〈論文〉

BEYOND SOUND-SYMBOLISM:
MORPHO-SEMANTIC DISTRIBUTIONAL ANALYSIS AND THE SOUND-MEANING CONNECTION

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It is a familiar principle of linguistics that the smallest meaningful unit of language is the morpheme: the individual sounds, or phonemes, of which morphemes are composed, and the distinctive features that characterize them, do not in themselves have meaning. While many words, especially those of an onomatopoetic nature, clearly seem to exhibit what is called "sound symbolism"—— a perceived resemblance between sound and meaning —— attempts to find regular correspondences between specific sounds and meanings have not produced any system enabling us to analyze words into smaller meaning-bearing constituents. We cannot, that is, explain the meaning of words in terms of their phonological constituents in the same way that we can derive the meaning of a sentence from that of the words that form it. In this sense then, at least, the orthodox position that linguistic signs are essentially arbitrary in nature remains unchallenged.

The standard approach to the problem of a possible connection between sound and meaning within words has been to compare words having the same sound in the same position and look for similarity in meaning. In the case of English this typically involves words beginning with a particular consonant cluster, such as *fl-, gl-, sl-, sw-, st-, str-,* or ending with certain consonant, usually a stop such as *-p* or *-t.* One of the many examples cited by Bolinger, who has done extensive work in the area, is words beginning with *sw-* suggesting "a smooth, wide-reaching movement": *swell, swarm, swerve, swoop, sway, swing, swivel, swirl, swoon, swipe, swish, swathe, swat, swaddle, swift, sward, swagger.*[1]   Another is the group of words beginning with *fl-* "expressive of movement": *flow, flip, flap, flake, flutter, flicker, fling, flit, flurry, flirt.*   The final *-rl*

of *curl, twirl, swirl, birl, pearl, knurl, gnarl, furl, barrel, and roll* "suggests roundness". The final *-ap* of *slap, clap, rap, tap, flap, and lap* is said to denote "actions that strike and then glide off", while the *-ip* in *nip, clip, tip, sip, dip, grip, pip, quip, yip, flip,* and *drip* is interpreted to mean "a lighter or sharper blow or its result". Other examples in which vowels serve to distinguish meaning in words with identical consonant frames are *slit-slot, chip-chop,* and *strip-stripe-strap-strop.* The vowel by itself is featured in the group *goof, spoof, stooge, coocoo, loon, galoot, boob, rube, nincompoop,* all suggestive of foolishness.

Further examples, taken from various sources, are listed below:[2]

GL- *glitter, glow, gleam*

SN- *sniff, snort, snore, snot*

SL- *slime, slither, slug, sloppy* ("unpleasant")

-K *crack, creak, click, cluck, flick, whack*

-B *blob, glob, jab, rub*

-Z *ooze, wheeze*

-SH *smash, crash, crush, splash, slash, lash*

-F *puff, gruff, biff, cough, woof*

V- *vicious, venomous, vile, vindictive, vituperative, vitriolic*

W- *well (up), whirl, wipe, waddle*

-NT *bunt, punt; stunt, runt, blunt, grunt (vs. groan)* (cutting short represented by abrupt stop of *t* after the sonorant *n*)

Such collocations of phonemes common to a set of words and suggestive of some degree of semantic interconnection were originally called "submorphemic differentials" by Bolinger,[3] who has since adopted the term "phonestheme" originally em-

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1 This listing and the others in this paragraph are taken from Bolinger's article *Sound Symbolism* in the *International Encyclopedia of Linguistics,* William Bright, editor-in-chief, Oxford University Press, 1992.

2 In addition to the article just cited, these sources include the section on Sound Symbolism in *The Cambridge Encylopedia of Language,* edited by David Crystal, Cambridge University Press, 1987; and Michael J. McCarthy's article on Morphology in *The Linguist's Encyclopedia,* edited by Kirsten Malmkjaer.

3 *Forms of English,* Dwight Bolinger. Cambridge, Mass. 1965.

ployed by Householder.[4]   Bolinger classifies phonesthemes alongside mimesis or onomatopoeia as a form of primary sound symbolism, which he defines as "cases where the linguistic sound represents something outside language."   They differ from onomatopoeia, which are non-analyzable — the name "cuckoo" is supposed to be a direct imitation of the bird's call, and does not necessarily bear any relation to other words starting with c-, for example.   But, as Bolinger himself emphasizes, phonesthemes are only vaguely analyzable, a fact which differentiates them sharply from morphemes. In fact, "vague" is a qualifier used frequently throughout the literature on sound symbolism, whether by Bolinger, Marchand, Bloomfield or any of the many other researchers who have made contributions to the field.[5]   The talk is always of "suggestiveness" and "associations" rather than specific correspondences and precise denotation. Semantic affinities are "felt" but rarely yield to rigorous analysis of the kind that would produce clearly statable rules.

This elusive quality of sound symbolism is evident throughout Roman Jakobson and Linda Waugh's *The Sound Shape of Language,* which contains an extensive overview of existing work in the field.[6]   The authors emphasize the underlying tension between the intrinsic suggestive value of distinctive features and their role in language as mediate building blocks to create lexical forms.   Whereas the former represents a natural harmony between sound and sense that is properly extra- or pre-linguistic, the latter refers to the conventional, arbitrary relation between linguistic form and function. While this conventional relation is primary in language, "the inner sound symbolism peculiar to [distinctive] features strives to burst forth and to sustain an immediate similarity relation, a kind of equivalence between the signans and the signatum. Besides the conventinal thesei relations, such a direct semantization of the sound shape comes into play."   Linguistic sound, as represented by phonological features, has

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4   On the problem of sound and meaning: An English phonestheme.   Fred W. Householder. 1946. *Word* 2. 83-4

5   Marchand, H., 1959: "Phonetic Symbolism in English Word-Formation", *Indogermanische Forschungen* 64, 146-168, 256-277.   Bloomfield, M.W.,1953: "Final Root-Forming Morphemes", *American Speech* 28, 158-164.

6   Roman Jakobson and Linda R. Waugh, *The Sound Shape of Language,* Mouton de Gruyter, Berlin, 1987.

"potential or latent symbolic value", as opposed to the definite meaning possessed by the lexical forms fashioned from this sound.

All research on the subject of sound symbolism thusfar shares the assumption that whatever is non-arbitrary in the relation between form and function must derive from this primal natural iconicity, and that any connection between sound and meaning must be explained in terms of semantic values associated directly with smaller segments contained within the morpheme. The ideal system under this approach would be one in which each phoneme or distinctive feature contributed a particular meaning to every word of which it formed a part, and in which a word's meaning was the sum total of the meanings associated with its phonological constituents. But because such a system would clearly be untenable given the fundamental underlying discontinuity between the complex world described by language and the artifice that is the phonological system of a language, any statement concerning the workings of sound symbolism requires qualification: not every word exhibits such sound symbolism, and even among those that do, not necessarily every sound imparts some aspect of meaning to the whole. The question becomes one of the extent and importance of the phenomenon. Some linguists, like Bolinger and Householder, may grant it far-reaching significance; others, the conservative majority, only limited scope. But all are agreed that if there is any non-arbitrary aspect to the relation between form and meaning, this is where we would expect to find it: in the inherent natural sound-sense of the features themselves or their concurrent and sequential bundles —— phonemes in isolation or combination. The task thus becomes to fathom the innermost nature of each sound and assign semantic values that will have the greatest explanatory power. But of course as one seeks to explain an increasing number of lexical items, any statement of the semantic value associated with a particular sound becomes so unfocussed, so vague, that it can no longer be convincingly claimed to represent any cognitive reality. The only way to continue the endeavor then becomes to abandon any rigorous search for actual semantic features and throw the phenomenon over to the affective realm, where the same standards of precision need not constrain the investigation. The discussion shifts from the linguistic to the paralinguistic, with the focus on exceptional or marginal forms of linguistic expression —— poetry, malapropisms, and nonsense verse.

The question still remains, then, whether there is any connection between sound and meaning that *is* precisely analyzable. We must first realize that asking whether or not the relation between a linguistic form and its meaning is arbitrary is not necessarily the same thing as asking whether the individual sounds that constitute it have meaning in themselves. That is, we need not assume that the only possible connection between sound and meaning resides in semantic values associated directly with individual phonological entities.

To see how this could be possible, we must first step back from sound symbolism itself and ask a broader, more fundamental question: is there any recognizable pattern to the distribution of phonological forms of words that are similar in meaning? When we say "words that are similar in meaning", we mean words that undeniably share a particular readily identifiable semantic feature (or bundle of features). That is, we will confine ourselves to very specific semantic categories, and not cross over into other meanings no matter how tempting it may be to make such associations.

