as "Letters" in the alphabet of facial expression.

Think of facial expressions as "words": combinations of these AU "letters".

Primary Muscles of the Face



1. Frontalis: Brow Raiser
2. Corrugator: Brow Lowerer
3. Levitor Palpabrae: Eyelid Raiser/Lowerer
4. Orbicularis Oculi: Eye Squinter
5. Alaeque Nasi Labius Superioris: Lip Wincer
6. Labius Superioris: Lip Sneerer
7. Zygomatic Major: Lip Smiler
8. Buccinator (deep, not shown)
9. Triangularis: Lip Frowner
10. Labius Inferioris: Lip Lowerer
11. Mentalis: Lip Shrugger
12. Incicivus (deep, not shown): Lip Purser
13. Risorius/Platysma: Lip Grimacer
14. Orbicularis Oris: Lip Tightener/Loosener

Action Units:
The Letters of The Alphabet

Muscle Actions of the Face: Upper Face





Relaxed Face



1)

Face Action: Raising Eyebrows
Muscle: Frontalis
Signature: Worry Lines

Action Unit **1,2**

1. Inner

2. Inner + Outer (shown)



2)

Face Action: Lowering Brow
Muscle: Corrugator
Signature: Furrowed Eyebrows



3)

Face Action:

Muscle:

Signature:

Blinking

Levator Palpebrae

Open/Closed Eyes

Action
Unit **5**

5a. L + R (shown)

5b. L only

5c. R only



4)

Face Action:

Muscle:

Signature:

Squinting

Orbicularis Oculi

Furrowed Eyes

Action Unit **6, 44**

6a. Lower L+R

6b. Lower L

6c. Lower R

44a. Entire L+R (shown)

44b. Entire L

44c. Entire R

Muscle Actions of the Face: Mid Face





5)

Face Action: Wincing

Muscle:

Alaeque Nasi Labius Superioris

Signature:

Squared Lips, Nasal Folds



6)

Face Action: Sneering
Muscle: Labius Superioris
Signature: Squared Lips

Action Unit **10**

10a. L + R (shown)

10b. L only

10c. R only



7)

Face Action: Smiling/Smirking
Muscle: Zygomatic Major
Signature: Upturned Mouth

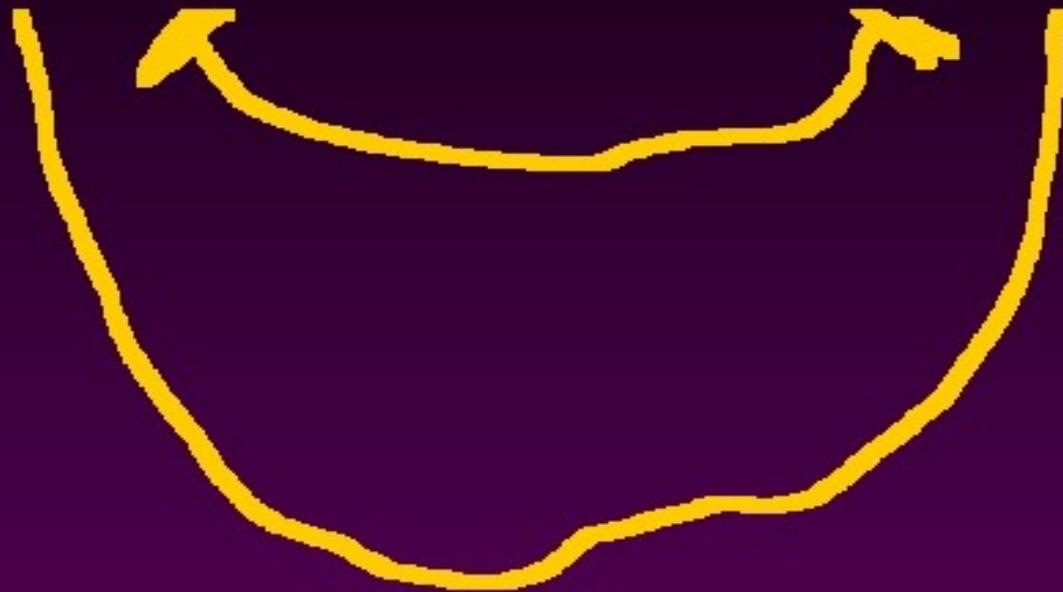
Action Unit **12**

12a. L + R (shown)

