

# Feature-Based Dissimilation

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*"In space, no one can hear you think."*

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# 1 Feature-Based Dissimilation

## 1.1 Defining the Phenomenon: What is Feature-Based Dissimilation?

Languages, those intricate tapestries woven from sound and meaning, are in a constant state of flux, shaped by forces that alternately draw sounds together and push them apart. While the assimilatory impulse – where neighboring sounds become more alike for ease of articulation, like the ‘n’ in ‘input’ often becoming ‘m’ before ‘p’ – is often the dominant sculptor, its counterpart operates with a different logic. This is the realm of **Feature-Based Dissimilation (FBD)**, a fundamental yet sometimes elusive phonological process where a sound actively changes *away* from a nearby sound in one or more specific phonetic or phonological characteristics. Rather than convergence, FBD demands divergence, driven by a need to reduce potential perceptual confusion or articulatory awkwardness arising from the repetition of salient features. Imagine two instruments playing the same piercing note in close succession; dissimilation is the phonological equivalent of one instrument shifting pitch to create a clearer, less grating harmony.

**1.1 Core Principle and Basic Definition** At its heart, feature-based dissimilation is a context-sensitive sound change governed by similarity avoidance. Formally, it can be defined as a phonological process whereby a segment (the *target*) undergoes a modification in one or more of its distinctive features specifically to become less similar to another segment (the *trigger*) occurring within a defined proximity. The driving force is often attributed to *markedness*: the repetition of a particular feature value in close succession is perceived as phonologically “marked” or undesirable, creating articulatory difficulty, perceptual overload, or simply violating a systemic preference for contrast. This stands in stark opposition to assimilation, the most pervasive force in phonology, where sounds become *more* alike, typically easing the transition between articulatory gestures (e.g., the nasal assimilation in ‘impossible’ from ‘in-possible’). While assimilation smooths the path for the speech apparatus, dissimilation carves out distinctiveness, ensuring critical features remain perceptually salient. A canonical example is the evolution of the Latin word *arbo*s to *arbor* (meaning “tree”). The sequence of two rhotic /r/ sounds (/r...r/) proved phonologically cumbersome; dissimilation resolved this by altering the *first* /r/ to the similar, but crucially distinct, lateral liquid /l/, yielding *arbor* – a form preserved in English and many Romance languages like French *arbre*. Here, the shared feature [+rhotic] triggered a change in the target to [-rhotic].

**1.2 Essential Components: Trigger, Target, and Domain** Understanding any dissimilatory event requires identifying three key players and the stage on which they interact. First, the **target** is the sound that undergoes the change. It is the segment deemed phonologically problematic due to its similarity to the trigger. Second, the **trigger** is the sound whose presence, possessing a specific feature value, instigates the change in the target. Critically, the trigger and target must share the feature that is the focus of the dissimilation; it is this shared feature value that creates the markedness violation prompting the alteration. If the sounds share no relevant features, dissimilation does not apply. Third, the **domain** defines the spatial relationship within which the trigger influences the target. This proximity constraint is crucial and varies significantly: \* **Adjacent**: The trigger and target are directly next to each other (e.g., consonant clusters like /dl/ potentially dissimilating). \* **Local**: The trigger and target are separated by only a very small number of segments, of-

ten within the same syllable or adjacent syllables (common in vowel dissimilation or harmony blocking). \* **Non-local/Long-distance:** The trigger and target can be separated by several segments, even across syllable or word boundaries. Grassmann’s Law in Indo-European, where two aspirated stops dissimilate across an intervening vowel (e.g., Sanskrit  $d\bar{a}-d\bar{a}-ti > da-dh\bar{a}-ti$  “he places”), exemplifies this long reach. The domain dictates the potential scope of the dissimilatory influence and is a major factor in the process’s typological classification. Misperceptions can sometimes illuminate these components; for instance, English speakers might mishear “handbag” as “hambag,” potentially reflecting an incipient dissimilatory tendency where the nasal feature of /n/ and /m/ conflict in close proximity, though this specific case is often analyzed as assimilation of place.

**1.3 Key Features Involved** Dissimilation is fundamentally *feature-based*; it manipulates specific, abstract phonological properties rather than entire segments wholesale. Certain features prove particularly susceptible to this pressure for divergence due to their perceptual salience or articulatory complexity when repeated. Major categories include: \* **Place of Articulation:** Changes affecting *where* in the vocal tract a consonant is made are extremely common. Latin rhotic dissimilation (/r...r/ > /l...r/) alters the coronal place of the first rhotic. Dahl’s Law in Bantu languages involves voiceless stops triggering a change in a following voiceless stop to voiced (e.g., Swahili *ki-tabu* “book” becoming *ch-tabu* [t̪...tabu] after the prefix /ki-/), where the /k/ triggers dissimilation of the following /t/ – often analyzed as dissimilation of the feature [±voice] or [±spread glottis], though the phonetics involve affrication). \* **Manner of Articulation:** Changes in *how* the airflow is modified, such as stops becoming fricatives or laterals becoming rhotics (as in the Latin *arbores* > *arbor* example). \* **Laryngeal Features:** Features like [±voice] (vocal fold vibration) and [±spread glottis] (aspiration) are frequent targets. Grassmann’s Law specifically dissimilates aspiration ([

## 1.2 Historical Emergence and Foundational Insights

Having established the core principles and mechanics of feature-based dissimilation (FBD), including its defining opposition to assimilation, its reliance on shared phonological features between trigger and target, and its manifestation across diverse articulatory properties, we now turn to the intellectual journey that brought this intricate phenomenon into focus. The recognition and theoretical formalization of dissimilation unfolded gradually, reflecting broader shifts in linguistic paradigms and the persistent challenge dissimilatory patterns posed to prevailing doctrines of regularity. Its path through linguistic history is marked by initial observations of puzzling irregularities, periods of skepticism, and eventual integration into sophisticated models of phonological structure, culminating in the feature-based framework that defines our modern understanding.

The earliest inklings of dissimilation emerged not from abstract theory, but from the meticulous work of 19th-century philologists and historical linguists grappling with apparent anomalies in sound change. These scholars, reconstructing proto-languages and tracing etymologies, encountered changes that stubbornly resisted explanation by regular sound laws or simple assimilation. A landmark moment arrived in 1863 with the German mathematician and philologist **Hermann Grassmann**. Analyzing Sanskrit and Ancient Greek verb paradigms, Grassmann identified a consistent pattern: when two aspirated stops ([+spread glottis]) oc-

curred within the same root across a vowel, the *first* lost its aspiration. Sanskrit *bhū-* (be) + *-dā* (put) yielded not *\*bhūdāmi* but *budāmi* “I wake”; similarly, *dā-* (put) + *-dā* yielded *dadāmi* “I place”. This discovery, formalized as **Grassmann’s Law**, provided the first rigorously documented case of a long-distance, feature-specific dissimilatory process. It demonstrated that sounds could actively change to become *less* like another sound separated by intervening segments, driven by the avoidance of identical laryngeal features. Around the same time, observations surfaced concerning the pervasive instability of adjacent or proximate identical liquids, particularly /r...r/ sequences, in the evolution from Latin to Romance languages – patterns later codified as rhotic dissimilation (e.g., *peregrinus* > French *pèlerin*). These early insights revealed dissimilation as a significant, though initially perplexing, force in language history, often operating across word boundaries in compounding or inflection and explaining forms that regular sound laws alone could not account for.

