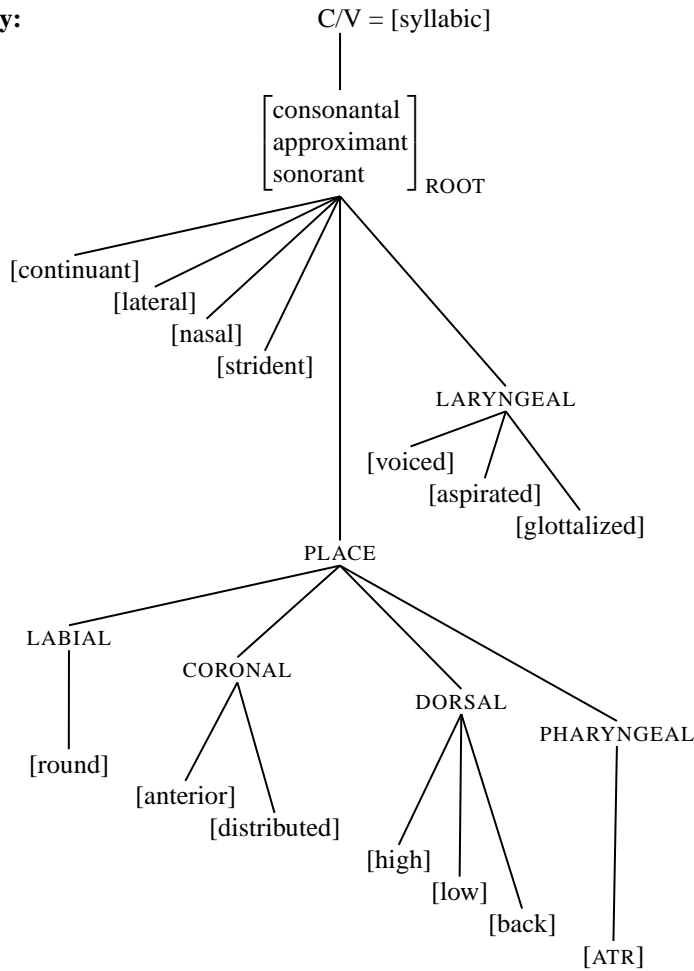
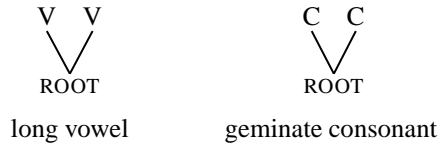


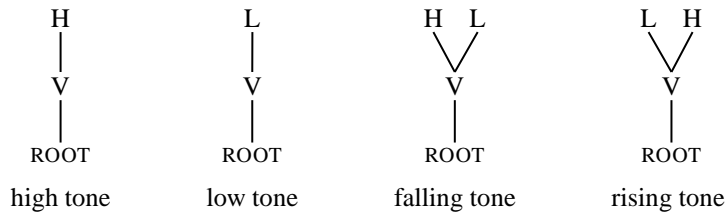
Feature geometry:



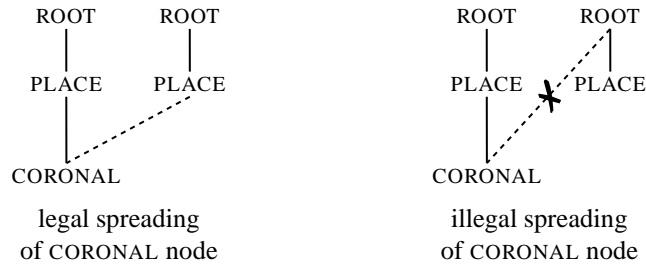
Length: A long segment is indicated by linking all of the segment's features via the ROOT node to two different slots in the prosodic skeleton:



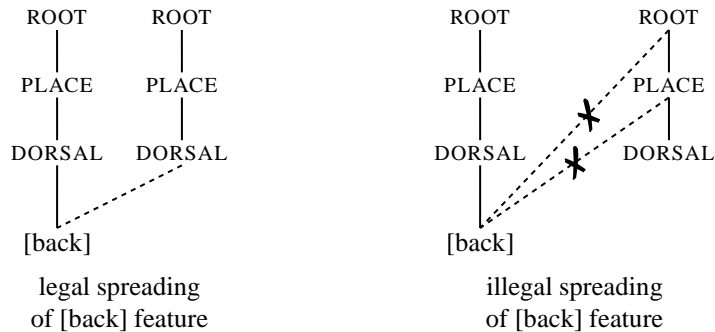
Tone: Just two tonal features, H (for high tones) and L (for low tones), can be used to describe the patterns of most tone languages. These tonal features are linked above the prosodic skeleton. A single tonal feature attached to the same slot indicates a level tone, while multiple tonal features in a particular order represent contour tones. If necessary, mid tones can be represented by introducing a third tonal feature (M).