12b. L only

12c. R only

Muscle Actions of the Face: Lower Face





8)

Face Action: Puckering
Muscle: Buccinator
Signature: Puckered Lip Corners



Action Unit **14**

14a. L + R (shown)

14b. L only

14c. R only



9)

Face Action: Frowning
Muscle: Triangularis
Signature: Downturned Mouth



Toyota President Akio Toyoda at US Congressional hearings, Feb 2010

Action Unit **15**

15a. L + R (shown)

15b. L only

15c. R only



10) Face Action: Lowering Lower Lip
Muscle: Labius Inferioris
Signature: “Sss” Mouth

Action
Unit **16**



11)

Face Action: Shrugging

Muscle: Mentalis

Signature: Squashed Lower Lip



Action Unit **17**
Unit



12) Face Action: Pursing/Smacking
Muscle: Incisivus
Signature: Kissy Face

Action
Unit **18**



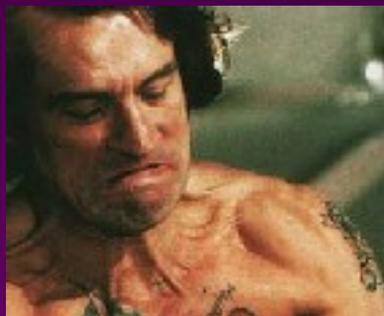
13) Face Action: Grimacing
Muscle: Risorius/Platysma
Signature: Stretched Lower Lip

Action Unit **20**

20a. L + R (shown)

20b. L only

20c. R only



Robert Deniro in
Cape Fear, 1991



14) Face Action: Lip Loosening
Muscle: Orbicularis Oris
Signature: “Sh” Mouth

Action Unit **22a-c**

22a. Up + Lo (shown)

22b. Up only

22c. Lo only



14)
(Cnt'd)

Face Action:

Muscle:

Signature:

Lip Tightening

Orbicularis Oris

Contracted Mouth

Action
Unit **23a-c**

23a. Up + Lo (shown)

23b. Up only

23c. Lo only





14)
(Cnt'd)

