

Nose-Raising, Nose-Lengthening and Grimacing: Expressions of Arousal, Vigilance, Confusion, Aversion and Aggression

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Raising the nose and upper lip with the adjacent nasolabial muscles (*levator labii superioris*) has traditionally been identified as our innate display for physical and emotional disgust (Le Brun, 1702, Darwin, 1896, Ekman & Friesen, 1971, Izard, 1971). In its more reflexive occurrences this action is triggered by the simple impulse to avoid an offensive odor; guided by a combination of instinct, habit and acculturation, it also appears during metaphorically related responses such as personal dislike and moral disapproval.

This facial movement is clearly a frequent indication of aversive states, and repeated cross-cultural studies have confirmed (with some dissent) that nasolabial disgust displays are universally recognizable (Ekman & Friesen, 1971, Izard, 1971). If one is observant however, similar nasolabial movement can also be identified in a much larger spectrum of responses, ranging from positive to negative; it can easily be found in everyday situations and has been connected with experiences such as pain in experimental conditions (Prkachin, 1992). As early as the seventeenth century, Charles Le Brun identified “raised” and “drawn up” nostrils in emotions such as “terror”, “desire” and “despair” (Le Brun, 1702).

The ubiquitous appearance of this movement suggests that there are interesting connections between seemingly disparate expressive behaviors—occasionally, dramatically different messages can be conveyed with almost identical displays, distinguishable only by context or subtle variations such as head orientation and quality of movement (illustrating such elusive nuances with still images is quite challenging; some of the images included here might easily be interpreted in different ways).

Similar muscular action can be used to unilaterally curl the upper lip in an additional variety of displays such as snarling and sneering. Furthermore, seldom-mentioned facial movements referred to here as *nose-lengthening* and *grimacing* should also be recognized in related patterns of expression.

I. Nasolabial/ Nose-Raising Movements

• *The Dichotomous Nature of Nose-raising*

Raising the nose can certainly shield our olfactory receptors from an odor; just as significantly though, when performed less sharply the same movement can also *intensify* our



Typical “Disgust” display, in which the nose is sharply raised to avoid an odor.

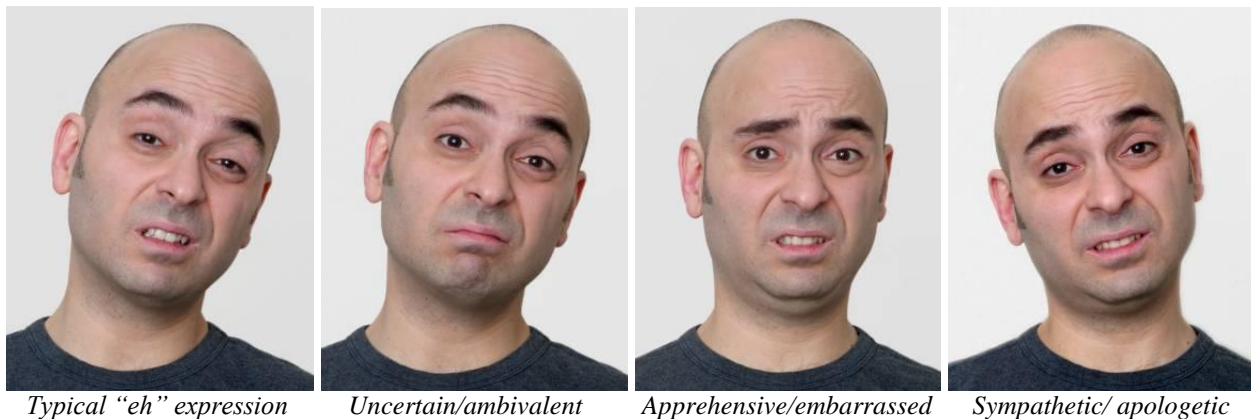


Similar muscular movements occur when we are actively sniffing an odor.

sense of smell. It is an integral part of our sniffing movements when we need to identify a faint or unfamiliar aroma—it shortens and angles the nasal passages, giving us more direct exposure to stimuli.