To see what this means in practice, let us return to the *sw-* words listed above (*swell, swarm, swerve, swoop, sway, swing, swivel, swirl, swoon, swipe, swish, swathe, swat, swaddle, swift, sward, swagger*). Though Bolinger intends us to see these as part of a single family, it is evident that they signify quite a variety of different concepts: while *swell* refers to growing and rising, *swarm* indicates a group (typically of insects) moving together in a particular way; *swerve* signifies a sudden turning off or away, *swoop* a sudden diving down in flight, *swoon* a sudden falling down (note also *swan dive* and *swan song*). Of the words cited here, *sway* and *swing* obviously belong to the same semantic category, back-and-forth movement, and would thus qualify for being treated together under our framework. *Swivel* and *swirl* would likewise qualify to be treated together. *Swerve* would be closely related here, but still differ from these in not referring to a complete rotational turning. *Swat* would fall under the category of hitting or striking, *swaddle* under wrapping, *swagger* under walking. Nor is it necessary that a word come under only a single category, of course. *Swagger*, as well as being considered under walking, would also have a feature denoting "pride" or "boastfulness" (a connection with the word *brag* immediately suggests itself).

In short, we are considering that aspect of a word's meaning that strikes us immediately —— the aspect that we would refer to first in explaining a word's meaning

to someone who did not already know it, such as a child or a foreigner. If someone learning English were to ask what *swat* means, it would do little good to point out that it suggests a "smooth, wide-reaching movement" without first having established the fact that it indicates a kind of striking, with the hand or an instrument functioning as an extension or the hand. Still less would Bolinger's phrase help clarify the meaning of *swift*, where the gloss "fast" identifies the essential concept.

What all the *sw-* words given above seem to have in common is not so much a specific semantic feature as a certain texture —— a certain descriptive tone that colors the basic underlying concept, which is actually quite different for each word. And whatever sound symbolism there is here, it cannot operate outside of a framework of definite reference to give form to the "pure essence" embodied in the sound. No matter how onomatopoetic or laden with expressive feeling a word may be, it must always refer to something —— a sound, smell or other perceivable phenomenon; a movement, or an action such as cutting, walking, talking, or eating; a shape, a contour, or some object serving a particular function such as a container or tool; an animal or plant, or parts thereof. Basic semantic categories such as these are as prosaic as their ideophonic counterparts are engaging and provocative. At the same time they are as accessible and easily defined as the others are nebulous and elusive, and represent the primary aspect of meaning, from which any serious semantic analysis must proceed. Without them, any intrinsic sound-sense is like daub without wattle or dye without fabric. If we ignore them, we will find ourselves adrift on a synesthetic odyssey, "crossing from sound to size, light, movement, sensation, etc."[7] By succumbing to the seduction of the sounds themselves, rather than starting with rigorous semantic analysis, researchers have ended up chasing the mirage of the pure essence embodied in linguistic sound. In doing so they have overlooked an order far more extensive and pervasive. For it is precisely in terms of our prosaic, straightforward semantic features, which represent the artificial or conventional aspect of the lexical bond between form and function, that the relation between sound and meaning will prove to be anything but arbitrary. (And once we have understood this underlying framework, any sound-symbolism will take care of itself.)

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7   The phrase is Bolinger's.

Now let us apply this method to a specific example involving words beginning with *cl-*, a consonant cluster often cited as having strong symbolic value. It is associated with the idea of sticking or pressing together in words such as *clamp, clench, cluster, clump, clasp, clutch, clip, cling, clot, close,* to name just a few examples. But here we will be narrowing our focus to a particular subset of the *cl-* words: those referring to groups of people. Here we find the following items: *club, class, clan, clique, claque, clientele,* and the *-clave* of *conclave* (and also *enclave*). Now it is obvious that all of these refer not merely to groups, but to closed, exclusive, at the extreme even secretive groups. (This sense is especially apparent in the derivative adjectives *clannish, cliquish,* and *clubbable,* as well as in collocations involving the word *class,* such as *class divisions, classless society, class consciousness.* Note also the adjective *clandestine,* and *closet* in the expression *come out of the closet.*) Of course this is entirely in keeping with the sound symbolism of *cl-.* But what is of even greater interest here is a remarkable phonological phenomenon involving the distribution of the final consonants of these morphemes. Their distribution follows a regular pattern, many more examples of which are to come.

To observe this pattern we begin by arranging all the possible word-final phonemes of English on a two-dimensional grid as follows:

FINALS

P	T	CH	K
B	D	J	G
M	N		NG
F V	TH	S Z	SH
W	L	R	Ø

As can be seen at a glance, the horizontal axis represents position of articulation, with the labials on the left and the velars on the right. The vertical axis combines features of voicing and continuity in a fortis-lenis scale of sorts. While this collapsing of more than one feature distinction onto a single axis may at first appear to be nothing more than a schematic convenience dictated by the two-dimensional constraints of paper, we will find that it actually seems to more accurately reflect the reality we are trying to

model than would a three- (or more-) dimensional representation more consistent with a binary feature analysis. We will find this to be especially true in the case of initial consonants, where clusters produce a greater variety of possibilities.

Several aspects of this arrangement should be noted. First, no voicing distinction applies among continuants: -F and -V pattern together, as do -S and -Z, as well as -SH and its voiced counterpart -ZH (as in *beige*), and the two sounds both spelled -TH in English (as in *both* and *bother*). Also, no distinction is made between affricates and stops — the palatal affricates -CH and -J being listed on the top two rows together with -P, -T, -K and -B, -D, -G respectively.

Second, the items in each row are arranged from left to right with each occupying a successive sector in the chart, regardless of whether or not the other sectors in the same column contain phonemes with the same position of articulation. The top three rows are consistent — the stops and nasals share precisely the same articulatory positions — but the fricatives and liquids do not align with these. Thus the fricative -SH, despite being articulated in a palatal position nearer the affricates -CH and -J, patterns in the final column under the velars -K, -G, and -NG, since it is the fourth in the fricative row after -F/-V, -TH, and -S/-Z. But the actual articulatory position of these fricatives can also come into play — there appear to be processes that affect only true velars or bilabials, others that require the chart to be divided in half with the sibilants -S and -Z falling to the left with the dentals rather than to the right with the palatals. The sibilants -S and -Z actually lie between the dentals and the palatal affricates -CH and -J; and -SH is really between -CH/-J and the velars. We have thus tried to indicate this true position by sliding them to the left in the chart shown above. But the sector divisions are still of paramount importance, as will be seen when we consider the illustrations that bear out the arrangement we have chosen, and paradigms will generally be given in a simplified schematic form with -S, -Z and -SH centered within their respective sectors.

Another point concerns the homorganic nasal clusters -MP, -NT, -NCH, -NK on the one hand, and -MB, -ND, and -NG on the other. While the former simply pattern with the voiceless stops that constitute their final element — P, T, C, and K respectively — the latter typically pattern with the nasals M, N, and NG, rather than with the voiced stops B, D, and G, though both segments are often relevant. This seems to

have something to do with the fact that the nasals occupy the position immediately below the voiced stops. Whereas the clusters with voiceless finals would have to "jump over" the voiced row to get to the nasals, those with voiced finals can slide down to the next row unimpeded. This phenomenon of a permeable boundary between contiguous sectors in the same column, and of a kind of "magnetic attraction" of clusters towards sectors containing one of their components, will be of key importance when we turn to initial consonant clusters.

When nasals appear before fricatives and sibilants, as in the combinations -NS and -NZ or, less frequently, -NF and -NV, those final elements predominate, as in the clusters with final voiceless stops. Clusters with S, including -SP, -ST, -SK, -PS, -TS, and -KS (i.e. -X), pattern more with -S, though it would be more appropriate to simply consider them to have two final consonants, since the stop element often comes into play as well.

The zero-consonant, represented by the null-set symbol Ø, exhibits patterning that places it at the bottom of the velar column. The -W at the bottom of the labial column is included to account for possible cases of final back-vowels patterning here rather than with the other zero-consonant finals.

Finally, we should clarify exactly what we mean by "final consonant." In the case of one-syllable morphemes, this is obvious enough. When a second unstressed syllable consisting of a semivowel or syllabic nasal is added, the consonant closing the initial stressed syllable remains as the final element. Thus the final consonants of words like *button, gobble,* and *hammer* are T, B, and M respectively. But when the consonant that ends the unstressed syllable is a stop, or even just lower in sonority than the preceding consonant, it tends to predominate. Thus *hermit* would have T as its primary final, and *gallon* N. Of course when the additional syllable (or syllables) consists of a regular derivational suffix, especially a productive one such as *-able* or *-ment,* it will not count at all as part of the morpheme that precedes it. But there are many morphologically ambiguous cases, and even some with what appear to be bona fide suffixes, such as *-age,* where the final element is included along with the base to form a unit. Thus, *sewage* seems to pattern with a -J final, even though it could be broken down into sew-+-*age* (cf. *sewer*).

Now that we have established the phonological framework within which we are

operating, let us return to the set of words introduced above: *club, class, clan, clique, claque, clientele, conclave, enclave.* If we plot the final consonants of these words on the grid just presented, we get a distribution that looks like this:

			K
B			
	N		
V		S	
	L		

Now if we are looking for a single feature that all these sounds share, we are obviously not going to find it. Not only are no two items positioned adjacent to each other, but all five rows and all four columns are represented in just these six items —— at first glance a fairly random distribution. Yet on closer inspection their distribution turns out to be far from random: if the grid were a checkerboard, they would all occupy squares of the same color, either all black or all white. The other squares of the same color would have the finals -T, -J, -NG, and -∅:

STRONG FINALS

	T		K
B		J	
	N		NG
V		S	
	L		∅
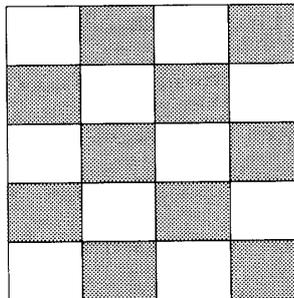
We will call these finals strong finals, and refer to them collectively as the strong line.

While there are no words in our *cl-* set ending in -T, -J, -NG, or -∅, we are not finished with this example yet. For it turns out that words beginning with a *c-* that contain an *-l-* anywhere before the final consonant pattern together with *cl-* words proper. Thus *collide* and *collision* are considered *cl-* words along with *clash,* even though their *c-* and *-l-* are separated by a schwa. And *cold* shares the same initial as *clammy,* notwithstanding the fact that its *-l-* stands after the vowel rather than before.

The same is true of *calipers* and *clip*. Other combinations behave similarly: *garbage* patterns with *grub* and *grubby;* *garden* with *ground;* *coarse* with *crass;* *insult* with *slight.*

We might look for other members for our *cl-* club, then, among words of this form. Sure enough, here we find *cult* and *college* — with the finals -T and -J as predicted — as well as *colony* and *collective*. And it would not be at all far-fetched to cite as an example with an -NG final the word *calling,* in the sense of vocation or career, which clearly implies work that not just anyone but only a chosen group can do. In any case, it is not at all necessary that each potential position within the grid be filled. All that the theory requires is that any word meeting the semantic conditions in question also meet certain phonological conditions — in this case, that its final consonant fall on what we have termed the strong line: T, K, B, J, N, NG, F/V, S/Z, L, or Ø. By choosing for our first example a set in which nearly every possible position is represented, we have merely saved ourselves the time and space of having to string together several examples to establish the pattern. And of course the greater the number of items contained in a set, the greater the odds against their following a particular distributional pattern by pure chance.

Complementing the strong line is the weak line, consisting of the finals -P, -CH, -D, -G, -M, -TH, -SH/-ZH, -R, and -W, and represented in the schematic below as the white squares on the checkerboard.

STRONG

	T		K
B		J	
	N		NG
F V		S Z	
	L		Ø

WEAK

P		CH	
	D		G
M			
	TH		SH
W		R	

The weak series can be illustrated with *cl-* pairs such as *cold-clammy* and *clash-collide,* both of which were encountered above. (In connection with the latter, note also *collision,* with the voiced counterpart of *-sh*). Another particularly striking example is *kaleidoscope-collage.*

Often a set on the weak line will have a strong counterpart of similar but

distinct meaning. Thus the group *clip, clamp, calipers, clasp,* (cf. also *kleptomaniac); clutch, clench, clinch; claw* (with -W final) and *clamber* is obviously related to the word *cling,* with strong final -NG, which pairs with *cleave.* While *cling* may refer to the pinching or grabbing kind of adhering associated with the weak set here, this is not an essential feature of its meaning — lint may cling to a skirt as well as may a child. (In this connection note also the word *cloy,* with strong final.)

Distinctions of this type are of vital importance and suggest a difference arising from markedness conditions related to relative position within semantic hierarchies. In the case just considered, the strong set has the unmarked meaning; the weak set is more specific — it bears an additional marking, and occupies a lower node on the semantic hierarchy.

Another example of this phenomenon occurs in connection with the weak-line counterpart to the strong-line set referring to groups. Whereas the strong set, as we have seen, designates groups of people, all items on the weak line refers to groups of organisms. There are only three words here: *clutch* (as in *a clutch of eggs* or *a clutch of chicks*), *culture* (as in *bacterial culture*), and *clade,* a technical terms designating "a group of organisms evolved from a common ancestor".[8] Here again these words have much more in common semantically than merely the fact that they refer to groups of organisms — they all involve the idea of breeding or hatching, with the concommitant association of closeness common to many words with initial *cl-.* (Alongside *culture,* and also on the weak line, consider too *clap* (i.e. gonorrhea) and *chlamydia,* as well as *(the common) cold.)* Now there is also a word on the strong line that can refer to groups of animals: *colony* (as in *ant colony*). The difference here is that it does not refer to animals (or non-humans) exclusively. (In passing also note the similarity of *colony* and *colonize* to *clone,* and the similarity of this latter to the *culture* and *clade* just cited, with the essential difference that *clone* can refer to humans as well.) Of the other strong-liners cited above, *class* may also refer to groups other than human. The strong line here seems to be unmarked, then. Just as *cling* is indeterminate with respect to the distinctive feature of meaning found in *clutch,* so too *colony* and the other

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8 All definitions given here are from either *The American Heritage Dictionary,* Third Edition. Houghton Mifflin, Boston, 1994; or *The Oxford Encyclopedic English Dictionary,* edited by Joyce M. Hawkins and Robert Allen. Clarendon Press, Oxford, 1991.

members of the strong set apparently occupy a higher node on the semantic hierarchy — they are marked only for the feature GROUP, while the weak set bears an additional marker for NON-HUMAN. (There may or may not be significance to the fact that in both this instance and the last it is the weak set that is marked.) By viewing the strong line as unmarked in this case, we can understand why generic terms for groups such as *cluster* and *collection* (with final -K) also fall on the strong line.

One final note about the weak set here. It is not confined to animal life — not only does *clade* refer to both the animal and vegetable kingdoms, but the micro-organisms of a bacterial *culture* bear as much resemblance to plants as they do to animals, at least from the human standpoint. We should thus not hesitate to also include here *clump* (as in *clump of trees* or *clump of grass*). But, it might be objected, is not *clump* also a generic, like *cluster*? There is a difference, however. Whether we speak of a cluster of trees, or a cluster of people, or a cluster of consonants, we mean in any case a collection of discrete individuals bunched closely together and considered as one. But when we use the word *clump* in any sense other than a clump of vegetation (trees, bushes, etc.), it refers not to such a collection but rather to an agglutination — one object formed from the fusing together of whatever distinct elements may have once existed. Thus we might speak of a clump in pancake batter or use the word in reference to a doughy mass of something like cheese in a dish of otherwise smooth consistency. (We might substitute the word *lump* in such cases.) In this sense it patterns on the weak line together with *clod*. The word *clump*, then, turns out to be what we might call a "false generic"— a term that may refer to more than one referential category, but for which the sense is not consistent across categories. At the creative outer limit of linguistic expression, not only in literature but in everyday language as well, semantic liberties may be taken with descriptive words such as *clump*. We might say something like "Most of the students sit toward the front of the classroom, but there's always a clump way back in the corner", by which we would mean something like "they are clustered so close together that they might as well be a single object rather than a group of distinct individuals"— a figurative use of the meaning given above. By using the word in this figurative way — by dispensing with what would normally be one condition on its use — the speaker is achieving an affective impact that would be lacking if a word like "cluster" or "bunch" were used.

Rules are being bent —— and if there were no rules to be bent, there would be no impact.

So far all our examples have begun with *cl-* (or *c-* followed by an *-l-* somewhere before the consonant that closes the stressed syllable). Now let us look at cases with other initials.

Consider this strong-line set beginning with B-: *buckle, button, badge, bib; beak, bill; beaver* (i.e. the visor of a helmet); *bit* (of a bridle); *bangs; bust, boob* (i.e. a woman's breast); *belly*. What these all have in common, of course, is that they refer to things attached to or projecting from the front of the body. (The feature FRONT is also seen in *bow* (of a ship) and *bunting*, where it does not involve the body.) Unlike the examples with CL-, there is no obvious connection between this meaning and the sound B-. In any case that is not what concerns us here. The point is not that words referring to things in front of the body are necessarily more likely to begin with B- than with other consonants —— though this may also in fact turn out to be the case. It is rather that the B- words that do have this semantic feature in common follow a particular distributional pattern with respect to their final consonants. Any correspondences between sound and meaning of the type traditionally dealt with in studies of sound symbolism will be the last thing considered in our investigation —— not necessarily because they are unimportant, but because it is first necessary to establish the semantic framework within which any system of sound symbolism must operate.

Another point that must be born in mind is that while all the words with a particular meaning must meet certain phonological conditions —— i.e. fall on a particular line, in the terminology we employed thusfar —— it obviously need not be the case that all words on that line share the meaning in question. In other words, it is beside the point that words like *butt* and *buttocks* fall on the strong line yet have precisely the opposite meaning of the set just considered, namely "things in back of the body". The only issue is what the distribution would look like for the set of words with that opposite meaning. In this case, as we will see shortly, the two distributions turn out to be very similar —— a not uncommon occurence where opposites are concerned. The point here, which cannot be overemphasized, is that language assigns form to meaning, and not, as we are accustomed to think, meaning to form. (If the latter were the case there would be no such thing as homophones, for one thing.) We must break

ourselves of the habit of first asking what sounds mean —— the traditional approach of investigators of sound symbolism.

