

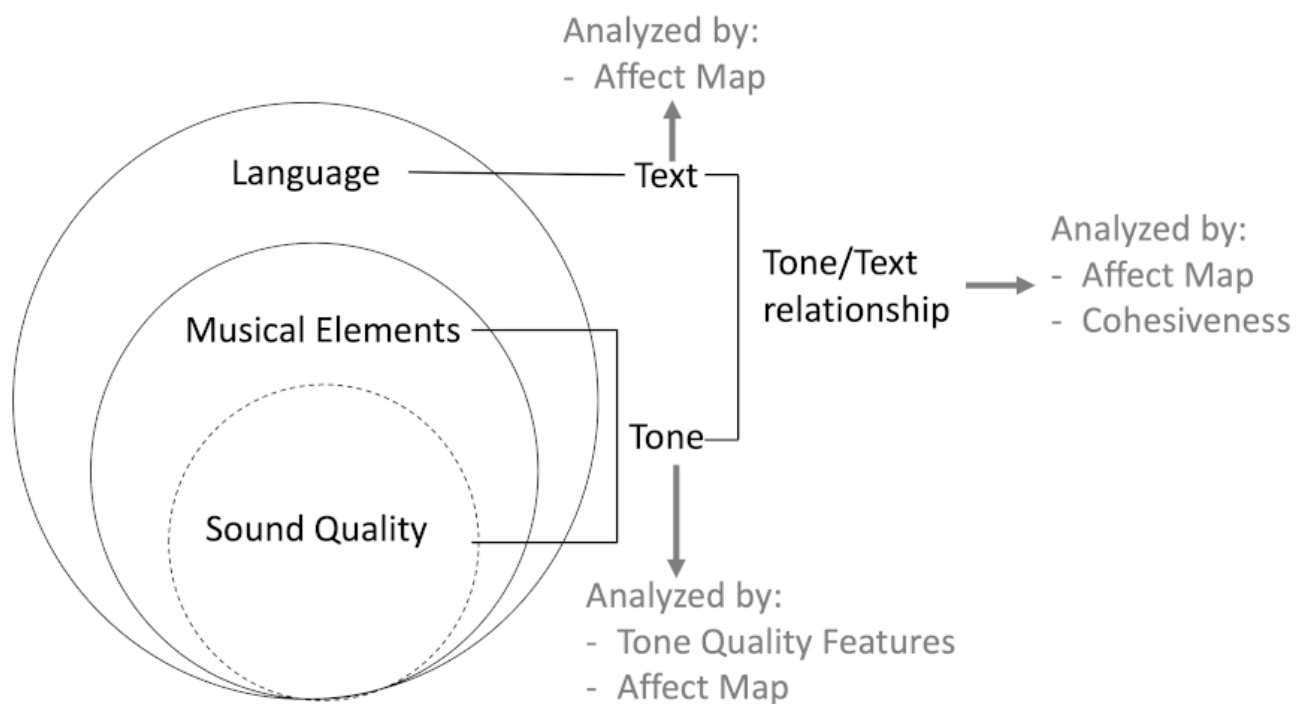


MTO 28.2 Examples: Spreadborough, Emotional Tones and Emotional Texts

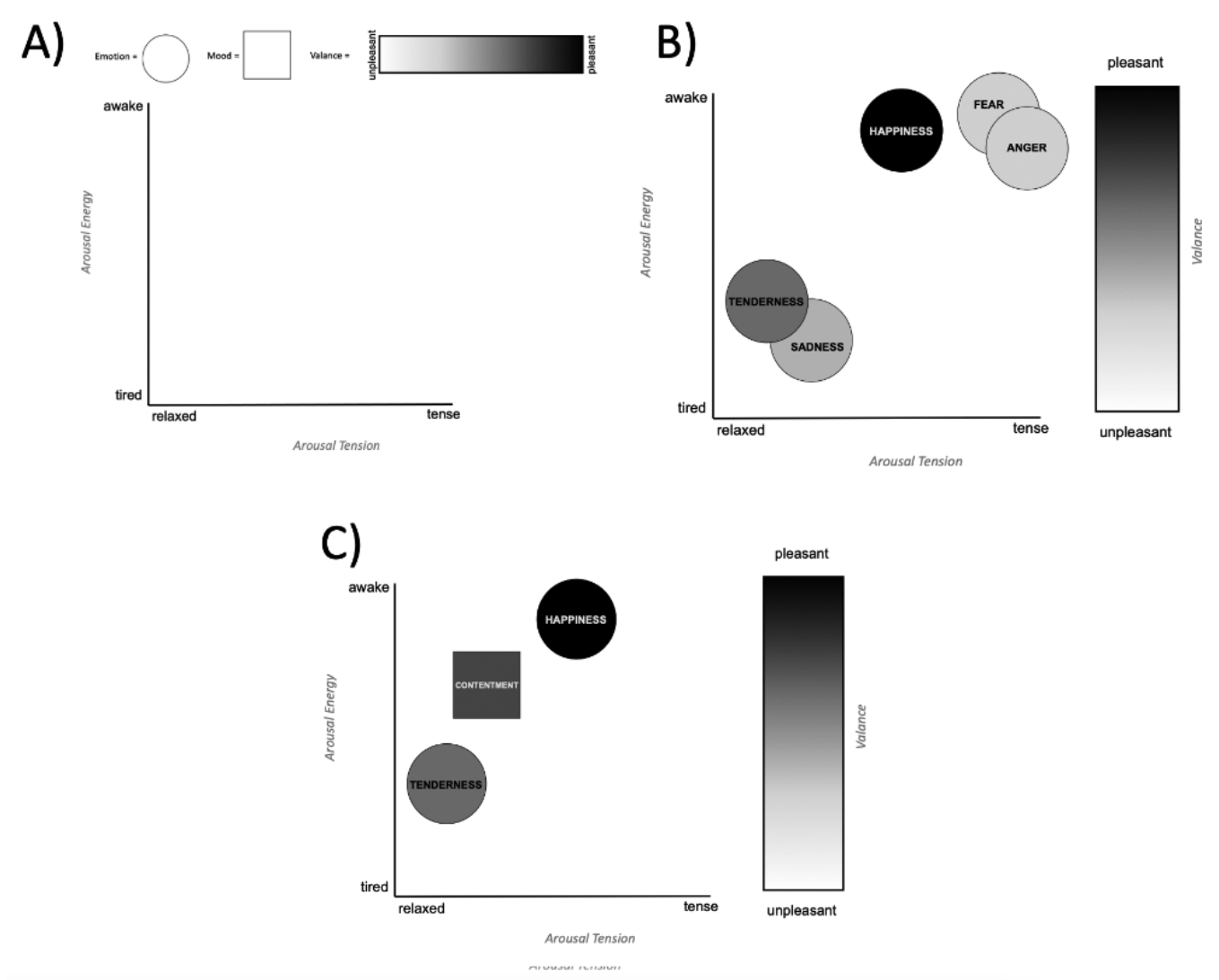
(Note: audio, video, and other interactive examples are only available online)