Since it can both increase *and* stifle our sensitivity, it follows that nose-raising as an expressive movement can convey arousal and vigilance, as well as aversion. It is exquisitely ambiguous; with subtle variations in performance it can just as easily appear receptive or rejecting. Playful nose-wrinkling, for example, might indicate fickle disdain or a desire to engage, such as the “cute” face one makes when interacting with an infant. In his satirical sketch, “Mister Robinson’s Neighborhood”, Eddie Murphy humorously exploits this ambiguity by sustaining an imitation of Fred (Mister) Rogers’ benevolent nose-wrinkle for just long enough to make it seem contemptuous.

Hovering between contradicting impulses, nasolabial movement often finds its way into expressions of ambivalence; it accompanies vocal responses such as *eh*, *so-so*, or *okay I guess*. Combined with wincing and assorted brow configurations, it can be seen in tentative displays for an odd assortment of affective states, such as sympathy, embarrassment, anxiety and indecision.



For some encoders, a slight lifting of the levator labii muscles is a pervasive defensive posture—they seem to tense these muscles as if in a continual state of assessing (metaphorically *sniffing*) potentially hostile environments, perpetually holding the world at arm’s length. This kind of affect may suggest apprehensiveness and anxiety; it may also indicate a distancing or contemptuous personality type. One must be careful not to over-pathologize though—for someone else, this might merely indicate sustained interest.

Nose-raising is a common paralinguistic device—a nonverbal punctuation that accompanies speech (Fridlund, 1994). It is frequently used to symbolically negate or diminish a subject being discussed. This gesture can have a derogatory tone, consistent with what is presumably its semantic root of rejection /disgust; however, the basic theme of negation can be broadly abstracted into a kind of visual idiom, often without any emotionally negative connotations at all. It might merely indicate that something is not an imminent cause for concern (accompanying remarks such as, “*ahh, don’t worry about it*”); it can even be a gracious, self-effacing gesture—when being thanked or commended we might wrinkle our noses to humbly deflect the acknowledgement (suggesting, “*aw, it was nothing*”).

• ***Expressions of Cognition, Appraisal and Confusion***

We are likely to raise our noses and knit our brows when performing cognitive tasks or processing and appraising unfamiliar information—rather dramatically so when we are amazed

or baffled. A sudden moment of comprehension of a difficult concept can induce sharp nasolabial lifting, along with the tilting back of our heads. There is a great deal of expressive variation in this context, ranging from active interest (consistent with sniffing/curious nose-raising) to a rejecting, withdrawing response (more in the domain of disgust).

An exaggerated nose-raising, combined with a slackened jaw, is a common facial expression for comedic buffoon characters, suggesting a permanent state of good-natured yet impenetrable befuddlement (when children mock each other for stupidity they make this face, with vocalizations such as *duhh*).



Listening/ remembering: angled head indicates appraisal; relaxed, smiling mouth is receptive; eyes squinting to “see” and nose raised to “smell” information.



Concentrating/problem-solving: brow is knit, eyes are squinted, nose is poised for investigation.



Puzzled/skeptical: sharp asymmetrical upper lip, withdrawn head.



Rejecting/ contemptuous: jaw is retracted aversively, eyes glaring with hostility.



Baffled: the jaw is passively loose, some defensive wincing, but also actively attempting to comprehend.



Buffoon expression: jaw is completely loose, upper teeth gregariously but pointlessly displayed.

• ***Expressions of Extreme Arousal***

Pronounced nose-raising with tightly knit brows are commonly found during highly aroused affective states, such as laughing and crying. This can be seen in moments of sharp agitation and disappointment, such as when we forget our keys or our favorite team loses a point (this is comparable to the expression of sudden comprehension described earlier, which might referred to as the “oh no/oh yeah” display). The raised nose is also combined with wincing and brow-knitting during acute physical pleasure and pain (occasionally, expressions of the two are

perplexingly indistinguishable). A similar expression appears, along with tensed lips and gritted teeth, when we struggle with physical tasks such as unscrewing a jar lid or lifting a heavy object.

