Acknowledgements

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[s] Under the influence of alcohol

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1. Introduction

This paper discusses the behavior of the segment [s] when native speakers of English are under the influence of alcohol. It is widely known that the speech pattern of an individual changes with the consumption of alcohol, leading to the production of what is commonly referred to as slurred speech. A salient feature of slurred speech is the production of the voiceless post-alveolar fricative. Indeed, when English speakers desire to imitate or mock drunken speech, they inject the sound 'sh' in the discourse at regular intervals. There is evidence in the literature to support the claim that production of the voiceless post-alveolar fricative in intoxicated speech occurs as a result of palatalization of the segment [s]. Based on the data presented in the literature, I propose that the palatalization of [s] is not random. I believe that generalizations can be drawn about the environment where palatalization is most likely to occur. I consider some behaviors of [s] and the voiceless post-alveolar fricative in sober speech. Using what is known about [s] and the voiceless post-alveolar fricative in sober speech, I attempt to explain their behavior in intoxicated speech in terms of phonological theory.

2. Background

Adults speaking in their native language exhibit disordered speaking patterns when they are under the influence of alcohol. Alcohol presents the speaker with a host of challenges to all aspects of language production. Any or all of the lexical, syntactic, morphological, and phonological processes may become degraded.

Sentence-level / gross effects

When intoxicated, speakers may have difficulty retrieving words from memory, leading to pauses and false-starts as sentences are formed (Chin & Pisoni, 1997, p.143). Speakers may reverse or substitute words within a sentence to form 'slips of the tongue', or 'spoonerisms' (Cutler, 2004).

Supra-segmental effects

The drunken speaker may also experience supra-segmental changes to speech. The supra-segmental effects include changes in speaking rate, fundamental frequencies, and pitch variability (Johnson & Pisoni, 1990).

Because alcohol adversely affects an individual's motor skills, the ability to control the active articulators is impaired. The amount of time required to complete some articulations may increase. Other articulations may be cut short prematurely, resulting in only a partial articulation. Intoxication results in an overall decreased rate of syllable production (Chin & Pisoni, 1997, p. 245). Several studies indicate that the time duration of consonants is affected more than the time duration of vowels. Lester and Skousen (1974) state, "lengthening is found for the most part in consonantal segments" (p. 233). Pisoni (Chin & Pisoni, 1997) concluded, "the increased

sentence duration was due largely to increased durations for voiceless segments as opposed to voiced segments" (p. 180). Because the time required to produce some segments changes, but remains nearly the same as in sober speech for other segments, the overall result is syllable distortion. Drunken speech does not sound the same as slow sober speech (Lester & Skousen, 1974).

Alcohol intoxication also affects formant frequencies and pitch variation (Chin & Pisoni, 1997). The average frequency of the second and third formants becomes lowered in intoxicated speech (Chin & Pisoni, 1997, p. 212). Alcohol also can cause a wider variation in fundamental frequency than during sober speech (Johnson & Pisoni, 1990). The consequence of these two effects is speech that sounds lower in pitch overall, and that appears less stable.

Segmental effects

In addition to sentence and syllabic level issues, the speaker may also make errors at the segmental level. The types of segmental errors that have been observed include: deaffrication, spirantization of stops, incomplete production and deletion of liquids, final-consonant devoicing, and palatalization of the fricative [s].

Stops, affricates, and nasals

Production of stops and the stop portion of affricates requires a momentary complete blockage of airflow. The failure to achieve complete closure during stop production in drunken speech results in a fricative-like production (Chin & Pisoni, 1997, p. 181). In a study performed by Lester & Skousen (1974), both the voiced and voiceless English affricates were realized as fricatives. Pisoni provides evidence that misarticulation of stop consonants can also occur across word boundaries in connected speech (Chin & Pisoni, 1997). Pisoni cites an example involving production of the phrase "garbage cans" by an intoxicated speaker. The phrase contains a voiced affricate in the coda of one word immediately followed by the voiceless velar stop in the onset of the second word. The speaker failed to achieve complete closure for either segment (Chin & Pisoni, 1997, p. 181).

Liquids

Errors or complete deletion of liquids [l] and [ɹ] may occur (Chin & Pisoni, 1997, p. 177). The effect on [l] is less pronounced when [l] occurs as the single segment in the word-initial onset, and is more likely to occur when [l] is located non-initially or in unstressed syllables (Chin & Pisoni, 1997, p.264).

Final consonant de-voicing

Word-final obstruents become devoiced in intoxicated speech (Lester & Skousen, 1974). Pisoni observed speakers failing to achieve voicing for word-final fricatives (Chin & Pisoni, 1997, p. 184).

Palatalization of [s]

Lester and Skousen (1974) first reported an alcohol-induced palatalization of the segment [s] in native speakers of English. In 1985, Pisoni also reported having seen instances of productions of [s] as [ʃ] in intoxicated speech (Chin & Pisoni, 1997, p. 184). In 1993, a more detailed study of the environment in which [s] becomes palatalized was conducted by Johnson et al. (1993). The Johnson study utilized a data word list containing instances of the segment [s] occurring singularly in an onset, singularly inter-vocalic, and in contact with stops and affricates. Details of each of these studies are provided in the next section.

3. Literature Review

The data relevant to the discussion of palatalization of [s] comes from three distinct periods of investigation into the nature of alcohol's effect on speech. The first set of data comes from Lester and Skousen (1974), who first documented an alcohol effect on the segment [s]. The second set comes from the investigation of the Exxon Valdez accident, in which Pisoni and Johnson analyzed voice recordings of the ship's captain, Joseph Hazelwood, looking for possible indications of intoxication (Johnson, Pisoni & Bernacki, 1990; Tanford, Pisoni & Johnson, 1992). Among the features that they searched for in the voice recordings was the palatalization of [s]. The third data set results from laboratory research that was conducted by Johnson et al.(1993), with the purpose of isolating the environment in which palatalization occurs.

Lester and Skousen (1974)

The intoxicated subject was asked to read words from a prepared list, and then engage in a few minutes of impromptu monologue or dialog with one of the test administrators. The prepared word list that was presented to the subjects is as follows:

(1) shrimp, Sue, shoe, light, bed, bread, rabbit, church, judge, spin, pin, sing, witch, which, mom, none, pray, play, right, refrigerator, leisure, garage, cut, dog, yes, happy, historical, first, tough, this, thin, either, ether, zoo, tease, keen, bait, bought, book, locomotive, joy, house, kill, hand, mush, lust, stress, bet, tooth, bin

The authors report that [s] was realized as the voiceless post-alveolar fricative in the following words:

(2) yes, spin, first, lust, stress*, historical

** In the case of the word 'stress', the [s] occurring in the onset was palatalized. The [s] occurring in the coda was not palatalized*.

Note that there are other words in the list that contain the segment [s] for which the authors do not mention observing palatalization. These words are the following:

(3) Sue, sing, this, house

Note that words containing the voiceless post-alveolar fricative appear in the list in (1). They are as follows:

(4) shrimp, shoe, mush

Of the three words in (4), the authors confirm that the first word, *shrimp*, was correctly produced. No information is given about production of [ʃ] in the remaining words in (4).

The Exxon Valdez Accident

The data comes from the investigation of the Exxon Valdez accident that occurred on March 24, 1989. Audio tapes of the voice of the ship's captain were obtained by the National Transportation and Safety Board (NTSB). At the request of the NTSB, linguists lead by David Pisoni and Keith Johnson analyzed the tapes for indications of alcohol intoxication in the captain's speech. The results of the investigation were published in several reports. I present information from two of the reports below. Following the data from the reports, I also provide a transcript of the Exxon Valdez's captain's words at the time of the incident.