This burgeoning awareness, however, collided with the dominant linguistic paradigm of the late 19th century: **Neogrammarianism**. Championed by scholars like Karl Brugmann, Hermann Osthoff, and Hermann Paul, the Neogrammarians famously asserted the absolute regularity of sound change (*Ausnahmslosigkeit der Lautgesetze*), positing that sound laws operate blindly, without exception, across all relevant words in a language. Dissimilatory changes, by their very nature – often sporadic, lexically specific, and contextually conditioned – appeared as glaring exceptions to this doctrine. Neogrammarians initially struggled to reconcile these patterns. Some, like Paul, acknowledged dissimilation as a distinct type of change but relegated it to the realm of sporadic, psychologically motivated alterations operating alongside the mechanical regularity of sound laws, often attributing it to “avoidance of difficult sound combinations” or “ease of pronunciation.” Others were more dismissive. Nevertheless, the sheer weight of evidence, exemplified by Grassmann’s Law and the Romance rhotic patterns, forced a nuanced accommodation. Dissimilation was gradually integrated as a specific type of *conditioned sound change*, where the conditioning environment was not a specific neighboring sound inducing assimilation, but the *presence of a similar sound within a domain* inducing divergence. This recognition, however tentative, marked a crucial step: dissimilation was acknowledged as a legitimate phonological process, albeit one operating under different principles than the assimilatory changes that formed the backbone of Neogrammarian sound laws. The challenge dissimilation posed to strict regularity underscored the need for more sophisticated models of phonological conditioning.

The rise of **Structuralism** in the early 20th century, particularly the **Prague School** led by Nikolai Trubetzkoy and Roman Jakobson, provided a radically different lens. Moving beyond the purely historical focus, structuralists examined languages as synchronic systems of functional oppositions. Within this framework, dissimilation gained new theoretical significance. Trubetzkoy, in his seminal *Grundzüge der Phonologie* (1939), analyzed phonological processes in terms of maintaining the distinctiveness of phonemes within the system. He recognized that sequences of highly similar sounds could potentially blur phonological contrasts, creating perceptual difficulties. Dissimilation, therefore, could be understood as a functional process serving to *preserve or enhance distinctiveness* within the speech chain. Jakobson’s contribution was even more foundational. Building on the concept of distinctive features – the minimal phonological properties that differentiate meaning (e.g., [±voice], [±nasal], [±coronal]) – Jakobson provided the conceptual tools to analyze dissimilation not as a change affecting whole segments, but as an alteration of *specific features*.

He argued that the avoidance of repetition pertained directly to these abstract features. This feature-based perspective, hinted at in earlier work but rigorously articulated by Jakobson, was pivotal. It shifted the focus from the segments themselves to the underlying properties they shared, offering a more precise way to define the “similarity” that triggered dissimilation and explaining why changes often targeted only one aspect of a sound (e.g., losing aspiration while retaining place and manner). Structuralism thus redefined dissimilation not merely as an irregularity

### 1.3 Mechanics of Dissimilation: Types and Processes

Building upon the historical recognition and theoretical foundations established by philologists, Neogrammarians, and Structuralists, we now delve into the intricate machinery of feature-based dissimilation itself. Understanding *how* dissimilation operates synchronically and diachronically requires dissecting its various mechanisms – the specific ways in which the pressure for dissimilarity manifests across languages. This involves classifying dissimilatory processes along several key axes: the temporal direction of influence between trigger and target, the spatial domain over which this influence operates, the nature of the segments undergoing change, and the precise phonological outcome on the targeted feature.

**3.1 Directionality: Anticipatory vs. Lag Dissimilation** A fundamental distinction in dissimilatory mechanics lies in the relative timing of the change: does the target alter its features *in anticipation* of encountering the trigger, or does it change *as a consequence* of having already encountered the trigger? This defines the crucial categories of anticipatory (or regressive) and lag (or progressive) dissimilation. Anticipatory dissimilation is overwhelmingly the more frequent type cross-linguistically. Here, the target sound, located *before* the trigger, changes *away* from the feature value it anticipates in the following trigger. The classic Latin rhotic dissimilation exemplifies this pattern. In *peregrinus* (“pilgrim”, underlyingly /peregrinus/), the first /r/ (target) anticipates the second /r/ (trigger) and dissimilates to /l/, yielding Old French *pelerin* (Modern French *pèlerin*). Similarly, Latin *mirabilis* (“wonderful”) becomes French *merveille* via /r/ > /v/ (a more radical change involving manner and place, but still triggered by the following /l/ which itself has rhotic qualities historically). The driving force is the avoidance of the impending repetition. Lag dissimilation, where the target follows the trigger and changes due to the preceding feature, is considerably rarer but attested. A potential example occurs in some dialects of English, particularly certain varieties of African American English and Cockney, where the sequence /θ□/ (as in *thread*) dissimilates to /f□/ (*fread*). Here, the alveolar fricative /θ/ (trigger) precedes the approximant /□/ (target); the target /□/ changes its place feature away from the coronal place of /θ/, adopting the labiodental place of /f/, becoming less similar in its point of articulation. Another debated instance involves the historical development of some Yiddish words from Hebrew, like *shabes* (Sabbath) from Hebrew *shabbat*, where the final /t/ might be seen as dissimilating in voicing or manner away from the preceding stop /b/, though alternative analyses exist. The predominance of anticipatory dissimilation suggests a cognitive or articulatory bias towards planning ahead to avoid upcoming marked sequences.

**3.2 Proximity Constraints: Local vs. Long-Distance** The domain over which dissimilation operates – the permissible distance between trigger and target – is another critical parameter, ranging from immediate

adjacency to separation across multiple syllables. Local dissimilation demands close proximity, often strict adjacency or presence within the same syllable. This frequently manifests in consonant clusters where two segments sharing a marked feature collide. For instance, some dialects of Spanish exhibit dissimilation in /dl/ clusters, where the lateral /l/ dissimilates to the vibrant /r/ after a /d/, as in *sue(d)lo* (“dream”) potentially surfacing as *sue(d)ro*, avoiding the sequence of two coronal sonorants (though this competes with deletion). Vowel dissimilation to resolve hiatus (adjacent vowels) often operates locally; in Japanese, for example, the genitive marker /no/ can cause dissimilation of a preceding /o/ in some compounds (e.g., archaic *kumo no* > *kumu no* “spider’s”). Crucially, dissimilation can also act locally to *block* assimilation or harmony processes; if a potential trigger for vowel harmony is too similar to the target vowel, dissimilation might prevent the expected assimilation from occurring. In stark contrast stands long-distance dissimilation, where the trigger and target are separated by one or more segments, potentially across syllable or even word boundaries. Grassmann’s Law remains the paradigmatic example: in Sanskrit and Greek, two aspirated stops dissimilate across an intervening vowel (Sanskrit *b□u + d□ā* > *bu-d□ā* “awake”; Greek *thrikh- + théō* > *trikh-éō* “I hair-put”). The feature [spread glottis] (aspiration) on the first stop is lost specifically because of the presence of the same feature on a later stop, regardless of the vowels or consonants in between. Rhotic dissimilation, as in Latin *arbor*, also often operates non-locally, affecting /r/’s separated by a vowel. The ability of dissimilation to act over longer distances, particularly for highly salient features like aspiration or rhoticity, highlights its distinct nature compared to most assimilatory processes, which are typically strictly local.

**3.3 Segmental Targets: Consonant vs. Vowel Dissimilation** While dissimilation can theoretically affect any segment

## 1.4 Theoretical Frameworks and Formal Accounts

Having explored the diverse manifestations of feature-based dissimilation – its directionality, domain constraints, segmental targets, and outcomes – we arrive at the crucial question: *how* is this phenomenon formally captured and explained within modern linguistic theory? Understanding the mechanics provides descriptions, but theoretical frameworks offer explanations and predictions, attempting to model the cognitive and physical underpinnings of why sounds diverge under pressure from similarity. The journey from observing patterns like Grassmann’s Law or rhotic dissimilation to developing robust formal accounts reflects significant advances in phonological theory, moving beyond simple rule statements to models grounded in representational structure, constraint interaction, articulatory dynamics, and cognitive representation.