It is difficult to tell in these situations whether the movement comes from an attempt to *shut out* sensory information, perhaps because of a saturated state of arousal, or if its purpose is to *intensify* one's affective state. There seems to be some neurological stimulation that results from squeezing features towards the center of the face—this might help us invigorate ourselves and cope with stressors. Theories have been proposed regarding the vascular “brain cooling” effects of smiling and other expressive movements (Waynbaum, 1907, Zajonc, 1985)—dramatically shortening the nasal passages would certainly introduce a rush of cool air that would facilitate lowering brain temperature. It is also conceivable that the pressure caused by such contractions would help prevent vascular eruptions during exertion.



Our nasolabial muscles are often raised during acute expressions of emotion such as laughter and crying.



The “oh no/oh yeah” display, induced by abrupt moments of disappointment, agitation or comprehension



An expression of intense physical exertion, such as pushing or lifting



An expression of pain or discomfort

The same kind of exaggerated nose-raising movement is demonstrated—often combined with smiling and shouting—in aggressively exuberant expressions. We find these expressions on the faces of energetic performers such as athletes, clowns and rock musicians. Their spectators often have similar expressions, which they combine with verbal encouragements. There are many situations that will elicit similar “cheering” behavior, such as when parents watch their children take their first steps.

The raised nose (as well as other assorted lip snarls and sneers) is also part of sexually provocative and vulgar facial displays. This may sometimes, as Ekman points out, communicate

an emotion of *enjoyed disgust* (Ekman, 1975), or a mischievous reveling in “nastiness”. It may also be interpreted as a playfully sadistic expression of contempt—a dare to approach. Sometimes it simply seems to be a campy imitation of a facial expression one might have during sexual arousal. Mike Meyers employs a lewd nose-raising display to suggest a combination of gleeful depravity and idiocy when portraying his *Austin Powers* character.



“Exuberant” nasolabial movement—nose-raising often appears in expressions of excitement and delight.

Nasolabial Movement in Displays of Anger, Distress and Terror



Enraged expressions

Some researchers have made a point of clearly distinguishing the “disgust” face from the “anger” face; however, pronounced nasolabial lifting is often an organic part of expressions of anger¹. It is actually difficult for some people to make an angry face *without* raising their noses, as this action very effectively exposes the teeth. I have photographed numerous models who instinctively included this in their depictions of rage, and had to make a conscious effort to do otherwise. Lip curling (as we shall see) is also a display that, because of its exposure of the canines, can express both disapproval and threat.

When we are enraged, as in other aggressively aroused states, we have a tendency to tighten our faces towards the center, rather like a fist—we narrow our eyes, force down our brows, pull up our noses and tense our lips. In physical confrontations these movements are quite pragmatic,

1. In the “test” section of *Emotions Revealed*, Paul Ekman informs readers that they are *incorrect* if they identify a snarling, rather hostile-looking model as depicting an emotion from the “anger family” (such as “annoyed” or “irritated”) because of the presence of nasolabial movement in her expression (Ekman, 2003). This kind of dogmatic adherence to theoretical models can lead to unfortunate blind spots in the study of such a dynamic phenomenon as facial expressions.

functioning as part of a defense/attack posture—they contract the vulnerable surface area of our faces, shield our eyes, protect our lips from being bitten, and make our noses more difficult to break, while at the same time enabling us to focus all our senses on an enemy and send out a clear, hostile signal. This might be compared to a castle that closes up its drawbridge and lines its archers up behind the turrets.

In terms of emotion theory, it's worth considering that there are situations in which there is a fuzzy distinction, if any, between violent aversion to an object and the outright desire to destroy it; perhaps the best word for this emotional state would be *hatred*.



