<table>
<thead>
<tr>
<th>Feature</th>
<th>Opposed to</th>
<th>Acoustic description</th>
<th>Articulatory description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vocalic</td>
<td>Nonvocalic</td>
<td>Sharply defined formant structure</td>
<td>Voiced, with free passage of air through vocal tract</td>
</tr>
<tr>
<td>2. Consonantal</td>
<td>Nonconsonantal</td>
<td>Low total energy</td>
<td>Obstruction in vocal tract</td>
</tr>
<tr>
<td>3. Compact</td>
<td>Diffuse</td>
<td>Energy concentrated in central area of spectrum</td>
<td>High ratio of front resonance chamber to back</td>
</tr>
<tr>
<td>4. Tense</td>
<td>Lax</td>
<td>High energy with greater spread across spectrum and longer duration</td>
<td>Greater deformation of vocal tract from its rest position</td>
</tr>
<tr>
<td>5. Voiced</td>
<td>Voiceless</td>
<td>Periodic low frequency excitation</td>
<td>Vocal cord vibration</td>
</tr>
<tr>
<td>6. Nasal</td>
<td>Oral</td>
<td>Additional formants and less intensity in existing formants</td>
<td>Coupling of nasal cavity</td>
</tr>
<tr>
<td>7. Discontinuous</td>
<td>Continuant</td>
<td>Interruption or abrupt transition</td>
<td>Rapid closure and opening of vocal tract</td>
</tr>
<tr>
<td>8. Strident</td>
<td>Mellow</td>
<td>High intensity noise</td>
<td>‘Rough-edged’ effect at point of articulation</td>
</tr>
<tr>
<td>9. Checked</td>
<td>Unchecked</td>
<td>Higher rate of energy discharge</td>
<td>Glottalized</td>
</tr>
<tr>
<td>10. Grave</td>
<td>Acute</td>
<td>Energy concentrated in lower frequencies</td>
<td>Peripheral (towards front or back of vocal tract)</td>
</tr>
<tr>
<td>11. Flat</td>
<td>Plain</td>
<td>Downward shift or weakening of upper frequencies</td>
<td>Narrowed aperture (e.g. by lip rounding)</td>
</tr>
<tr>
<td>12. Sharp</td>
<td>Plain</td>
<td>Upward shift of upper frequencies</td>
<td>Reduced oral cavity and widened pharynx</td>
</tr>
</tbody>
</table>
# Chomsky and Halle’s universal set of phonetic features (1968)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Articulatory description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major class features</strong></td>
<td></td>
</tr>
<tr>
<td>1. Sonorant</td>
<td>Produced with vocal tract cavity configuration in which spontaneous voicing is possible. (Nonsonorant = obstruent)</td>
</tr>
<tr>
<td>2. Vocalic</td>
<td>Constriction does not exceed that of high vowels, and position of vocal cords allows spontaneous voicing. (Syllabic) (Proposed renaming of vocalic)</td>
</tr>
<tr>
<td>3. Consonant</td>
<td>Radical obstruction in mid-sagittal region of vocal tract</td>
</tr>
<tr>
<td><strong>Cavity features</strong></td>
<td></td>
</tr>
<tr>
<td>4. Coronal</td>
<td>Produced with blade of tongue raised from neutral position</td>
</tr>
<tr>
<td>5. Anterior</td>
<td>Produced with obstruction in front of palato-alveolar region</td>
</tr>
<tr>
<td>6. High</td>
<td>Tongue body above neutral position</td>
</tr>
<tr>
<td>7. Low</td>
<td>Tongue body above neutral position</td>
</tr>
<tr>
<td>8. Back</td>
<td>Tongue body retracted from neutral position</td>
</tr>
<tr>
<td>9. Round(ed)</td>
<td>Narrowing of lip orifice</td>
</tr>
<tr>
<td>10. Distributed</td>
<td>Constriction extends for some distance along direction of airflow</td>
</tr>
<tr>
<td>11. Covered</td>
<td>Pharynx walls narrowed and tensed and larynx raised (in vowel production)</td>
</tr>
<tr>
<td>12. Glottal constriction</td>
<td>Constriction of vocal cords</td>
</tr>
<tr>
<td>13. Nasal</td>
<td>Lowered side(s) of mid-section of tongue</td>
</tr>
<tr>
<td>14. Lateral</td>
<td></td>
</tr>
<tr>
<td><strong>Manner of articulation features</strong></td>
<td></td>
</tr>
<tr>
<td>15. Continuant</td>
<td>Primary constriction in vocal tract does not block air flow. (Noncontinuant = stop)</td>
</tr>
<tr>
<td>16. Instantaneous release</td>
<td>Instantaneous release (of stops)</td>
</tr>
<tr>
<td>(Chomsky and Hall’s discussion, 1968, pp. 318-22, suggests two release features: 16a Instantaneous versus delayed release of primary closures 16b Instantaneous versus delayed release of secondary closures)</td>
<td></td>
</tr>
<tr>
<td>17. Velar(ic) suction</td>
<td>Velar closure producing suction (clicks)</td>
</tr>
<tr>
<td>18. Implosion</td>
<td>Glottal closure producing suction (implosives)</td>
</tr>
<tr>
<td>19. Velar(ic) pressure</td>
<td>(Velar closure producing pressure-no evidence of use in language)</td>
</tr>
<tr>
<td>20. Ejection</td>
<td>Glottal closure producing pressure (ejectives)</td>
</tr>
<tr>
<td>21. Tense</td>
<td>Deliberate, accurate, maximally distinct articulation (of</td>
</tr>
<tr>
<td>Source features</td>
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<tr>
<td>22. Heightened subglottal pressure</td>
<td>Tenseness in subglottal musculature producing greater subglottal pressure</td>
</tr>
<tr>
<td>23. Voiced (Nonvoiced=voiceless)</td>
<td>Vocal cord vibration (induced by appropriate glottal opening and airflow)</td>
</tr>
<tr>
<td>24. Strident</td>
<td>Turbulence (in fricatives and affricates) caused by nature of surface, rate of airflow and angle of incidence at point of articulation</td>
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<tr>
<th>Prosodic features</th>
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<tr>
<td>(listed but not discussed in Chomsky and Halle 1968)</td>
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<tr>
<td>25. Stress</td>
</tr>
<tr>
<td>26. Pitch (high, low, elevated, rising, falling, concave)</td>
</tr>
<tr>
<td>27. Length</td>
</tr>
<tr>
<td>Feature</td>
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</tbody>
</table>
| 1. Glottalic | Ejective  
  Pulmonic  
  Implosive          | Upward or downward movement of the glottis                          |
| 2. Velaric   | Click                   | Degree of suction of air in mouth                                   |
| 3. Voice     | Glottal stop  
  Laryngealized  
  Voiced  
  Murmur  
  Voiceless    | Degree of glottal stricture                                         |
| 4. Aspiration| Aspirated  
  Unaspirated  
  Voiced                 | Delay in onset of voicing                                           |
| 5. Place     | Bilabial  
  Labio-dental  
  Dental  
  Alveolar  
  Retroflex  
  Palato-alveolar  
  Palatal  
  Velar  
  Uvular  
  Pharyngeal  
  Glottal       | Location of articulation                                            |
| 6. Labial    | Labial                  | Approximation of centers of lips                                    |
| 7. Sop       | Stop  
  Fricative               | Degree of approximation of articulators                             |
| 8. Nasal     | Nasal                   | Lowering of soft palate                                             |
| 9. Lateral   | Lateral                | Amount of airflow over sides of tongue                               |
| 10. Trill    | Trill                   | Vibration of articulator                                             |
| 11. Flap     | Flap                    | Rate of articular movement                                          |
|             |                         | *(Ladefoged notes uncertainty about the characterization of flaps)* |
| 12. Sonorant | Sonorant                | Amount of acoustic energy                                            |
| 13. Sibilant | Sibilant                | Amount of high-frequency                                             |
| 14. Grave    | Grave                   | Ratio of low-to high-frequency energy                               |
| 15. Height   | 4 height  
  3 height  
  2 height  
  2 height         | Inverse of frequency of first formant  
  *(distinguishing four degrees of vowel height)*                      |
<p>| 16. Back     | Back                    | Difference between frequencies of formants two                      |</p>
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<tbody>
<tr>
<td>17. Round</td>
<td>Round</td>
<td>Inverse of distance between corners of lips</td>
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<tr>
<td>18. Wide</td>
<td>Wide</td>
<td>Advancement of tongue root</td>
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<tr>
<td>19. Rhotacized</td>
<td>Rhotacized</td>
<td>Lowering of frequency of formant three</td>
</tr>
<tr>
<td>20. Syllabic</td>
<td>Syllabic</td>
<td>(No agreed physical scale)</td>
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</tbody>
</table>
4. Components in dependency phonology (Anderson and Ewen 1987)

<table>
<thead>
<tr>
<th>Gesture</th>
<th>Subgesture</th>
<th>Components</th>
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<tbody>
<tr>
<td>Categorial</td>
<td>Phonatory</td>
<td>Consonantality or periodicity: a scale ranging from</td>
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<tr>
<td>Initiatory</td>
<td></td>
<td>Degree of glottal opening: a scale encompassing aspiration as well as voicing, represented by the extent to which a component</td>
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<tr>
<td>Articulatory</td>
<td>Locational</td>
<td>i frontness (acuteness, sharpness)</td>
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<tr>
<td>Oro-nasal</td>
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