

Where the Spelling '-sion' Comes From

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An ideal letter (especially an ideal alphabet) is one by which only one sound is represented. It is often said that English spelling is inconsistent and that each letter of English usually represents two or three sounds. In English, the letter 'v' exceptionally represents only one sound [v]. However, the sound [v] can be represented by the letter 'ph' that is found in the word 'Stephen'. There is no letter in English that corresponds to only one sound and by which alone the sound can be represented.¹⁾

As stated by Aronoff [2]*, recently Chomsky and Halle [3] have begun to notice that despite its inconsistency, there are many cases where the English spelling system gives us useful insight into English phonology. The irregularity of English spelling might be somewhat consistent with a native speaker's intuition, which could explain why attempts at spelling reformation have resulted in failure. The question to ask is what is the phonological implication of the fact that a letter is used for the representation of several sounds and vice versa. The spelling may indicate that there are some vowel or consonant alternations. In phonological theory, only phonological segments or suprasegments are regarded as a valid object of the research. Therefore, phonological study is apt to be indifferent to differences in spelling. However, if we wish to show that some part of a spelling system is based on a nontrivial observation, we must choose an example that does not involve phonology. The preservation and change of a spelling system may reflect a linguistic observation. In this paper, one such case will be dealt with.

In English spelling, there are a number of words that end in [sən], spelled *sion* or *tion*. In some words, the difference in the spelling corresponds to the different phonological surface; that is, in *tion* we get [sən], and in *sion*

* Numbers in brackets refer to the references at the end of the paper.

we get [zən]. Such cases must be accounted for in the phonology. Let us look at two pairs cited from Aronoff [1] as follows:

- | | | |
|-----|--------|----------------------|
| (1) | invert | inversion [invərzən] |
| | insert | insertion [insərʃən] |

If we wish to produce the correct forms in (1), there are four possible solutions we can easily find. First, we can have recourse to a simple rule which voices the *t* of *vert* to *d* before *ion*. Second, we could use as abstract segment *T* which shows up as *t* everywhere except before *ion*. Third, we could use a rule feature, which triggers the relevant rule only when it has *sent*. Lastly, we could make use of a rule of allomorphy²⁾. In the present paper, we cannot discuss which of four solutions is best one. Rather we are concerned with the question of what causes the spelling *sion*.

The example (1) may suggest that [zən] is spelled *sion* and [ʃən] is spelled *tion* without exception. But the problems are not so simple enough to be dealt with. Most of the nominals spelled *sion* are derived from corresponding verbs. These verbs can be classified on the basis of their stems or roots. It is convenient to tabulate their alternations with the phonological representations of their *sion* nominals. Let us look at the following table:

- | | | |
|-----|-----------------------------------|------------|
| (2) | a. X + C(C)V - de:invade, explode | zən |
| | b. X + CV - nd:comprehend, extend | nsən |
| | c. X + fuse:confuse | zən |
| | d. X + here:adhere | rzən |
| | e. X + cise:incise | zən |
| | f. incur | rzən (ʃən) |
| | g. X + vert:invert | rzən (ʃən) |
| | h. asperge, emerge | rzən (ʃən) |
| | i. X + pel:propel | lʃən |
| | j. X + sent:dissent | nsən |
| | k. intort | rsən |
| (3) | a. X + mit:permit | ʃən |
| | b. X + cede:concede | ʃən |

c. $X + C(C)V$ – cuss: discuss

sen

In (2) we get *sion* and in (3) we get *ssion*. The examples in (2) indicate that some words have \check{z} , some have \check{s} and others have both \check{s} and \check{z} . In (3) we get only \check{s} . Note that \check{z} is found in the words spelled with Vowel + *sion* and we get \check{s} in the words spelled with Consonant + *sion*. In the words with the spelling *ssion*, only \check{s} is found. If this is true, we can say that words spelled with Consonant + *sion* are inclined to have \check{s} in the phonological representation, though it is said that in some words with the spelling *r + sion*, \check{z} is found in American usage whereas \check{s} is found in British usage. We find *r*, *l*, *n* and *s* before *sion*. Among these combinations, either \check{s} or \check{z} is found in *r + sion*. In the other case, we always find only \check{s} . Thus we can assume that there are different strengths among these consonants and vowels in the voicing of \check{s} before *ion*. We might claim the following scale for them:

(4) s n l r vowels

One of the problems in explaining the occurrence of \check{z} or \check{s} arises in the case of *ssion*, if we try to account for \check{s} in *ssion* within phonological framework. For *ss* in *ssion* corresponds to a sound [\check{s}] in Modern English³⁾, in spite of two letters. This shows that *ssion* phonologically belongs to the same class as Vowel + *sion*. Therefore we are forced to speculate an abstract *s* in *ssion*. By the assumption of such *s*, it may be claimed that *s* before *sion* always represents voiceless [s] and *s* in *sion* assimilates to *s* before *sion* completely. But this claim is easily falsifiable, since it cannot account for the non-occurrence of assimilation in the environment where voiced consonants appear before *sion*.