Face Action: Lip Locking

Muscle: Orbicularis Oris

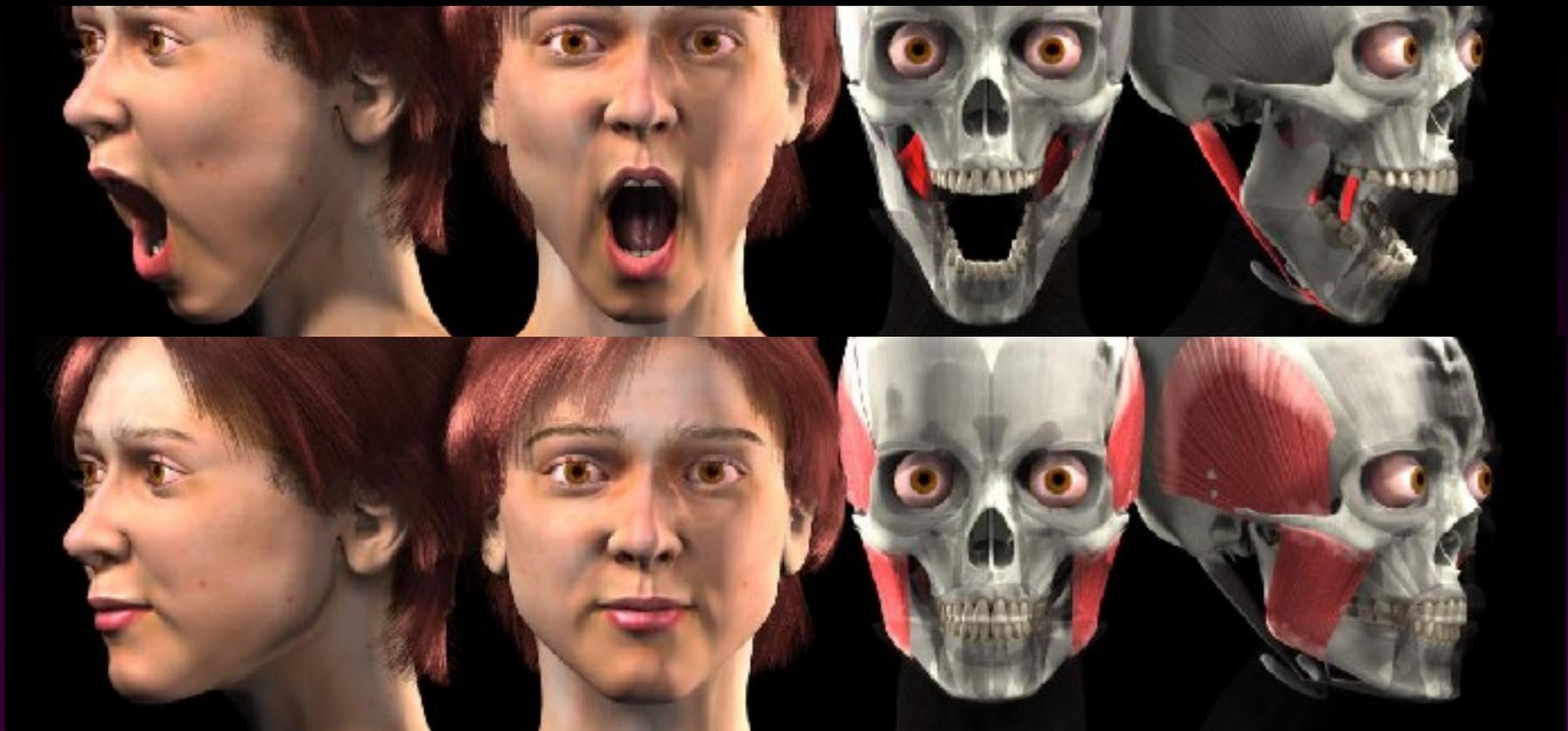
Signature: Lips Pressed Together

Action
Unit **24a-c**

23a. Up + Lo (shown)

23b. Up only

23c. Lo only



15) Face Action: Moving Jaw
 Muscle: Digastric (opening)
 Temporalis, Masseter (closing)

Signature: Open/Closed Mouth

Action Unit **26a-d**

26a. Open (shown)

26b. Leftward

26c. Rightward

26d. Forward

How
many
letters in
this
alphabet?

AU1,2	(Frontalis):	2
AU4	(Corrugator):	1
AU5	(Levitor Palpabrae):	3
AU6,44	(Orbicularis Oculi):	6
AU9	(Alaeque Nasi Labius Superioris):	1
AU10	(Labius Superioris):	3
AU12	(Zygomatic Major):	3
AU14	(Buccinator):	3
AU15	(Triangularis):	3
AU16	(Labius Inferioris):	1
AU17	(Mentalis):	1
AU18	(Incisivus):	1
AU20	(Risorius/Platysma):	3
AU22,23	(Orbicularis Oris):	6
AU26	(Jaw):	4
TOTAL:		41 AU's

Homework (for Monday Jan. 31):

Take photographs of yourself flexing all the muscles shown in Session 3. Compile these photos, with appropriate captions.

Example:



Neutral Face



Frontalis



Corrugator



Lev. Palpebrae open



Lev. Palpebrae closed



Orbicularis Oculi



Labius Superioris AN



Labius Superioris



Zygomatic Major



Buccinator



Triangularis



Labius Inferioris



Mentalis



Incisivus



Risorius/Platysma



Orb. Oris (lip loose)



Orb. Oris (lip tight)



Orb. Oris (lip lock)



Open Jaw

Anatomy of a happy face



Neutral face



Slight smile:

The Zygomatic kicks in first, pulling the corners of her lips back, up and into the Maxilla part of her skull (a.). The folds under her eyes flatten out (b.).



Grin:

As her smile increases, Labius Inferioris pulls down on her lower lip, exposing her upper teeth (c.). Zygomatic pulls harder, deepening her nasolabial fold (d.) and puffing out her cheeks (e.).