Accident Report (Johnson et al., 1990)

The data from the voice recordings made on board the Exxon Valdez contained a great deal of background noise. Performing transcriptions manually proved to be difficult. Therefore, acoustic analyses were performed to examine the supra-segmental characteristics of the captain's speech and his production of the segment [s] in the word 'sea'.

The researchers sampled the data at five time periods, with the goal of comparing the captain's speech before, during, and after the grounding of the ship. They chose the time points of -33 hours, -1 hour, time of the accident, +1 hour, and +9 hours. Negative time represents points in the tape before the accident. The data from the samples is shown below in Table 1.

Table 1. Indications of [s] palatalization and supra-segmental effects in samples from Exxon Valdez tapes

	-33 hours	-1 hour	time of the accident	+1 hour	+9 hours
sea [si]	[s]	[s]	[ʃ]	[ʃ]	[s]
Exxon [ɛksɑn] or [ɛksən]	[s]	no data	[ʃ]	no data	no data
supra-segmental effects	none	yes	yes	yes	none

Five occurrences of the word *sea* were identified in the tapes corresponding to the five time references. The two occurrences of the segment [s] for the time periods prior to the accident did not show evidence of palatalization. The samples at the time of the accident and at 1 hour afterward showed evidence of palatalization. The final sample, taken at a point 9 hours after the accident, did not show evidence of palatalization.

Supra-segmental changes were found at the time intervals 1 hour prior to the accident, time-of-accident, and 1 hour after the accident. These supra-segmental effects included a slower speaking rate, lower fundamental frequency, and greater variation in pitch (p. 225). The authors provided arguments against the possibility that the supra-segmental changes could have been due to fatigue or emotion. The authors concluded that the supra-segmental effects were most likely due to intoxication.

What gave the researchers difficulty was explaining why data at the time interval 1 hour prior to the accident showed supra-segmental changes, but no palatalization of [s] in the word *sea*. The authors concluded their report by stating that, based on the supra-segmental evidence, the captain was likely to have been intoxicated at the time of the accident. However, establishing the captain's state of intoxication with complete certainty was not possible due to the absence of palatalization of [s] in the word *sea* at the time 1 hour before the accident (p.236).

Accident Report (Tanford et al.,1992)

This report regarding the Exxon Valdez accident contains an interesting comment regarding palatalization of [s] in the word *Exxon*. The researchers state that they paid particular attention to the [s] production in the phrase 'Exxon Valdez'. They noted that, although the captain pronounced *Exxon* correctly the day before the accident (-33 hours), he produced it as [ʃ] at a point in the tape around the time of the accident. They state that the production of the voiceless post-alveolar fricative was perceived audibly and was also confirmed by spectral analysis.

Data (Exxon Valdez Audio Archives and Transcript)

Archives containing excerpts of the voice recording and a transcript of the captain's call to the Valdez traffic center to report the incident are available online. A copy can be found at the Anchorage Daily News website at http://www.adn.com/evos/pgs/intro.html. A copy is also available at The Whole Truth, located at http://www.wholetruth.net/history.htm. Below, I present the transcript of Captain Hazelwood's words spoken just after the grounding of the ship.

> Hazelwood: "Yeah. Ah, It's Valdez back. Ah, we've- ah, should be on your radar there- we've fetched up, ah, hard aground, north of Goose Island, off Bligh Reef, and, ah, evidently, ah, leaking some oil and, ah, we're gonna be here for a while and, ah, if you want, ah, so you're notified."

Note that the captain's words contain four occurrences of the segment [s].

(5) It's, Goose, some, so

Johnson et al., 1993

Words were chosen with [s] located in different word positions, word-prosodic environments, and sentence-prosodic environments. The set of words consisted of three subsets: s-words, s-ch words, and sh-words. The speakers were asked to read the sentences as their blood alcohol levels were increased during the test.

(6) s-words: saw, possible, possibility, posterior

(7) s-ch words: postulate, posturing, postulatable

(8) sh-words: shah, posh

Words in (6) and (7) differ in that all of the [s] segments in (7) are followed by the voiceless affricate. The words in (8), containing [ʃ], were chosen as a control group for comparison purposes. All test words were contained in sentences. To examine effects of sentence prosody, pairs of sentences were constructed in which emphatic stress fell either on the test word or on a word preceding the test word. The speaker's productions were measured using acoustic equipment.

The results showed that the words in (6) and the words in (8) were produced faithfully. However alcohol did affect the s-ch words in (7). Measurement of the production of the segments [stʃ] in the word *postulate* showed that the speakers failed to achieve full stop closures.

4. Analysis of Data

Lester and Skousen (1974) reported seeing palatalization of [s] in the words in (2). Among the words in (2), one word, *yes*, contains a single [s] segment in the coda position. Two words, *spin* and *stress*, contain [s] in an onset cluster. Two words, *first* and *lust*, contain [s] in a consonant cluster in the coda. The final word, *historical*, contains [s] appearing as a single segment coda immediately followed by a stop consonant in the onset of the following syllable.

Lester and Skousen (1974) did not explicitly state how the words listed in (3) were realized by the speakers. However, the fact that the authors did not mention palatalization for these words leads one to the assumption that there was nothing remarkable about their production. A lack of evidence to the contrary indicates that the speakers faithfully produced the segment [s] in these words. Therefore, the data in (3) is evidence that [s] can be produced faithfully by intoxicated individuals.

By looking at (3), some interesting observations can be made. Note that each of the words in (3) contains [s] as a single segment. In (3), [s] appears twice in the onset, *Sue* and *sing*, and twice in the coda, *this* and *house*. The word *stress* listed in (2) also contains an example of the segment [s] which was not palatalized. In *stress*, the first [s], located in the onset cluster, became palatalized. The second [s], occurring as a single segment in the coda, was not palatalized. Lester and Skousen (1974) provided a transcription for the word *stress*, clearly showing production of the voiceless post-alveolar fricative in the onset, but not in the coda.

Of the data listed in (2), one can see that there were five occurrences of [s] in a cluster or next to an adjacent stop consonant. All five of these occurrences underwent palatalization. However, the behavior of [s] as a single segment is not as clear. There are six occurrences of [s] as a single segment in the word list in (1). Only one occurrence, in the word *yes*, became palatalized. The remaining five of the six cases did not.

Lester and Skousen (1974) did not draw any generalizations regarding the environment where [s] is realized as the voiceless post-alveolar fricative. From looking at the data in (2), the claim that palatalization of [s] occurs exclusively in the environment of adjacent consonants is prevented by the existence of palatalization in the word *yes*.

It is curious that the single segment [s] in *yes* was affected, but the single segments in *Sue*, *sing*, *this*, *house,* and *stress* were not. If an explanation for the palatalization in *yes* could be found, perhaps a generalization of the behavior of [s] in intoxicated speech could be made from the Lester and Skousen data.

One possible cause for palatalization in the word *yes* might be found by examining the onset of the following word in the list. Looking at the data in (1), we find that *yes* is followed by the word *happy*.

(9) *yes, happy*

The onset of *happy* contains the glottal fricative [h] in the onset. Although the segment [h] is considered a fricative, it has qualities that are sonorant-like. It is difficult to justify palatalization of [s] in the word *yes* by the existence of a consonant cluster formed across the word boundary with *happy*. The realization of the segment [s] as the voiceless post-alveolar fricative in the word *yes* is an anomaly in the Lester and Skousen (1974) data set.

More than a decade later, Johnson et al. (1990) attempted to apply what was known about alcohol's effect on the production of [s] to solve a real-world question. Was the captain of the Exxon Valdez under the influence of alcohol at the time of the accident?

Johnson et al. (1990) measured the production of the single segment [s] in the onset of

the word *sea* at various points in the recording. Through acoustic analysis, they found evidence that some of the productions of the segment [s] in *sea* had frequency profiles characteristic of the voiceless post-alveolar fricative. However, not all instances of the segment [s] in *sea* showed evidence of palatalization.

Johnson et al. (1990) found supra-segmental indication of intoxication in the captain's speech at the time of the accident. The transcript of the captain's call to report the accident, made at approximately the same time that supra-segmental effects of intoxication were evident, contains four words containing the segment [s] (see (5)). When the captain reported the accident, he spoke two words containing [s] in the onset: *some* and *so*. Two words contained [s] in the coda: *it's* and *goose*. Johnson et al. (1990) do not report observing palatalization of any of these words.

The only audible palatalization of [s] that the investigators report was the captain's production of [s] in the word *Exxon*. In the word *Exxon*, [s] occurs immediately after the voiceless velar stop as the onset of an unstressed syllable. The authors state that their subjective observation of the palatalization of [s] in *Exxon* was confirmed by spectral analysis (Tanford et al., 1992, p. 583). However, they do not specifically state that the palatalization of [s] in *sea* was audible to the human ear. The subjective evidence seems to indicate a stronger post-alveolar production in the word *Exxon* than in the word *sea*.

Approximately one year after the final reports on the Exxon Valdez accident were published, members of the investigating team, Johnson, Southwood, and Schmidt, performed research on the production of [s] by intoxicated speakers. Under controlled laboratory conditions, they examined production of [s] in various phonological environments. Johnson et al. (1993) found that only the words in (7), where [s] is followed by the voiceless affricate, underwent palatalization. The words in (6) did not.

Of the words in (6) that were produced faithfully by the intoxicated speakers, [s] occurs as a single segment, either in the onset or between vowels. The word *posterior* also is listed in (6). In *posterior*, [s] is located at a syllable boundary to an adjacent stop.

The lack of palatalization in the word *posterior* seems to contradict the observations that Lester and Skousen (1974) found in the word *historical*. Both *posterior* and *historical* have similar environments for [s]. [s] appears in the coda of an unstressed syllable and is adjacent to a stressed syllable beginning with the voiceless alveolar stop consonant [t].

However, the data from Johnson et al. (1993) does confirm in a general way what was observed in the Lester and Skousen (1974) data and in the Exxon Valdez voice recordings. The first conclusion that can be drawn is that alcohol intoxication may indeed cause the realization of [s] as the voiceless post-alveolar fricative. However, palatalization of [s] is not obligatory. It is possible for an intoxicated speaker to produce [s] faithfully. In this sense, palatalization of [s] due to intoxication is not a predictable process in English, as is the process of voice matching in the realization of the /-s/ suffix in the third person singular and plural morphology, for example. The fact that intoxication may produce, but does not entail, palatalization of [s] has consequences for anyone attempting to use this research in a legal setting to prove a state of intoxication or sobriety in a given speaker.

Second, it is likely that palatalization is a function of the proximity of [s] to adjacent consonants. It is unlikely that palatalization will occur for single [s] segments, whether they are located word-initially in the onset, word-terminally in the coda, or between vowels. Palatalization is likely to occur when [s] is located in a cluster or next to a consonant in an adjacent syllable and highly likely if [s] is adjacent to an affricate.

5. Discussion

Tanford et al. (1992) write that "Although some segmental effects may accompany any kind of loss of motor control, the substitution of an /sh/ sound for /s/ seems to be unique to loss of control caused by alcohol" (p. 582). Reading this statement, one may get the impression that palatalization of [s] is a bizarre phenomenon only seen in persons under the influence of alcohol. In fact, palatalization of [s] to [ʃ] happens regularly in English among sober speakers.

One readily observable palatalization of [s] as [ʃ] occurs when morphology is applied to words ending in [s]. Adding a suffix of the form [i+vowel] to a word ending in [s] will result in the palatalization of the [s] (Roca & Johnson, 1999, p. 557). Examples of suffixes of this type have the following English spellings: *-ion, -ial, -ious*. Appending any of these suffixes to a word ending in [s] will cause [s] to be produced as [ʃ]. *Impress* [ɪmpɹɛs] becomes *impression* [ɪmpɹɛʃən], *race* [ɹeɪs] becomes *racial* [ɹeɪʃəl], and *grace* [gɹeɪs] becomes *gracious* [gɹeɪʃəs].

Palatalization of [s] also occurs in connected speech when a word ending in [s] is unstressed and the glide [j] immediately follows in the onset of the next word (Avery, 1992, p. 88). Although palatalization of [s] in this situation does not occur with the same frequency as palatalization due to added morphology, the effect is just as predictable. Example sentences are: "*This young man is a linguistics student*." and "*Pass your plate over here*." When spoken casually by a native speaker of English, "*this young*" becomes [θɪʃɑŋg] and "*pass your*" becomes [pæʃɚ].

[s] and [ʃ] are in complementary distribution in English onset clusters. In English, onset clusters containing [s] can be formed as follows: [sl], [sk], [sp], [st], [sn], [sm], and [sw] (Nilsen, 1973). Although [s] can form a valid onset with the liquid [l], the same does not hold true for the liquid [ɹ]. [s] appears in onset clusters with [ɹ], but only in the three-consonant clusters. It seems like [sɹ] is missing from the list. However, the cluster [ʃɹ], which is the only onset cluster in English containing [ʃ], is valid. The fact that [sɹ] is missing, and that [ʃɹ] is the only valid onset cluster containing [ʃ] suggests that [ʃ] is an allophone of /s/ in English onset clusters.

Knowing that there is a relationship between [s] and [ʃ] in English doesn't fully explain why intoxicated speakers palatalize [s]. It is also necessary to consider the environment where palatalization occurs. Table 2 below summarizes the observations provided in the literature.

Table 2. Behavior of [s] and [ʃ] in intoxicated speech

[s]	[ʃ]	syllable structure	markedness	likeliness of [ʃ]
Sue,sing,this,house, sea, saw, possible, possibility	sea,yes	CV, CVC, CVC + V	relatively unmarked	unlikely
posterior	spin, first, lust, historical	CCVC, CVC+C	marked	likely
	Exxon	VC + C		
	stress postulatable, posturing, postulate	CCCVC CVC +CC	most marked	highly likely

The results of the research show that palatalization is least likely to occur for the syllable structures CV, CVC, and CVCV. The data in the literature show that words with these structures were often produced correctly by intoxicated speakers. These structures are relatively unmarked. The likelihood of palatalization increases when [s] is located in a cluster or adjacent to a consonant: CCVC, CVCC, and VCC. These structures are more marked. In the case where [s] is located adjacent to an affricate, the likelihood of palatalization is greatest, and the structure is also most marked, CVCCC. There is no data available in the literature to indicate that an intoxicated speaker can faithfully produce [s] when it occurs adjacent to an affricate.

It seems that alcohol intoxication degrades the active articulators to the point where the speaker is incapable of producing the more marked syllable structures involving [s]. It makes intuitive sense that marked structures would be more problematic than unmarked structures, but why is palatalization of [s] the mechanism that is employed? After all, intoxicated individuals are not the only speakers who have difficulty in producing marked structures. Children and second language learners also face challenges. Why don't intoxicated speakers employ some of the means that members of those groups use, such as epenthesis or deletion, to deal with [s] in marked environments?

In children, deletion is typically employed in [s] cluster production (Barlow, 1998, p. 4). On the other hand, second language learners usually epenthesize to reduce [s] clusters (Carlisle, 1992,). For native speakers of Spanish, epenthesis in English words occurs when [s] is adjacent to stop consonants (Carlisle, 1992, p. 71).

Optimality theory provides an explanation of why the surface form of speech produced by children and second language learners differs from the underlying lexical form. The language learner ranks adherence to an unmarked output higher than faithfulness to marked structures. For both children and second language learners, language acquisition is a process of re-ranking constraints to gradually permit marked structures. The fact that language learners employ strategies such as epenthesis and deletion demonstrates that their ranking system does not permit marked structures. However, this is not the case for adult native speakers of the language.

According to optimality theory, a sober, adult native speaker of a language possesses a mature ranking system that allows for the marked structures.

If an individual's ranking system is such that faithfulness to marked structures outranks all other constraints, what happens when that person becomes intoxicated? Is the influence of alcohol sufficient to alter an individual's markedness constraints?

The temporary effects of alcohol do not re-order an adult's ranking system (Hale, 1998). Lester and Skousen (1974) write "perceptually, the drunken speaker is very much aware of his mispronunciations of s's, but finds it nonetheless very difficult to pronounce them correctly" (p. 238). Because the intoxicated speaker does not view the marked structures in English as violations of the ranking system, a coping strategy, such as deletion or epenthesis, designed to decrease markedness is not employed. The intoxicated speaker has every intention of producing a surface form that is faithful to the underlying form.

In the data listed in (2), the coronal voiceless stop [t] immediately follows the [s] in four of the six words: *first*, *lust*, *stress* and *historical*. In these cases, the speaker must successfully move the tongue forward to create the restricted airflow for the [s], and then immediately move it upward to form a stop closure. The intoxicated individuals in the study attempted to do these two movements. However, in anticipation of positioning the tongue to form the coronal stop [t], the formation of [s] became degraded. The tongue fell slightly farther back in the mouth, in a slightly more relaxed state, and allowed greater airflow. The words in (7) present the intoxicated speaker with a similar challenge of raising the tongue to produce a stop immediately after [s]. In (7), the speaker must restrict airflow to form [s] and then raise the tongue to the palate and completely stop airflow to form the affricate [tʃ].

In the case of the word *Exxon*, [s] is preceded by a stop consonant. The speaker is required to place the tongue in the back position to produce the stop [k], and then immediately move it forward to restrict the airflow to form [s]. In the literature, these two successive movements proved to be difficult for the speaker. The diminished control of the active articulator resulted in a production of [s] which fell short of the front position, and did not restrict airflow sufficiently, resulting in something closer to [ʃ].

An alcohol effect is less visible when [s] occurs adjacent to a vowel. In simple CV words, such as *sea*, or *Sue*, the speaker is not required to make rapid successive tongue movements. The tongue is held in the same position throughout the duration of the vowel. Even in a diminished state, the speakers under the influence often managed to move the tongue forward, maintain it there, and restrict air tightly enough for proper production of [s].

6. Conclusion

The literature indicates that palatalization of [s] due to alcohol intoxication is possible, but not guaranteed. [s] is likely to be produced as [ʃ] when [s] occurs adjacent to stops and affricates. The production of [s] as [ʃ] can be explained as an attempt to honor faithfulness constraints in marked structures when the articulatory skills are in a degraded condition.

References

Avery, P., & Ehrlich, S. (1992) *Teaching American English Pronunciation*. Oxford: Oxford University Press.

Barlow, J. & Dinnsen, D. (1998) Asymmetrical Cluster Development in a Disordered System. *Language Acquisition*, 7(1), 1-49.

Carlisle, R. (1992) Environment and Markedness as Interactive Constraints on Vowel Epenthesis. *NewSounds* 92.

Chin, S., & Pisoni, D. (1997). *Alcohol and Speech*. San Diego: Academic Press.

Cutler, A. & Henton, C. (2004). There's many a slip 'twixt the cup and the lip. *On speech and language: Studies in honor of Sieg Nooteboom*, 37-45. Utrecht, The Netherlands: Netherlands Graduate School of Linguistics (LOT).

Hale, Mark & Reiss, Charles. (1998). Formal and Empirical Arguments concerning Phonological Acquisition. *Linguistic Inquiry*, 29(4), 656-683.

Johnson, K., Pisoni, D., & Bernacki, R. (1990). Do Voice Recordings Reveal whether a Person Intoxicated? A Case Study *Is. Phonetica*, 47, 215-217.

Johnson, K., Southwood, M.H., Schmidt, A.M., Mouli, C.M., Holmes, A.T., Armstrong, A.A., ...Wilson, A.S. (1993). A physiological study of the effects of alcohol on speech and voice. In S.Chin & D. Pisoni (Eds.) *Alcohol and Speech* (258-268). San Diego: Academic Press.

Lester, L. & Skousen, R. (1974). *The Phonology of Drunkeness*. Papers from the parasession on natural phonology, 233-239.

Nilsen, D. & Nilsen, A. (1973). *Pronunciation Contrasts in English*. Long Grove: Waveland Press.

Roca, I. & Johnson, W (1999). *A Course in Phonology*. Malden: Blackwell Publishing

Tanford, J., Pisoni D., & Johnson, K. (1992). *Novel Scientific Evidence of Intoxication: Acoustic Analysis of Voice Recordings from the Exxon Valdez*, The Journal of Criminal Law & Criminology, 82(3), 579-609.

The Whole Truth. (2009). Retrieved from http://www.wholetruth.net

On Language Use: A Theoretical Treaty on the Workings of Language.

THAMIR HILANTO

Abstract

This paper reviews past and current theories on language use and proposes an alternative perspective on how to view language. The senses are at the forefront of language creation. A given stimuli will initiate one or more senses thus sending signals to the mind, which continues the language process often resulting in some speech output. The language model presented has a linear directionality: sense → image → thought → speech act. Each of the elements is dependent upon one another, but language can occur at any point beyond the stage of sense. At the point of a speech act, language universals must be considered to help choose a workable framework in which to analyze speech acts and utterances. Moreover, language can only be understood in terms of contact with the outside world in relation to ones prior experiences, thoughts, and images. Concepts in language such as speech act, image, and utterance are revisited and redefined to accommodate the theory presented.

"I think therefore, I am". French philosopher Rene Descartes (1984) reasoned that his existence was based on an ability to think. However, what does it mean to think? Is thinking a necessary predecessor to language, or is there something else that precedes thought? Einstein was said to have thought in images or pictures[1]. This raises another question: what are the characteristics of a mental image? Furthermore, does the image precede or follow the thought? Much of what we have read and studied in class has centered on defining language from a perspective of utterances or speech acts[2], and some discussion about thought in language. In our class discussion about speech acts, Sarah brought up a thought-provoking comment on the role of images in language (Alamoudi, 2010). The first question that came to my mind was: what sparks an image in the mind? The answer to what generates an image, I believe, should have a universal component, and it would operate on an unconscious level in the mind. The answer to the beginning of language[3] use, I believe, is the senses: touch, smell, sight, taste, hear, and possibly intuition. The

[1] Arguments have been made that Einstein's ability to think in images is attributed to a unique growth pattern in his brain. An autopsy on Einstein's brain showed that the Sylvian fissure was largely absent, and therefore an expanse in the parietal lobes may have created a more efficient communication system between neurons (Abraham, 2002).

[2] In this paper, I do not differentiate between *utterance* and *speech act*. In the most basic form, they are simple stringed words which are spoken by an individual.

[3] The definition of language I propose is general and widely encompassing: *Language is a system of communication.* It can be a speech act, sign language, a gesture, body language, writing, a painting, a sculpture, or even a chess game. In short, it is any form of communication generated by a human or an animal intended for oneself or others.

role that these senses play in relationship to images, thoughts, and speech acts is fundamental in understanding language use and language competency.

Most of our senses are essential to social interaction. Hearing and sight are used as mechanisms to gather input; the brain then processes the input, and will generate some type of output. For those who are impaired and lack the capacity to hear or see, other senses may compensate. A blind person can use the sense of touch for input, running fingers across an object, or maybe someone's face to create a mental picture of an object or person. A deaf person could compensate by using sight to read the lips of a speaker, and understand a given utterance with the same competency as a person who has the ability to hear. Intuition is a more abstract sense, often referred to as the sixth sense. Intuition involves knowledge of the world, which relies on instinct (e.g. maternal instincts, twins who are aware of the sibling's thoughts or feelings), and is separate from the other senses. Consider for a moment a person who is devoid of all senses. There would be a complete absence of input, and without input, there cannot be language. However, if just one of the senses is operable, language is possible. The beginning of all language and social interaction, I believe, is the ability to sense.

The senses gather input and from the input a mental image is created. The image that is constructed in the mind is a combination of the input just received and the previous input from one's past experiences and contact with the world. Moreover, from identical input, distinctive images may be produced from one person to another. To illustrate, consider the following utterance: "You have a lovely wife and daughter." A guest may offer this compliment to an American man upon leaving his home, and the American may likely form an image, or series of images, of a guest praising him for choosing a beautiful wife as his bride, and raising a charming daughter. The same compliment offered to a Middle Eastern Muslim man may trigger an image, or series of images, of the guest attempting to have a sexual encounter with his wife and daughter. Clearly, culture plays an integral role in the image constructed from one individual to another. Edward Sapir spoke of an "auditory image", which necessarily precedes speech (Sapir, 1921, p.15). However, where Sapir states that "sound is replaced by the visual image", I propose that any of the senses may generate (not replace) a mental image (Sapir, 1921). Moreover, I believe that the image resembles more a mental picture, or series of mental pictures, of an event, rather than an "image of an articulation which corresponds to sound" (Sapir, 1921). From the mental image, as I have described, comes the thought.

Once the mental image is shaped, a thought reflecting the mental image is formed and the mind begins preparing for the next stage of language: output. The thought is strictly an internal mechanism, and may operate on a conscious, subconscious, or unconscious level. At the conscious level, we may offer a handshake to communicate a greeting or salutation, or just say "hello". Often when a person has repeated a certain speech act, such as a speech or lecture, the speaker operates on a subconscious level speaking to an audience without consciously thinking about what is being said. The unconscious realm of thought may occur in dream states. In an unconscious state, sleep talking can take place, and is at times intelligible and other times not. That being said, all three states of thought (conscious, subconscious, and unconscious) have an unconscious component. The neurons in the brain fire despite our control, and we could not order our neurons to stop firing in the same manner as a conscious command to stop speaking. The dilemma with thought is that it is abstract and cannot be studied empirically. It is also limited in terms of communicating to others, unless Man, someday, evolves to use telepathy. Therefore, what often proceeds thought is the stage in language which produces a communicable output: the utterance.

A thought may materialize into an utterance, and it is at this point that empirical evidence may be used to better understand the processes of language. Theories into the operations and proper analyses of speech acts are numerous. Is a grammatical approach suitable where we speak of subjects, direct and indirect objects, topic markers, and predicates? Or should we look at thematic relations between the actors such as agent, patient, experiencer, theme, goal, etc. where verbs are associated with a number of theta-roles (Gruber, 1970)? Or should utterances be viewed as a product of pre-existing rules which undergo transformations from deep to surface structure (Chomsky, 1965)? Or is there a plethora of pre-existing rules to which everyone has access, and is ranked in terms of salience according to one's language, dialect, or idiolect (Prince & Smolensky, 2004)? There are a number of theories on how one should go about analyzing utterances to explain language use. The argument for an innate mechanism that allows us to take our thoughts and transform them into speech acts is credible. However, the matter of a deep and surface structure filled with transformations, or a system of ranking which guides the structure of language, I find analogous to Hollywood's portrayal of reality……much art and little matter. To investigate the use of language in terms of speech acts or utterances it may be best to begin with language universals:

1. We have five (possibly six) senses, the ability to think, and the ability to speak.
2. We are self-reflecting and social creatures, and, therefore, target our utterances towards one another, and sometime towards ourselves.
3. There are various registers in language which are determined by social customs and hierarchies.
4. We have the capacity towards creativity and unpredictability.
5. There are a number of intentions in the use of language (e.g. convince, entertain, direct, inform)
6. Acquiring an additional language after fluency in the native language(s) is considerably more difficult.

Considering universals #2, #3, and #5 it seems most logical to analyze utterances from a perspective of thematic relationships. The speech act itself is dependent upon the social context, the relationship between the actors, the communicative intention of the speaker and listener, and the immediate physical/environmental surroundings. Thus, language use and competency may be better understood by investigating relationships of Man to Man, Man to Nature, and Man to himself. Observing, noting, and documenting the interactions and utterances of these relationships in a wide variety of social context may provide a clearer understanding of the complexities of language.

To understand the operation of a model (e.g. language model), one should consider the *modus operandi* from beginning to end. If phases in the operation of the model are ignored or set aside, for whatever reason, there is a risk that the conclusions drawn on the nature of the model are rendered faulty or incomplete. The language model I propose, in the form of a general framework, contains the following hierarchy: 1) sense creates an image 2) image triggers a thought 3) thought may conclude in a speech act. As described earlier, there are numerous ways to express a thought other than speech acts, including the decision to internalize the thought. Descartes believed that thought defined Man's existence, and intimated that language began with thought. Thought, I believe, has an important function in language. However, there is a catalyst which instigates the thought process. Perhaps a more suitable maxim is *I sense, therefore I am*.

References

Abraham, C. (2002). *Possessing Genius: The Bizarre Odyssey of Einstein's Brain* (1st ed.). St. Martin's Press.

Alamoudi, S. (2010, September 11). *Speech Acts*. Class Discussion, George Mason University.

Chomsky, N. (1965). *Aspects of the Theory of Syntax*. Cambridge: M.I.T. Press.

Descartes, R. (1984). *The Philosophical Writings of Descartes*. Cambridge [Cambridgeshire]: Cambridge University Press.

Gruber, J. S. (1970). *Studies in lexical relations*. Indiana University Linguistics Club.

Prince, A., & Smolensky, P. (2004). *Optimality Theory: Constraint Interaction in Generative Grammar*. Malden, MA: Blackwell Pub.

Sapir, E. (1921). *Language, an Introduction to the Study of Speech*. New York: Harcourt, Brace and company.

Making Phonological Sense out of Nonsense Poetry

JODI LAMM

Abstract

Poets like Carroll, Seuss, and others have defined the genre of Nonsense Poetry by making an art out of combining neologisms with poetic form, and giving their readers a sense that they know what is happening in a poem without having any idea what these new words mean alone. These poets must not only have knowledge about word rhymes and the rhythm of poetry, but they must also have a sense of what could phonologically constitute a word. An analysis of the neologisms contained in the poetry of nine different works will reveal exactly what the poets are phonologically aware of, and to what extent these poets can manipulate phonological constraints while maintaining the poetic form, and with it, some sense of meaning in their poetry. My aim in this categorization is to find out how far a nonsense poet can stretch the constraints on human language and still present a poem that reads easily for an English speaker. This tension between the sound and form of natural language and the creativity of neologisms comes through in the poems from which the data come. None of the nonsense goes so far outside the constraints of English, or even human language, that it is rendered meaningless within the poetry.

1. Introduction

With one read through Lewis Carroll's (1995) "The Jabberwocky," an English speaker is bound to notice two things: the poem seems to make "sense," yet there are words contained in it that they know have never appeared in the English language. Poets like Carroll, Seuss, and others have defined the genre of Nonsense Poetry. They have made an art out of combining neologisms with poetic form and giving their readers a sense that they know what is happening in a poem without having any idea what these new words mean alone. These poets must not only have knowledge about word rhymes and the rhythm of poetry, but they must also have a sense of what could phonologically constitute a word. An analysis of the neologisms contained in the poetry of nine different works will reveal exactly what the poets are phonologically aware of, and to what extent these poets can manipulate phonological constraints while maintaining the poetic form, and with it, some sense of meaning in their poetry.

1.1 Scope

While the genre of Nonsense Poetry contains works without neologisms, I will be looking only at those poems with neologisms and natural English within the same poetic form. I will look only at the phonology of the neologisms: whether they conform to English and human universal segment constraints and how they conform to English syllable structure. I am interested not in the meaning the neologisms intend, but how they adhere to these phonological principles. I am concerned with meaning only insofar as it may affect the pronunciation of a word. Essentially, I am interested in knowing what linguistic knowledge a poet attempting to create such nonsense possesses and how his "words" will demonstrate that such knowledge is not actually phonological nonsense.

1.2 Methodology

In my search for nonsense words I began with an anthology of the genre, and worked my way through poems containing any words that were clearly coined by the poet. If it did not look like a natural word of English, I considered it nonsense. These words were checked against the Merriam Webster (2010) online dictionary to ensure neologistic status. I then categorized the words into non-violating of English segments or structure, one violation of English segments or structure, or a violation of human language segment or structure. My aim in this categorization is to find out how far a nonsense poet can stretch the constraints on human language and still present a poem that reads easily for an English speaker.

2. Literature Review

As one of the most well known examples of nonsense poetry, Lewis Carroll's (1995) "The Jabberwocky" not only pulls the reader into an alternate universe simply by the creation of new words, but it also challenges a reader to accept these new words as legitimate parts of speech well suited to the rhyme and meter of the poem. Like Alice, the readers are drawn through the "looking-glass" into a world where the natural order of the world has been disturbed, and they question the meaning of known words while looking for meaning in words they do not recognize. It is precisely this tension between the real and the unreal that causes nonsense poetry to flourish. The combination of sounds may be unfamiliar, but the reader is able to make sense out of them within both a poetic framework and a phonological one. To what extent meaning is obscured is a matter of contention for some authors, but all agree that the strict adherence to pattern is what makes the poem maintain any sense of meaning overall, and there is a definite limit to how nonsensical the words can be in English Nonsense poetry.

Holquist (1969) reports Elizabeth Sewell's opinion on nonsense: It is "a collection of words of events which in their arrangement do not fit into some recognized system" (p. 150). Overall, this is the effect which nonsense poetry produces, but we will see that the words themselves actually do fit into a system: English phonology. Holquist (1969) himself writes on nonsense that, "It is a closed field of language in which the meaning of any single unit is dependent on its relationship to the system of the other constituents" (p. 150). Surely for these nonsense poets, the neologisms depend on the surrounding architecture of the English language in the poem.

For the poetry critic, nonsense poetry makes any definite meaning of language difficult to grasp, but the rhyme and rhythm of the poetry create an ideal setting for nonsense words to blend in and thrive. Flescher (1969) states that, "The backbone of nonsense must be a consciously regulated pattern" (p. 128). There must be a more stable situation for nonsense words in order to make any kind of meaning come through, and this setting consists of not only the form of poetry, but also the natural sounds, grammar, and stress pattern of the original language. The poem, this controlled form of language, almost completely overtakes meaning for Shires (1988): "Jabberwocky privileges form without regard for content; it privileges the metonymic over the metaphoric" (p. 276). To suit the theme of his story, Carroll uses strict form with nonsense words to create tension between order and disorder. For both Flescher and Shires there is a theme of

lost identity in the Alice stories, and the nonsense of "The Jabberwocky" and other poems I have included in analysis lend a voice to that theme by blurring the line between sense and nonsense.

Although Imholz (1987) does not go into depth phonologically, in his article evaluating translations of the Jabberwocky, he notes that the nonsense words of the English version are all pronounceable, and that it is important that they fit the pattern of sounds relative to the language in which they occur. Beyond the "Jabberwocky," then, there should be a pattern controlling exactly how nonsensical the created words can be in any poem of this genre. Whether a translation, or original creation in a specific language, the neologisms must inevitably succumb to the pattern of the language they are contained in. Imholz describes the translation of the original into new languages as a game: "The rules of this game require that we, like the author and the translator, maintain a perfect, though short lived, Humpty-Dumpty-like balance upon the narrow wall of language between sense and nonsense" (p. 225). It is clear that the strict poetic form along with a linguistic pattern define the sense, while the created words define the nonsense of this game.

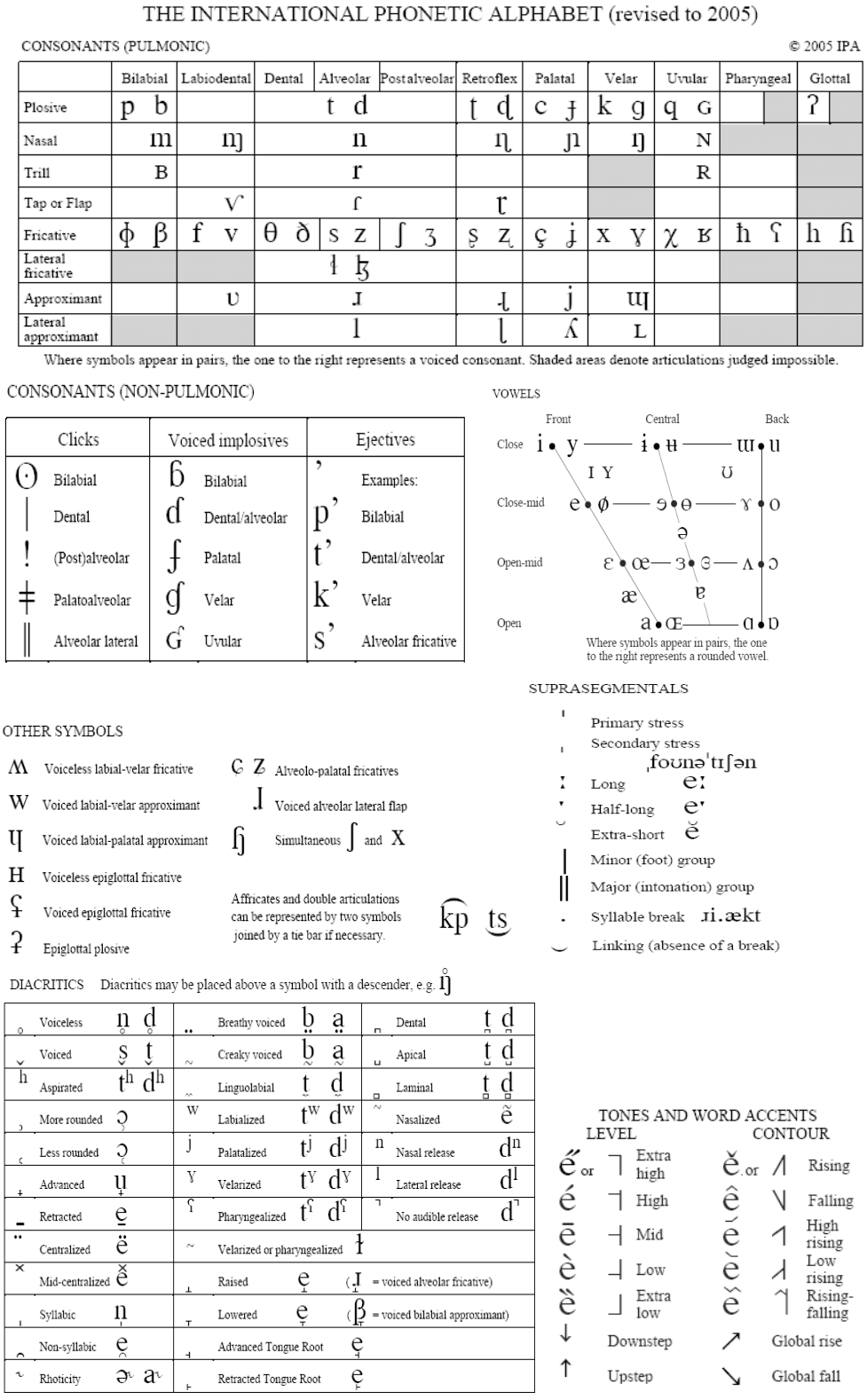
In a presentation on nonsense poetry, Weinberger (2005) details in a phonological framework the extent to which authors of this genre have taken their nonsense. He defines limits to the nonsense in segmental and syllabic terms, and categorizes the nonsense words of fifteen authors based on how far these words diverge from segmental and syllabic constraints of English and universal principals. The conclusion is that there are patterns to which the nonsense words conform, and no nonsense word strays from these. No words are deemed impossible for a human speaker, and most words, in fact, are possible for speakers of English. At the phonological level too, there must be order for the chaotic words of nonsense poetry to be placed into, just as there must be a rather strict poetic form.

These sources indicate that there must be some limits to nonsense. For the poetry I will look at, those limits include the rhyme and rhythm of the poem as well as phonological constraints for the nonsense words themselves. The words should conform to English or any language the poem is translated into while maintaining their nonsense appeal. The words may have no meaning in the language, but the use of them, for Carroll, adds to the tension between order and disorder that is thematic in his work featuring this poem. This is the case for the other poets as well; they insert their nonsense words into a pattern that is already set up by English. A phonological analysis of nonsense poetry should reveal that these nonsensical items have the same structure as the original language, providing a sense of chaos within the structure of the poem and the confines of the language.

3. Constraints

3.1 Human Segments

Before looking at the sounds that are contained within nonsense words, one should understand the limits to the sounds contained in human language. According to the International Phonetic Association (2005), the sounds included on the following chart are all the phonemes found in non-disordered human languages.



The blank white spaces are potential sounds that have not yet been discovered in a human language, and the shaded areas of the chart are sounds that could not possibly occur in a human language (IPA, 2005). Should any of the nonsense poets have taken advantage of non-existing

speech sounds, their neologisms would surely be complete nonsense to any human reader. However, this nonsense poetry must still be readable by speakers of the language it was written in, so it is likely that English poets will stay within the segment structure of their own language: English.

3.2 English Segments

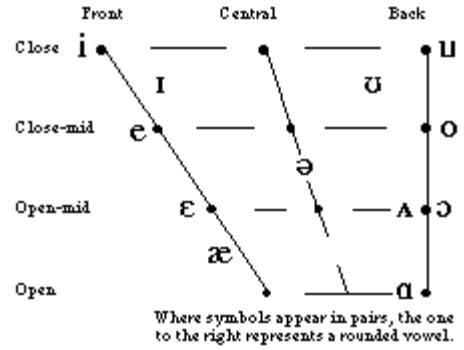
Of the possible consonants in human language, English uses 24 phonemically, and takes twelve of the possible vowels for its own inventory (Speech Accent Archive, 2010). Although nonsense poets could make use of any human sound, they are still limited by the English alphabet, and the spelling principles of the language. A poem may not become very popular in print if the poet makes up his own symbols, or even uses phonetic symbols the average reader would not recognize. If the poet wants to create nonsense with unknown symbols, he may have to include a note of explanation along with the poem. This would become burdensome for the reader, and take away the usual tension found in nonsense poetry between the structure of the rhyme and meter of our own familiar language and the unknown words that seem to fit so well into that structure.

CONSONANTS (PULMONIC)

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d				k g			
Nasal	m			n				ŋ			
Trill											
Tap or Flap											
Fricative		f v	θ ð	s z	ʃ ʒ						h
Affricate					tʃ dʒ						
Lateral fricative											
Approximant				ɹ			j				
Lateral approximant				l							

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

VOWELS



Where symbols appear in pairs, the one to the right represents a rounded vowel.

other sounds: labio-velar voiced central approximant [w]; 5 diphthongs. (Speech Accent Archive, 2010)

Since most nonsense poetry is not entirely made up of nonsense words, the nonsense words are surrounded by the natural language, and so must fit into the rhyme of the language in which it is written. This means that poets must have some knowledge of not only the sounds themselves, but also the way the sounds are put together in their language.

3.3 Syllable Constraints

In addition to individual sounds, there are constraints on the formation of human languages, and these also function specifically for the English language. The Sonority Principle, one of the constraints on how human language segments are placed together, plays a huge role in syllable formation for English. An ideally formed syllable proceeds from the least sonorous segment in the onset to a more sonorous segment in the nucleus, and finally to a less sonorous segment if there is a coda (Clements, 1992, p. 65). According to Selkirk (1984), following this Sonority Principle, the segments of human language can be ranked according to how sonorous they are, from most to least: vowels>glides>liquids>nasals>fricatives>stops. If a syllable, moving from onset to nucleus, becomes more sonorous, and from nucleus to coda it becomes less sonorous, it follows that onset clusters of English should also proceed from a less sonorous to a more sonorous segment. This is true for English, and limits the amount of onset clusters English is capable of producing with its segment inventory. In fact, for English onset clusters, only an approximant may serve as the second element. The only exceptions to this condition are onsets that begin with [s] (Clements, 1992, p. 65). Nonsense poets could take advantage of the Sonority Principle to form truly foreign words, but once again, they must adhere to their rhymes and structure. This will limit the kind of nonsense poets are able to conjure.

Another condition that will limit the kind of phonological nonsense poets are able to compose should be the Obligatory Contour Principle (OCP). Yip (1988) provides a definition of this principle: “At the melodic level, adjacent identical elements are prohibited” (p. 66). This means, for instance, that the OCP will not allow two segments with the same place of articulation in a row, or as we will see in one nonsense example, two or more segments that are exactly the same in a row.

3.4 English Spelling Convention

In addition to these phonological constraints, the English alphabet itself plays a role in the ability of poets to compose their neologisms. Like any reader of this nonsense poetry, I will assume that the authors adhere to the conventions of English spelling; the letters used to represent the sounds of their nonsense words are pronounced the way they typically are in known English words. For instance, if the English letters “tch” are used in a coda, I will assume they are pronounced as in the word “catch” [t□] and not that the author wants to insert the stop [t] before the affricate. For any words that do not obviously conform to rules of English spelling, I will explain my interpretation in the data section.

4. Data

4.1 No English Violations

a. "Jabberwocky" (Carroll, 1995, p. 27-28)

brillig	slithy	toves	gyre
gimble	wabe	mimsy	borogoves
mome	raths	outgrabe	Jubjub
frumious	Bandersnatch	vorpal	manxome
Tumtum	uffish	tulgey	frabjous
callooh	callay		

Any English speaker reading "The Jabberwocky" could effortlessly and fluently pronounce each of Carroll's nonsense words. Although the reader may be looking at these words for the first time, since every one of them conform to English rules of syllabification and none contain any non-English segments, there would be no problem. Indeed, the words fit quite effectively into the meter of Carroll's poem, and rhyme with the words of English.

b. "The Cannibals' Grace before Meat" (Dickens, 1979, p. 124)

Choo a choo a choo tooth.
Muntch, muntch. Nycey!
Choo a choo a choo tooth.
Muntch, muntch. Nycey!