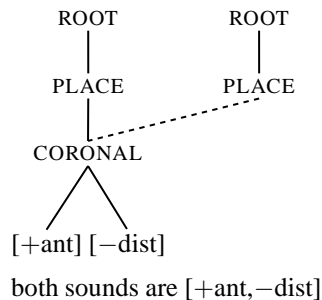
Rules using autosegmental feature trees are more restricted than our original simple feature rules, which were essentially unlimited in power. This increased restriction constrains the theory in a desirable way, to curb the prediction of unattested phonological rules. Autosegmental rules are ideally suited to explain the cross-linguistic prevalence of **assimilation**. Assimilation is easily represented as “spreading” of a node or feature from one sound to another sound. A dashed line is used to indicate the new attachment caused by assimilation. The assimilated node or feature must attach to the appropriate node. For example, the CORONAL node must spread to the PLACE node:



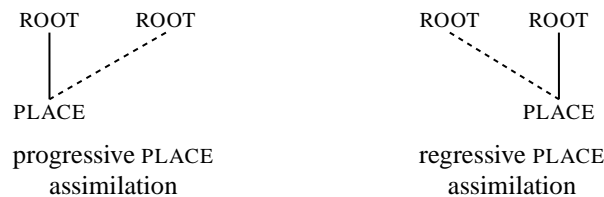
Similarly, the [back] feature must spread to the DORSAL node:



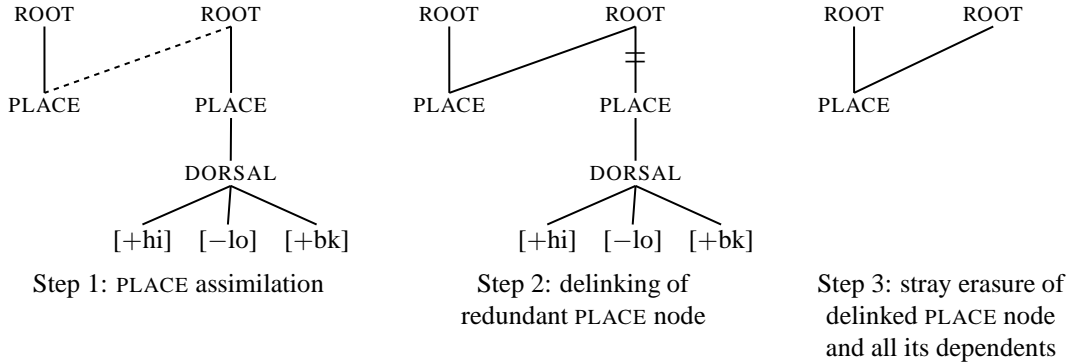
Because of the hierarchical structure of autosegmental feature trees, a spreading node carries all of its dependent features with it. For example, if the CORONAL node spreads, the target sound will have the same values for the features [anterior] and [distributed]:



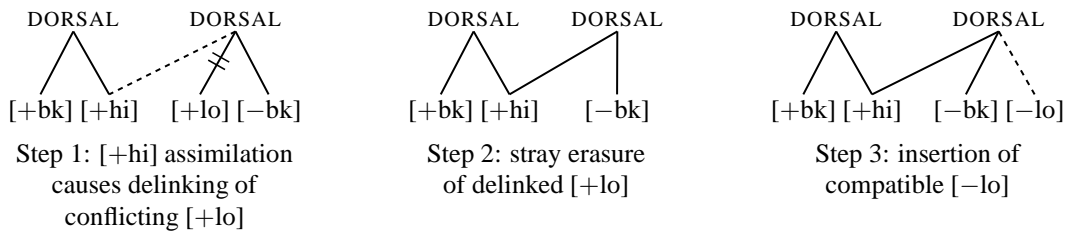
Assimilation may be **progressive** (rightwards) or **regressive** (leftwards):