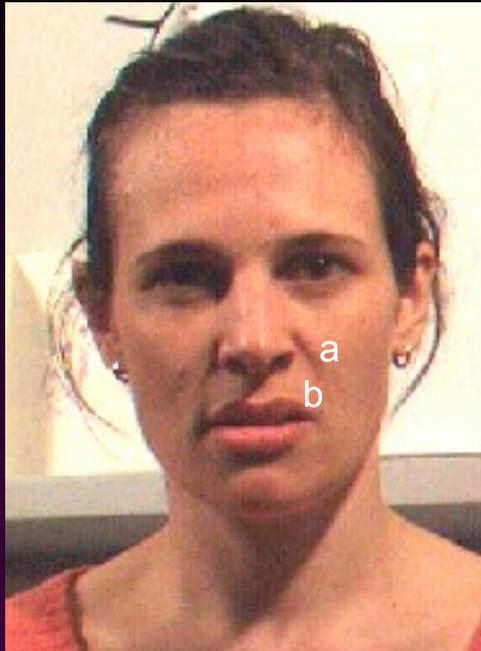
Laugh:

In intense joy, her eyes narrow down to slits, with sharply defined crow's feet (f.). Her cheeks are so puffed out that a specular highlight is clearly visible (g.).

Anatomy of Anger

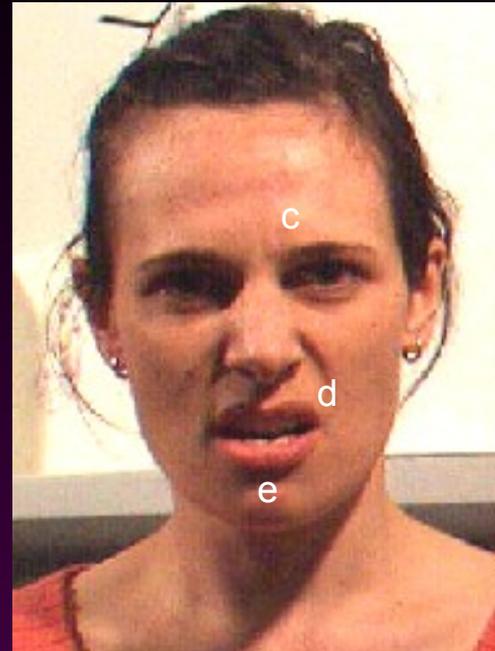


Neutral face



Glare:

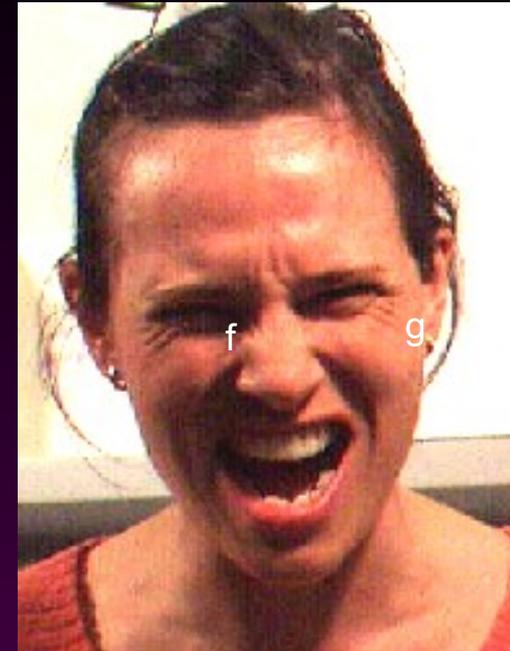
Alequi Nasi Labius Superioris contracts slightly, deepening her nasolabial fold (a) and rounding her upper lip (b)



Snarl:

As her anger increases, her brow begins to furrow (c). Both Labius Superioris and AN Labius Superioris contract, squaring off the corners of her upper lip (d).

Labius Inferiors begins contracting, exposing her lower teeth (e)



Rage:

In a full scream of anger, AN Labius Superioris fully contracts, producing diagonal wrinkles from her tear ducts down her nose (f). Her eyes narrow to slits from Orbicularis Oculi, complete with pronounced crow's feet (g).

Portraits of Grief



Neutral face



Muted Grief:

Her eyes show the pain: The eyebrows are pulled slightly upward by Medial Frontalis (a), and there are slight furrows in her brow from Currogator (b). Below her lips, Mentalis begins to pucker her chin (c).



Anguish:

As her sadness escalates, the furrows in her brow become more pronounced, but her brows still keep their upward pull (d). The corners of her mouth begin to turn down sharply from Triangularis (e).