Now for another example, this time involving words beginning with R- that refer to kinds of birds. I choose this illustration because Bolinger cites *raven* as a typical example of a word that is arbitrary in the sense of bearing little or no resemblance to what it designates. Now from the standpoint of sound symbolism this is quite true, but from our new distributional perspective, it is anything but arbitrary. Just as *raven*, with final -V, stands on the strong line, so too do all other names of birds starting with R-: *robin, wren, rook, rooster, rail.* And this is a list of only the most commonly known birds. A thorough search for less well-known ones turns up the following items: *ruff, rafter, reeve, roller, rhea.* Again all have strong finals. And just as the semivowel element of consonant clusters can be separated from the first element and follow the vowel, so too a form beginning with a vowel and followed by an -R- will pattern with the R- initials. Thus *oriole, ortolan,* and *erne* also belong here.

Birds beginning with B- and with K- also flock to the strong line —— as do indeed birds in general, though a complete accounting of their distribution would require an understanding of the distinction between strong and weak initial consonants as well, a subject we have yet to come to. The B- birds are: *bittern, bunting, bantam, booby, bobwhite, bobolink, budgy, bufflehead, bustard, buzzard, and ibis.* (Note also *bat*, which, though not a bird, does fly like a bird.) The word *bird* itself does not belong here, but rather with BR-. But even there it is the only weak member (vs. the strong *brant, barb*, and *brambling*). This is because it is the generic word for the entire category being dealt with, and such words regularly fall on the opposite line from what would otherwise be predicted.

The K- set has *cock, cuckoo, kookaburra, cockatoo, kittywake, kite, coot, kingfisher* (-NG), *condor, kestral, courser, cassowary, capercaillie* (-L), *cushat, kea*, and *cob.* (*Canary* falls under the N- initials.) The lone weak-line exception is *capon.* But note that this refers to a castrated male chicken, in direct contrast to several items on the strong line that specifically indicate male birds: *cock* and *cob* (a male swan).

Among words in S- we find the following set having to do with knowledge and mental ability: *psyche, psychic, sage, sorcerer, sorcery, seance, seer (see + -er), sibyl, source* (as in "*informed* sources"), *sense; sensible, sober, sound (mind); cybernetics,*

cyberspace, cerebral; savvy. (We could also add the *-sight* of *insight*, the *-cern* of *discern(ment)*, and the *-source-* of *resourceful*, as well as the phonologically more complex *sophisticated.*) These all fall on the by now familiar strong line.

An good example of a weak-line set contrasting with a semantically close strong-line set is found in R- words referring to the color red and red things. On the weak line we have the word *red* itself, of course, along with *ruddy, radish, rash,* and *rouge* (with -ZH, the voiced counterpart to -SH). We should also include here *rare* (as in "a *rare* steak"), and *raw* (as in "skin rubbed *raw*"), and the variety of apple known as *Rome,* which are all on the weak line as well. Now contrast these with the following, all from the strong line: *raisin, rust, robin, russet* and *roan.* In contrast to the first set, these all refer to a reddish-brown or purplish color — what we might call "off-red". The last item in the list, *roan,* means "having a chestnut, bay, or sorrel coat thickly sprinkled with white or gray." Bay, of course, is "reddish-brown", sorrel a "yellowish to reddish brown", and chestnut a "deep reddish brown". *Ruby,* on the strong line, may at first appear to contradict the pattern. But the dictionary defines it as a precious stone "with a color varying from deep crimson or purple to pale rose," with an adjectival sense of "deep purplish red." Another item with a strong final where the description "off-red" is appropriate is *rhubarb,* which is not unequivocally red but ranges from green to dusky red — contrast this with the bright red of radish, for example. (Non-red varieties of radish such as the white daikon are, it must be remembered, a rather recent phenomenon in the English-speaking world. And in any case these other varieties are always referred to with the appropriate qualifier: *daikon radish.*) Another way in which a word may come under the off-red or not-pure-red category is by indicating something that may be typically red, but also occurs in other completely different hues. Such a case is the word *rose,* which is commonly associated with the color red — note the derivative *rosy* — even though white and yellow varieties also exist. And interestingly enough, when used as an adjective it refers not to the plain red or slightly dark red of the typical red rose, but to a pinkish color — a color that is off-red in being lighter than just plain red. Also on the strong line here is the word *orange.*

Another example of a semantically contrastive pair of sets, one strong one weak, occurs in the H- initials. On the strong line we have *house, hut, hovel, hangar,*

and *hall*, all referring to buildings. (*Home* does not belong here because it does not signify a building in its physical aspect per se; it patterns on the weak line with *hearth*, however.) Opposite these we have the weak set consisting of *hopper, hamper, hod,* and *hogshead*, all indicating containers. *Hutch*, a coop for small animals, also belongs here. (It has the additional meaning "a cupboard with drawers and usually open shelves on top.")

Among words beginning with SL- we find this weak set indicating ways of striking: *slap, slam, slug,* and *slash*. The last item also includes the feature CUT, but is to be distinguished from the affiliated strong set *slit* and *slice*, where the cutting is not necessarily accompanied by any striking motion. Also note the noun *sliver*, obviously related to these last two. (Another associated set on the strong line is *slaughter* and *slay*.)

Also on the weak line: *sleep, slumber, sluggish, sloth,* and *slow*, all of which refer to slow movement or none at all. Cognate with these is the pair *slump* and *slouch*. Note also *slur*. These three and the first set all indicate muscular looseness, inactivity or lethargy, as opposed to *slack* on the strong line, which refers to inanimate objects, such as rope. When referring to human activity, as in "*slacken* one's efforts" or "business is *slack*", it pairs with the *slough* of "*slough* off", with strong -F. The weak set is unmarked here, so that *slow* and *sluggish* may also be used in this abstract sense ("the economy is *sluggish*", "business is *slow*"). Likewise *slide* can be used in a sense similar to *sluff off* (viz. "let things *slide*") even though it falls on the weak line, since it occupies a higher node in the semantic hierarchy here, belonging together with *slip* to an set unmarked for this feature — a set which is congruent with *slump* and *slouch*.

We conclude this section with a list of additional examples of sets showing either of the two complementary distributional patterns in their final consonants:

WEAK FINALS (-P, -CH, -D, -G, -M, -TH, -SH, -W, -R)
>   *plod (along), plug (away at), plow (through)*
>   *broom, brush; branch; bramble, briar; beard;*
>   *stumble, stagger*
>   *staunch, steady, steadfast, staid, stoic* (-W + -ic); *staple, standard* (-D)

step, stoop, stairs, story (vs. strong *stage, stand, stool, (stilts))*

stop, station; studio, store, stadium

crap, crud; crappy, cruddy, crummy

crag, outcropping

scream, screech

hood, hoodlum, hooligan, home-boy, (Mongol) horde

hype, hoopla, ham (it up)

vampire, viper, venom, virus (-R); *voodoo*

bother, bug

STRONG FINALS (-T, -K, -B, -J, -N, -NG, -F/V, -S/Z, -L, - Ø)

slab, slate, (slice)

bluff, bluster, blarney, blandish, blandishments, baloney

plane, plain, plank, plaque, placard, plate, platform, platter, pallet, palanquin, plaza, plain, plateau, plot, ply-wood, (two-)ply, pelt

pilfer, plunder, pillage, plagiarize, (pluck), (plutocracy)

plan, plot, plank of a political platform, (campaign) pledge, policy; plebiscite

speak, spokesman, spiel, spell, respond, expound, spin (a yarn), spin doctor, spout (nonsense)

to spot, spotlight, inspect, spectacle, spectacles, spectator, conspicuous, spelunker, spy, spook

spite, spurn, despise, despicable, spoiler

swivel, swirl, swizzle(stick)

swerve; swing, sway (cf. weak *swagger* in the category of walking)

swank, swell, suave, swing(er)

dry, drought; drain, dredge

trail, trace, track; trawl, troll

twirl, twist, twine, tweak

stab, sting, stick

stubborn, stodgy, stuffy, stuffed-shirt, stiff, stilted, stultifying, stick in the mud, stuck up, stickler, stingy, standoffish, stony (silence); stock (phrase, answer)

stout, stocky, stalwart, stamina

stout, stocky, stubby

stable, stall, sty

grit, grits, grout, groat, grain, granule, grounds, ground, grist, grub(s), gravel,
granola, (gruel)

crabby, cranky, crotchety, cross, (cruel)

scribble, scrawl, scrivener, scribe, scroll, script

scan, scout, scavenge(r)

harangue, harass, hassle (cf. weak haggle, harp on)

hick, hillbilly, hobo, hermit

hoot, honk, hawk, hacking (cough), howl, holler, hail, hey, hi, hue and cry, hooray,
huff, hiss (vs. weak *hum* and *hush*)

rant, rave, rail, rage (against)

rib, razz, raillery, roast

rob, robber, racket, racketeer, (drug) runner, to rook

vengeance, revenge, vindictive, vendetta; violent, vice, vicious, villain; vandal,
viking

badger, bully, buffalo, bait, (banter), (bicker) (cf. weak *bother* and *bug*)

bob, bobble, bound, bounce, buck, boing, bat (eyes); bubble, boil

lie, loll, lounge, loiter loaf, linger, lurk, lull, lacy, listless, lank, lean

SPLIT OR SHIFTED PATTERNS

So far we have dealt only with distributions that extend across either the strong line or the weak line of final consonants. But many sets exhibit split patterning — that is, the chart is divided at some point, with the two sides falling on opposite lines.