Petulant/ Distressed expressions

Nasolabial lifting can also be an integral part of distressed expressions (see above images). Here, the movement is incorporated into the overall upward, imploring motion of the central vertical axis of the face. This often appears in children's faces as part of a petulant, whining affect, as though those muscles were being raised in protest.



Fearful/Terrified expression

The vigilant/ defensive aspects of nose-raising can be seen in a heightened state with some expressions of fear and terror (see above image)—here the movement is part of a tensed, frozen state of arousal, with lifted brows, widened eyes, and open mouth.

II. Lip-Curling and Elvis' Sneer



*Contemptuous-disgusted
lip curling*



Mouth dimpling/compressing



Curling combined with compressing

Asymmetrical lip curling is a common expressive movement that has been classified by psychologists as a display for emotions somewhere between “disgust” and “contempt”. It is often considered to be a variant of mouth “dimpling” (compressing the corners of the mouth), which is unfortunate; although the two are sometimes combined to complement each other, the muscular actions and subjective feel of each is quite different, as are their expressive ranges.



Hostile



“Sleazy”



Distressed/imploring



Haughty

The lip curl has a somewhat more distanced, withdrawn quality than bilateral nasolabial lifting—this generally seems to be the case with asymmetrical movements. The muscular action is caused mostly by the outer *levator labii superioris* part of the muscle group, as opposed to the *levator labii superioris alaeque nasii* which is more in control of the nose and middle part of the upper lip. As we can see in the accompanying plates, the movement has a broad expressive range and can participate in displays that are aversive, distressed, hostile, or even lewd. The lifting action can suggest a judgment, threat, protest, plea, suggestion, or inquiry, depending on how it is applied and combined with other movements.



The acerbic punk sneer (below) vs. the distant rockabilly sneer (above). With subtle variations, the same facial movement can have dramatically different effects. (The third image of Sid Vicious shows a combined lip-curling/compressing expression).



Perhaps second only to Mona Lisa's smile, Elvis Presley's enigmatic sneer is one of the most recognizable facial icons in western culture and is an intriguing example of the expressive possibilities of a single facial movement. The contempt/disgust designation really doesn't seem to do Elvis' sneer justice, and would hardly explain the romantic fascination it has inspired. Compared to Sid Vicious' unambiguously malevolent sneer (see illustrations above), Elvis' lip curl seems defensive and imploring—it functions as a childlike mask, a shield against the dangers of the world. There is a cursory, resigned quality to this mask—the relaxed asymmetry of his upper lip suggests a distant, distracted air, whereas the general flaccidity of the rest of his face indicates a passive stoicism. Globally, the expression conveys a complex *mélange* of messages—a guarded, lonely sadness, vulnerability, flirtatiousness, and a sense of irony. When combined with a smile, the sneer can even seem bashfully friendly.

III. Nose-Lengthening

We raise our noses when there is a faint aroma that we wish to identify; we also *lengthen* our noses (bringing down the tip and compressing the nostrils) to hold stimulus in our nasal passages when there is a complex aroma that requires subtle identification, such as when determining whether milk has spoiled. Nose-lengthening is combined with face-lengthening and frowning movements in expressions of contemplation, receptiveness, or suspicious inquiry. We might see this expression on the face of someone who is carefully considering a new idea or making a decision. Sometimes, instead of frowning, the lips might protrude in accompaniment, forming an inquisitive or skeptical facial display; when this is highly exaggerated, the nose may be flattened against the face. When combined with a puckered mouth and furrowed brow, nose-lengthening is also an effective display for disgust.



“Nose Lengthening” displays, ranging from thoughtful to disgusted

As we have seen, facial movements have complex functions that are often difficult to disentangle. Clearly they convey emotional states and paralinguistic messages to others and they reflexively react to physical stimuli; intriguingly, they also seem to send afferent neural messages to the encoders themselves in a sort of “feedback” effect and can thus be used to regulate their own behavior (Tomkins, 1962, Izard, 1977).