The advent of **Autosegmental Phonology** in the late 1970s, pioneered by John Goldsmith, revolutionized the representation of phonological features and provided powerful tools for modeling dissimilation. Central to this framework is the idea that features are not simply bundled properties attached directly to segments, but autonomous entities residing on separate *tiers* linked to segmental positions via association lines. This separation allows features to spread or delink independently. Crucially, **Feature Geometry**, developed subsequently by scholars like G.N. Clements and Elizabeth Sagey, organized these features into a hierarchical tree structure, reflecting their articulatory and functional relationships. For dissimilation, this geometry is paramount. It explains why certain features can dissimilate independently: dissimilation targets a specific



node in the feature tree (e.g., the [Place] node, the [Laryngeal] node, or even a sub-node like [Labial]), leaving other features of the segment intact. For instance, in Latin *peregrinus* > *pelerin*, the dissimilation specifically targeted the [rhotic] feature under the [Place] node or a designated [Liquid] node, changing it to [lateral], while the consonant's basic manner and voicing remained unchanged. The geometry also imposes constraints on locality. Dissimilation is modeled as *delinking* the offending feature value from the target segment (triggered by the presence of the same feature value on the trigger within a certain domain), followed by repair, often via feature insertion (filling in a default or contextually determined value) or deletion. The hierarchical structure defines the minimal domain for such operations; dissimilation is constrained to operate within the scope defined by the relevant tier. A long-distance dissimilation like Grassmann's Law, targeting [spread glottis], is thus analyzable because laryngeal features often occupy a high, autonomous tier capable of influencing segments across intervening vowels and consonants, whose features reside on different tiers (like [Place] or [Manner]). Autosegmental theory transformed dissimilation from an opaque rule into a process governed by the independent behaviour and hierarchical organization of features themselves.

While Autosegmental Phonology offered a structural account, **Optimality Theory (OT)**, developed by Alan Prince and Paul Smolensky in the early 1990s, provided a radically different perspective based on constraint interaction and violation. OT posits that phonological processes emerge from the conflict between universal, violable constraints. Dissimilation finds its primary driver here in the **Obligatory Contour Principle (OCP)**, formalized within OT as constraints prohibiting the repetition of identical features (or feature values) within a specified domain (e.g., OCP[Place], OCP[Voice], OCP[Nasal]). The OCP is the formal embodiment of the markedness pressure against similarity repetition. However, OCP constraints conflict with **Faithfulness constraints** (e.g., Ident[F]: "The output feature [F] must be identical to the input feature [F]"), which demand that underlying forms surface unchanged. The core of OT lies in how languages *rank* these constraints. If an OCP constraint outranks the relevant Ident[F] constraint, dissimilation occurs: the output form violates Ident[F] (changing the feature on the target) to satisfy the higher-ranked OCP[F]. Conversely, if Ident[F] dominates OCP[F], the repeated feature sequence surfaces faithfully, despite its markedness. The specific *repair strategy* employed (feature deletion, feature change, metathesis, etc.) is determined by the interaction of the dominant OCP constraint with other markedness and faithfulness constraints. For example, in a language exhibiting Dahl's Law voicing dissimilation (e.g., hypothetical input /ki-tabu/), the constraint ranking OCP[Voice] (specifically forbidding adjacent voiceless stops) » Ident[Voice] » OCP[Place] would force the second stop to voice (/kidabu/) or potentially affricate (/tʃ/ as in Swahili *ch-tabu*) to break the voiceless stop sequence, preferring that violation over violating the higher-ranked OCP[Voice]. OT elegantly captures typological variation: languages differ not in *whether* they have OCP constraints, but in *which* OCP constraints are active (e.g., OCP[Nasal] might be crucial in one language, irrelevant in another) and how highly they are ranked relative to faithfulness. Furthermore, OT handles long-distance dissimilation through alignment constraints or domain-specific versions of OCP (e.g., OCP[aspirated] within the phonological word), explaining why Grassmann's Law operates across syllables but not necessarily across word boundaries. OT shifted the focus from *rules* to the *constraints* that motivate them, providing a unified account of dissimilation and other phenomena driven by markedness avoidance.

Moving beyond abstract representation and constraint ranking, **Articulatory Phonology**, developed primar-



ily by Catherine Browman and Louis Goldstein, grounds dissimilation in the physical realities of speech production. This model views speech not as sequences of discrete segments, but as overlapping constellations of articulatory **gestures** – dynamically defined, linguistically significant actions of the vocal tract organs (lips, tongue tip, tongue body, velum, glottis). Dissimilation arises from the difficulty in executing two highly similar gestures in close temporal proximity, leading to **gestural conflict** or **crowding**. When the planning or

## 1.5 Dissimilation in Language Acquisition and Processing

The exploration of feature-based dissimilation through historical, mechanical, and theoretical lenses reveals its profound roots in the cognitive and physical architecture of speech. Moving beyond synchronic systems and diachronic change, we now examine how dissimilation manifests dynamically within the individual speaker – in the developing linguistic system of the child and the real-time processing mechanisms of the adult. This perspective naturally leads us from abstract formalisms and articulatory gestures to the realms of language acquisition, perception, and production, illuminating dissimilation not merely as a historical residue or systemic constraint, but as an active force shaping and being shaped by the human capacity for language.

**5.1 Child Phonology: Simplification and Error Patterns** The babbling and early word productions of children provide a fertile ground for observing phonological processes in their nascent state. While assimilation, particularly consonant harmony (where consonants become more alike, e.g., *dog* > *gog*), is a hallmark of early phonology, dissimilatory patterns also emerge as crucial simplification strategies, often intertwined with the drive to reduce complexity. One prominent manifestation is the avoidance of reduplication. Young children frequently simplify adult target words that contain repeated syllables or segments by altering one instance. For example, *water* might surface as *wawa* [w□wə], where the final liquid /□/ is not only deleted but replaced by another labial sound (/w/), arguably dissimilating from the initial /w/ by changing manner (from approximant to glide/vowel-like) or simply replacing a complex segment. Similarly, *blanket* might become *banke* [bæŋkət], where the sequence of two labial consonants (/b/ and /l/ – as /l/ has a secondary labial component for some children) is broken by altering the second labial (/l/ > /ŋ/), a change involving both place and manner dissimilation. These patterns often occur before the child has fully mastered the articulation of certain sound classes, like liquids (/l/, /□/) or fricatives. Crucially, the developmental trajectory shows a shift. While strong assimilatory forces dominate the earliest stages (1;6-2;6 years), dissimilatory constraints, often reflecting the Obligatory Contour Principle (OCP), begin to exert influence as the child's phonological system matures. Researchers like Neil Smith and Marilyn Vihman documented cases where children initially produced forms with harmony (e.g., *snail* > *neil* [nil], assimilating the /s/ to the coronal place of /n/) but later shifted to dissimilatory repairs (e.g., *snail* > *sneil* [sne□l], preserving the /s/ but altering the vowel, potentially dissimilating from the following liquid) as their ability to sequence distinct articulatory gestures improved. This suggests that the pressure against feature repetition, while perhaps innate, becomes operationalized as a productive repair mechanism later than the pressure for assimilation, aligning with the cross-linguistic observation that dissimilation is often a less frequent process.