If the target sound already has the node or feature being spread, we will assume by default that assimilation is **feature changing**, which means that the topmost duplicate node or feature is **delinked** to accommodate the assimilated feature. Delinked nodes are marked with a double line through the connection to the higher node. A delinked node and all of its dependent nodes and features are eventually deleted by a “clean up” process called **stray erasure**:

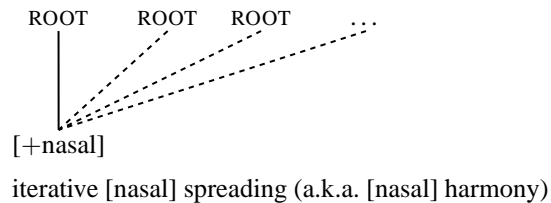


Assimilation may cause a feature conflict. For example, spreading [+high] to a sound that is already [+low] would create an impossible sound, since nothing can be [+high, +low]. We assume that, like duplicate nodes and features, conflicting nodes and features on the target are delinked and deleted by stray erasure. Further, we assume that compatible features are eventually inserted to guarantee that all sounds are well-formed:



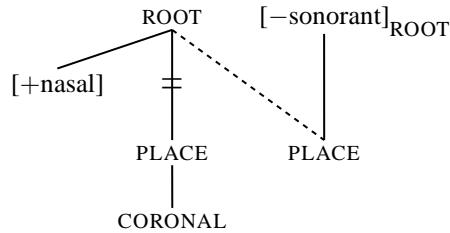
Note that there is no conflict with the [back] features, so they remain unchanged!

Assimilation may also be **iterative** (continually spreading to all available sounds) or **non-iterative** (only spreading once, even if further valid targets are available). Assume that all assimilations are non-iterative unless specified otherwise. Iterative assimilation is sometimes called **harmony** to further distinguish it from ordinary, non-iterative assimilation:



Unlike linear rules, autosegmental rules have the target, the change, and the environment all written in the same structure. There are no arrows, no slashes, and no underlines. The target and environment are written all together, as they would appear in autosegmental tree format. The trees should be sufficient to describe the relevant natural classes of sounds involved with the rule, and ideally, they should also be minimal by leaving off unnecessary features. Note that features and nodes belonging to a segment cannot be left floating, so if you need both [nasal] and PLACE, then you must have a ROOT node to connect them, so that they are identifiably part of the same segment. The changed features are indicated by spreading of features from the environment to the target, delinking of features on the target, and/or insertion of new features.

Sample rule: Coronal nasals assimilate the PLACE node of a following obstruent



The ROOT node for the target is needed because the assimilated PLACE node can only attach to a ROOT node.

The [+nasal] feature is needed to specify that the target of the rule is nasal.

The CORONAL node is required, since only coronal nasals are targets of the rule. Without a PLACE node, there would be no way to specify that the CORONAL node and the [+nasal] feature must belong to the same segment, so the PLACE node is also required to help unite the target's features.

The [-sonorant] feature is needed to specify that an obstruent is a required part of the triggering environment for the rule. Recall that the feature [sonorant] is in the root, so we do not indicate the ROOT node separately. The subscript ROOT in the rule is not strictly required, but it is a helpful reminder that the [sonorant] feature is part of the ROOT node, and not an independent feature.

The PLACE node for the obstruent is needed because it is the node being spread by the rule. A dotted line is drawn from it to the ROOT node of the target. Note that this is regressive assimilation, because the target gains the PLACE node of a *following* obstruent. By putting the relevant trees directly together side by side in the order they must appear in the word, there is no need to use an environment description like __ [-son], as we did in our old linear rules.

We assume that redundant features and nodes are delinked automatically, but for clarity, it is helpful to indicate the forced delinking of the old PLACE node anyway, by putting double lines through the connection between the delinked node and the node it is attached to (here, the target's ROOT node).

All other features and nodes are either irrelevant (for example, the major and minor place features of the obstruent, which get assimilated along with the PLACE node and do not affect whether the rule applies or not) or redundant (for example, [consonantal] and [approximant] for these sounds), so they should be left off to avoid clutter and confusion.

It may be necessary at times to make use of structure higher than the prosodic skeleton. For example, if we have a rule that epenthesizes [a] between two consonants at the end of the word, we currently have nowhere to attach the new vowel. In this case, we can make use of a higher level WORD node, which the prosodic skeleton is attached to:

