

Action Unit Combinations - 10+12+25, 12+16+25, 10+12+16+25

It is easiest for you to learn these combinations at the same time. Have ready before you images 12+25, 10+12+25, 12+16+25 and 10+12+16+25.

A. Appearance Changes due to 10+12+25, 12+16+25, 10+12+16+25

The appearance changes due to AU 12 are unchanged, although it is possible for a strong AU 10 to obscure the cues of a weak AU 12. The changes to AU 10 are sometimes obscured by AU 12, especially when 12 is two or more is two or more intensity steps greater than 10.

AU 12 (with 10 and/or 16+25)

1. Pulls the corners of the lips back and upward (obliquely) creating a  shape to the mouth.
2. Deepens the nasolabial furrow, pulling it laterally and up. The skin adjacent to the nasolabial furrow is raised up and laterally.
3. In a weak to moderate AU 12, there is some raising of the infraorbital triangle and there may be some deepening of the infraorbital furrow.
4. In a strong action of AU 12:
 - a. The infraorbital triangle push upwards is more evident.
 - b. The infraorbital furrow deepening is more evident.
 - c. Bags the skin below the lower eyelid.
 - d. Narrows the eye aperture by pushing up the cheek and skin below the lower lid.
 - e. Produces crow's feet at eye corners.
 - f. May raise and widen the nostrils.
 - g. May flatten and stretch the skin on the chin boss.
5. Almost all of the appearance changes listed under 4 above (with the exception of changes f. and g.) can also be produced by AU 6 in the upper face. When you see a strong action of 12, often it is difficult to be certain whether the changes listed under 4 above are due to 12 alone or to the combination of 6 plus 12 because a strong 12 hides many of the effects of 6. When the action of 12 is weak to moderate the appearance changes under 4 above do not occur, unless AU 6 has been added. With such weak to moderate actions of 12 you score 12 or 6+12 based upon whether the evidence of AU 6 is apparent. In either case, it is important to determine whether the appearances should be scored as 12 or 6+12.

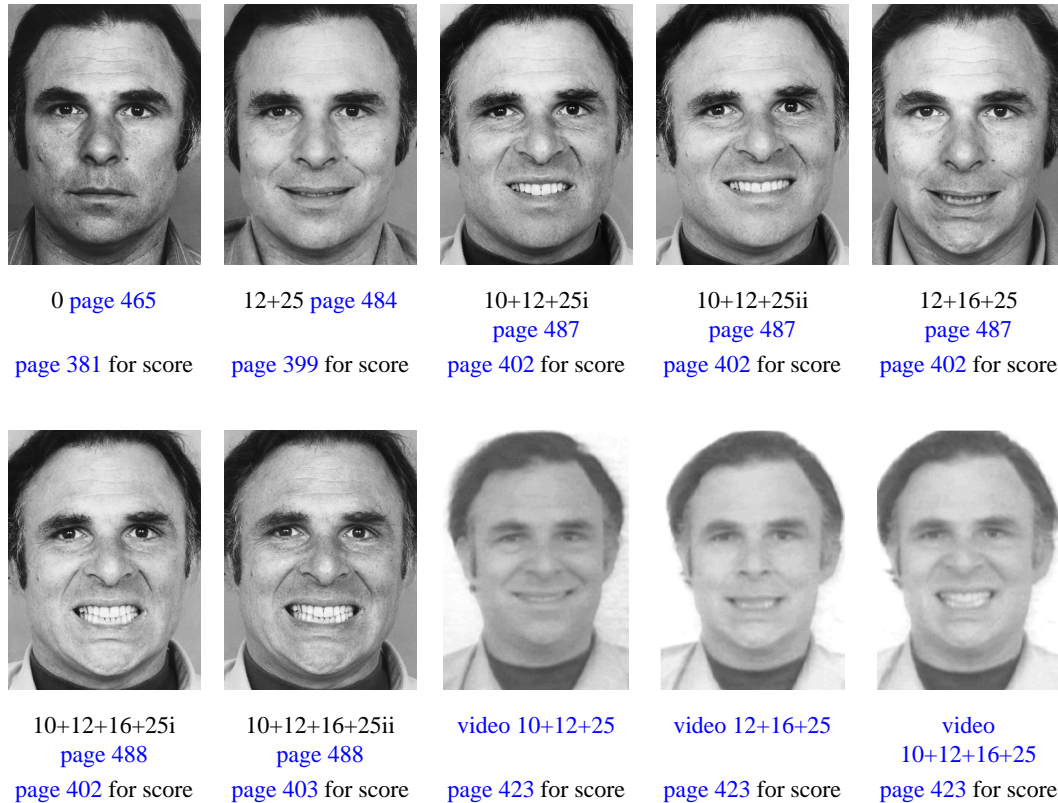
AU 10 (with 12+25 or with 12+16+25)

6. AU 10 is difficult to detect when 12 is at high intensity, unless the actions are observed sequentially; or if 10 and 12 are about the same low or moderate intensity. In the latter case, 10 is evident by its characteristic pouching of the medial upper corner of the infraorbital triangle, the deepening of the top portion of the nasolabial furrow, and increased exposure of the roots of the upper teeth and gums. If 12 is *slight* and 10 is *maximum*, there may be little evidence of 12 at all.

AU 16 (with 12+25 or with 10+12+25)

7. Pulls down the lower lip so that the lower front teeth are exposed and sometimes also the lower gum is exposed. Note the type of lateral lip stretching due to 16 may be obscured by 12's stretching of the lips.
8. Stretches the chin boss laterally and down, flattening the skin over the chin boss and sometimes causing wrinkles to appear over the chin boss.
9. Pulls the lower lip down and may cause the lower lip to protrude or flatten.

Compare images 10+12+25i with 10+12+25ii. Note how the characteristic 10 pouch becomes harder to see in 10+12+25ii when 12 becomes C or D than in 10+12+25i where 12 is less intense. Note the same difference in the evidence of 10 in the images 10+12+16+25i and 10+12+16+25ii. Examine the image 12+16+25. Examine the video segments of these combinations.



B. How to do 10+12+25, 12+16+25 and 10+12+16+25

First do 12+25, then add in AU 10, noting how the upper gum is exposed. Then do 12+25 adding in AU 16, noting how the lower gum is exposed. Then do all three AUs. Do 10E then add 12E noting how such a strong 12 reduces the evidence of AU 10. Do 12B then add 10E and note how evidence of 12 becomes very difficult to see when 10 is strong relative to 12.

C. Intensity scoring for AUs 10+12+25, 12+16+25, 10+12+16+25

The criteria for AU 12 in these combinations are the same as for 12 alone. Note that when 12 combines with 10 or 10+16 the angling up of the lip corners due to 12 is not as evident. Also, note that the lips appear stretched and flattened by 12 in 10+12 or 10+12+16. Compare 10+12+25i with 12+25 and 10+12+16+25 with 10+16+25ii to see this difference.

The criteria for AUs 10 and 16 are different in combination with 12. AU 12 often hides signs of 10. The intensity criteria below describe the changed guidelines for AU 10 and AU 16 when in combination with AUs 12 and 25 of unspecified intensity. Any combination of the intensities of AUs 10, 12, and 16 might occur in combinations with one another, and the determination of their intensity scores depends upon your evaluation of the balance of effects contributed by these AUs.

The intensity criteria for 25 are also repeated below.

AU 10A in AU Combination 10A+12+25 or 10A+12+16+25

The appearance changes for AU 10 are sufficiently present to indicate AU 10, but are insufficient to score 10B in these combinations (e.g., a *trace* of pouching in the medial top corner of the infraorbital triangle and a *trace* of its deepening and the shape of the upper lip is a compromise between 10 and 12).

AU 10B in AU Combination 10B+12+25 or 10B+12+16+25

1. Characteristic 10 pouching of medial top corner of infraorbital triangle is at least *slight*.
and
2. *Slight* deepening of top portion of nasolabial furrow.
and
3. Shape of upper lip is a compromise between due to 10 and due to 12.

Note that if 12 is very strong (12E), it produces criterion 2 and conceals criterion 1 and the shape of the upper lip is not a compromise between 10 and 12, but rather one due to 12. Since 12 dominates the appearances of 10, you must look carefully for signs of 10, especially at onset and offset to determine if 10 is present. AU 10 raises the medial part of the infraorbital triangle more than 12 can, 10 lifts and deepens the medial part of the nasolabial furrow more than 12 can, 10 lifts the nostril wings up much more than 12 can, and 10 exposes the roots of the upper teeth and gums but 12 does not. If 10 is very strong and 12 is very weak (e.g., 10E+12B), little evidence of 12 will be evident, but 10 will be evident.

AU 10C in AU Combination 10C+12+25 or 10C+12+16+25

The criteria 1, 2, and 3 listed for AU 10B are all at least *marked*, but the evidence is less than the criteria for 10D in 10+12+25 or 10+12+16+25.

AU 10D in AU Combination 10D+12+25 or 10D+12+16+25

The criteria 1, 2, and 3 listed for AU 10B are all *severe*, but the evidence is less than the criteria for 10E in 10+12+25 or 10+12+16+25.

AU 10E in AU Combination 10E+12+25 or 10E+12+16+25

The criteria 1, 2, and 3 listed for AU 10B are all *extreme to maximum*.

Note that the criterion 3 is rarely *extreme to maximum* if the 12 is strong, since such actions of 12 counteract the influence of 10 on the shape of the upper lip. With such a strong 12, you can only score 10 as A to C. With a 12A, B, or C, you may be able to score a 10E.

AU 12A

The appearance changes for AU 12 are sufficiently present to indicate AU 12, but are insufficient to score 12B (e.g., a *trace* of raising of skin in the lower/middle nasolabial furrow area and a *trace* of lip corners elongated and angled up). You should emphasize detecting the oblique upward movement of the lip corners in low intensity 12s that changes the angle of the lip corners. Note that neither AU 6 or 11 changes the angle of the lips, as does 12.

AU 12B

1. Skin in the area of the lower-middle portion of the nasolabial furrow or the furrow itself has been raised up and laterally *slightly*. If the nasolabial furrow is permanently etched, it usually deepens with a 12B, but the crucial change is that the skin in this area shifts obliquely. If the nasolabial furrow is not permanently etched, it may not appear with 12B.
and

2. *Slight* evidence that infraorbital triangle has been raised; most likely showing in lifting and puffing out of lateral top corner of infraorbital triangle.
and
3. *Slight* evidence that lip corners elongated and angled up. If upward angle is permanent, it must increase *slightly*.

Note that when 6 is added to 12B there often is more evidence of the nasolabial furrow deepening than in 12B without 6, and the excursion of the lip corners is small in comparison to the extent of crow's feet wrinkles.

Note that appearance changes 1 and 2, as expressed in words, could be due to AU 6, rather than AU 12. However, the appearance of 6 is noticeably different from 12, seen in the images for these AUs. Furthermore, the appearance of 6 and 6+12 also differ. If there are other signs of AU 6, inspect carefully for change 3 to score AU 12.

AU 12C

All three criteria for 12B above are present and all are at least *marked*, but the evidence is less than the criteria for 12D.

AU 12D

Appearance changes 1 (lip corners raised obliquely to make U shape), 2 (deepened nasolabial furrow and oblique movement of skin in that area), and 4 in 12secA are all at least *severe*, but the evidence is less than the criteria for 12E.



AU 12E

Appearance changes 1 (lip corners raised obliquely to make U shape), 2 (deepened nasolabial furrow and oblique movement of skin in that area), and 4 (infraorbital triangle raise, infraorbital furrow deepening, in 12secA must be *extreme to maximum*.

AU 16A in AU Combination 12+16A+25 or 10+12+16A+25

The appearance changes for AU 16 are sufficiently present to indicate AU 16, but are insufficient to score AU 16B in the combination 12+16+25 or 10+12+16+25 (e.g., exposure of the front teeth and a *trace* of skin over the chin being stretched down).

AU 16B in AU Combination 12+16B+25 or 10+12+16B+25

1. Almost the entire tooth surface of the lower front teeth in the center is exposed.
or
2. The shape of the lower lip has been changed by the pulling down of 16 so that instead of  it becomes more like ; and there is more of the lower teeth exposed than in 12+25, even if less than called for in criterion 1 above, as long as you see the lip move down.
or
3. The skin covering the chin has been pulled down *slightly* and stretched laterally *slightly*. Do not use this requirement if the stretch of the skin over the chin is only lateral, as a lateral upward pull is caused by a strong 12.

Note that 16 without 25 is a very unlikely occurrence in these combinations.

AU 16C in AU Combination 12+16C+25 or 10+12+16C+25

The criteria 1, 2, and 3 listed for AU 16B are all at least *marked*, but the evidence is less than the criteria for 16D in 12+16+25 or 10+12+16+25.

AU 16D in AU Combination 12+16D+25 or 10+12+16D+25

The criteria 1, 2, and 3 listed for AU 16B are all at least *severe*, but the evidence is less than the criteria for 16E in 12+16+25 or 10+12+16+25.

AU16E in AU Combination 12+16E+25 or 10+12+16E+25

The criteria 1, 2, and 3 listed for AU 16B are all *extreme* to *maximum*.

AU 25A

When the jaw is shut, the appearance changes for AU 25 are sufficiently present to indicate AU 25, but are insufficient to score 25B (e.g., a clear opening between the lips that is less than 2 millimeters, but you can see no teeth).

When the jaw is lowered by AU 26 or 27, score 25A when actions that act to move the lips together have reduced the lip separation at least *severely* from the separation produced by the jaw opening itself.

In either case, if you are uncertain that the lips are parted, do not score 25A.

AU 25B

There are two alternative criteria for scoring 25B when the jaw is shut:

1. Teeth show - you can see teeth without doubt. The sight of but one part of one tooth is sufficient, but you must be certain that you see a tooth.
or
2. Space between lips – must be at least 2 millimeters (the thickness of 2 quarters, an American coin) between the lips.

When the jaw is lowered, use the intensity score of B to indicate that lip uniting actions are reducing the lip separation at least *slightly* from what they would otherwise be, given the extent of jaw lowering.

AU 25C

If the teeth remain together, i.e., no jaw drop can be detected, the increased lip separation from the criteria for 25B likely comes from another lip separating action or actions and must be a *marked* or *pronounced* departure from the B criteria. For example, you might score a 25C if there is a moderate action of AU 10 or AU 16 (or other lip parting action) or a small action of both 10 and 16 that parts the lips at least *markedly* more than the criteria for 25B, but less evidence than the criteria for 25D.

If the jaw is lowered by AU 26 or 27 to separate the lips, and the separation is not increased more than a *trace* by other lip separating actions or decreased more than a *trace* by lip constricting actions, score 25C. The intensity score of C for AU 25 represents the lip separation controlled virtually entirely by the jaw lowering, the lips otherwise remaining relaxed or minimally affected by other muscles pulling them open or constricting them, regardless of the absolute distance between the lips. Use the relative position of the upper lip to the upper teeth and the lower lip to the lower teeth as a guide to whether the lip separation is more or less than the jaw lowering alone produces. If other muscles act to constrict the lips, consider scoring B or A; if they act to separate the lips, consider scoring D or E.

AU 25D

When there is no jaw lowering and the lips part due to other lip separating actions, the lip separation must be *severely* greater than the criteria for 25B to assign a D intensity code to AU 25. Thus, when the teeth are together, lip parting actions other than jaw lowering, such as AU 10 and/or 16, must be pulling the lips apart at least *severely* beyond the B criteria, but less evidence than the criteria for 25E.

When the jaw is lowered, assign a D intensity score to AU 25 when these same lip lowering and raising actions are separating the lips at least *slightly* more than they would be from the jaw lowering alone, but not more than the criteria for the E intensity score. A *slight* departure from the opening caused by the jaw lowering might result from a lip lowering action, a lip raising action, or both.

AU 25E

Like the other intensities of AU 25, the E intensity is not intended to reflect the absolute maximum possible separation of the lips, but rather the maximum possible separation given the degree of jaw lowering, if any. When the teeth remain together, score an E intensity when lip parting actions, such as AUs 10 and 16, separate the lips at least *extremely* or near *maximum* by both lowering the lower lip and raising the upper lip, so that the lips are separated about as much as possible.

When the jaw is lowered, assign the E intensity when both the upper lip is raised and the lower lip is lowered so that the lips are separated at least *severely* more parted than what would result from the lowered jaw alone. Thus, for example, if AU 10 and AU 16 were both acting at *maximum* so that you think the lips are separated as much as possible given the jaw lowering, you assign an E intensity code to 25.