**5.2 Perception Biases and the OCP** Why does the repetition of features pose a challenge? Experimental psycholinguistics provides compelling evidence that the OCP reflects a fundamental bias in human speech perception. Sequences involving repeated identical or highly similar features are consistently harder to perceive accurately and process efficiently than sequences with contrasting features. Classic demonstrations come from **tongue twisters**. Phrases like “toy ship” versus “toy tip” highlight the difficulty: “toy ship” (/tʃɪp/) involves two distinct coronal fricatives/affricates ([+coronal, +continuant]), while “toy chip” (/tʃɪp/) contains two voiceless coronal stops ([+coronal, -continuant]). The latter, featuring repeated place *and* manner features in close proximity, is notoriously harder to articulate rapidly and accurately, leading to blend errors like “toy ship” or “toy chip” becoming confused. This difficulty isn’t merely articulatory; perceptual confusion studies show listeners are more likely to misidentify words containing repeated features. For instance, presenting listeners with non-words like /sʃsʃp/ versus /sʃʃʃp/ in noise reveals higher error rates for the sequence with two identical coronal sibilants (/s...s/). Neuroimaging studies using EEG have shown increased neural activity (often reflected in components like the N400 or P600) when processing words that violate OCP constraints compared to well-formed controls, indicating greater cognitive load during comprehension. This perceptual hypersensitivity to feature repetition, arguably rooted in the auditory system’s preference for contrast to maximize signal distinctiveness, provides a plausible cognitive foundation for the OCP. It suggests that dissimilation, as a repair strategy, is not merely an articulatory shortcut but serves a vital function in ensuring perceptual clarity by mitigating inherent processing difficulties associated with feature repetition.

**5.3 Production Planning and Articulatory Ease** The challenges of perception translate into challenges for production planning. Models of speech production, such as Levelt’s **WEAVER++** model, conceptualize speaking as a multi-stage process involving lemma selection (meaning), word-form retrieval (morphophonology), phonological encoding (syllabification, metrical structure), and finally, articulatory planning. It is during phonological encoding and articulatory planning that feature repetition can cause bottlenecks. Planning two segments sharing a specific feature value in close temporal proximity requires distinct motor programs for sounds that are, by definition, similar. This similarity can lead to interference or competition during the retrieval or assembly of articulatory

## 1.6 Sociolinguistic Dimensions and Variation

The cognitive pressures and articulatory constraints explored in language acquisition and processing do not operate in a vacuum. Rather, they unfold within the rich tapestry of human societies, where language serves not only as a tool for communication but also as a marker of identity, social standing, and group affiliation. Feature-based dissimilation, like all linguistic phenomena, is profoundly shaped by these sociolinguistic dimensions. Its occurrence, frequency, and specific forms are not fixed universal constants but dynamic elements subject to variation across dialects, sensitive to communicative context, influenced by contact between languages, and embedded within the gradual currents of language change across communities and time.

**Dialectal Variation in Dissimilatory Processes** provides compelling evidence for the social grounding of phonological patterns. The fate of the English /θ/ cluster, mentioned previously as a potential case of lag

dissimilation (*thread* > *fread*), vividly illustrates this. While this dissimilation is robust in certain urban British dialects like Cockney and Multicultural London English, and is also a recognized feature of African American English, it is largely absent or highly stigmatized in Standard American English and Received Pronunciation. The social stratification is clear: variants like *frew* for *through* or *froat* for *throat* often carry covert prestige within specific communities while facing overt stigma in others, potentially influencing their adoption or suppression. Similarly, the dissimilation of /r...r/ sequences, a hallmark of Romance language development from Latin, exhibits fascinating dialectal nuances within modern languages. In Latin American Spanish, dissimilation in words like *croqueta* (“croquette”) often surfaces as *croqueta* (faithful) or *cloqueta* (dissimilated), with preferences varying regionally and often correlating with sociolectal factors – the dissimilated form might be perceived as more colloquial or rustic in some areas. Even a process as ancient as Grassmann’s Law left uneven footprints; while pervasive in Sanskrit and Ancient Greek, its effects are less consistent in other Indo-European branches, suggesting dialectal variation existed even in the proto-language or during its early diversification. These variations underscore that the activation and application of dissimilatory constraints are not solely determined by universal phonetics but are mediated by social norms and community-specific linguistic conventions.

**Dissimilation as a Marker of Style and Register** further demonstrates its sensitivity to communicative context. Speakers often modulate their pronunciation based on the formality of the situation, and dissimilated forms frequently align with specific registers. In informal, rapid speech, where articulatory ease and fluency are paramount, dissimilation may flourish. For instance, the dissimilation of adjacent sibilants in English, often seen as hypercorrect when overapplied, is more likely in casual contexts: pronunciations like *horspi-tal* for *hospital* (avoiding /s...s/) or *mense* for *menace* (avoiding /n...s/ with alveolar place) might emerge spontaneously in relaxed conversation but be consciously suppressed in formal presentations or careful reading. Conversely, the *avoidance* of certain dissimilated forms can itself be a marker of formality or prestige. In Japanese, a language rich in honorifics, dissimilation operates within the complex system of politeness levels. For example, the humble prefix *o-* combined with nouns beginning with /o/ often triggers dissimilation of the initial vowel in the noun (e.g., *o* + *okashi* > *o-kashi* “sweets”). Using the non-dissimilated form *o-okashi* might sound overly familiar or even childish in polite company, making the dissimilated form the expected register marker. This interplay even extends to hypercorrection, where speakers, overly aware of stigmatized dissimilated forms associated with lower-prestige dialects, might mistakenly “correct” non-dissimilated forms. An English speaker aiming for prestige might produce *athalete* instead of *athlete*, incorrectly dissimilating the /θl/ cluster based on a subconscious association of /θ□/ > /f□/ dissimilation with informality and attempting to avoid a similar structure.

**Contact-Induced Dissimilation** reveals how languages evolve under mutual influence. When languages collide, dissimilatory patterns can be introduced, suppressed, or reshaped. Loanword adaptation is a prime arena. A borrowing language might impose its own OCP constraints onto foreign words. For example, Swahili, which has active voice dissimilation processes like Dahl’s Law, often applies similar principles to loans. The Arabic word *kitabu* (“book”), borrowed into Swahili as *kitabu*, aligns with the native pattern where /ki-/ prefix plus voiceless stop triggers dissimilation (though /t/ remained voiceless, potentially reflecting the stability of the loan). Conversely, contact can suppress native dissimilation. Some dialects

of Spanish in close contact with indigenous languages lacking strong rhotic dissimilation might show less frequent application of processes like /r...r/ > /l...r/ compared to more isolated dialects. Furthermore, prolonged bilingualism can lead to the grammaticalization of dissimilatory patterns. The contact between Norman French and Old English influenced the development of English indefinite articles; the Old English *ān* (“one”) dissimilated to *a* before consonants (where the following nasal consonant might have been a trigger) but retained *an* before vowels, a pattern solidified through centuries of contact-induced restructuring and now a core feature of English grammar.

**Change in Progress: Grammaticalization and Lexical Diffusion** showcases dissimilation operating dynamically within the lexicon over time, often intertwined with social

## 1.7 Case Studies: Prominent Examples Across Languages

The sociolinguistic tapestry woven in the previous section reveals feature-based dissimilation not as a monolithic, universal constant, but as a dynamic process shaped by community, contact, and conscious choice. This inherent variability, however, rests upon concrete, well-documented patterns that have shaped languages across the globe and through millennia. To truly appreciate the power and subtlety of dissimilation, we must examine its most prominent and theoretically illuminating manifestations. These case studies, drawn from diverse language families and historical periods, serve as empirical anchors, demonstrating the core principles in action and highlighting the specific linguistic features and domains most susceptible to this pressure for divergence.

**7.1 Grassmann’s Law: Aspiration Dissimilation in Indo-European** No discussion of dissimilation can begin without **Grassmann’s Law**, the foundational discovery that propelled the phenomenon into linguistic consciousness. Hermann Grassmann’s 1863 analysis of Sanskrit and Ancient Greek verb forms unveiled a remarkably consistent pattern: when two aspirated stops ([+spread glottis]) occurred within the same root, separated only by a vowel or sonorant, the *first* aspirate invariably lost its aspiration. This long-distance, feature-specific dissimilation operates with striking regularity. Consider Sanskrit reduplicated verb forms: the root *dā-* (“put”) forms the present tense *da-dhā-ti* (“he places”), not *\*dā-a-dā-ti*. The initial aspirated /d/ dissimilates to plain /d/ because of the following aspirated /d/ (trigger) in the root syllable. Similarly, *bhū-* (“be”) + *dā-* yields *bu-bhū-ṣati* (“he wishes to be”), not *\*bhū-u-bhū-ṣati*. Greek exhibits identical behavior: *thriks* (“hair”, stem *thrikh-*) combined with *tithēmi* (“I put”) yields *trikh-éō* (“I provide with hair”), not *\*thrikh-éō*, dissimilating the initial aspiration away from the root-internal aspirated /kh/ (spelled *kh*). Crucially, the dissimilation is strictly regressive (anticipatory) and operates across vowels and sonorants, demonstrating its long-distance nature. The targeted feature is exclusively [+spread glottis] (aspiration); place and manner of articulation remain unaffected. The historical development suggests this law was active during the late Proto-Indo-European period or very early in the separate histories of the Indo-Iranian and Hellenic branches, leaving its mark on their core vocabulary. Its theoretical significance is immense: it provided the first rigorous proof of a phonological process driven solely by feature similarity avoidance over a domain spanning syllables, challenging the Neogrammarian emphasis on strictly local, mechanically conditioned sound change and paving the way for autosegmental and constraint-based analyses of long-distance

dependencies.

**7.2 Dahl’s Law and Similar Voice Dissimilations in Bantu** Moving to the vast Bantu family of Africa, we encounter **Dahl’s Law**, a canonical example of voice dissimilation operating on consonant sequences, often across morpheme boundaries. Named after the missionary linguist E. W. Dahl, this process typically involves a voiceless stop in a prefix triggering dissimilation on a following voiceless stop in the stem, commonly resulting in voicing. In Swahili, the noun class 7 prefix is underlyingly /ki-/. When prefixed to a stem beginning with a voiceless stop, such as *-tabu* (“book”), the expected /ki-tabu/ surfaces as *ch-tabu* [tʃtabu]. While the surface form shows affrication, the core dissimilatory change is the voicing of the stem-initial /t/ to [d] *before* it undergoes further palatalization and affrication triggered by the prefix vowel, yielding the complex [tʃ] (a voiced [d] would become [dʃ], so the dissimilation must target the underlying voicing feature first). The sequence of two voiceless stops /k...t/ is avoided by voicing the second. This pattern is widespread across Bantu languages, though the precise realization varies. In Gikuyu, /ko-tema/ (“to cut”) surfaces as *ko-dema*, with straightforward voicing of /t/ to /d/. Luganda exhibits a similar process, often termed **Dahl’s Law** or **Stumpff’s Law**, where /ku-kola/ (“to work”) becomes *ku-gola*. The trigger-target relationship is usually regressive and local, often strictly adjacent or within the onset of adjacent syllables. The targeted feature is [±voice] or perhaps more accurately the laryngeal feature [±spread glottis], distinguishing it from Grassmann’s Law which targeted [+spread glottis] specifically. Dahl’s Law demonstrates how dissimilation interacts intricately with other processes (like palatalization in Swahili) and operates systematically within complex morphological systems, shaping the surface phonotactics of numerous Bantu languages.

**7.3 Rhotic Dissimilation: Latin to Romance** Perhaps the most pervasive and phonetically intuitive case study is the widespread dissimilation of rhotic consonants (/r/ or /ʀ/) in the evolution from Latin to the Romance languages. Sequences of two rhotics, particularly /r...r/ within a word, proved exceptionally unstable. This instability resolved primarily through regressive dissimilation, where the first /r/ changed, typically to the acoustically and articulatorily similar lateral liquid /l/, creating a perceptually clearer sequence. This phenomenon, often called **\*\*rhotac**

## 1.8 Boundaries and Interactions: Related Phonological Phenomena

The intricate case studies of Grassmann’s Law, Dahl’s Law, and pervasive rhotic dissimilation illuminate the diverse manifestations and profound impact of feature-based dissimilation across languages and time. Yet, no phonological process operates in isolation. To fully grasp the nature and function of dissimilation, we must situate it within the broader ecosystem of sound patterns, exploring its dynamic boundaries and interactions with other fundamental forces shaping speech. This involves understanding its inherent tension with assimilation, its deep theoretical roots in the Obligatory Contour Principle, its complex interplay with harmony systems, and its occasional convergence with the process of metathesis. Examining these relationships reveals dissimilation not merely as an isolated mechanism, but as a vital component within the intricate economy of phonological well-formedness.

**The constant, often competing, interplay between Dissimilation and Assimilation** represents one of the core dynamics shaping phonological systems. As established in defining dissimilation, these are fundamen-

tally opposing forces: assimilation promotes similarity for articulatory ease (e.g., nasal place assimilation in *impossible* from *in-possible*), while dissimilation enforces divergence to enhance perceptual distinctiveness or avoid articulatory conflict (e.g., Latin *peregrinus* > French *pèlerin*). This creates a perpetual tension within the “phonological marketplace.” The dominance of one force over the other in any given context is determined by a complex interplay of factors: the specific features involved, the proximity of the interacting segments, the overall phonological structure of the language, and crucially, the relative ranking of competing constraints in models like Optimality Theory. For instance, adjacent consonants frequently assimilate in place (*green boat* pronounced [gri:m bo□t] with labial [m] before labial [b]), driven by gestural overlap minimizing articulatory effort. However, if the resulting sequence creates a marked repetition of a salient feature, dissimilation may override assimilation. Consider the development of the Latin prefix *dis-* before /s/ in Romance: assimilation might predict *dissimo* (cf. Italian *stesso* “same”), but dissimilation instead yields forms like Italian *disonesto* “dishonest” (where the /s/ of the prefix remains, avoiding a sequence of two identical sibilants) or French *déshonnête* (where the prefix vowel changes). Here, the pressure to avoid identical sibilants (an OCP effect) outweighs the potential pressure for sibilant harmony or deletion. This complementary relationship underscores that phonology constantly negotiates between minimizing effort and maximizing clarity, with dissimilation serving as a crucial counterbalance to the often overwhelming tendency towards assimilation, ensuring critical contrasts are not eroded by phonetic smoothing.

**The theoretical bedrock of dissimilation lies firmly within the Obligatory Contour Principle (OCP),** a cornerstone constraint in modern phonology formalizing the prohibition against adjacent identical elements. While introduced earlier, its relationship with dissimilation merits deeper exploration. The OCP is not merely a driver of dissimilation; it represents the fundamental *markedness constraint* that dissimilation acts to repair. The OCP posits that the repetition of identical features (or autosegments like tones) in close proximity is inherently disfavored – it is phonologically “marked.” Dissimilation is the active phonological process that resolves this violation. For example, Grassmann’s Law (Sanskrit *d□a-d□ā-ti* > *da-dhā-ti*) directly addresses an OCP violation on the feature [+spread glottis] (aspiration) across syllables. Crucially, OCP effects extend far beyond triggering active dissimilation. They manifest as static distributional gaps, preventing certain sequences from arising in underlying forms or surfacing faithfully. In many Semitic languages utilizing root-and-pattern morphology, roots rarely contain two identical consonants (e.g., Hebrew roots like *s-p-r* “count” are common, but **s-s-r is highly improbable**), **reflecting an OCP constraint on radical consonants.** Similarly, **tonal languages like Mandarin Chinese exhibit OCP effects where identical tones on adjacent syllables are often avoided through tone sandhi rules (e.g., two third tones becoming second + third: *nǐ hǎo* > *ní hǎo* “hello”), which can be analyzed as tonal dissimilation.** **Dissimilation, therefore, is the most overt repair strategy for a fundamental principle of phonological organization – the OCP – whose influence permeates phonotactics, morphophonology, and tonal systems, actively shaping the permissible sound patterns of languages worldwide.**

**The interaction between Dissimilation and Harmony Systems** presents a fascinating paradox, as these processes pull in opposite directions within the phonological string. Harmony systems, whether vocalic (e.g., Turkish vowel harmony: *ev-ler* “houses” vs. *odalar* “rooms”) or consonantal (e.g., sibilant harmony in Inari Saami), enforce agreement (assimilation) of specific features across a domain, creating uniformity.



Dissimilation, conversely, enforces disagreement within a domain. This inherent conflict means dissimilation often acts as a *blocker* of harmony. A classic example occurs in Hungarian vowel harmony. Hungarian suffixes harmonize with the backness of the stem vowel (*ház-ban* “in the house” [back harmony], *kert-ben* “in the garden” [front harmony]). However, stems containing certain vowels, like the neutral vowel /i/ (long)

## 1.9 Computational Modeling and Experimental Approaches

The intricate dance between dissimilation and harmony systems, where the pressure for contrast clashes with the drive for uniformity, exemplifies the complex dynamics shaping phonological patterns. Resolving such puzzles requires moving beyond descriptive typology and abstract formalisms into the empirical arena of controlled experimentation and computational modeling. Section 9 delves into how modern linguistics leverages computational power, laboratory techniques, and vast linguistic datasets to probe the mechanisms, origins, and real-world manifestations of feature-based dissimilation, transforming theoretical postulates into testable hypotheses and observable phenomena.

**Computational Simulations of Dissimilatory Change** offer virtual crucibles in which to explore how dissimilatory patterns might emerge and propagate within speech communities. Agent-based modeling, where simulated “speakers” interact according to defined production, perception, and learning rules, provides insights into the historical puzzle of why dissimilation, while attested cross-linguistically, is less frequent than assimilation. Models incorporating principles of articulatory effort minimization and perceptual distinctiveness often show assimilation spreading rapidly due to its clear articulatory benefits. Dissimilation, driven by perceptual distinctiveness or OCP-like constraints, typically emerges more slowly and sporadically in simulations, requiring specific initial biases or higher thresholds of perceptual difficulty for feature repetition to overcome the inertia of existing forms. For instance, simulations exploring the origins of Grassmann’s Law-like patterns suggest that even a slight perceptual bias against sequences of identical laryngeal features across syllables, combined with imperfect learning, can gradually lead to the regularization of dissimilation over generations of virtual speakers, especially if reinforced by morphological structure. Artificial language learning experiments provide a complementary window. Participants trained on miniature languages containing sequences violating potential OCP constraints (e.g., repeated sibilants or aspirated stops) often spontaneously introduce dissimilatory changes when reproducing or generalizing the patterns, demonstrating a cognitive predisposition to avoid such repetitions. Crucially, these experiments can isolate factors: Kirby and colleagues found that dissimilatory changes were more likely when the repeated feature was highly salient (like sibilancy) and when the sequences occurred in morphologically complex or unpredictable contexts, mirroring conditions seen in natural language change. Computational approaches thus bridge the gap between individual cognition and population-level change, suggesting dissimilation arises from the interplay of inherent biases and the dynamics of communicative interaction.

**Psycholinguistic Experiments: Perception and Production** shift the focus to the individual mind, directly testing the cognitive and neural underpinnings of dissimilation. A cornerstone finding comes from **reaction time (RT) studies**. Participants are consistently slower and less accurate at judging or repeat-



ing words or non-words containing sequences that violate OCP constraints (e.g., *sissor* with repeated /s/) compared to well-formed controls (e.g., *sishor*). This processing cost, observed even in languages without active dissimilatory rules for those specific features, strongly supports the idea that the OCP reflects a deep-seated cognitive bias against feature repetition, making such sequences inherently harder to process. **Event-Related Potential (ERP)** studies provide finer-grained neural signatures. Violations of OCP constraints, such as presenting a word like *sissor* (if momentarily accepted as a potential form), often elicit a characteristic negativity around 200-400ms post-stimulus onset (N200/N400), associated with phonological mismatch or lexical access difficulty, and sometimes a later positivity (P600) linked to syntactic or structural reanalysis. This neural response pattern confirms that the brain detects and struggles with feature repetition at an early stage of phonological processing. **Articulatory studies** using techniques like Electromagnetic Articulography (EMA) or ultrasound tongue imaging directly measure the physical gestures involved in producing or avoiding dissimilatory sequences. Work by Stefan Frisch and colleagues demonstrated that when speakers produce tongue twisters with repeated coronal consonants (e.g., “top cop” vs. “top chop”), sequences requiring dissimilar places (like /k/ and /t/ in “cop chop”) show less gestural overlap and more distinct tongue trajectories than sequences with similar places (/t/ and /t/ in “top chop”), even when no overt dissimilation occurs. This suggests speakers actively *modulate* articulation to enhance distinctiveness, a phonetic precursor to categorical phonological dissimilation. Furthermore, experiments measuring speech errors show that blends and substitutions are significantly more common in sequences violating OCP constraints, providing a direct link to the potential origins of sound change. These laboratory methods collectively reveal dissimilation not as an abstract rule, but as the emergent outcome of fundamental perceptual and articulatory pressures operating in real-time language use.

**Corpus Linguistics and Quantitative Analysis** leverages the power of large-scale language databases to uncover statistical patterns, track historical developments, and validate theoretical predictions about dissimilation in authentic usage. By analyzing millions of words of spoken and written text, researchers can identify subtle frequency effects and pathways of lexical diffusion. For example, quantitative studies of English confirm that words containing sequences prone to dissimilation (like /θ/ and /s/, or adjacent sibilants as in *horspital/hospital*) are significantly rarer than would be expected by chance, reflecting an active OCP constraint shaping the lexicon even without categorical change. Corpus analysis also illuminates the path of change in progress. Examining historical corpora reveals how dissimilatory changes like the loss of /r/ in certain English words (e.g., *caterpillar* from Old French *chatepelose*) spread gradually through the lexicon, often affecting high-frequency words first or being influenced by word class and morphological structure. Modern sociolinguistic corpora capture stylistic variation, showing how dissimilation rates for features like /θ/ > /f/ fluctuate dramatically based on speech context (formal vs. informal) and speaker demographics, providing empirical grounding for the sociolinguistic dimensions discussed previously. Crucially, corpus data allows researchers to test predictions of theoretical models. Optimality Theory, for instance, predicts that faithfulness constraints may protect high-frequency words from dissimilation longer than low-frequency words. Corpus

### 1.10 Debates, Challenges, and Unresolved Questions

The rich tapestry of empirical findings, computational simulations, and laboratory investigations detailed in the preceding sections underscores the significant advances in understanding feature-based dissimilation. Sophisticated models like Optimality Theory, Articulatory Phonology, and exemplar-based approaches offer powerful frameworks for describing dissimilatory patterns and linking them to cognitive and physical mechanisms. Yet, despite these strides, the study of dissimilation remains punctuated by persistent debates, methodological challenges, and fundamental puzzles that resist easy resolution. Section 10 confronts these unresolved questions head-on, acknowledging the frontiers of current knowledge and the ongoing scholarly discourse that drives the field forward.

**The Universality of the OCP** stands as perhaps the most profound theoretical debate. While the Obligatory Contour Principle, prohibiting adjacent identical elements (features, tones), provides an elegant explanation for dissimilation and static phonotactic gaps, its status as a universal cognitive constraint is fiercely contested. Proponents argue that OCP effects surface, in some form, across virtually all documented languages – from sibilant restrictions in English and Arabic to tone sandhi rules in Chinese and radical consonant constraints in Semitic root morphology. The apparent ease with which artificial language learners internalize OCP-like patterns and the consistent perceptual and articulatory difficulties associated with feature repetition further suggest an innate bias. However, critics point to languages where seemingly identical feature sequences persist without triggering dissimilation or phonotactic avoidance. For instance, some dialects of O’odham (Uto-Aztecan) tolerate word-initial sequences like /t̪t̪/ (e.g., *shsho’on* “it is rained on”), which would trigger dissimilation or deletion in many other languages. Similarly, while Grassmann’s Law operated in Greek and Sanskrit, other Indo-European branches like Germanic show no comparable systematic aspiration dissimilation in their early histories. This variation leads some researchers, like Juliette Blevins, to argue that the OCP is not a primitive universal but an *emergent* property arising from convergent evolution – languages independently develop constraints against feature repetition because such sequences are perceptually confusable and articulatorily challenging, not because of an innate grammatical module. Others propose a weaker universality, suggesting the *potential* for OCP constraints exists universally, but their activation and specific formulation (which features, what domain) are determined by language-specific phonologies shaped by historical accident and functional pressures. The discovery of languages like Hamar (Omotic, Ethiopia), analyzed by Azeb Amha as lacking robust OCP effects even for highly salient features like labialization, keeps this debate alive. Resolving it requires not only broader typological surveys but also deeper investigations into the neurocognitive foundations of feature processing across diverse populations.

**Predictability and the Role of Chance** presents a persistent practical challenge. Why does dissimilation strike some words or sequences while sparing others that appear equally susceptible? Historical linguists grapple with this constantly. Latin /r...r/ sequences dissimilated extensively (*peregrinus* > *pelerin*, *arbor* < *arbor*), yet other words like *terra* (“earth”) or *curro* (“I run”) remained stubbornly unchanged in most Romance varieties. Similarly, while Grassmann’s Law applied remarkably regularly in Sanskrit verb roots, nominal forms like *buddhá* (“awakened”) escaped aspiration dissimilation despite the sequence /b...d.../. This apparent capriciousness cannot always be explained by frequency alone. High-frequency words are

sometimes the *first* to change (lexical diffusion from above) or the *last* to change (conservatism due to robust exemplar traces). Analogy often plays a crucial, yet unpredictable, role. The survival of Latin *terra* might be attributed to its association with the productive *-erra* suffix or its grounding in common geographical terms, resisting the dissimilatory pressure felt by less entrenched forms. Sociolinguistic factors, as explored in Section 6, add another layer of complexity; a dissimilated form might gain traction in one social group and spread, while another group resists it. Furthermore, the potential role of pure historical contingency – the idiosyncratic choices of influential speakers or the random misperception in a critical communicative event – cannot be entirely discounted, especially in the initial triggering of a change. Computational models incorporating stochastic elements can replicate this sporadic spread, but predicting *which* specific word in a language will succumb to dissimilation next remains largely elusive, highlighting the interplay between systematic phonological pressures and the inherent messiness of language as a social phenomenon. The work of Joan Bybee on lexical diffusion emphasizes that dissimilation, like many sound changes, often spreads gradually and unevenly through the lexicon, its path shaped by complex networks of word usage and association.

**Directionality and Locality Puzzles** continue to intrigue theorists. The overwhelming cross-linguistic predominance of **anticipatory (regressive) dissimilation**, where a sound changes *away from* a *following* trigger (Latin /r...r/ > /l...r/), over **lag (progressive) dissimilation**, where a sound changes *away from* a *preceding* trigger (like some /θ□/ > /f□/), demands explanation. The leading hypothesis links this asymmetry to the sequential nature of speech production planning. Articulatory Phonology suggests that planning a gesture for the target segment is influenced more by the *upcoming* gesture (trigger) that it must coarticulate with or distinguish itself from, than by a gesture that has already been executed. Models like Levelt’s WEAVER++ emphasize the incremental nature of phonological encoding; information about upcoming segments is available and can proactively influence the articulation of the current segment to avoid impending conflicts. John Ohala’s theories of sound change via misperception and hypercorrection also align better with anticipatory shifts; a

## 1.11 Significance and Broader Implications

The persistent debates surrounding the universality of the OCP, the capriciousness of lexical diffusion, and the puzzling asymmetry between anticipatory and progressive dissimilation underscore a crucial reality: far from being a peripheral curiosity, feature-based dissimilation sits at the very heart of fundamental questions about human language. Its intricate dance between cognitive pressures, articulatory realities, and social dynamics makes it not merely an object of study but a powerful lens through which to illuminate the architecture of linguistic knowledge, the engines of historical transformation, the principles governing linguistic diversity, and even the broader cognitive systems that underpin human communication. Understanding dissimilation, therefore, yields profound significance far beyond the confines of phonology itself.

**Insights into Phonological Competence** are perhaps the most direct yield. Dissimilation provides compelling evidence for the abstract, feature-based nature of phonological representations stored in the mind. The fact that a process like Grassmann’s Law specifically targeted the feature [+spread glottis] across in-

tervening segments, leaving place and manner untouched, strongly argues that speakers manipulate discrete phonological features, not holistic sounds. Similarly, the ability of constraints like OCP[Place] to block assimilation or trigger dissimilation (as in Italian *disonesto* resisting assimilation to **diss-\*** before /s/) **reveals a mental grammar actively evaluating and repairing configurations based on featural similarity within specific domains. Dissimilation acts as a diagnostic tool for markedness hierarchies, demonstrating that certain feature repetitions (e.g., identical sibilants, adjacent rhotics, proximate aspirates) are universally or near-universally dispreferred, suggesting an innate cognitive or perceptual bias encoded within phonological competence. Furthermore, dissimilation vividly illustrates the constant** tension between faithfulness and markedness\*\* within the phonological system. The sporadic nature of many dissimilatory changes, their sensitivity to lexical frequency and sociolinguistic context, and their interaction with analogy highlight that competence is not a static rulebook but a dynamic system where abstract constraints interact with the rich detail of stored exemplars and social conventions. The Latin *arbor* example didn't erase the original *arbos* from all traces; it coexists in the historical record, showing how competence navigates variation and change.

**Contribution to Understanding Language Change** is immense. Dissimilation stands as a major, recurring driver of historical sound shifts, demonstrably shaping the phonological landscapes of language families across millennia. Grassmann's Law fundamentally altered the consonantism of Indo-Iranian and Hellenic branches. The pervasive rhotic dissimilation sculpted Romance phonology away from its Latin roots. Dahl's Law shaped Bantu noun class systems. Crucially, studying dissimilation reveals the complex **interplay of forces** in change. It often acts as a repair strategy for OCP violations emerging from other changes, such as vowel loss creating new consonant clusters (*peregrinus* losing unstressed vowels potentially increasing the perceptual salience of the /r...r/ sequence). It interacts intricately with **analogy**: the survival of non-dissimilated forms like Latin *terra* may be bolstered by its paradigmatic relationship to words like *terrenus*. Dissimilation also plays a key role in **grammaticalization**, the process where lexical items evolve into grammatical markers. The English indefinite articles *a* and *an* stem directly from the Old English numeral *ān* ("one"). Dissimilation of the nasal consonant before a following nasal (*ān* > *a* before consonants, e.g., *a book*; retention of *an* before vowels, e.g., *an apple*) became grammaticalized as a core rule of English morphophonology. Similarly, the dissimilation observed in the grammaticalization of pronouns or auxiliaries across languages often serves to enhance their distinctiveness as functional elements. Finally, dissimilation is a prime example of **lexical diffusion**, where changes spread gradually and unevenly through the vocabulary, often influenced by word frequency, phonetic environment, and social factors, as seen in the variable application of /θ/ > /f/ dissimilation in modern English dialects. Dissimilation thus offers a microcosm of the mechanisms driving language evolution.

**Relevance for Linguistic Typology** is undeniable. Patterns of dissimilation provide crucial data points for classifying languages and identifying universal tendencies versus language-specific quirks. The cross-linguistic rarity of progressive dissimilation compared to the prevalence of anticipatory dissimilation points to a strong universal bias likely rooted in speech planning. The specific features most prone to dissimilation (Place, Laryngeal specifications like [spread glottis] or [voice], Laterality) and the typical domains in which it operates (long-distance for highly salient features like aspiration or rhoticity, local for place or voice in

clusters) contribute to defining phonological **typological profiles**. For instance, a language exhibiting long-distance laryngeal dissimilation like Grassmann’s Law occupies a specific point in typological space, distinct from one showing only local sibilant dissimilation or no active dissimilation at all. Examining which OCP constraints are active and how they are prioritized relative to faithfulness constraints across languages helps map the **constraint typology** predicted by Optimality Theory. Furthermore, the presence, absence, or specific form of dissimilatory processes can serve as evidence for historical relatedness or contact. The shared pattern of rhotic dissimilation across Romance languages is a unifying feature inherited from their Latin ancestor, while the presence of Dahl’s Law-like processes across geographically dispersed Bantu languages supports their genealogical classification. Conversely, the suppression or introduction of dissim

## 1.12 Conclusion: Synthesis and Future Directions

Our exploration of feature-based dissimilation (FBD) has traversed vast linguistic terrain, from its intricate mechanics and historical emergence to its cognitive underpinnings and sociolinguistic variability. We have witnessed its role as a fundamental, though often less frequent counterweight to assimilation, driven by the powerful Obligatory Contour Principle (OCP) – the cognitive and articulatory imperative to avoid excessive similarity. As we synthesize these threads, the core principles crystallize: FBD is defined by a *target* sound altering one or more phonological *features* (Place, Laryngeal, Manner, etc.) to become less similar to a *trigger* sound within a specific *domain* (adjacent, local, or long-distance), typically operating in an *anticipatory* manner. This process acts as a corrective, resolving potential perceptual confusion or articulatory conflict arising from feature repetition, ensuring clarity in the speech chain. The transformation of Latin *peregrinus* to French *pèlerin* (/r/ > /l/) to avoid adjacent rhotics, or the systematic deaspiration in Sanskrit  $d\bar{a}-d\bar{h}\bar{a}-ti$  > *da-dhā-ti* via Grassmann’s Law, stand as enduring testaments to this principle in action.

Integrating the diverse perspectives reveals FBD as a phenomenon demanding a multifaceted lens. Historical linguistics illuminated its role as a driver of change, challenging Neogrammarian regularity and providing crucial evidence for reconstructing proto-languages. Structuralist and generative frameworks, particularly through the advent of distinctive features and autosegmental tiers with feature geometry, provided the representational tools to model dissimilation’s specificity – explaining why, for instance, only aspiration dissimilates across syllables in Grassmann’s Law, leaving place and manner untouched. Optimality Theory reframed it as the outcome of conflict resolution, where OCP constraints overpower faithfulness demands. Articulatory Phonology grounded it in the physical realities of gestural conflict, explaining the motor planning difficulties behind sequences like repeated sibilants. Language acquisition showed its developmental trajectory as a later-emerging repair strategy compared to assimilation, while psycholinguistics provided empirical evidence for the inherent perceptual difficulty of OCP-violating sequences through tongue twisters and EEG studies. Sociolinguistics demonstrated its dynamism, showing how forms like English /θ/ > /f/ (*thread* > *fread*) vary by dialect, register, and social identity. Computational modeling offered virtual testbeds for its emergence, and corpus linguistics tracked its often sporadic path through the lexicon. This convergence of approaches underscores that dissimilation is not merely a rule but an emergent property arising from the complex interplay of cognitive biases, articulatory constraints, systemic phonological pressures,

and social dynamics.

Despite significant advances, enduring puzzles beckon future research. Three persistent questions stand out. First, the **universality of the OCP** remains debated. While OCP effects appear widespread, languages like Hamar challenge its absolute status. Future typological surveys, coupled with advanced neuroimaging (fMRI, MEG) probing the neural basis of feature repetition processing across diverse language speakers, are crucial to determine if the OCP is a hardwired cognitive constraint or an emergent tendency arising from convergent functional pressures. Second, the **predictability gap** – why dissimilation affects some eligible words/sequences (Latin *arbor*) but not others (Latin *terra*) – requires deeper integration of factors. Large-scale diachronic corpora analyzed with sophisticated computational models incorporating lexical networks, usage frequency, morphological structure, sociolinguistic networks, and phonetic detail (informed by exemplar theory) promise a more nuanced understanding of lexical diffusion pathways. Third, the strong **cross-linguistic asymmetry favoring anticipatory dissimilation** over lag dissimilation demands clearer explanation. While articulatory planning models offer plausible accounts, real-time neurocognitive studies using techniques like EEG or MEG during speech planning tasks contrasting anticipatory and progressive dissimilation contexts could provide direct neural evidence for the proposed planning bias. Furthermore, integrating findings from gesture studies in sign language phonology, where simultaneity plays a larger role, might offer contrasting perspectives on directionality constraints. The burgeoning field of **cross-modal cognitive studies** also presents a promising trajectory, investigating if the aversion to feature repetition observed in phonology finds parallels in other cognitive domains like visual pattern recognition or musical perception, potentially revealing deeper cognitive universals governing similarity avoidance.

Within the phonological canon, feature-based dissimilation occupies a place of profound significance. It stands not as a marginal curiosity, but as a fundamental process integral to a complete understanding of phonological systems and their evolution. While assimilation may be the dominant force shaping phonetic transitions for ease, dissimilation acts as the essential counterweight, safeguarding perceptual distinctiveness and systemic contrast. It is the yin to assimilation's yang, the divergent force balancing the convergent pressure. Its study has yielded crucial insights into the abstract nature of phonological features, the reality of markedness constraints, the cognitive architecture underpinning speech perception and production, and the intricate dance between individual cognition and community-wide language change. From resolving the apparent irregularities in Sanskrit verbs that perplexed Grassmann to explaining the spontaneous slips of the tongue in modern speakers, dissimilation provides a unifying lens. It reminds us that language is a system perpetually negotiating between efficiency and clarity, between inertia and innovation. As research continues to unravel its enduring puzzles through interdisciplinary collaboration and novel methodologies, feature-based dissimilation will undoubtedly remain central to our quest to understand the remarkable human capacity for sound and meaning, a testament to the intricate design and dynamic evolution of language itself. Its investigation reveals fundamental truths not just about sounds changing, but about the cognitive and social forces that shape how we speak and hear our world.