<https://www.mtosmt.org/issues/mto.22.28.2/mto.22.28.2.spreadborough.html>

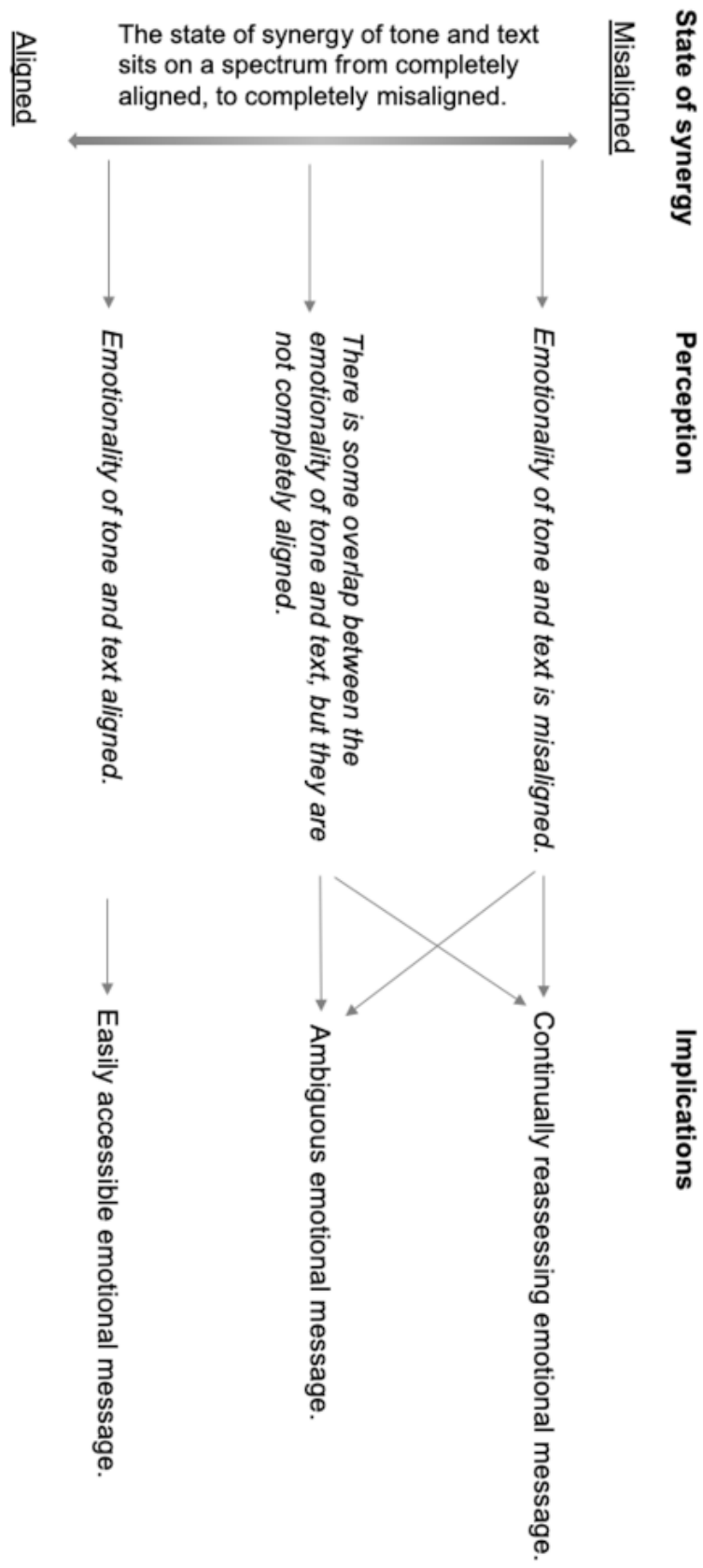
Example 1. A high-level conceptualization of the analytical approach



Example 2. The Affect Map, a graphical representation of moods and emotions represented first through the dimensional model of emotions, then assigned discrete labels based on this placement



Example 3. Cohesiveness. A tool to describe the state of synergy between the emotionality of tone and text and the flow-on effects for emotion perception.



Example 4. The levels of a song considered in this paper

Level		Example	
Song		Whole song	
Section		Verse, chorus, bridge, etc	
Analysis	Musical Phrase	Defined by melodic contour, rhythm, harmony (i.e., not defined by lyrical content)	
Annotation	Word	One syllable word, e.g., song	Multi syllable word, e.g., singing
	Note	Onset-sustain-termination	Onset-sustain-termination + Onset-sustain-termination

Example 5. The Tone Quality Features and their graphic representations

Onset

Aspirate
Onset



Simultaneous
Onset



Creak
Onset



Glottal
Onset



Sustain

Rough



Smooth



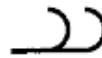
Tense



Lax



Breathy



Clear



Vibrato



Plain



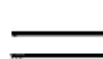
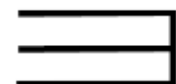
Loud (strong)



Soft (weak)



High



Low



Nasal

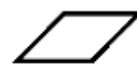
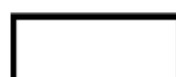


Non-nasal



Termination

Clear termination



Tapering termination



Example 6. A list of Tone Quality Features that relate to onset. The first column gives the name of the feature, the second column provides a description of how the feature sounds/is produced, the third column provides implications for emotion perception. Column four describes where the feature in its extreme form may sit on the Affect Map.

Tone Quality Feature	Description	Perception	Position on Affect Map <i>1 Valance</i> <i>2 Arousal Energy</i> <i>3 Arousal Tension</i>
Glottal Onset	Glottal onsets are very percussive and are created by air “suddenly and forcefully escaping through a previously tightly closed glottis” (Heidemann 2016, 6). Creak onsets are both percussive and rough and are produced by the vocal folds rapidly opening and closing as breath passes through.	Glottal and creak onsets may both be noisy (e.g., rough, breathy) and may therefore tend to be associated with negative emotional states (e.g., weariness, pain, sadness, fear) (Spreadborough 2018, 168 – 171). These onsets also tend to be very audible (it is difficult to produce a soft glottal onset, although creak onsets may have more dynamic variety). Therefore, in this paper I contend that glottal and, at times, creak onsets may also be associated with externalised negative emotions. That is, emotions which are typically expressed loudly and openly, either intentionally or involuntarily. For example, a scream of fear, or a yell of pain.	1 Either pleasant or unpleasant 2 More awake 3 More tense
Creak Onset			1 More unpleasant 2 Either awake or tired 3 Either tense or relaxed
Aspirate onsets	Aspirate onsets occur when breath passes through the vocal folds before they begin to vibrate (this may occur both while exhaling or inhaling). This creates a breathy effect which is noisy and unpitched, but not necessarily rough.	Aspirate onsets are like glottal/creak onsets in that they have the potential to be negative. However, they may signify a different kind of negative emotion compared to creak/glottal. The noisy but soft nature of the aspirate onset may signify more internalised negative/sad emotional states, for example the sound of a quiet sob or the airy quality of a frightened voice. Aspirate onsets may also have the potential to evoke a sense of intimacy or closeness as, to hear such soft nuances, one needs to be in close proximity to the singer (see discussion of breathiness below).	1 Either pleasant or unpleasant 2 Either awake or tired 3 Either tense or relaxed
Simultaneous onsets	Simultaneous onsets involve the breath and the vibration of the vocal folds occurring at the same time. This creates a clear onset where pitch begins without delay.	Simultaneous onsets may be more likely to be associated with neutral and happy emotions. For example, the clear onsets of laughter, or the deliberate articulation of the prime minister’s speech. In this way, simultaneous onsets may be associated with neutral and happy emotive states.	1 More pleasant 2 More awake 3 Either relaxed or tense

Example 7. A list of Tone Quality Features that relate to sustain. The first column gives the name of the feature, the second column provides a description of how the feature sounds/is produced, the third column provides implications for emotion perception. Column four describes where the feature in its extreme form may sit on the Affect Map.