Vowels and /r/ are specified by a phonological feature [− anterior], and /s, n, l/ are [+ anterior]. Vowel and /r/ can be distinguished from /s, n, l/ by the feature [± anterior]. This also supports the scale of strengths of these consonants before *sion*. It seems that such dynamics like the strengths of segments are at work in languages and that they performs nontrivial functions as so-called implicational laws. Again, /š, ž/ are specified as [− anterior, + coronal]. The occurrence of š and ž in *sion* can be

accounted for by an informal rule of allomorphy as follows:

$$(5) \quad s \longrightarrow \begin{bmatrix} + \text{ cons} \\ + \text{ cont} \\ - \text{ ant} \\ + \text{ cor} \\ \alpha \text{ voiced} \end{bmatrix} / [- \alpha \text{ ant}] ______ + \text{ ion}$$

Note that rule (5) of allomorphy cannot suggest the interesting fact that *s* in *r+sion* swings between \check{s} and \check{z} .

Next we should be concerned with the interesting fact that spelling mirrors consonant alternations before *ion*, when *sion* nominals are derived from their corresponding verbs. The consonant alternations are roughly shown by the following chart roughly:

$$(6) \quad \begin{array}{ll} \text{Xde [d]} & \longrightarrow \text{Xs [\check{z}] + ion (or Xss [\check{s}] + ion)} \\ \text{Xnd [nd]} & \longrightarrow \text{Xns [\check{s}] + ion (or Xss [\check{z}] + ion)} \\ \text{Xmit} & \longrightarrow \text{Xss [\check{s}] + ion} \\ \text{Xerge [g]} & \longrightarrow \text{Xers [\check{s} \text{ or } \check{z}] + ion} \\ \text{Xrt, Xnt [t]} & \longrightarrow \text{Xrs, Xns [\check{s}] + ion} \end{array}$$

Possibly the alternations are oversimplified in the chart (6), for the alternations in segments and spellings are not triggered by only a single or a complex sound, but by the larger elements of stem or root. For example, a consonant alternation of *g* to *s* before *ion* can occur in stems such as *emerge* and *asperge*, but cannot occur in the stems like *Xterge* and *Xverge*.

We will examine all of stems from which the spelling *sion* is derived and discuss where the spelling *sion* comes from. First, consider the following examples of *mit* stem

(7)	permit	permission	admit	admission
	intermit	intermission	submit	submission
	emit	emission	comit	comission
	*dismit	dismission	thermit	*thermission
	limit	*limission, but limitation		
	*mit	mission		

As we have seen, *t* in *mit* stems changes into \check{s} before *ion* without exception and \check{s} is spelled with *ss*. There are some exceptions which, while apparently having the form *mit* or *mission*, do not conform. The word *thermit* has a variant *thermite*, so that the form *mit* in *thermit* is not regarded as the stem of the form *mit*. The form *limit* has its nominal *limitation* derived by the suffix *Ation*, but this case is not considered as a true exception either, for we cannot analyze *limit* into *li* + *mit*, since the form *li* does not function as an affix. Some of the examples (7) indicate that not all the nominals with the spelling *mission* have their corresponding verbs with the stem *mit*. It seems that there are two types of the nominals that are not derived from the verbs through appending the suffix *ion*. One of them is the type exemplified by *dismission*, and the other is the type as seen in *mission*. In the latter case, we cannot find a verb *mit* in English. It might be thought that this is a historical accident, which also befell words like *mansion*, *pension*, and so on. In the former case, it is clear that the form *dismission* is derived from a verb *dismiss* and we will discuss *sion* nominals with a stem of the form *Xss* + *ion*.

We will consider the case *Xde* in detail. The relevant examples are given below:

	verb	nominal	verb	nominal
(8)	decide	decision	allude	allusion
	invade	invasion	persuade	persuasion
	conclude	conclusion	explode	explosion
	collide	collision	extrude	extrusion
	divide	division	corrode	corrosion
	deride	derision	abrade	abrasion
	recede	recession	succeed	succession

The forms cited in (8) shows that there are many kinds of stems belonging to this class. The vowels in these stems of the verbs are tense. On the other hand, in the nominal some are tense and some are lax. We can notice that the front vowels in the verb stems change into their lax counterparts before *sion* in the nominals. The initial consonants of the verb stems are *s*, *v*, *l* and *r*. In two examples, we get the initial consonant

clusters *pl* and *tr* in their stems.

The occurrence of the spelling *sion* in the *sion* nominals with the stem in *Xde* may be captured by a spelling rule functioning as a well-formedness condition like $de \rightarrow s/[(C)\{s, v, l, r\}[+ \text{vocalic}, + \text{tense}] \text{---verb}] \text{ stem} + \text{ion}$. But this rule cannot produce the correct forms of *sion* nominals for *recede* and *succeed*. In this case, we get *ssion*. This ad hoc rule must be a little modified in order to produce the correct spelling in the last pairs in both columns. We need to add a feature $[\pm \text{mid}]$ for the vowel *e* to the environment of the rule using the angled bracket convention⁴⁾. The spelling rule might now be stated as follows:

$$(9) \quad d(e) \rightarrow \left\{ \begin{array}{c} s \\ \langle ss \rangle \end{array} \right\} / \left[(C) \left\{ \begin{array}{c} s \\ v \\ l \\ r \end{array} \right\} \left[\begin{array}{c} + \text{voc} \\ + \text{tense} \\ \langle + \text{mid} \rangle \end{array} \right] \text{---} \right] \text{v} \text{ stem} + \text{ion}$$

This ad hoc rule works comparatively well, since the occurrence of *sion* or *ssion* depends on the combination of the initial consonants or consonant clusters with the stem vowels in the forms given here. However, rule (9) cannot cover some exceptions which contain similar spellings but do not produce nominals spelled with *sion* or *ssion*. Consider the following examples:

- (10) a. parade, glide, crude, stride
 d. denude, abide, desuetude, confide,
 c.. glissade, coincide
 d. preside

Among these examples, the forms cited in (10)b can be excluded from rule (9), since their initial consonants or consonant clusters do not meet the environment of (9). The examples (10)a also reject the derivation of their *sion* nominals, since they cannot be analyzed into prefix + stem; for example, it is absurd to factorize *parade* and *glide* into *pa + rade* and *g + lide* respectively. But it seems that the forms in (10)c and (10)d cannot be excluded from the application of rule (9). In fact, rule (9) does not work well,

since these examples meet the condition, and wrong nominals with the spelling *sion* will be generated for them. A close observation of the forms tells us that the words cited in (8) have stop consonants as the first elements of the consonant clusters but the forms in (10)c have continuant consonants in the same position. It is now possible to modify rule (9) to explain case (10)c. We must add the feature [–continuant] to the first element of initial consonant cluster in the environment. Therefore (C) in rule (9) is modified and we get [+cons, –cont] instead. By this modification, the rule can prevent the forms of the (10)c type from producing nominals spelled with *sion*. However, there is no device for excluding the verbs like *preside*, *reside* from *Xde* class which has *sion* nominals. Note that the spelling of the stem is not *cide*, but *side*. This may provide insightful information on their exceptional behavior. In this case, the spelling system mirrors a lack of *sion* nominals.

Next we will proceed to examine a verb class with the stems *Xnd*. A stem *prehend* is also included in this verb class. Let us look at the following examples:

(11)	apprehend	apprehension	expand	expansion
	extend	extension	ascend	ascension
	rescind	rescission	suspend	{ suspension suspense
	pretend	{ pretension pretence	distend	{ distension distention
	descend	{ descension(rare) descent	respond	{ responsion response

In this case, *sion* comes from six different roots of verbs. These are *pand*, *pend*, *tend*, *scind*, *spend* and *hend*. Among these roots, the root *scind* has the *sion* nominals spelled with *ssion*. In addition, the *ssion* is pronounced as [zən]. It is said that in British usage the *ss* in the *ssion* of *rescission* has *s* instead of *z*. Another interesting characteristic in the stem *scind* is that the *sion* nominal does not preserve the *n* of its corresponding verb stem. All the other examples preserve the *n* in their *sion* nominals. As shown by the examples, some verbs belonging to this *Xnd* class have two

different shapes of nominals ending in *tion*, *t*, or *se (ce)*; for example, *suspense* and *suspension*.

Investigation of the examples (11) reveals that the roots have [– high] vowels except *scind* and contain *s*, *p*, *t*, and *h* as the initial consonants. In the same way as with the stem *Xde*, we may establish a well-formedness condition in order to explain consonant alternation of *d* to *s*. This condition is given as follows:

$$(12) \quad \langle n \rangle d \longrightarrow \left\{ \begin{array}{c} s \\ \langle ss \rangle \end{array} \right\} / \left[\begin{array}{c} \langle s \rangle \\ s \\ p \\ t \\ h \end{array} \right] \left\{ \begin{array}{c} \left[\begin{array}{c} V \\ + \text{high} \end{array} \right] \\ \text{high} \\ \left[\begin{array}{c} V \\ - \text{high} \end{array} \right] \end{array} \right\} \left[\begin{array}{c} \text{---} \\ n \\ \text{---} \end{array} \right] \left[\begin{array}{c} \text{---} \\ v \\ \text{---} \end{array} \right] \right] \begin{array}{l} + \text{ion} \\ \text{root} \end{array}$$

We must admit that the rule (12) is a minor rule and of little value, since it can be applied to only a few verbs and has several exceptions. We can easily find verbs whose nominals are formed by suffixes other than *ion*, as we have seen.

Some relevant examples are listed below:

(13)	subtend	subtense	contend	contention
	abscond	abscondence	depend	dependence
	expend	expense	compound	compound

A more interesting question is what produces non-'sion' nominals' from the root *Xnd*. It is clear that these variants have been created through long historical processes. Here it could be thought that there are certain drafts in the sense that Sapir [4] pointed out. In spite of serious exceptions, the root *Xnd* of verbs is one of the sources of the spelling *sion*.

Now we cite examples below that show all possible sources of the spelling *sion*.

(14)	a. profuse	profusion,	confuse	confusion
	b. contuse	contusion		
	c. inverse	inversion,	diverse	diversion
	d. disperse	dispersion		

- | | | | | |
|----|----------|------------------|------------|-----------------------------|
| e. | precise | precision, | circumcise | circumcision |
| f. | immerse | immersion, | emerge | emersion, asperge aspersion |
| g. | propel | propulsion, | expel | expulsion, ϕ emulsion |
| h. | convulse | convulsion | | |
| i. | intort | intorsion, | evert | eversion |
| j. | cohere | cohesion, adhere | adhesion, | but decohere decoherence |
| k. | previse | prevision | | |
| l. | scan | scansion | | |
| m. | dissent | dissension | | |
| n. | incur | incursion | | |
| o. | excuse | excursion | | |
- (15)
- | | | |
|----|----------|-------------|
| a. | confess | confession |
| b. | percuss | percussion |
| c. | progress | progression |
| d. | express | expression |
| e. | possess | possession |

Note that in (14) some verb stems have *s* as the source of the spelling *sion* and consonant alternations are found in such verb stems as *Xhere*, *Xert*, *Xerge*, and *Xnt* when suffix *ion* appends to them. We might posit a rule to generate the change of *r*, *t*, *g* into *s* before *ion*. However, the examples cited in (14) tell us that there are only a few words with the stems in *Xrt*, *Xerge*, *Xnt* and *Xhere*. The verb stems *Xrt* and *Xnt* which have *sion* nominals are found only in the forms cited here. We can find an epenthetic vowel and an *s* addition in the case of the stem *Xpel*. In the form exemplified in (15), the *s* in *sion* is always found in their stems. There are only two vowels, *u* and *e*, contained in the verb stem *Xss*. The verbs with the stems in *Xss* given in (15) seem to have only *sion* nominals. Some verbs given in (14) have nominals ending in *ence*. Nominals spelled with *ence*, *ent*, *ment* and *tion* are derived from verb stems which have the same or similar spelling as in (14) and (15). These are given below:

- | | | | | |
|------|----------|-------------|-----------|---------------|
| (16) | converge | convergence | assess | assessment |
| | deterge | detergent | occur | occurrence |
| | recur | recurrence | improvise | improvisation |

extort extortion

Now we will consider the differences in morphological functions that lie between *tion* and *sion*. Nominals ending in *tion* have two different sources. One of them is formed by suffix *ion*, and the other is produced by appending the suffix *V + tion*. These two *tion* nominals should not be confused. Consider the following examples:

- (17) a. Nominals ending in *ion*
 edit edition, delute delution, erect erection
 b. Nominals ending in *tion*
 exude exudation, eternize eternization, exclaim exclamation
 exult exultation, expose exposition

We can say that there are four morphophonemic properties between *tion* in (17)a, *tion* in (17)b and *sion*, though their phonological representation are the same. Each morphophonemic property is illustrated as follows:

- (18) a. *S* in *sion* is produced from several different consonants through consonant alternation process.
 b. *Tion* in (17)b uses thematic vowels when it appends to verb stems.
 c. The position of primary stress within a form shifts after appending suffix *tion* in (17)b to it.
 d. In both *sion* and *tion* in (17)b, tense stem vowels in verbs are in some cases shortened.

The property stated in (18)d is shown in nominals derived by *V + tion* and *sion*, but there are no nominals with the *tion* of (17)a that show this change of vowel quality.

From a historical viewpoint, some verbs which are sources of *ion* nominals were borrowed from Latin and some came into English from Latin by way of French. History, however, will reveal no useful generalization about the source of the spelling *sion*, even if we trace the verbs discussed here back to their Latin counterparts. Basically, nominals spelled with *sion* are reflexes of Latin Latin hominals ending in *siō* which is closely related with the Latin perfect participles with the ending in *sus*. In Modern English,

there are *sion* nominals which have no counterpart with the ending *siō*. These are Latin verbs corresponding to the verbs which have *sion* nominals in Modern English:

(19)	English	Latin	English	Latin
	confess	cōnfiteor	congress	congregior
	discuss	discutiō	impress	impremo(- ere)
	cohere	cohaereo	possess	possideo
	incur	incurro(- ere)	dissent	dissentio
	intort	intorqueo	repel	repello(- ere)
	emerge	ēmergo(- ere)	apprehend	apprehendo(- ere)
	admit	admitto(- ere)	ascend	ascendo(- ere)
	suspend	suspendo(- ere)	adrade	abrādo(- ere)
	provide	prōvideo	exclude	excludo(- ere)
	recede	recēdo(- ere)	scan	scando(- ere)
	disperse	dīspergo(- ere)	averse	āvertō(- ere)
	effuse	effundo(- ere)	divde	divido(- ere)

where endings in brackets are present infinitive and all the Latin verbs are given as present indicative first person singular.

Note that there is no verb of so-called first conjugation and the verbs of third conjugation are more in number than those of any other conjugations. Among the verbs of third conjugation, only *averto* has *t* in the stem, and *divide* belongs to a different class of conjugation from *provide* in Latin, though in English they seem to have the same stem. The Latin verbs in (19) show that only a few verbs belonging to second and fourth conjugation can be found among the verbs which have English counterparts as the sources of *sion* nominals. In Latin, the spelling *sion(em)* chiefly comes from nominals derived from the verbs of third conjugation. But even if this is true (and we can assume that it is), we cannot have recourse to this fact in order to describe *sion* nominals in Modern English. Moreover, it is clear that this does not mirror user's intuition.

We have discussed the sources of the spelling *sion*. Many examples investigated in the present paper give us the impression that the

verb stems relevant to *sion* nominals might share some common features. The relation between stem vowels and stem initial consonants or consonant clusters is given in the following table:

(20)

cons voc	r-	t-	p-	s-	k-	h-	v-	l-	m-	f-	pl-	cl-	sp-	gr-	pr-	tr-
ē (e)		○	○	○		○	○			○				○	○	
ī (i)	○			○		○	○	○	○							
ū (u)				○			○	○		○		○				○
ō	○										○					
ā	○															
æ			○										○			
ɔ		○														
ə			○		○		○		○							

What does this data tell us? We can claim that there are two remarkable tendencies. One of them is that in the stems or roots containing the combination *s, v, f, l* + narrow vowels, the degree of aperture is apt to keep lower, and the other is that in the stems or roots containing wide and middle vowels find a transition of the degree of aperture of the type described as Low.....High.....Low. Therefore, the spelling *sion* might appear and be preserved in accordance with the user's linguistic intuition based on the implicational tendencies stated here.

NOTES

- 1) See Yasui, M (1955) *Onsei to Tsuzuriji* (Sounds and Letters in English). Tokyo. Kenkyusha.
- 2) For detail discussion, see Aronoff, M. [1] pp. 98-114.
- 3) See Yasui, M. op. cit.
- 4) See Chomsky, N. and M. Halle [3] pp. 76-77.

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