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| **Tone Quality Feature** | **Description** | **Perception** | **Position on Affect Map**  *1 Valance*  *2 Arousal Energy*  *3 Arousal Tension* |
| 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 ‘tense’—and makes tense” (van Leeuwen 1999, 131). | 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 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. | Extreme tension is:  1 Either pleasant or unpleasant  2 More awake  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 sound” (Haynes and Cooke 2001, para. 1). | 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 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). | Extreme range (i.e., high pitch) is:  1 Either pleasant or unpleasant  2 More awake  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 |