Tone Quality Feature	Description	Perception	Position on Affect Map <i>1 Valance</i> <i>2 Arousal Energy</i> <i>3 Arousal Tension</i>
Roughness: rough/smooth	A rough voice “is one in which we can hear other things besides the tone of the voice itself” (van Leeuwen 1999, 131). “Much of the effect of ‘roughness’ comes from the aperiodic vibration of the vocal cords which causes noise in the spectrum” (Laver 1980, 128 as cited in van Leeuwen 1999, 132). Roughness is created by tensing the vocal folds and holding them tightly together (Heidemann 2016, 6).	Noisy qualities may signify negative emotions (Spreadborough 2018, 168 – 171). For example, a scream is noisy, and a scream may be considered negative. Noisy sounds are related to roughness, which may result in roughness too being associated with negative emotions. However, there are different kinds of roughness. That is, in addition to the “tone of the voice itself”, other sounds that are present in a rough voice might range from extremely irregular aperiodic vibrations (like in screaming) to an equally rough but much more regular sound produced through consistent tension and air pressure (like in growling). Although it is true of all tone quality features, it is especially the case that one must assess roughness against the equipoise of analysis (see paragraph 30 above).	Extreme roughness is: 1 More unpleasant 2 Either awake or tired 3 More tense
Breath: breathy/clear	Breath can occur when “extraneous sound mixes in with the tone of the voice itself” (van Leeuwen 1999, 133). It is produced when air leaks through an incompletely closed glottis (Heidemann 2016, 5). When an aspirate sound is produced by vocal folds which are low in tension, the resulting sound is soft. When it is produced by vocal folds which are high in tension, the sound has more of a “hissing or grainy” quality (Heidemann 2016, 5).	The breathy voice may represent a number of emotive states. The first is closeness as the breathy voice is “always also soft, and fervently associated with intimacy” (van Leeuwen 1999, 133). For example, a whisper is a breathy sound, and to hear a whisper one needs to be in close proximity to the speaker. From a para-linguistic perspective, Poyatos has identified the breathy voice as potentially expressing a sense of anticipation, “fear, surprise, expectancy, or sheer terror” (Poyatos 1993, 202). Consider, for instance, the ragged whispering heard in horror films as the victim telephones for help. Breathiness may also be associated with the “uncontrollable nonverbal expression of sexual arousal” (Poyatos 2002, 31). I also suggest that breathiness in the voice may indicate vulnerability. For example, a sobbed utterance or the ragged breathy quality of a fearful voice.	Extreme Breath is: 1 Either pleasant or unpleasant 2 Either awake or tired 3 Either tense or lax
Tension: tense/lax	To sound tense, one constricts the muscles in the body, particularly the throat; to sound lax one relaxes these muscles. As van Leeuwen puts it, “[t]he sound that results from tension not only is tense, it also means	Tension may allow listeners to not only extrapolate information about a speaker’s physical state, but we may also gain a sense of their emotional state. For example, when we hear tension we may extrapolate that the speaker may be nervous, or in pain. Tension	Extreme tension is: 1 Either pleasant or unpleasant 2 More awake

	‘tense’—and makes tense” (van Leeuwen 1999, 131).	is produced alongside other tone quality features. For example, an extremely tense voice produced in the upper register may create the effect of a scream, while produced in the lower register with breath may sound more like a hiss. There are many situations in which tension may be present in the voice and the assessment of the emotional meaning of tensions is context dependant.	3 More tense
Vibrato: vibrato/plane	Vibrato is “a family of tonal effects in music” that is created by “periodic vibrations of one or more characteristics in the sound wave” (Rossing 1990, 134)	Both vibrato and non-vibrato sounds may have the potential to evoke emotional responses in listeners. As van Leeuwen puts it “vibrato literally “means what it is”. The vibrating sound literally and figuratively trembles. What makes us tremble? Emotions.” (van Leeuwen 1999, 134) However, “[n]ot trembling, sounding plain and unmoved can also acquire a variety of contextually specific meanings” (van Leeuwen 1999, 135). In this way, vibrato and non-vibrato sounds may have the potential to evoke a range of responses. On the one hand, vibrato may signify love, tension, fear, and anticipation while non-vibrato may signify steadiness, an unmoving attitude, resolution, or acceptance (van Leeuwen 1999, 134 – 135).	Extreme vibrato is: 1 Either pleasant or unpleasant 2 More awake 3 Either relaxed or tense
Dynamic: loud/soft	Dynamic here is related to performance intensity, which is “the loudness of the sound sources when ... performed in the recording studio process” (Moylan 2017, 139). This is distinct from the intensity (the actual volume) of the recording, which is the “energy transmitted by the sound wave across unit area per second”, the “duration and the frequency spectrum of the sound, and by the context in which the sound is heard” (Campbell and Greated 2001, para. 1). In other words, Dynamic in this framework is concerned with the volume at which the sound was produced, rather than the volume at which it has been mixed into the recording. This is because this framework draws on the social semiotic experience of sound – the lived experience of speaking and listening to spoken voices.	Dynamic is related to distance and power, both physical and social (van Leeuwen 1999, 133). Loudness is related to strength in the sense that louder sounds are stronger in volume and therefore can signify that a listener is in closer proximity to a sound source. Loudness may also be associated with more powerful sounds and thus be an indicator of importance. Soft sounds, on the other hand, may signify distance between the sound’s source and listener. Softer sounds may also be associated with less power and importance as these sounds may play a secondary role to loud sounds. Consider the softer volume of backup singers in a band, or of the sotto voce of a pit orchestra during a dialogue scene in a musical. In this way, soft/loud sounds can signify power and proximity (strong), as well as physical and social distance (weak).	Extreme loudness is: 1 Either pleasant or unpleasant 2 More awake 3 Either relaxed or tense
Range: high/low	Range is connected to the changing location of sympathetic vibrations within the body (Heidemann 2016, 8). The pitch of a sound is “determined by what the ear judges to be the most fundamental wave-frequency of the	The use of high/low ranges may be associated with ideas of dominance and assertiveness. Van Leeuwen has found that men who mean to assert their dominance may speak in a higher range, while women who mean to do the same may speak in a lower range. High/low singing also has an	Extreme range (i.e., high pitch) is: 1 Either pleasant or unpleasant 2 More awake

	sound” (Haynes and Cooke 2001, para. 1).	impact on tone quality. Falsetto may be used when men and women sing high. This falsetto results in a very different tone quality of the voice, when compared to singing in the lower range where intimate/soft sounds are more easily achieved. Singing in falsetto may also evoke ideas of effort, as to produce these sounds one must focus vibrations in the top of the head/sinuses (Heidemann 2016, 8).	3 More tense
Nasality: nasal/non-nasal	Nasality is related to tension in that it is also produced by tensing the muscles, however nasality can also be produced through a cul-de-sac oscillation of air by allowing air to escape either through the nose or mouth only (van Leeuwen 1999, 136).	Nasality in music has been shown to be a marker of sarcasm (Palzak 2011, as cited in Huron 2015, 190), and, especially for females, submission (Lomax 1968 as cited in van Leeuwen 1999, 137). Following on from this, and because of its close ties to tension, in this paper sounds which are very nasal are considered indicative of negative, high arousal emotions.	Extreme nasality is: 1 Either pleasant or unpleasant 2 More awake 3 More tense

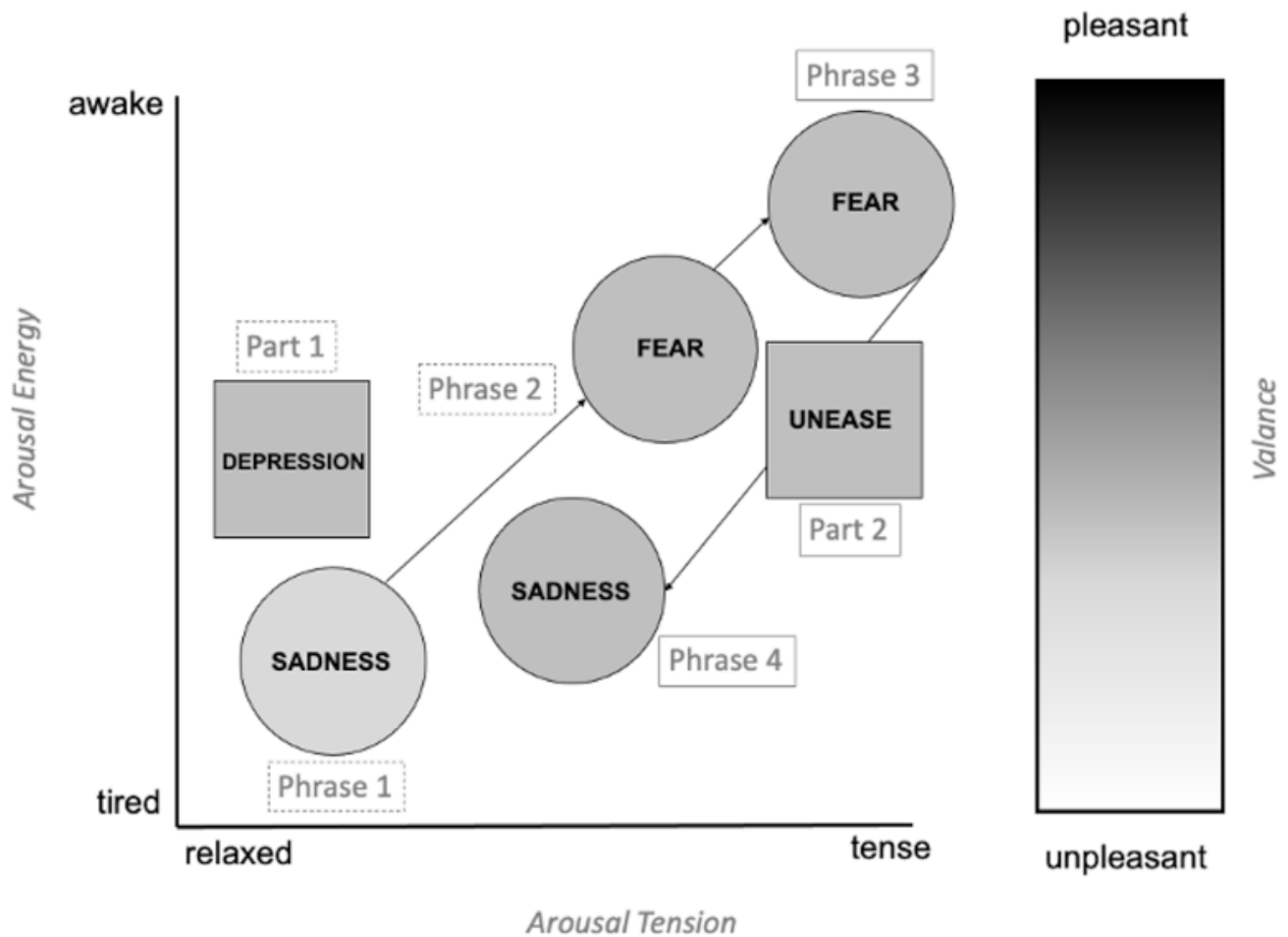
Example 8. A list of Tone Quality Features that relate to termination. The first column gives the name of the feature, the second column provides a description of how the feature sounds/is produced, the third column provides implications for emotion perception. Column four describes where the feature in its extreme form may sit on the Affect Map.

Tone Quality Feature	Description	Perception	Position on Affect Map <i>1 Valance</i> <i>2 Arousal Energy</i> <i>3 Arousal Tension</i>
Clear/tapered	A clear termination is one that has a strong ending; a tapering termination is one in which the sound slowly fades, allowing for other elements (such as noise) to become present.	Tapered terminations allow for noise to become present in the sound, and therefore may be associated with negative emotions (Spreadborough 2018, 162 – 163). Clear terminations, on the other hand, may be associated with happier emotional states since there is less opportunity for extraneous sounds to become present. Take, for example, the ragged speech of a distraught individual (tapered termination) compared to the fast, clipped chatter of a happy child (clear termination).	Extremely clear termination is: 1 More pleasant 2 More awake 3 Either relaxed or tense

Example 9. Timeline of the song “Casey’s Last Ride” by Kris Kristofferson

Time	Structure	Character	Line	Phrase	Part	Lyrics
0:00	Intro					
0:07	Verse One	Casey	1	1	1	Casey joins the hollow sound of silent people walking down
			2			The stairway to the subway in the shadows down below;
			3	2		Following their footsteps through the neon-darkened corridors
			4			Of silent desperation, never speakin' to a soul.
			5	3	2	The poison air he's breathin' has the dirty smell of dying
			6			'Cause it's never seen the sunshine and it's never felt the rain.
			7	4		But Casey minds the arrows and ignores the fatal echoes
			8			Of the clickin' of the turnstiles and the rattle of his chains.
0:58	Interlude					
1:04	Chorus One	The woman	1	1		Oh! she said, Casey it's been so long since I've seen you!
			2	2		Here she said, just a kiss to make a body smile!
			3	3		See she said, I've put on new stockings just to please you!
			4	4		Lord! she said, Casey can you only stay a while?
1:39	Interlude					
1:46	Verse Two	Casey	1	1	1	Casey leaves the under-ground and stops inside the golden crown
			2			For something wet to wipe away the chill that's on his bone.
			3	2		Seeing his reflection in the lives of all the lonely men
			4			Who reach for any thing they can to keep from goin' home.
			5	3	2	Standin' in the corner Casey drinks his pint of bitter
			6			Never glancing in the mirror at the people passing by
			7	4		Then he stumbles as he's leaving and he wonders if the reason
			8			Is the beer that's in his belly, or the tear that's in his eye.
2:36	Interlude					
2:43	Chorus Two	The woman	1	1		Oh! she said, I suppose you seldom think about me,
			2	2		Now she said, now that you've a family of your own;
			3	2		Still she said, it's so blessed good to feel your body!
			4	4		Lord! she said Casey it's a shame to be alone!
3:17	Outro					
3:38						

Example 10. An assessment of the emotion present in the lyrics of verse one, “Casey’s Last Ride”



Phrase	Part	Lyric
1	1	Casey joins the hollow sound of silent people walking down The stairway to the subway in the shadows down below;
2		Following their footsteps through the neon-darkened corridors Of silent desperation, never speakin' to a soul.
3	2	The poison air he's breathin' has the dirty smell of dying 'Cause it's never seen the sunshine and it's never felt the rain.
4		But Casey minds the arrows and ignores the fatal echoes Of the clickin' of the turnstiles and the rattle of his chains.

Example 11. Glottal and creak onsets in the first verse of “Casey’s Last Ride.”

Line	Phrase	Part	Lyrics
1	1	1	Casey joins the hollow sound of silent people walking down
2			The stairway to the subway in the shadows down below;
3	2		Following their footsteps through the neon-darkened corridors
4			Of silent desperation, never speakin’ to a soul.
5	3	2	The poison air he’s breathin’ has the dirty smell of dying
6			‘Cause it’s never seen the sunshine and it’s never felt the rain .
7	4		But Casey minds the arrows and ignores the fatal echoes
8			Of the clickin’ of the turnstiles and the rattle of his chains.