There are many sets that show a consistent pattern, either strong or weak, except for a single item that falls to one side of a line drawn through the chart. The words *gripe, grumble, grumpy, grouch, grouchy*, (and *grinch*), for example, all represent the weak line. The only other GR- word with similar meaning is *grouse*, with strong -S. But notice that all the weak items position above -S in the chart. We posit, therefore, a horizontal shift between the nasal and fricative rows. The exact same pattern — weak on top, strong on the bottom — is seen in the following case as well:

proper, prim, prude, prudish, prig, priggish; but *prissy.*

In other cases it is the top that is strong while the bottom is weak, as in this example in SP-: *spike, spoke, spit, spine, spindle; spear, spar, spire, spare ribs, spur.* (Note the contrast on top with weak *spade* and *spatula* (-CH).) Likewise in this other example from SP-: *spunk(y), spark, spanking (new), spicy, spice up, spirit, sport(y), spiffy, spontaneous, spectacular;* but *spur (on)* and *inspire.* Since these are not the only examples of bottom-shifting in SP —— usually it is just the bottom row that is affected —— we might suspect a phonological motivation for the change here.

An example of a vertical shift is seen in the group of words beginning with SL- that includes *slip, slide,* and *slick.* (Note also *silk* and *silky.*) On the basis of just this sample, we would have to posit a shift somewhere between the dental and velar columns to account for the difference in value between weak -P and -D, on the one hand, and strong -K on the other. On the strength of this evidence alone, of course, this would be nothing more than a hypothesis; without any further reasons to substantiate it, it would merely be an ad hoc solution to an apparent counter-example to the theory as developed up to this point. If our hypothesis is correct, we would expect to find supporting examples in the form of additional weak finals with similar meaning to the left of the chart and additional strong finals to the right. This is indeed what we find. On the weak left we have *sled* and *slalom*; on the strong right *sleigh* and *sledge.* This is not all. *Slink* and *slinky* on the strong right pattern with *slither* on the weak left. In connection with *slink* note also *sleuth.* Another word on this split line indicating smooth movement across a surface is *slather,* which means "to spread thickly or lavishly." The chart is split in half, with the strong -J indicating a rightward orientation for the palatals.

Another split pattern in SL- with the same dividing line contains the following items: *slime, slush, sludge, slag, slop, slobber, slaver, saliva, (oil) slick, sleet, slough* (with final -W). At first glance it is very difficult to disentangle these words —— they seem to all belong to the same semantic set. But there are important differences which become apparent when we subgroup them. First, *sludge* and the *slick* of *oil slick,* both strong and on the right side, obviously belong together, as do *slobber, slaver,* and *saliva,* all strong on the left. But these two subgroups, though both on the strong line, are fairly different in meaning. In fact, they seem almost to represent opposite poles of the

total set — whereas the former are black and thick or gummy, the latter are clear, runny and watery. If we consider the other items in terms of these features of clarity and relative viscosity, we discover something very interesting. *Sleet* and *slush*, both indicating half-frozen forms of precipitation (rain or snow), are typically half-white half-transparent and low in viscosity (i.e. runny). The former falls on the strong left side, the latter on the weak right. *Slime*, on the weak left, is definitely viscous and though not necessarily dark, not necessarily clear or white either. The same goes for *slop*. A *slough* is muddy, placing it together with *slick* and *sludge* on the opposite side of the chart. Finally there is *slag*, which is "the glassy mass left after smelting metallic ore". The key word here is "glassy", which obviously belongs together with the white and clear or transparent items in what we will call the WHITE category, for lack of a more suitable generic term. And since viscosity means "resistance to flow", and slag is refuse from a process that involves melting ore so that it can flow, the word clearly does not have the feature VISCOUS.

On the basis of the above analysis, we conclude that there are two contrasting split lines here: a strong-weak line (i.e. strong on the left, weak on the right) marked for WHITE (or clear) and unmarked with respect to the feature VISCOUS (thus tending to be runny or watery); and a weak-strong line marked VISCOUS but unmarked for WHITE (and thus typically, though not necessarily, dark or muddy.) The former contains the members *slobber, slaver, saliva; sleet, slush; slag*. The latter set consists of *sludge, (oil) slick, slough; slime; slop*.

We have left one word in reserve for use in testing the above analysis. *Slip* refers to "clay in a creamy mixture with water, used mainly for decorating earthenware". It is also allowed to solidify in a mold to form a kind of ceramic ware. The word is thus MUDDY (i.e. not clear), and falls on the weak-strong line as predicted. And though originally runny, it does harden.

The split sets we have just analyzed both divided right in the middle of the chart — between the second and third, or dental and palatal, columns. But the break in such cases of shifting may come at either of the other two possible vertical positions: the leftmost labial column or the rightmost velars alone may pattern the exact reverse of the rest of the chart.

A good example of a labial split occurs in the set of B- words denoting things

in back of the body, whether body parts or articles of clothing. Here we have *back, butt, buttocks, buns,* and *bustle.* (Also note *caboose.*) While these are all on the strong line, *bum,* another member of the set, falls on the weak line ——and it ends in a labial, -M. The only other item here is *bottom,* which has both -T and -M at the end.

If we are correct in positing a labial switch to account for this phenomenon, we should be able to find another closely related set with the same switch —— preferably one on the opposite line. Sure enough we have *bush* and *beaver,* referring to a woman's pubic hair or genital area. This pair falls on a strong-weak labial-split line, as opposed to the last set, which is weak-strong. Notice also the precise semantic contrast between these two and the family of B- initials cited earlier: *butt, buns, bum* and company (all except *back*) denote BOTTOM and BACK; *bush* and *beaver* are characterized as BOTTOM and FRONT (or possibly just BOTTOM); *beak, bill, boob, bust, button, bib, badge, bangs* and the others from the all-strong set considered earlier would bear the features FRONT and NON-BOTTOM.

INITIAL CONSONANT PATTERNS

If our analysis of the distributional patterning of final consonants in words sharing the same initial ultimately encounters exceptions that can only be explained by introducing shifting rules, it may be time to shift our vantage point. The paradigms we have observed thusfar are, after all, not the ultimate end of our investigation but only parts of a greater whole. We have been viewing the lexicon in cross-section: holding the initial consonant and the meaning constant, and taking note of the arrangement of the final consonants. But we could just as easily reverse the process and test for patterning in the initial consonants of words sharing the same final consonant. This may give us an even clearer view of the phenomenon we have discovered, and reveal patterning less in need of qualification.

To observe the patterning of initial consonants we start with a grid similar to the one for finals, with important differences to be noted below.

INITIAL CONSONANTS

P	T	CH	K
B	D	J	G
F	TH S	SH	H
M W	N L	R	Ø

The vertical arrangement of this grid differs from that of the previous one in that the nasals do not occupy a separate row, but are included together with the liquids as voiced continuants. On the horizontal axis, the only difference is that TH- and S- occupy the same dental sector, so that SH- aligns with its fellow palatals CH- and J-. Several phonemes, namely V-, Z-, and Y-, have been omitted from the chart as shown here. They will be included in the full version the chart given below, along with consonant clusters.

The basic checkerboard pattern, whereby alternate squares are either strong or weak, applies here as well. Since the stops are arranged in the same way for both initials and finals, the designations coincide here. But the continuants on the bottom half of the chart —— with the exception of S- and SH- —— have values just the reverse of before, due to the different status of the nasals in initial position.

STRONG

	T		K
B		J	
	TH S		H
M W		R	

WEAK

P		CH	
	D		G
F		SH	
	N L		Ø

As with the final consonants, strong tends to pattern with strong and weak with weak. But within this general framework we can be even more specific. If the basic principle underlying the strong-weak distinction itself could be stated as one of maximum contrast or opposition —— the members of a class are spaced out in such a way as to utilize the entire alloted space, with no two of them coming into contact with each other —— so too within each of the two families, items that pattern together tend

to be maximally opposed. This primarily takes the form of lines passing through the grid at a diagonal, such that no two points on a line fall on the same column or the same row. To state this basic structural principle another way: two positions on the same line must vary along both axes simultaneously. Triangular and rhomboid patterns also exist, exhibiting the same characteristic. Items in a paradigm are spaced out at regular intervals, much in the same way that a chord in music is composed of a series of notes at intervals on a scale. Just as the combination 1-3-5 is harmonious, and 1-2-3 dissonant, so too a combination such as B-S-R is possible whereas B-D-J is not. Any single note may enter into a number of different chords, but only certain combinations are permissible —— at least within a given genre of music. So too with words in a semantic set ending in a particular consonant —— only certain combinations are possible; and if two matching positions in the chart have been identified, the third must fall within a very narrow range of possibilities.

This defining distributional principle is seen most clearly in the primary axial patterns: K-J-S-M/W for the strong line, P-D-SH- Ø for the weak.

PRIMARY AXIAL PATTERNS

STRONG				WEAK			
			K	P			
		J			D		
	TH S					SH	
M W							Ø

Thus, on the strong axial line we find sets such as *counter-mantle, coat-mantle, cot-mattress-mat*, and *keg-jug-mug*. Here too are *joke(r)-wacky* and the closely related *wacky-kook(y)-psycho-sick(o)-kinky*. (The first also includes *circus, mickey mouse* (i.e. so easy it's a *joke), for kicks*, and *sarcastic*.) What K- word pairs with *waiter*? It's *cater*, of course. (We also have *maitre de'* here.) If there are any more -T words with the same semantic configuration, we would expect to find them in J- or S-. Sure enough there is the item *sutler*, which means "a person following an army and selling provisions, etc. to the soldiers." How about the S- word that belongs with *kite* in the same group with *meteor, comet*, and *jet*? It is *satellite*, of course. (Note also *catapult*.)

Does the series *mime, mimic, same, similar, simulate* continue on up the line to K-? Yes, for there we find *camouflage, camera,* and *chameleon,* as well. Pairing with *jam* we have *marmalade.* (Compare also the *comb* of *honeycomb.*) *Kind* goes with *generous.* Here is a brief sample of further examples:

> *money, coin, economy*
>
> *magic, conjure*
>
> *worry, sorrow, care*
>
> *wary, beware, care(ful)*
>
> *cane, wand, candle, cylinder*
>
> *comic, comedy, mime*
>
> *mummy, coma, somnolent, insomnia*
>
> *son, minor, junior, Johnny, kindergarten*
>
> *mind, sane, genius, cunning, canny, can, keen, ken*
>
> *meat, cutlet, mutton*
>
> *count, account, amount*
>
> *canter, saunter, jaunt*
>
> *kit, set, suit, coterie (cf. mate)*
>
> *map, copy*
>
> *man, john, son*
>
> *caddie, maid*
>
> *bikini, mini-skirt*
>
> *suss out, case (a joint)*
>
> *case worker, social worker*
>
> *maid(en), coed*

The full significance of these examples can be appreciated only when it is understood that the words listed together here represent the closest semantic matches within their respective phonological domains (in this case, final consonant groups). That is, words that belong to the same line are not just close in meaning, but the closest of all items under consideration. Apparent exceptions actually belong to related but distinct groups.

Moving to the weak primary axial line, P-D-SH- Ø, we find matches such as

dimple-pip(of dice), pit-dent, peel-shell, pare-shear, pure-sheer, pock(mark)-pox-acne,
pants-shorts. More examples follow:

> *opium, dope, poppy, pipe-dream*
>
> *amble, shamble*
>
> *diamond, emerald*
>
> *omen, doom, damn*
>
> *awn, panicle*
>
> *pope, emperor, (umpire)*
>
> *pack, deck (of cards)*
>
> *redeem, amnesty*

Sometimes the presence of other features obscures a consistent semantic feature
running through a group. At first glance we might overlook the similarity between
pimp and *chaperone*, for example. But they both clearly refer to what we might call
"sexual overseers" or go-betweens. Minus the sexual component, we see on the same
line *operator* (i.e. *telephone operator*) and even *diplomat*. Likewise a *sherpa*, like a
chaperone, is someone who accompanies on a trip. (Also clearly related here is
shepherd, and, for that matter, *the Pied Piper of Hamlin.*) It might at first seem to
be taking things a bit too far to suggest that a *sherpa* negotiates mountain passes the
way a *diplomat* negotiates treaties or a pimp negotiates a sexual encounter —— just as
it sounds comical to say that the *Pope* is like an *umpire* —— but when we strip these
terms of the value judgments and other connotations that tend to spring foremost to
mind, we find that there is indeed a common conceptual skeleton to them. This
skeleton may be a bundle of semantic features rather than a single one, with not all
items possessing each individual feature, further obscuring the relationship.

Now we come to the question of what to do with consonant clusters. Since we
have only considered two patterns up to this point —— the primary axial lines —— a
complete answer must wait until more paradigms have been introduced. But the most
important point can be stated now: clusters pattern as continuants, the continuity of
the semivowel or sibilant element predominating over any stop element. The cluster
occupies the position on the lower half of the chart corresponding to the position of the
stop on the upper half. Thus, SP- behaves like F-, ST- like TH-, and SK- like H-. In

the case of semivowel clusters, however, there is one crucial qualification: a stop and a semivowel must be of the same value — either both strong or both weak — for this straight "dropping down" to apply. Thus, since T- and R- are both strong, TR- occupies the same position as TH-, along with ST-. The same goes for TW-, with strong W-. Likewise KR- and KW- pattern with H-, along with SK-, as well as SKR- and SKW-. (The presence of two continuant elements here, the S- and the semivowel, apparently does not have any more effect than just one — though, interestingly enough, STR- does fall from the ST- position down to the S- position within the same sector, as does THR- from TH-.) B- and R- are both strong, so BR- occupies the same strong sector with M- and W-, as do SM- and SW-. Likewise GL- drops down to the Ø- sector, since G-, L-, and Ø- are all weak.   BL- and GR-, on the other hand, are "mixed clusters"— they consist of one strong and one weak element.   We will in due course consider where they fit in.   But first let us look at some examples with those of the clusters just analyzed that fall on either of the two lines we have studied so far.

In the group with *mind, sane, genius, cunning, keen* and so one, listed above, we also have *brain.* (Note also *discern(ing)*, with an unstressed prefixed element.) Along with *canter, saunter,* and *jaunt,* there is also *trot.*   Between *amount* and *account* on the strong line, we also find *statement* (as in *bank statement*).   These cases of clusters all fit into strong groups we had before.   Now consider these additional examples involving new sets:

swindle, con

wit(ty), smart, bright, insight(ful), scintillating, subtle, (catty)

swipe, kipe, cop

broom, comb

mug(ger), burglar, brigand, thug, (Jimmy Cagney)

cop, trooper; captain

sweet, tart, treat, mint, (peanut) brittle, (cotton candy)

match, torch

wick, stalk, trunk

kind, brand, gender, breed, model, mode, trademark, strand, sundry; breed, brood,
      midwife, bride, wed, stud (horse), seed, descendant

kind,... kin, genus, generation, strain, son, born, cocoon; manner, vein

model, standard, breeding; Cadillac, Mercedes; tried and true, bread and butter,
sound, steady

son, moon (also cf. *coin)*

burn, kindle, candle, brand, incendiary

weld, solder, kindle, candle, brand...

can, john, latrine, men's room

condo(minium), manor; monastery, sanitarium; barn, kennel

umbrella, ceiling, cowling

king, mogul, magnate, strongman

On the weak axial we have examples such as the following confirming the position of GL-: *ditch-gulch, puddle-pond-everglades-(rice)paddy, glamor(ous)-charming-dreamboat-dreamy-amorous.*

We mentioned mixed clusters above. In addition to BL- and GR-, these are DR-, PR-, FR-, SPR-, SHR-, and KL-. Since a mixed cluster contains one strong and one weak element, it must occupy an intermediate position between a strong sector and a weak sector, patterning sometimes with strong consonants and sometimes with weak ones —— and very frequently patterning with fellow mixed clusters (or other items of "mixed" status). What this means is easiest to see in the case of FR-: it patterns between its weak parent F- and adjacent strong M-. This is also the position occupied by PR- and SPR-. In symmetry with this, on the other side of the chart, KL- falls between H- and -Ø. Thus we have the following cases where these mixed clusters pattern on one of the two axial lines we have been considering. First, the weak line, with KL-:

dough, clay

pure, clear

pinch, clench, clutch

pub, club

paw, claw

Now the strong line, with FR-, SPR-, or PR-:

kind, generous, friend(ly)

kind, friend(ly), considerate, modest, breeding

sweet, tart, treat, fruit

frame(work), (honey)comb

wacky, kook(y), psycho, freak(y), freak out, wack out

sperm, semen, cum, jam, jism

sperm, comet, comma

problem, trouble, perturb, cumbersome, encumber

coax, sic (a dog on someone), provoke

If there seems to be something slightly "off" about some of these sets, it is merely a reflection of the fact that the mixed clusters are slightly *off* the line here. *Porter*, for example, is obviously related to but slightly different from *cater(er)-waiter-maître d'*. And mixed clusters tend to enter into other paradigms that assign them additional semantic features that partially obscure their kinship here. *Fruit*, for example, shares a different feature with the word *nut*, which begins with weak N-, than it does with *sweet* and the others above.

Also note that there are comparatively fewer clear-cut examples with PR- (*provoke* could just as well be interpreted as having initial V-). This is because it occupies a higher position within the intermediate sector, above FR- and SPR-, and is thus farther off the line we are dealing with. It is more likely to pattern with H- and its kin, on a line to be introduced shortly — here indeed we find *escort* as a more likely counterpart to *porter* — or with other mixed clusters such as GR-, or on hybrid lines that combine weak and strong initials.

We have one more matter to attend to before moving off the axial lines to other patterns: the status of V- and Z-. As voiced continuants, these should pattern on the bottom row, but as the voiced counterparts of F- and S- on the row just above, their status takes on a somewhat mixed character. In the case of V-, this means that it occupies the high range of the bottom sector, or even the bottom end of the intermediate sector above that. Thus, when it does pattern up the axial, it tends to hit the high end of the next sector up the scale, passing through TH-/ST-/TR- rather than S-/STR-/THR-. (This can be seen in the pair *van-train*, which is parallel to the group *manor, condo; barn, kennel* seen above.) When it does pass through S-/STR-/THR-,

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the line continues on not to J- and K- but to H- and its kin, the next pattern to be considered. Straightforward axial patterns with V- are not common. The best that comes to mind is *cannibal - Venus' fly-trap*, which, though a fascinating example in its own right, exhibits great phonological complexity. *Vomit* and *venom* are reminiscent of the set *sperm, semen, cum, jam*, yet different still. Pairing with *to divine* we have *discern* —— obviously related to the set *mind, brain, cunning,...* seen above. But the prefixed D- here may place these items somewhat off the line. In a case like *canyon-ravine*, the prefixed R- could be needed to reinforce the strong character of the otherwise ambiguous V-. (Or then again the R- might constitute a third element in a triangular configuration K-V-R, a type we will consider in our next article.) We also have the sterling example of *mutiny - revolt - coup d'etat*, where all three items contain weakening elements against a strong backdrop. Not only does *revolt* contain an -L- and *coup d'etat* an interposed -D-, both weak, but the long *u* of *mutiny* contributes a semivocalic Y-, which has the same status as weak L-.

Z- is likewise intermediate between S- on the one hand and N- on the other. Its distribution mirrors closely that of SL- and SN-, which, though S- clusters like SM- and SW-, pattern higher than their labial counterparts. There are a number of factors that help explain this. First, these sibilant-semivowel clusters are in fact mixed initials, owing to the difference in voicing between their two constituents. And in all mixed clusters, when push comes to shove, the strong element is slightly predominant. This has the effect of exerting downward pressure on SM- and SW-, and upward pressure on SN- and SL-. (The same is true of V- and Z-.) But even more importantly here, the position immediately above SN- and SL- is none other than S- itself, the initial element of these clusters. This exerts further gravitational pull upward, in accordance with the principle that simple elements act as magnets for adjacent clusters of which they form a part —— a principle which we saw at work in the phenomenon of the final nasal clusters -MB, -ND, and -NG patterning with the straight nasals -M, -N, and -NG.

These factors combine to place SN-, SL-, and Z- high enough to partake of the strong axial line. Thus we find examples such as the following:

coma, mummy, slumber, zombie, somnolent, insomnia

wacky, kook(y), psycho, freak(y), freak out, berserk (S- or Z-)

cuff, muff, sleeve

candle, cylinder (cf. cane, wand)

slot, slit, cunt

Saloon is related to the set *condo, manor; barn, kennel, etc.* And of particular interest is *dessert*, where the prefixed D- seems to exert a raising influence to set the word on the path of *sweet, tart,* and *treat*.

As stated above, mixed or intermediate initials such as SM-, V-, SN-, SL-, and Z- are more likely to pattern on the line of shallow slope that runs from M- to H-, passing through S-/STR- and JN- en route. The initial JN- requires some comment. It is posited to account for the fact that words such as *jump* pattern differently from J- words without a pre-final homorganic nasal: they seem to drop down to the bottom half of the chart in the same way as words with post-vocalic -R-, such as *jerk* or *germ*. Two possible factors seem to be involved here. One is that there are no true clusters of affricates and semivowels, and the language seems to be bolstering the lowered position here by loosening the conditions to include nasalized forms as well. But more likely the mere fact that affricates are themselves semi-continuous and just on the verge of "dropping down" even without any help from additional continuant elements is enough to explain the phenomenon. CH- likewise patterns on the bottom half of the chart with SH- when the vowel is followed by an -R- or a homorganic nasal, as witnessed by the following examples:

ape, chimp; (puppet)

dope, dupe, chump

glamor(ous), charm(ing), dreamboat, dreamy, amorous

amulet, charm, shamrock

Further confirmation for this interpretation of the phenomenon comes from the irregular behavior of forms such as *bound*, in which a W-glide is followed by a homorganic nasal. These too pattern consistently as if they had BR-: *boundary* goes with *border, bounder* with *cad*, and the verb *bound* with *hurdle, stride,* and *straddle*. While neither the W-glide nor the nasal by themselves is enough to lower the B-, in combination they have precisely that effect —— another case in which a post-vocalic

nasal contributes continuity to the initial.

In any case, forms of the type we have represented as JN- stake out a position not all the way down in the R- sector, but rather at the very bottom of the SH- sector. JR- itself patterns at the top of the R- sector, just as BR- positions with M-.

Now for some examples of the M–S–H line. Remember that SK-, KR-, KW-, SKR-, and SKW- all pattern with H-, and STR- and THR- with S-, as well as SN-, SL-, and Z-, as we have just seen. Most tellingly, while M- and its brethren at the top of the lowest labial sector lie on this line, W-, at the bottom, only rarely makes an appearance here. (In an example like *wipe, sweep, mop, sop (up), soap, scoop, scrape*, there is a slight discontinuity in meaning when we reach the velar end-point here; *shampoo* would be a more likely candidate to end a line running through *soap* and *mop*.) This clearly distinguishes the line from the W–S–J–K axial.

mouse, cursor

caress, massage

monitor, screen, sign

vein, sinew

brain, cranium, sinus; kernel

brook, creek

suck, milk, vacuum, smoke (cigarettes), smack (lips), quicksand, hickey

sucker, jaw-breaker, crackerjack(s)

hurt, smart

hot, sultry, swelter(ing), melt, smelt, sweat

(in) heat, hot (to trot), slut, wanton, sultry, dissolute (cf. rut, satyr, excited)

cartwheel, somersault, cavort, vault

to court, suitor, escort, mate

invite, court

viper, serpent, creep

subtle, gentle, hint

sentry, scout, escort, monitor, (Canadian) Mountie

skit, sitcom, cartoon

hat, miter, mortarboard

affront, insult, slight, hurt (cf. criticize, berate)

meat, heart, senter, seat (of), vital, important

branch, crotch

crotch, breeches

scratch, match

jinx, hex, (get the) monkey (off one's back), freak (accident)

perk, pork (barrel), junket

break, crack

hormone, (bodily) humor, serum, venom, vim (and vigor) (cf. sperm, semen)

vermin, germ, scum, slime, vomit, seamy, slum

hood, snood, shroud, swaddling clothes, (bed)spread, saddle, bridle (cf. hide; beard)

bound, hurdle, stride, straddle; spread, broad, wide, ford (bandy-legged)

porn, fornicate, obscene, sin, scandal, horny

scarf, muffler, scruff (of the neck); (ear-muffs)

cruel, malice

In addition to M- patterning with S-, J-, and K- on the axial line, and with S- and H- in the examples just seen, there are also many cases in which it pairs with GR-:

meet, greet, salute, curtsy

mumble, grumble

grit, silt, soot, salt, sleet, mortar, cement

greedy, Midas

grains (of sand), grainy, (coffee) grounds, sand, cinders, bran

moan, groan (cf. whine, complain)

thief, traffic(ker), mafia, graft

groceries, mess (hall, kit)

grease, vaseline

mercy, grace

grass, moss

advance, progress

browse, graze

Recall that GR- is one of the mixed clusters discussed earlier. Along with BL-

and DR-, the other mixed clusters with voiced stops, we have still not located it in the chart. Now if GR- were to behave as GL-, it would fall to the bottom of the chart. But since it is mixed, it would have to then rise to a position midway between the H- and the Ø- sectors, near the position occupied by KL-. Such a maneuver appears to be ruled out, for indeed GR- does not pattern in this position. Coupled with M- and S-, as in the above examples, it would require the line to slope up from M- to S-/SL-, then taper back down to reach GR-, or at best level off. This is not a type of pattern we observe anywhere else in the chart, where straight lines, and later broad inscribed triangles and rhomboids, are the rule. Besides, even if we could somehow jigger the line to make it seem straight so it wouldn't bend back down to the same level it had passed on its upward slope, we still could not explain why there are not more mixed labial initials like FR-, SPR-, PR-, or SM- included in the examples. After all, the M–S–H line, with what would be a steeper slope, contains some of these. If our M–GR line had a flatter trajectory still, we would expect more of these initials that position slightly above M-, not fewer. In short, this line displays a slope that places it midway between the axial M–K line and the shallow M–H line, suggesting that GR- occupies a position between G- and H- rather than between H- and Ø-. And this will be born out by other patterns yet to be considered.

