

Subtle Differences Among Single Action Units in the Upper Face

You have now been introduced to all of the Action Units in the upper face. Before turning to the combinations of these AUs, we will describe ways to distinguish between particular AUs which differ in subtle ways. Later, when you have learned combinations of upper face AUs, we will describe more subtle differences between single AUs and combinations, and between particular combinations.

Compare the video example of each contrast, checking it against the text. Appendix I is an index of the AUs and combinations appearing in video. It will help you find the AUs contrasted below. Also, compare the images for each contrast.

Table 2-1 Subtle Differences Among Single Upper Face Action Units

AUs	Subtle Differences
5 vs. U5	When it appears that AU 5 has acted on only the left or right side, it is very likely that there is at least a <i>trace</i> of movement of the other upper eyelid. If there is at least a <i>trace</i> , score AU 5 as bilateral and score the intensity of the eyelid raise equal to the side with greater intensity. Be very cautious about scoring U5 to be certain there is no <i>trace</i> on the other side.
6 vs. 7	<p>Both AUs share the appearance changes of narrowing the eye aperture, and changing the appearance of the skin below the lower eyelid.</p> <ul style="list-style-type: none"> •the most important difference is that the infraorbital triangle is raised in 6 but not in 7: evident in more prominent, raised cheeks and a more apparent or deepened infraorbital furrow which takes on a more horizontal or crescent shape. •AU 6 can lower the outer corner of the eyebrow while AU 7 cannot. •the bagging or wrinkling of the skin below the eye occurs more in 6 than in 7 and extends further down the face in 6 than in 7. •crow's feet in 6 not in 7; or, if in 7, a single line or wrinkle (or toe), not many lines or wrinkles (or feet). •some pulling upwards of upper-lip and skin above upper-lip in an extreme 6, but not in 7. •skin below the eye is drawn up and medially towards the inner corner of the eye in 7, not 6. •a bulge may appear in the lower eyelid skin in both 6 and 7, although it is due to a different action (pulling of the skin over the eyeball in 7, or pushing of the skin up by the drawing in action of 6), and usually appears somewhat different. •AU 6, unlike 7, pushes down on the eye cover fold by constricting skin above it. <p>If you are uncertain whether the signs of 6 have increased from neutral, consider scoring 7 or 11. If 6 is evident on one side of the face and 7 on the other side, score bilateral 6, unless the purpose of the study is to examine asymmetry.</p> <p>In drawing the skin in towards the eye, AU 6 makes it difficult to see the lid tightening action of AU 7. When the question is whether AUs 6 and 7 have combined, watch for the independent tightening and movement of the lower eyelid in these combinations. When the onset or offset of the two AUs is not synchronized, the AU 7 is more easily detectable. Also, check for signs of 7 that are not produced by 6 alone, as indicated in the comparison of 6 vs. 6+7 below. If you cannot detect independent evidence of the 7 from the 6, do not score the 7.</p>

6 vs. 6+7	AU 7 is very difficult to detect when simultaneously involved with AU 6, and the more intense the 6, the more it covers the action of 7. First, check for signs of asynchrony in the actions of 6 and 7. Look at the moments when these AUs begin to act or later when they relax. For example, if the lower eyelid is pulled medially during initial action of a possible 6+7, then AU 7 is acting with 6. If during relaxation the extreme inner corner of the lower eyelid moves laterally and not only downward, AU 7 must have been on the face, not 6 alone. Second, check the signs of 7 that 6 does not produce. Besides the medial pulling of the lower eyelid by 7, AU 7, not 6, pulls the upper eyelid down. AU 6 <u>pushes</u> the skin of the lower eyelid up to produce wrinkling in the lower eyelid, but AU 7 <u>pulls</u> it up even more onto the eyeball to cover more of the eyeball than 6 alone can do. Often, you can distinguish this wrinkling of the lower eyelid, which can be produced by either 6 or 7, from the bulging of the skin as it is pulled up onto the eyeball by AU 7. If in doubt that 7 has acted with 6, score 6 alone.
7 vs. 43B vs. 7+43B	AU 43 can be scored without scoring 7, but it is rare that 7 can be scored without at least a 43A unless AU 5 has acted with 7 to lift the upper eyelid. If 7 is scored, it is not necessary to score 43 and its intensity unless the study is examining the degree of eye closures, regardless of the action that causes them. If upper eyelid closure is being scored comprehensively and 7 can be scored and the upper lid is lowered, score 7+43 and score the intensity of 43 to reflect the degree that the upper eyelid is pulled downward. In both 43B and 7 there is a narrowing of the eye aperture, but the action that is responsible differs. In 7 it is primarily a tightening action, while in 43 alone it is primarily due only to drooping or relaxing. AU 7 is more visible on the lower eyelid although it changes both lids, while 43 is an upper eyelid action. In 43B the upper eyelid is so relaxed that it droops down covering more of the iris than in neutral. In 7 the lids are tightened, the lower lid raised by the tightening, the upper lid pulled down. The clue to 7 is watching the lower lid go up, the skin below the lower lid pulled towards the root of the nose, and the bulging of the skin in the lower lid.
7E vs. 43D	In both 7E and 43D the eye aperture is very narrow. However, 43D is primarily an upper eyelid action; the upper eyelid being lowered gently or relaxed so that the eye is almost closed. AU 7E is 7 at its most extreme intensity; therefore, the narrowing of the eye aperture is due to the extreme raising and tensing of the lower lid and pulling down of the upper lid. If the cues of AU 7 are clearly present and the eyes are open only a slit, and a comprehensive scoring of eye closure is not required, score it as 7E; otherwise, score 7E+43. Examine the images 7E and 43ii on page 469 .
7+43E vs. 43E	In 43E alone the eyelids appear relaxed. In 7+43E the eyelids are tightened together, not relaxed. Examine the images 7+43 on page 473 and 43iii on page 469 .
43D vs. 43E	In 43E, the eyes are definitely closed for at least ½ second. AU 43E is scored only when you can be certain that the lids are touching or resting on each other, and the lashes are together. The upper and lower eyelids touch together and stay together for at least ½ second in 43E. If there is even a very small gap between the lids, score 43D not 43E. You will not see any part of the eyeball between the lids or the glistening of the lower lid's wet tissues when the eyes close, and the lower eyelashes are obscured by the upper lid and lashes when an eye closes. If the eyes are almost closed, score 43D.
43E vs. 45	If the eyes remain closed for more than ½ second, it is closed (AU 43E) and not a blink (AU 45). If the actions are unilateral, see U43E vs. 46 and U45 vs. 46.
U43E vs. 46	AU 46 must be unilateral. If the eye closure is longer than 2 seconds, it must be 43E or some combination of 6 or 7 with 43E. If the eye closure is under 2 seconds, but longer than ½ second, it could be either an unilateral eye closure or a wink. Decide by determining if you think there was an intentional quality to the closure, perhaps shown in the movement itself or by an accompanying head movement, or deliberate pause during the moment the eye is closed. These are signs of the wink (AU 46), not an eye closure (AU 43E). As AU 46 must be unilateral, score R46 or L46.
U45 vs. 46	In a wink one eye closes and is usually held closed for a longer duration than a blink. A blink cannot exceed ½ second in duration, but a wink can be as long as 2 seconds. Therefore, the only difficulty in distinguishing a wink from a blink is when the eye closure is unilateral and does not exceed ½ second. To score a wink (46) that is less than ½ second there must be a deliberate pause or hesitation when the eye is closed.

Subtle Differences Involving Action Units in the Upper Face

Table 2-2 lists characteristics of actions and combinations that can help you distinguish between sets of behaviors that differ only subtly. Some of these subtle differences are between a single Action Unit and a combination of AUs; some are between two different combinations. Since you will use this material as a reference when you encounter difficulties in scoring upper face behavior, the information listed earlier on the subtle differences between single Action Units is repeated for easy reference.

Read Table 2-2 carefully. Study the relevant images and videos. Refer to Appendix I to locate the video comparisons that can be made.

Table 2-2: Subtle Differences for Action Units in the Upper Face

AUs	Subtle Differences										
1 vs. 1+4	<p>In 1+4 but not 1:</p> <ul style="list-style-type: none"> •inner eyebrow corners pulled together. •vertical wrinkle or muscle bulge between eyebrows. <p>1+4 more than 1:</p> <ul style="list-style-type: none"> •if the eyebrow shape becomes oblique, it is more evident in 1+4. •if the eyebrow shape has a dip in the center and goes up at inner corner, it is more evident in 1+4. <p>May be present in 1+4 not in 1:</p> <ul style="list-style-type: none"> •oblique wrinkle or muscle bulge running from the forehead above the eyebrow's center down medially towards inner corner of eyebrow. 										
1+2 vs. 1+2+4	<table border="0"> <thead> <tr> <th style="text-align: center;">1+2</th><th style="text-align: center;">1+2+4</th></tr> </thead> <tbody> <tr> <td>brows arched in shape</td><td>brows more flattened</td></tr> <tr> <td>brows raised</td><td>brows raised less than 1+2 at equivalent intensities and also pulled together</td></tr> <tr> <td>horizontal wrinkles extend across forehead; or, if no wrinkles the brows are <i>markedly</i> raised and eye cover fold very exposed</td><td>horizontal wrinkles mostly in center of forehead; wrinkle lines are less smooth than those of 1+2</td></tr> <tr> <td>not present</td><td>oblique muscle bulge or wrinkle from the forehead above the eyebrow down to the inner corners of the brow may be evident.</td></tr> </tbody> </table>	1+2	1+2+4	brows arched in shape	brows more flattened	brows raised	brows raised less than 1+2 at equivalent intensities and also pulled together	horizontal wrinkles extend across forehead; or, if no wrinkles the brows are <i>markedly</i> raised and eye cover fold very exposed	horizontal wrinkles mostly in center of forehead; wrinkle lines are less smooth than those of 1+2	not present	oblique muscle bulge or wrinkle from the forehead above the eyebrow down to the inner corners of the brow may be evident.
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1+2 vs. 1+2+5	<p>Difficult only because in some people the action of 1+2 may lift the upper eyelid to a limited extent. Since you won't know when this is the case, if the signs of 5 are present you score it as 1+2+5.</p> <p>Present in 1+2+5 but not in 1+2:</p> <ul style="list-style-type: none"> •if in neutral top portion of iris covered by upper eyelid, then all of top of iris should be revealed. •if in neutral iris top shows, then sclera is revealed. •person seems to be staring in fixed fashion if the 5 is strong. 										