Key:

Aspirate
Onset



Simultaneous
Onset



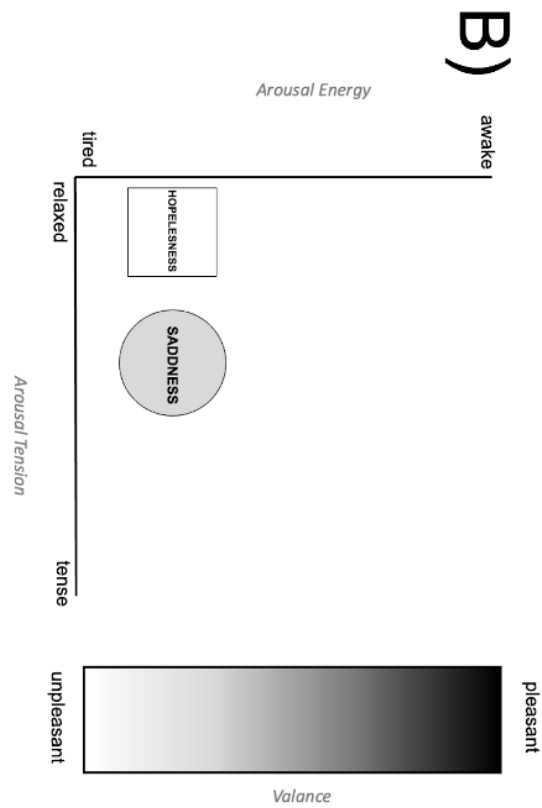
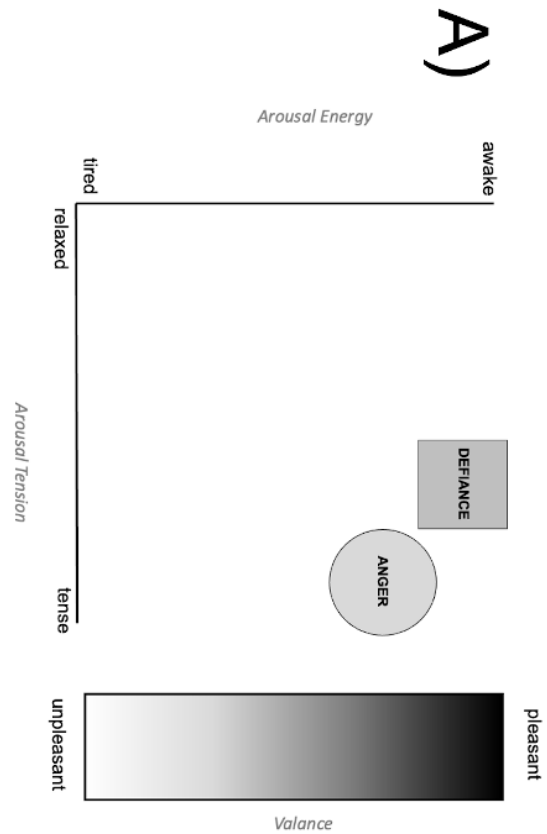
Creak
Onset



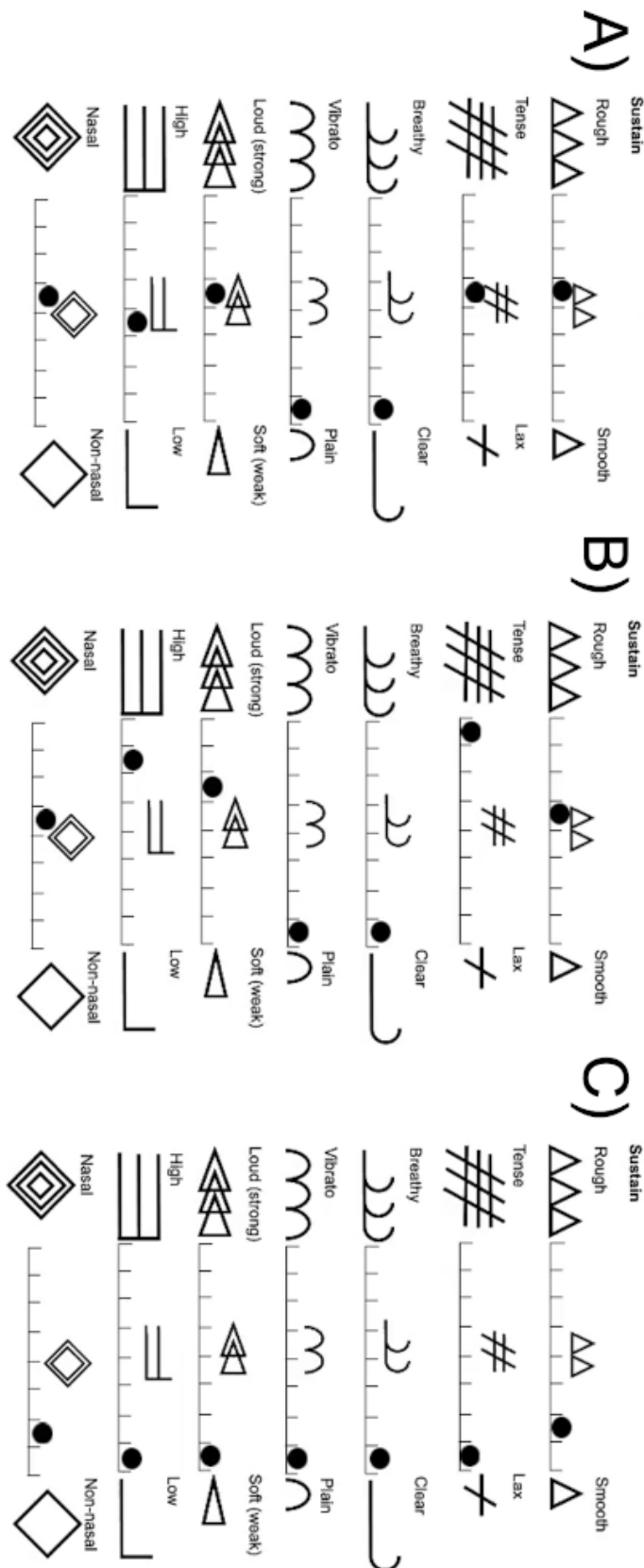
Glottal
Onset



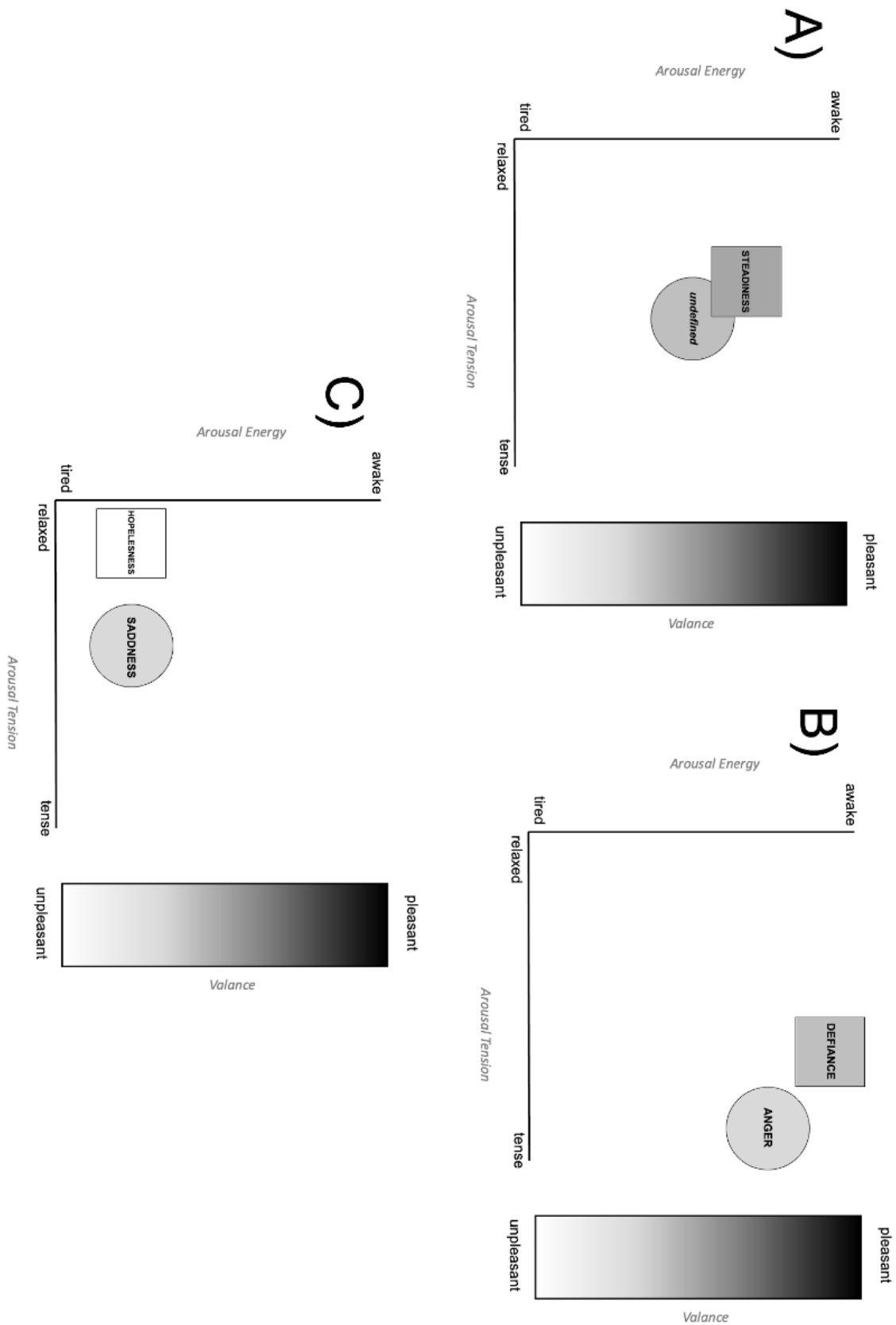
Example 12. Assessing the onsets in part two of verse one against the Affect Map. 12A shows the assessment for lines 5–7, 12B shows the assessment for line 8.



Example 13. Annotation of Tone Quality Features which are exemplars of sustain in verse one.
 13A shows the assessment for part one, 13B shows the assessment for part two lines 5–7, 13C
 shows the assessment for part two, end of line 8.

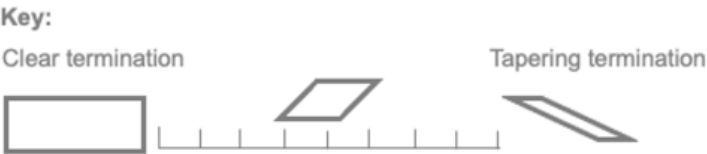


Example 14. Assessing the sustain of verse one against the Affect Map. 14A shows the assessment for part one, 14B shows the assessment for part two lines 5–7, 14C shows the assessment for part two line 8.

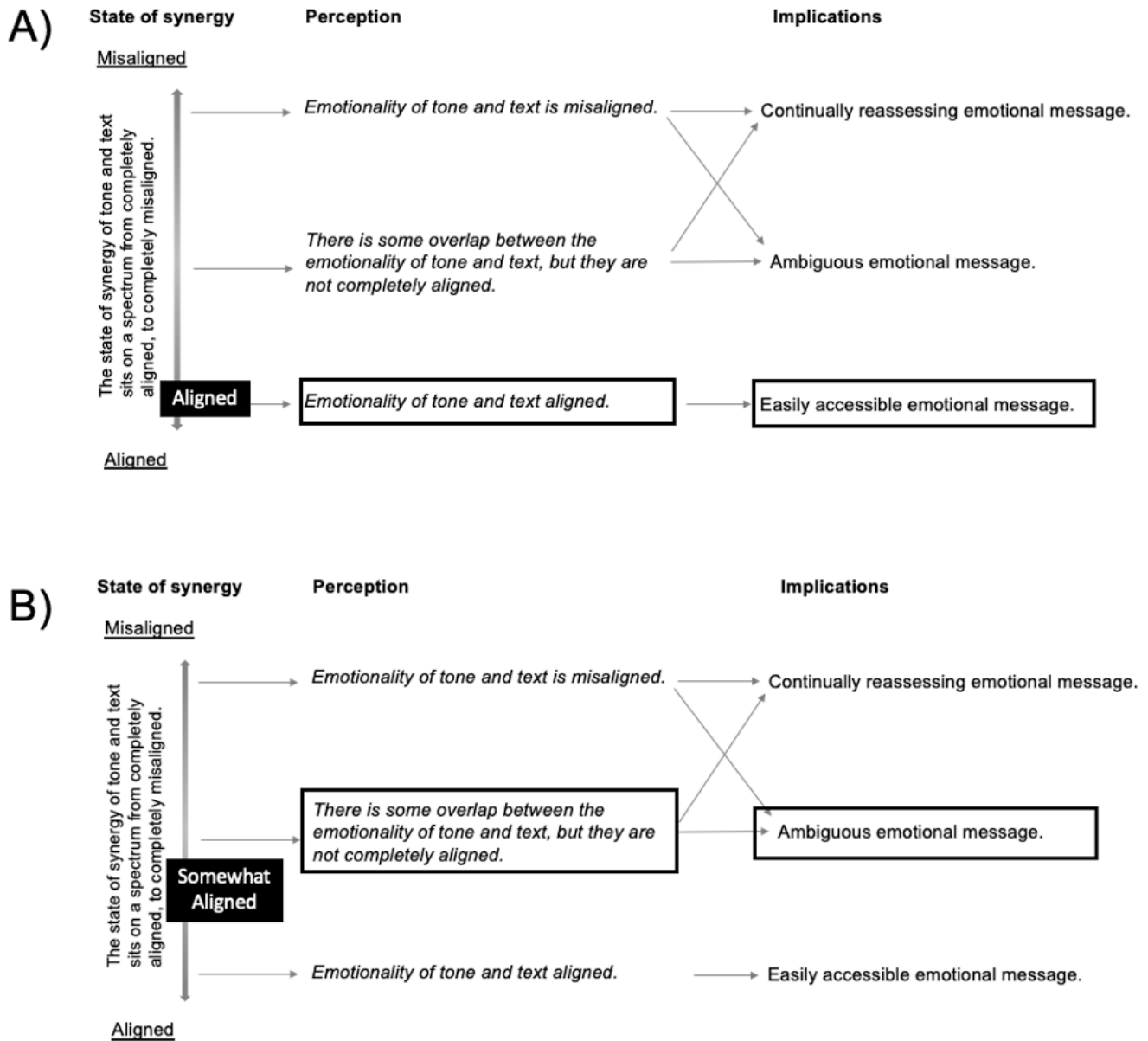


Example 15. Terminations in the first verse of “Casey’s Last Ride.”

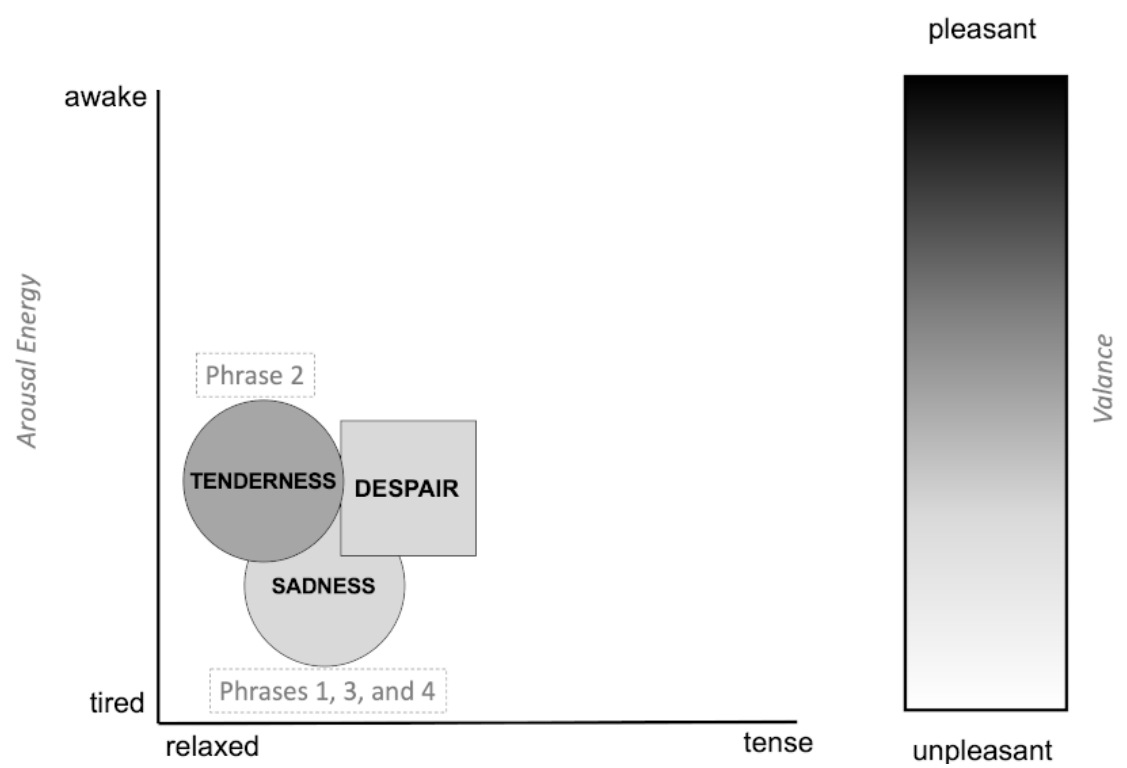
Line	Phrase	Part	Lyrics
1	1	1	Casey joins the hollow sound of silent people walking down
2			The stairway to the subway in the shadows down below;
3	2		Following their footsteps through the neon-darkened corridors
4			Of silent desperation , never speakin' to a soul .
5	3	2	The poison air he's breathin' has the dirty smell of dying
6			'Cause it's never seen the sunshine and it's never felt the rain.
7	4		But Casey minds the arrows and ignores the fatal echoes
8			Of the clickin' of the turnstiles and the rattle of his chains .



Example 16. Using cohesiveness to assess the state of synergy of emotion conveyed through tone and text in verse one of “Casey’s Last Ride”. Example 16A shows the state of synergy for part one; Example 16B shows the state of synergy for part two.



Example 17. An assessment of the emotion present in the lyrics of chorus one, “Casey’s Last Ride”

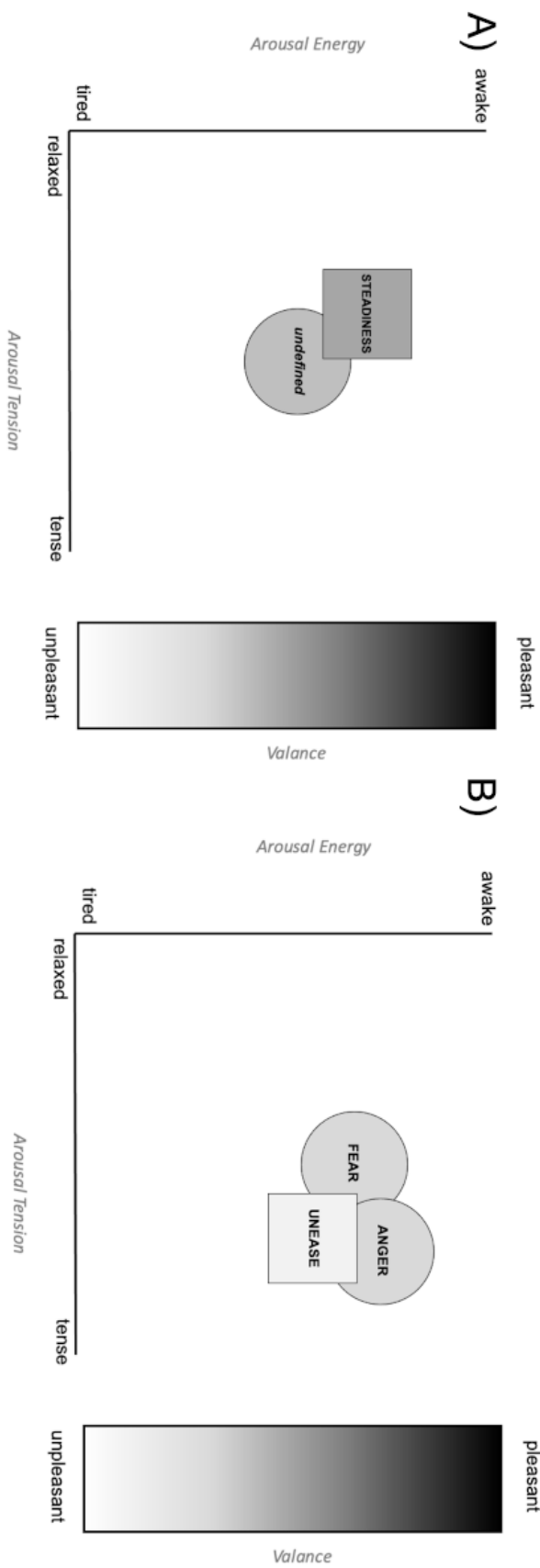


Example 18. Glottal and creak onsets in the first verse of “Casey’s Last Ride.”

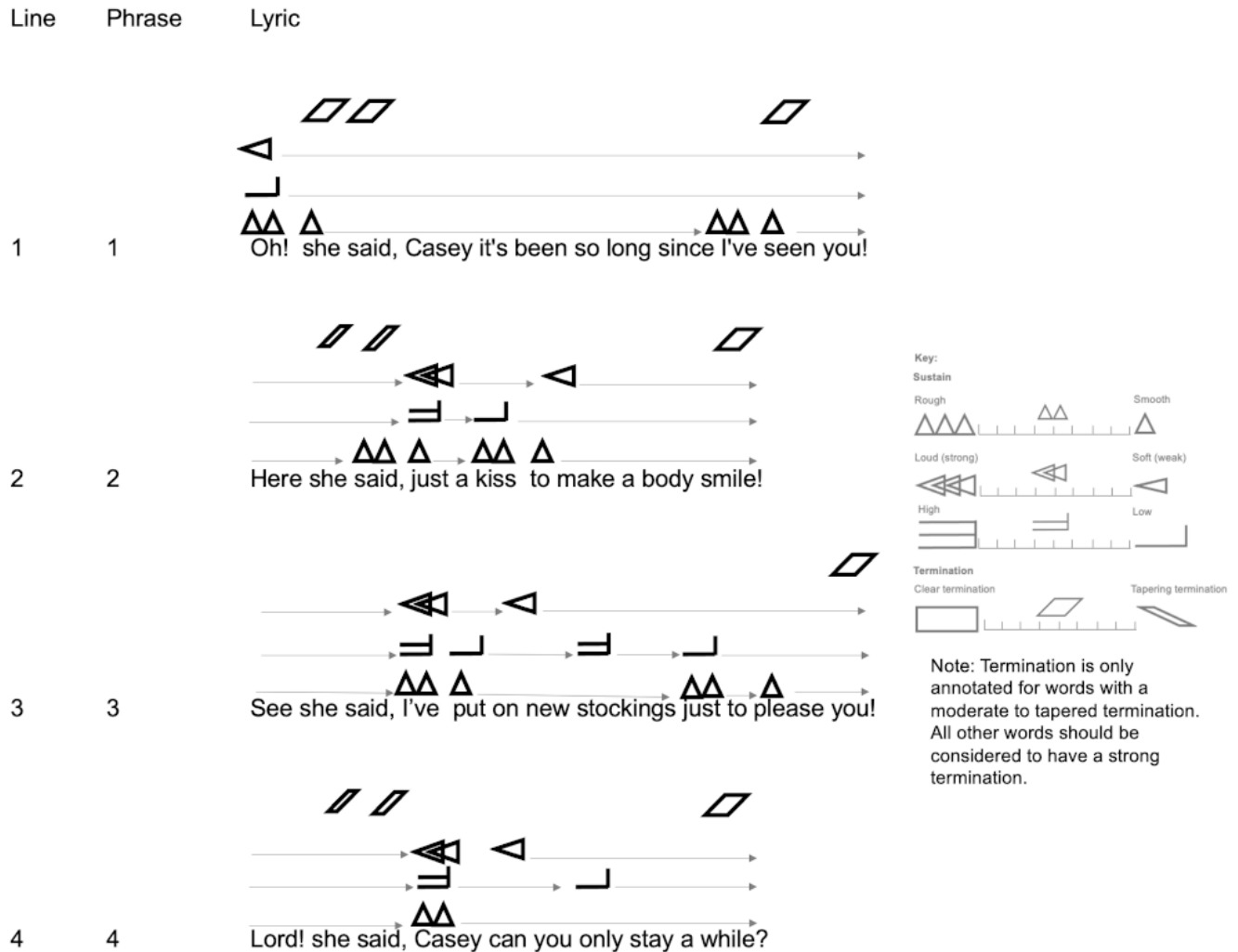
Line	Phrase	Lyric
1	1	Oh! she said, Casey it's been so long since I've seen you!
2	2	Here she said, just a kiss to make a body smile!
3	3	See she said, I've put on new stockings just to please you!
4	4	Lord! she said, Casey can you only stay a while?



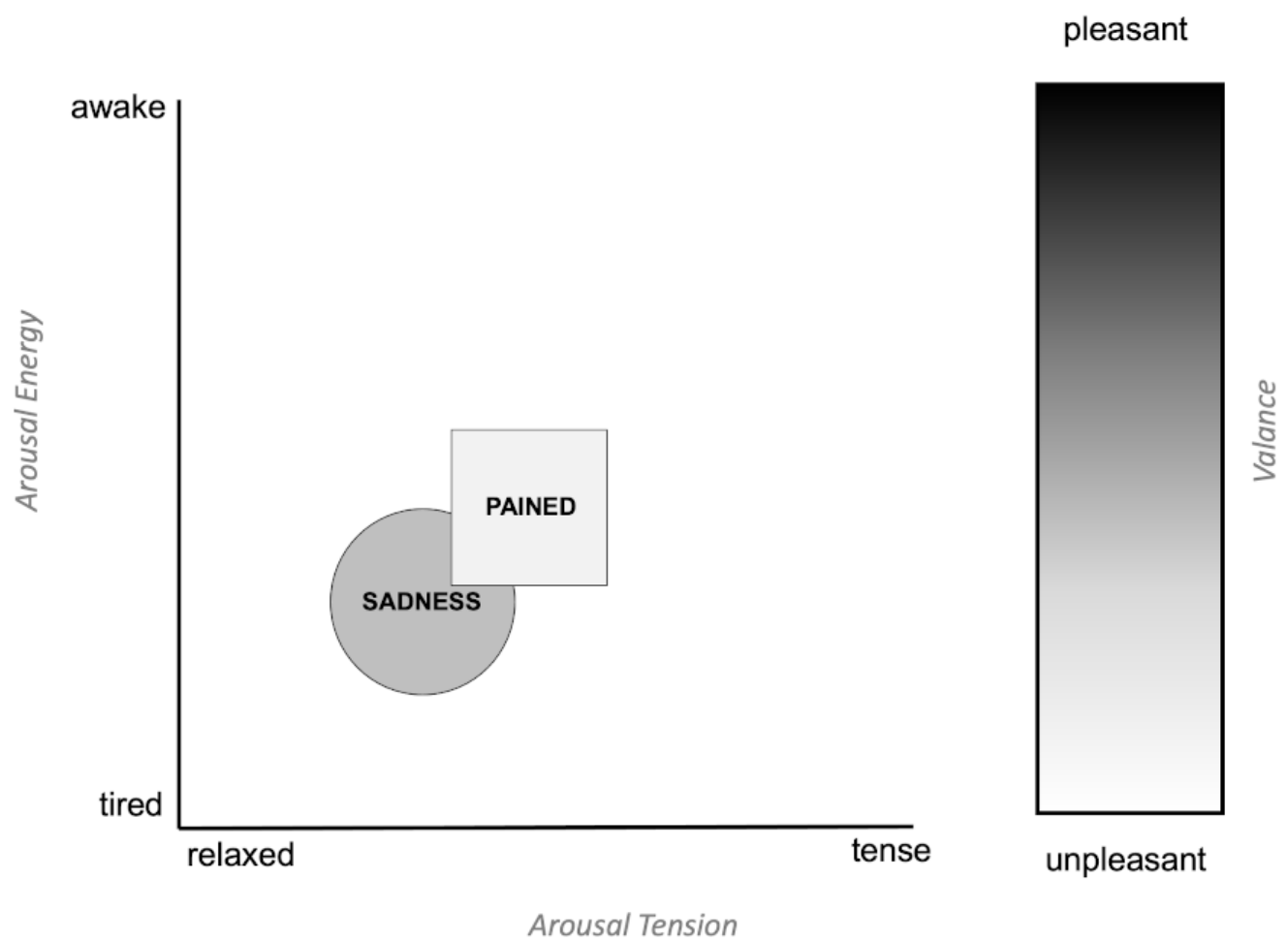
Example 19. Assessing the onsets in chorus one against the Affect Map. Example 19A shows the assessment phrases 1, 2, and 3; Example 19B shows the assessment for phrase 4.



Example 20. Annotation of roughness, dynamic, range, and termination for chorus one of “Casey’s Last Ride.” Example 22A shows the state of synergy for the chorus overall; and Example 22B shows the state of synergy for the tone/text relationship on the words “just a kiss” and “just to please you.”



Example 21. Assessing the sustain and termination in chorus one against the Affect Map.



Example 22. Using cohesiveness to assess the state of synergy of emotion conveyed through tone and text in chorus one of “Casey’s Last Ride.”