I recently observed a guitar player who displayed two alternating facial expressions that suggested the self-regulating aspects of nose lengthening/raising movements. During the more exploratory, nuanced passages of his solos, his face lengthened; he dramatically elongated his mouth and nose while raising his brows, as though he were trying to increase his own receptivity while searching for the next musical idea. During heightened, climactic moments—particularly the high notes—he scrunched and tightened his whole face, as though trying to experience the notes he played with the greatest possible intensity.

IV. Grimacing

• *Aversive Grimacing—Expressions of Disgust and Fear*

We have numerous quirky mouth expressions that can indicate disgust or aversion—in these displays we typically mimic our responses to unpleasant tastes, such as sourness or bitterness, with variations of puckering and wincing. These vary a great deal amongst encoders.

There is, however, one aversive/disgusted mouth display that is as universal as nasolabial lifting but is seldom mentioned in facial expression literature: this is a stretched, retracted, recoiling movement of the mouth, jaw and neck.² It is commonly identified as part of our innate expression of fear (Ekman & Friesen, 1971, Izard, 1971); perhaps the overzealous desire for discrete categorizations has caused it to be overlooked in connection with disgust. The action in both cases seems to be designed to protect our mouths—either from structural damage to the teeth and jaw, or from unwanted entry into the oral cavity. It involves the lower muscles of the mouth, such as the *platysma* and *depressor anguli oris*, and should be distinguished from wincing movements (which it is often combined with) — *grimacing* is probably the most appropriate word for it. In the context of disgust it is also connected with a gagging reflex; it might be thought of as a response specific to oral/gustative disgust, as opposed to olfactory disgust.

2. Fridlund describes “gagging”, with tongue extended, but it is not clear if he is referring to the same movement (Fridlund, 1994)



"Innate" fear grimace



Disgusted grimace

Recently I witnessed several young women in a coffee shop exhibit “mouth disgust” expressions when they saw a cockroach, accompanied by a chorus of “e-e-ew!” I caught myself making the same facial movements while watching a particularly revolting video of a man with large, sticky clumps of mucous and spittle on the corners of his mouth. It seems to be triggered by things with an objectionable texture, or things that crawl and squirm and might potentially trespass into one of our orifices. When we combine this movement with an extended tongue, raised nose and squinted eyes, we can create a delightful expression of total disgust—shivering and wagging our fingers in agitation communicates even greater sensory distress.

Looking at the striking similarity between the mouth movements in the pair of illustrations above, it is tempting to consider “fear” and “disgust” merely as two points on a spectrum of aversive responses—the former as a flight impulse to withdraw from a dangerous object, the latter as a more empowered impulse to push an offensive but inferior object away. There certainly seem to be states in which there is confusion or overlapping between the two emotions, causing harmless creeping things to take on an exaggeratedly malignant quality. Pain—especially sharp, sudden pain, such as from a burn or an electric shock—also often induces the



"Total" disgust, with nose and mouth display

same kind of expression, suggesting a frantic aversive impulse to pull away from the source of pain, or even from the painful sensation itself (physical pleasure can induce grimacing as well; as with nose-raising, there is sometimes a strange similarity between pain and pleasure displays).

- **Appraisal/Confusion Expressions: Grimacing Vs. Nose-Raising**

Interestingly, grimacing also appears in an array of appraisal/confusion displays somewhat paralleling that of nose-raising, ranging from befuddlement to contempt. In comparison, grimacing seems to indicate confusion, ambivalence or disdain regarding a proposed *action*, rather than a *stimulus*—a “what should I do/say now?” or “what are you, crazy? I’m not doing *that!*” kind of response, versus a “what does that mean?” or “that’s the stupidest thing I’ve ever heard” response that might induce nasolabial movement. From an ethological perspective, we might think of “nose confusion/disgust” as relating to an unfamiliar *odor* that may or may not be harmful, and “mouth confusion/disgust” as a response to an unfamiliar *object* that one would be reluctant to eat without more information.