Crying:

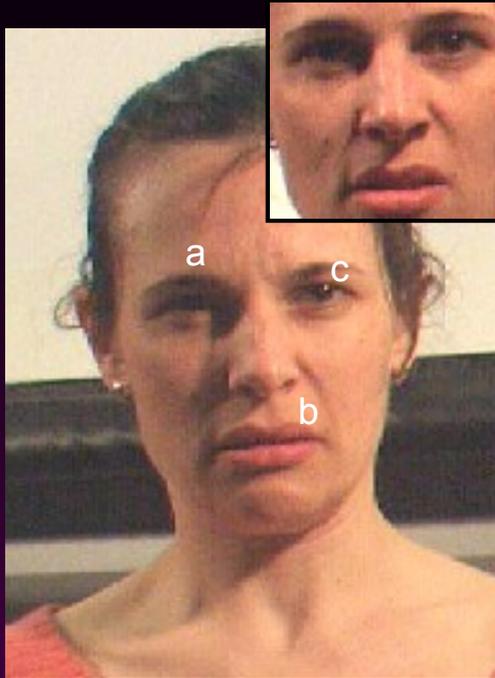
In a full cry, the face stretches in many different directions. The eyes squint heavily (Orbicularis Oculi, f), the upper lips are contorted by Labius Superioris (g), and the chin is deeply puckered by Mentalis (h).

Her anguish is capped off by Risorius/Platysma, which pulls the corners of her lower lip out (i) and the tendons in her neck up (j).

Gross Anatomy

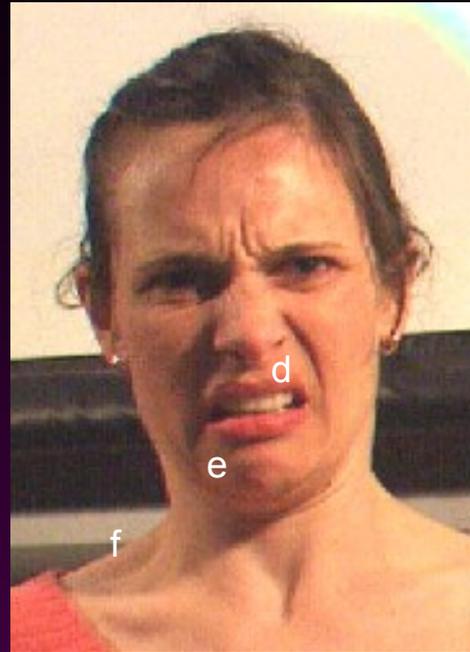


Neutral face



Mild Disgust:

In her low-level disgust, her face resembles mild anger (inset): her brow furrows (a) and her nose and lips crinkle (b). One difference is in her eyes: they don't glare in anger (open eyelids)—they are actually slightly relaxed (c).



Yechh:

As she gets more grossed out, her sneering increases (Labius Superioris, d). But most pronounced is the grimace in her lower lip and flaring tendons in her neck, from Risorius/Platysma (e, f).



Retching:

She is on the verge of sickness now. Her sneering (Labius Superioris) and grimacing (Risorius/Platysma) are in overdrive, and her lower eyelids are so contorted (Lo. Orbicularis Oris) that they are concave in shape (g).

Anatomy of Surprise

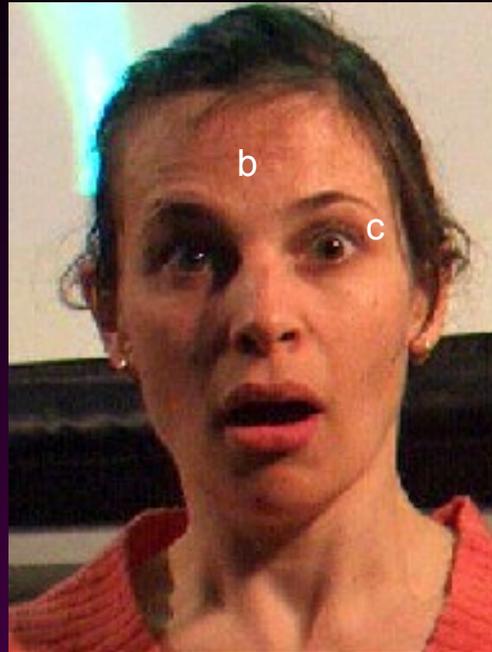


Neutral face



Stunned:

Her face is mostly relaxed, except for a slight widening of her eyes (Levitor Palpabrae, a).