If we are correct in this analysis — that GR- clings high to its parent G- — we would expect the same behavior from BL- and DR-, the other two mixed clusters with voiced initial elements. Indeed, DR- fits between D- and TH-/ST-/TR-, patterning sometimes with the one and sometimes with the other. We have already seen it on the weak axial line in *glamor(ous), charm(ing), dream(boat)*. Another example is the pair *drill-awl*. Its kinship with D- is also apparent in comparisons such as *dip, dump: drip, drop*. BL- likewise patterns with B- as well as with F-. Examples of the former are forthcoming, as we now turn out attention to patterns involving B- itself.

Just as M- could slant across the chart to reach H-, so too B- links up with H- in the same way, passing through ST-/TR- and SH- on the way — though it should be pointed out that SH-, which differs from the other members of the series in being weak, is not as common here. Note that B- and H-, like K- and M-/W-, are maximally opposed in terms of distinctive features: while B- is a voiced stop produced with the lips, H- is a voiceless continuant produced as far back in the throat as possible. The

line is also a symmetrical counterpart to the M-GR line just encountered. Some examples of the B-ST/TR-H line:

bump, hump

bitter, biting, hot (i.e. spicy), tart

bookish, hackneyed, stock (phrase)

bed, cradle

crown, beany, bonnet

crowd, huddle, band (together)

bean, stone, corn, kernel

bum, homeless, bohemian

stem, stymie, hem (in), trammel

stammer, hem (and haw)

booze, carouse

honey, (Playboy) bunny, stunning, stone fox

staff, shaft, haft

humid, steam, balmy

boot, skate

bunion, corn

A common variation of the B-H line involves the slight lowering of B- to BL- and/or H- to KL-:

boulder, clod (cf. turd, curd)

blanket, cloak

bluff, cliff

blind, shade, cloud

column, stem, stamen

balm, calamine (lotion)

scaffold, belfry, belvedere, shelf (cf. rafter, roof)

When the B-H combo is not joined by any representative from the middle of the line such as ST- or TR-, it often patterns with N-, L-, or Y- to form an inscribed triangle configuration. Notice once again the striving for maximum separation. Of

course, just as B- and H- can pair together without a third member, so too B- can team up with N-/L- alone, or N-/L- with H-. In this last case, notice also the linking position JR-/JN-.

bump, hump, lump

babbage, luggage, cargo

bet, lot(s), lottery, slot machine, 'hit me', ante (N-)

booty, loot, hot (i.e. stolen) (cf. also bootleg)

batty, nutty, (mad as a) hatter, schizo, fanatic

lewd, bawdy, crude

bug, nag, haggle (beg)

bog, quagmire, water-logged

bum, homeless, bohemian, nomad, on the lam

crummy, bum (adj.), lemon (of a car), lame (excuse..)

lift, loft, heft, heave, above; leaven, heaven

loft, scaffold, belfry, belvedere, shelf

buckle, knuckle under, crack (under pressure)

hick, cracker, redneck, local yokel, bumpkin, backwoods, outback, yankee, honky,
    (biker)

hoop, loop, lap

limp, cripple

huge, large (cf. big)

yank, jerk, crank

leap, jump, hop, skip, blip

knot, joint, heart (cf. clot)

button, nut, bolt, cleat

but, yet, not

hitch, latch

hock, liquidate

booger, loogie

bathe, lather

hide (i.e. skin), (eye)lid

nasty, beastly, hostile

Included with L- in the bottom sector of the dental column is DL-, just as GL-shares the same sector with Ø-. Though no DL- sequence occurs at the beginning of words, a word like *dolt*, with an -L- after the vowel, qualifies here. Likewise *idiot*, with a -Y- after the D-, occupies the same position. These are both members of the following set, which shows the pattern we have just been considering: *nitwit, benighted, lout, cretan, scatterbrain, butt (of a joke), butthead, ding-bat, lobotomy, obtuse* (B-T).

The B–H–L triangle has its exact symmetrical counterpart in a triangular variation of the M–H line. If the third member that complemented B–H was L-, we would expect the corresponding complement for M–H to be D-. Note that both complements are weak, while the original two elements are strong.

harm, damage, maim

swoop, sweep, scoop, dip

mumble, hum, mum's the word, dumb

swing, hang, dangle

swift, deft, clever

waft, drift, hover

Slightly different triangular configurations are seen in *scold, upbraid, chide* and *court, invite, tout.* Note also *vibrate, tremble, rumble.*

Finally, there is one other major inscribed triangle pattern, consisting of all weak members: G–L–F. It can be seen in the following sets:

field, garden, yard, land, spread

lead, guide; lord, god, leader, elder, alderman, feudal, federal

ground, foundation, land; lawn, green, plain

give, lavish, favor

love, favor, prefer(ence); loving, giving

gory, lurid, prurient

lodge, garage, (housing) project

lace, gauze, gossamer, floss

In addition to the full triangular set, any two of these may pair up on their own, as in the pairs *laugh–guffaw* or *lot–fate.* The G–N/L line also passes through SH-, a

position occupied by CHR-/CHN- as well. Thus, between *net, lattice,* and *grate* we find *chart.* Also on the weak line, P- can pattern with L-, and less frequently with G-. Illustrations of these connections are given below:

G — N/L

  grab, nab

  gobble, nibble

  gum, (bird) lime

  animal, game

  ladle, gourd

  groin, loins, loincloth, (fanny)

  lusty, zest(y), gusto

P — N/L

  lobby, public, pub

  public, publicity, celebrity

  pooh-bah, nabob, (snob)

  limey, pom (my)

  pine, yearn

  licence, pass

F — G

  speed, giddy up

  prod, goad

  baloon, gondola

  whisper, gossip

  suppose, guess

  gully, defile

P — G

  pond, lagoon

  pod, gourd, gondola

Parallel to the primary axial lines treated above, we find two "outrigger" lines, one strong, one weak. The weak one runs through F-, D-, and CH-, and is observed in groups such as the following:

party, appointment, date, chat, fraternize, plot

point, detail, data, plot (on a graph)

flinty, doughty, redoubtable

cheat, default; debt

point, dot, spot, blot, plot

frock, smock, dickey

to block, check, dike

block, check, checkerboard

afraid, dread

derrick, cherry picker, ferris wheel

Just as this weak outrigger parallels the strong axial line, the strong outrigger runs parallel to the weak axial, passing through B-, S- or ST-/TR-, and R-. Here again the presence of BL- confirms the analysis that places it directly under B- rather than lower on the labial column.

rot, blight

boot up, start up, set up, set out

rump, stump

runt, stunt(ed), bantam(weight), blunt(ed)

stink, rank

blade, sword, reed (of instrument)

ride, stride, straddle, saddle

read, study

bid, order

bogus, rigged

ring, bangle

revel (in), savor, ravish

bacon, steak, jerky

Finally, there is a line that exhibits lateral symmetry with the shallow M–H line. It passes from F- through N- and R- to Ø-. Alternately it may follow a slightly flatter trajectory, from F- through S- and ending in GL-, or even KL-:

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fault, guilt(y), naughty

wheedle, needle, ride

plug, clog

poison, arsenic

fame, name, rumor

roam, ramble, nomad, perambulate

fit, suit(able), right

inflate(d), bloat(ed), fat, glut, glutton, sated

We have now completed our preliminary overview of the major simple distributional patterns observed among initial consonants in groups with the same final consonant. The remaining patterns, which will be dealt with in a subsequent article, follow the same basic principle of maximum featural differentiation and diagonal sloping. We conclude here with a chart showing the relative position of all initials, including consonant clusters.

P	T	CH	K
B	D	J	G
BL	DR		GR
F SP PL FL	ST TH TR TW STR THR S	CHN SH JN	SK SKR SKW H KR KW
PR WH FR SPR V	SL SN Z	SHR	KL
M BR SM SW	N	JR	
W	L Y	R	GL Ø

It should be clear from even the brief account given here that the phonological distribution of lexical forms is anything but random —— that phonological form is connected with meaning at the deepest level. Semantically similar forms stand in

predictable relation to each other —— if the consonants in either initial or final position are the same, those in the other position will vary from each other at regular intervals. Semantic features are assigned on the basis of rules stated in terms of both phonological identity and opposition, rather than being assigned directly to individual phonemes, let alone phonological features. While this article has concentrated on describing the most common basic patterns, these are in fact only parts of greater wholes that it is beyond the scope of this short study to attempt to characterize. The next step is to show how various paradigms relate across a single semantic field, both within limited phonological domains and for the lexicon as a whole, to produce integrated patterns of an even higher order.