6 vs. 6+7	<p>AU 7 is very difficult to detect when simultaneously involved with AU 6, and the more intense the 6, the more it covers the action of 7. First, check for signs of asynchrony in the actions of 6 and 7. Look at the moments when these AUs begin to act or later when they relax. For example, if the lower eyelid is pulled medially during initial action of a possible 6+7, then AU 7 is acting with 6. If during relaxation the extreme inner corner of the lower eyelid moves laterally and not only downward, AU 7 must have been on the face, not 6 alone. Second, check the signs of 7 that 6 does not produce. Besides the medial pulling of the lower eyelid by 7, AU 7, not 6, pulls the upper eyelid down. AU 6 <u>pushes</u> the skin of the lower eyelid up to produce wrinkling in the lower eyelid, but AU 7 <u>pulls</u> it up even more onto the eyeball to cover more of the eyeball than 6 alone can do. Often, you can distinguish this wrinkling of the lower eyelid, which can be produced by either 6 or 7, from the bulging of the skin as it is pulled up onto the eyeball by AU 7. If in doubt that 7 has acted with 6, score 6 alone.</p>
6 vs. 7	<p>Both AUs share the appearance changes of narrowing the eye aperture, and changing the appearance of the skin below the lower eyelid.</p> <ul style="list-style-type: none"> •the most important difference is that the infraorbital triangle is raised in 6 but not in 7: evident in more prominent, raised cheeks and a more apparent or deepened infraorbital furrow which takes on a more horizontal or crescent shape. •AU 6 can lower the outer corner of the eyebrow while AU 7 cannot. •the bagging or wrinkling of the skin below the eye occurs more in 6 than in 7 and extends further down the face in 6 than in 7. •crow's feet in 6 not in 7; or, if in 7, a single line or wrinkle (or toe), not many lines or wrinkles (or feet). •some pulling upwards of upper-lip and skin above upper-lip in an extreme 6, but not in 7. •skin below the eye is drawn up and medially towards the inner corner of the eye in 7, not 6. •a bulge may appear in the lower eyelid skin in both 6 and 7, although it is due to a different action (pulling of the skin over the eyeball in 7, or pushing of the skin up by the drawing in action of 6), and usually appears somewhat different. •AU 6, unlike 7, pushes down on the eye cover fold by constricting skin above it. <p>If you are uncertain whether the signs of 6 have increased from neutral, consider scoring 7 or 11. If 6 is evident on one side of the face and 7 on the other side, score bilateral 6, unless the purpose of the study is to examine asymmetry.</p> <p>In drawing the skin in towards the eye, AU 6 makes it difficult to see the lid tightening action of AU 7. When the question is whether AUs 6 and 7 have combined, watch for the independent tightening and movement of the lower eyelid in these combinations. When the onset or offset of the two AUs is not synchronized, the AU 7 is more easily detectable. Also, check for signs of 7 that are not produced by 6 alone, as indicated in the comparison of 6 vs. 6+7 above. If you cannot detect independent evidence of the 7 from the 6, do not score the 7.</p>
6 vs. 6+43D	<p>In addition to the signs of 6, the upper eyelids are relaxed so the eyes are almost closed in a slit in 6+43D. Note that neither upper nor lower eyelid can be tensed in 6+43, if so, AU 7 must be present.</p>
6+43E vs. 7+43E vs. 6+7+43E	<p>The eyes are closed in these combinations. In 7+43E the tightening affects primarily the eyelids, while in 6+43E the infraorbital triangle is raised and crow's feet wrinkles appear.</p> <p>When the eyes are squeezed and closed by the combination of AUs 6 and 43E, the addition of AU 7 can be difficult to see. When considering scoring both 6 and 7 in addition to 43, look carefully for the independent tightening and movement of the lower lid caused by 7 before scoring this combination.</p>
6 vs. 7E vs. 6+7E	<p>AU 7E produces a squinting, narrowed eye aperture. AU 6 can narrow the eye aperture, but with different appearances from AU 7 (see Subtle Differences for 6 vs. 7), and AU 6 can act without causing an eye squint. If in addition to the squint of 7E, you see the signs of AU 6, infraorbital triangle raise, drawing skin from the temple and cheeks towards the eye, etc., score as 6+7E. If you only see the squint without these signs of 6, score 7E alone.</p>

7 vs. 43B vs. 7+43B	<p>AU 43 can be scored without scoring 7. On the other hand, with all but the weakest 7, it is rare that 7 can be scored without evidence of at least a <i>trace</i> of upper lid lowering or 43A, unless AU 5 has acted with 7 to lift the upper eyelid. If 7 is scored, it is not necessary to score 43 and its intensity unless the study is examining the degree of eye closures, regardless of the action that causes them. (Scoring 43E is always recommended, however.) If upper eyelid closure is being scored comprehensively and 7 can be scored and the upper lid is lowered, score 7+43 and score the intensity of 43 to reflect the degree that the upper eyelid is pulled downward.</p> <p>In both 43B and 7 there is a narrowing of the eye aperture, but the action that is responsible differs. In 7 it is primarily a tightening action, while in 43 alone it is primarily due only to drooping or relaxing. AU 7 is more visible on the lower eyelid although it changes both lids, while 43 is an upper eyelid action. In 43B the upper eyelid is so relaxed that it droops down covering more of the iris than in neutral. In 7 the lids are tightened, the lower lid raised by the tightening, the upper lid pulled down. The clue to 7 is watching the lower lid go up, the skin below the lower lid pulled towards the root of the nose, and the bulging of the skin in the lower lid.</p>
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7+43E vs. 43E	In 43E alone the eyelids appear relaxed. In 7+43E the eyelids are tightened together, not relaxed.
43D vs. 4E	In 43E, the eyes are definitely closed for at least ½ second. AU 43E is scored only when you can be certain that the lids are touching or resting on each other, and the lashes are together. The upper and lower eyelids touch together and stay together for at least ½ second in 43E. If there is even a very small gap between the lids, score 43D not 43E. You cannot see any part of the eyeball between the lids or the glistening of the lower lid's wet tissues when the eyes close, and the lower eyelashes are obscured by the upper lid and lashes when an eye closes. If the eyes are almost closed, score 43D.
43E vs. 45	If the eyes remain closed for more than ½ second, it is closed (AU 43E) and not a blink (AU 45). If the actions are unilateral, see U43E vs. 46 and U45 vs. 46.
U43E vs. 46	AU 46 must be unilateral. If the eye closure is longer than 2 seconds, it must be 43E or some combination of 6 or 7 with 43E. If the eye closure is under 2 seconds, but longer than ½ second, it could be either an unilateral eye closure or a wink. Decide by determining if you think there was an intentional quality to the closure, perhaps shown in the movement itself or by an accompanying head movement, or deliberate pause during the moment the eye is closed. These are signs of the wink (AU 46), not an eye closure (AU 43E). As AU 46 must be unilateral, score R46 or L46.
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Upper Face Action Units

1+2+4 vs. 1+4	<p>1+2+4</p> <p>entire brows lifted and barely curved or straightened; due to opposing actions of 1+2 and 4 elevation of the brow may not be very evident.</p> <p>outer corner of the eyebrow may be up about level with the inner portion or if below the inner portion, the outer corner will be raised sufficiently to expose the lateral portion of the upper eyelid.</p> <p>eye cover fold stretched up more, if it changes at all, and outer portion is almost as visible as in neutral; you can see almost as much upper eyelid as in neutral.</p>	<p>1+4</p> <p>inner corner of the brow lifted and pulled together resulting in an oblique shape or dip in center and up at inner corner.</p> <p>outer corner of the eyebrow is not lifted, and if oblique shape is present, it will be somewhat lower than in neutral. The exposure of the lateral portion of the upper eyelid is less likely.</p> <p>eye cover fold usually is triangulated, the lateral portion of the fold is down and covers the upper eyelid more than in neutral. If the eyes are directed downward or if upper eyelid droops (e.g., 43B), this is not as apparent</p>
1+2+4 vs. 4	<p>1+2+4</p> <p>brows raised and drawn together.</p> <p>horizontal wrinkles mostly in center of forehead with wrinkles or bulge between brows.</p>	<p>4</p> <p>brows lowered and/or drawn together.</p> <p>wrinkles appear just between brows.</p>
1+2+4+5 vs. 1+2+5	See description in this table of difference between 1+2 and 1+2+4.	
4 vs. 4+5	<p>4</p> <p>eye cover fold covers more of top of eye than in neutral</p> <p>not present</p> <p>not present</p>	<p>4+5</p> <p>counteraction of 5 against 4 causes top of iris to be about as evident as in neutral</p> <p>some sclera may show above iris or more sclera may show medially and laterally</p> <p>eye has harsh stare quality</p>
4+6 vs. 6	If there is clear evidence of 6, then to score 4+6, the brows must not only be lowered, but also must be pulled together.	
5 vs. U5	When it appears that AU 5 has acted on only the left or right side, it is very likely that there is at least a <i>trace</i> of movement of the other upper eyelid. If there is at least a <i>trace</i> , score AU 5 as bilateral and score the intensity of the eyelid raise equal to the side with greater intensity. Be very cautious about scoring U5 to be certain there is no <i>trace</i> on the other side.	