Slackjawed:

Brow goes up (Frontalis, b) and jaw goes down. The whites of the eyes are visible above her irises (c).



OMYGOD!:

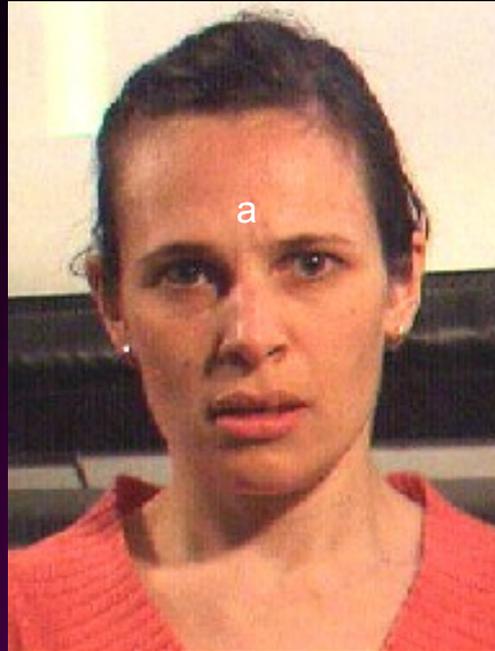
Worry lines are really bulging now. Frontalis is rounding out the shape of her eyebrows (d).

But even in extreme surprise, most of her face is relaxed.

Anatomy of Fear

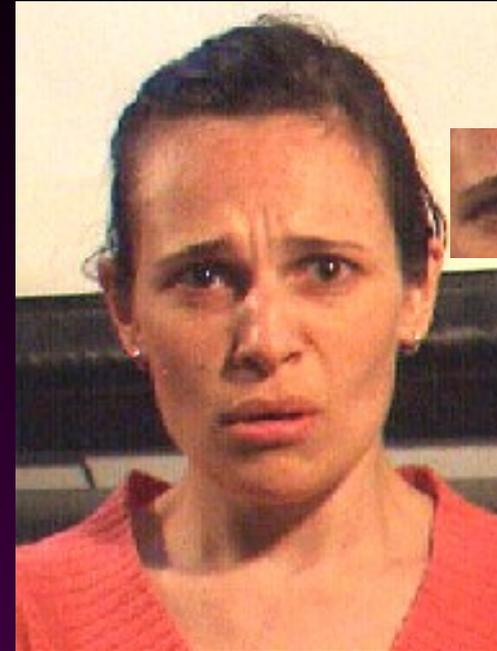


Neutral face



Worry:

Her worried face resembles her mildly angry glare, except for the slightly upturned eyebrows (a).



Deep Concern:

Eyebrows are more upturned, like her expression of sadness (inset). The difference is in the eyelids—they are opened wider than grieving eyes.

Anatomy of Fear, continued



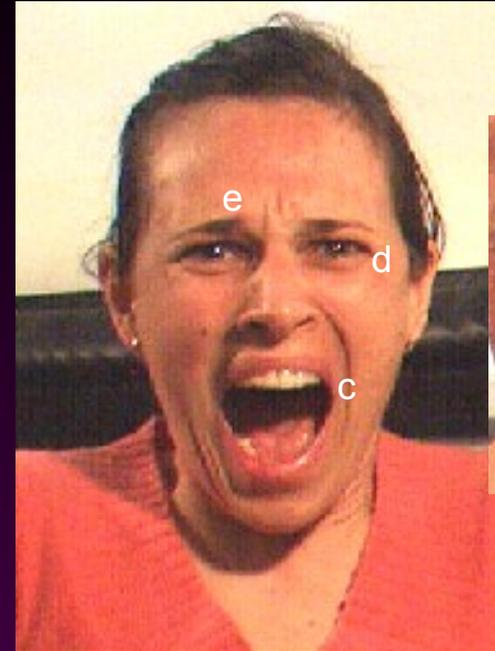
Neutral face



Terror:

Eyes are wide and brows fully furrowed and upturned.

Deep nasolabial folds from Labius Superioris (a).
Mouth is upturned, as in a smile, from Zygomatic (b).



Screaming:

Even in full scream, her mouth has an upturned look from her Zygomatics (c), similar to her anger scream (inset).

Unlike her anger scream, however, her eyes are still opened wide (d) and her eyebrows upturned (e).