These differences can be seen in simple exchanges—the “mouth confusion” display often appears at moments when an encoder is uncertain about how to respond to a question or explain an idea, whereas “nose confusion” will prompt the encoder’s partner to clarify or expand upon a statement (it should be stressed that such distinctions are subject to great individual variation, depending on an encoder’s style or habit).



Anxious/Confused grimace

An “I dunno” shrug

Contemptuous/skeptical

Mortified/appalled

An exaggeration of the “mouth confusion” expression is incorporated into another archetype of comic buffoonery. It is usually assigned to characters that are quite out of it, even drunk or developmentally disabled; Jerry Lewis often demonstrated this kind of absurd affect in his film



Jerry Lewis’ “mouth confusion” expressions

performances. Children are also fond of this face, combining it with bulging eyes, swaying head, and distorted vocalizations. Similar comical grimacing is often used paralinguistically, to comment on confusing or ridiculous situations, or to sarcastically refer to foolish behavior. The movement usually appears and disappears quickly, rather like the snap of a rubber band.

- ***Aggressive and Distressed Grimacing***

Variations of grimacing movements appear in a range of approach/withdrawal behavior, conveying our desires, intentions and apprehensions. Our lower facial and jaw muscles are our most evolutionarily primitive expressive muscles; being our primary means of ingestion (indeed, the very tensing of these muscles can induce salivation), it naturally follows they would express appetitive and aggressive responses in addition to aversive ones.



Voracious-lustful aggressive mouth



Helpless weeping mouth

An almost cartoonish expression of voracious hunger, lust, or rage can be created with an aggressive, forward-thrusting grimace. In these displays the facial muscles are stretched and retracted, but the jaw is poised for aggressive action; the bottom teeth and jaw are exposed rather than being shielded from harm. In contrast, the buckling and writhing of those same muscles during weeping is a highly effective display of helplessness; perhaps this is because it suggests an inability to fend for one's self (see above illustrations).

Thrilled emotions, such as when we anticipate positive events, often induce a kind of grimace-smile. Some encoders habitually enlist their lower facial muscles when they smile, augmenting the usual zygomatic major muscle action with a stretching of their lower mouths; this adds an eager or excited quality to the display.

“American Idol” contestant Taylor Hicks and actor Robin Williams both incorporate a great deal of lower mouth/grimacing movement in their excited and appetitive facial expressions, which suggests a “lusty” quality.



Suppressed anger or frustration is sometimes revealed by grimacing, combined with a restrained grinding movement of the jaw muscles. Expressions of thoughtful hesitation can involve similar movement—here, the mouth/jaw retraction suggests holding back action while considering one's options or listening to another point of view. Some encoders subtly incorporate this into their speech movements, which seems to impart a deliberate, precise quality

to their words. There are myriad ways in which subtle grimacing movements can be integrated into speech, communicating a remarkable array of anxious or engaged emotions—there is also a great deal of individual variation in lower mouth expressiveness, ranging from a virtual absence of it for some encoders to constant rubbery movement for others.



Frustrated/ thoughtful grimacing, with grinding jaw

When considering how speech interacts with facial behavior, linguistic contributions should certainly not be ignored—for example, Latin languages, such as Spanish and French, seem to employ muscles of the lower mouth more than English and Russian, which seem to involve more compressed chewing and blowing movements. Thus, it might be hypothesized that speaking English imitates the feeling of mastication while Spanish imitates nibbling or biting—but that is of course highly speculative. There is evidence that individual phonemes induce specific affective responses (Zajonc, Murphy, Inglehart, 1989), but the cumulative results of speaking an entire language have yet to be explored. Whether languages induce distinctive affective experiences for their speakers and how combinations of phonemic movements relate to cultural dynamics are questions worthy of investigation.

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