Since this poem is about a group of cannibals preparing to roast a Latin teacher, I assume that the nonsense word, *muntch*, is only a variant of the English word, munch, and does not violate the Sonority Principle by progressing from a nasal to a stop, then to the more sonorous fricative in pronunciation. The word, *nycey*, I interpret as the cannibals exclamation of how nice the "meat" will taste. I pronounce it [naɪsi]. None of these nonsense words violate English segments or syllable structure.

c. Vogon Poetry (Adams, 1980, pp. 65-66)

Oh freddled gruntbuggly thy micturations are to me
As plurdled gabbleblotchits on a lurgid bee.
Groop I implore thee, my foonting turlingdromes.
And hooptiously drangle me with crinkly bindlewurdles,
Or I will rend thee in the gobberwarts with my blurglecruncheon,
See if I don't!

Known as "the third worst poetry in the universe," Vogon poetry is used to torture the protagonist, Arthur Dent, as he is a prisoner of these aliens (Adams, 1980, p. 64). Even though written by aliens, it does not contain any segments foreign to human language, and no words violate sonority or the Obligatory Contour Principle. Like "The Jabberwocky," the poem contains novel word creations, but all words contained could be English words.

d. *Did I ever tell you how lucky you are?* (Seuss, 1973, p. 13)
He never will know if the *Gick* or the *Goor*
fits into the *Skrux* or the *Snux* or the *Snoor*.

This final example of non-violating nonsense contains only a few of the words coined by Dr. Seuss for his children's books. There is nothing in the structure of either *gick* or *goor* that violates English syllable structure, and although the onset clusters of *skrux, snux*, and *snoor* appear to violate the Sonority Principle, they are acceptable onset clusters in English, as in the words *scream*, or *snake.*

4.2 Violation of an English Constraint

a. Did I ever tell you how lucky you are?

You're lucky you don't have a Borfin that *shlumps*. (Seuss, 1973, p.18)

And, while we are at it, consider the *Schlottz*,
the Crumple-horn, Web-footed, Green-bearded *Schlottz*. (Seuss, 1973, p. 20)

Although the shl- onset of these Seuss words occurs in English loanwords from German or Yiddish, it is not found in the standard dialect of English (Crystal, 1995, p. 243). For this reason, I consider these words in violation of Standard English syllable structure. The coda of *Schlottz* presents another violation of the Sonority Principle since the less sonorous stop precedes the fricative. This coda progression is atypical for an English syllable.

b. "Two Old Crows" lines 21-28 (Lindsay, 1979, p. 270-271)
And those two black crows
Turned pale,
And away those crows did sail.
Why?
B B B B B B B B B B B B B-cause.
B B B B B B B B B B B B B-cause.
'Buzzzzzzzzzzzzzzzzzz zzzzzzzzz zzzzzzzzzzzzzzz
ZZZZZZZZ.'

One of the crows in Lindsay's poem happens to stutter, and the repetition of 'B' is meant to represent this. It is easy to imagine that the stutterer would insert vowels, interrupting the continuous stream of a stop consonant. However, if the poet had meant this, perhaps there would be some vowel interrupting these B's. The string of z's, on the other hand, represents the sound of a bee, and is likely pure onomatopoeia. One must always keep in mind, however, that poetry is meant to be shared aloud, and optimally should be easily spoken. In this case, the three clusters of z's are an obvious violation of English structure. According to the OCP, there should not be more than two identical elements, and there are many more than two in these sequences.

c. *The Lorax* (Seuss, 1971, p. 24)
"Look, Lorax," I said. "There's no cause for alarm.
I chopped just one tree. I am doing no harm.
I'm being quite useful. This thing is a *Thneed*.
A Thneed's a Fine-Something-That-All-People-Need!"

The onset, thn- is a violation for English onset clusters. Although it is not a sonority violation since the progression is from a less sonorous fricative to a more sonorous nasal, it is a

cluster that does not exist in English words. Clements (1992)wrote that only approximants may occur as the second segment of an onset cluster, with the exception of [s], and indeed the only allowable English onset cluster with [n] as its second element is sn- as in *snow*.

d. *On Beyond Zebra!* (Seuss, 1955, p. 13)
I ramble, I scramble through *swampf* and through *swumpf*

In this Dr. Seuss story, a young boy has created new "letters" of the alphabet that begin after the letter 'z'. These new letters are in fact clusters of the original sounds in the alphabet, and his new symbols used to represent them are combinations of letters. The coda –mpf of *swampf* is a violation of the Sonority Principle. Instead of ending in the least sonorous [p], this segment is followed by a more sonorous [f]. The nasal, stop, and fricative are also three labials in a row, a violation of the OCP, which does not prefer more than one adjacent element in a row which shares place of articulation. It is possible that Dr. Seuss is representing in the orthography what he hears in an English speaker's pronunciation of this coda. This process, known as English Stop Intrusion, occurs in English when there is a nasal followed immediately by a fricative. A stop will be inserted between the nasal and the fricative in some dialects of English (Dinnsen, 1984, p. 269).

4.3 Violation of Human Language Constraint

a. "A Radical Creed" (Burgess, 1979, p. 230)
I don't give a $\sqrt{D^2}$

For the stuff you denominate hair
And your fingers and toes and your

Neck and your nose,

These are things it revolts me to wear.

In his "A Radical Creed" Burgess presents perhaps the most interesting of nonsense words when he uses mathematical symbols in place of a word. The radical and squared signs are not present on the IPA chart, and so have no obvious sound interpretation. It is most likely that Burgess wants the reader to say, "I don't give the square root of D squared" so that there is at least a slant rhyme with hair and wear, fitting his meter and rhyme scheme. He is still using a symbol not found in English, and not documented on the IPA chart to reflect a series of sounds. If this is not a violation of human language, it is still a very creative and completely novel use of symbolism and sound.

5. Conclusions

Of all the literary arts, the genre of Nonsense Poetry should allow for some of the most creative uses of human language. As seen in the data, many of these poets create entirely new words in their languages, but only one poet goes as far as attempting to create a truly nonsensical, that is, non-human utterance. This, however, is still a symbol recognized by most humans who are familiar with mathematics. It is not that these poets are not fully exercising their capacities for creativity; rather, they are confined by the constraints of human language and of their own English language.

English speaking poets will inevitably choose not only human segments, but specifically English segments. Working within the orthography of their own language, in order to represent even nonsense words, they must stay within the English alphabet. Only Burgess (1979) steps outside the realm of the alphabet and inserts the mathematical symbol for a square root, but this is fairly easily recognized and read as "the square root of." In order for poetry, even nonsense, to be read by English speakers, poets must be confined to segments (the alphabet) familiar to their readers.

As shown by the data, poets are not only confined to the set of English segments, but they have limitations in the way these segments are combined as well. Most of the data (4.1) are kept within the syllable structure of English. In fact, the entire collection of neologisms from "The Jabberwocky" stays within the confines dictated by the Sonority Principle and the Obligatory Contour Principle as manifested in English. Two of the violations of English syllable structure in 4.2, both from Seuss, contain onset clusters not found in the standard form of English, but one is common enough as a borrowing from Yiddish (Crystal, 1995, p. 243), and the violation in *Thneed* , while not an onset cluster in English, is not at all difficult for English speakers to pronounce. The coda of *swampf* is a violation of the Sonority Principle, but is also easily pronounceable for English speakers. The most extreme example of an English violation occurs in "Two Old Crows," where the strings of consonants are examples of onomatopoeia. These strings of consonants, however, can still be pronounced by an English speaker, so a reading of this entire poem would not be affected by such a violation.

The only potential violation of human language is in section 4.3, where a mathematical symbol is used in place of letters. Since the rest of the nonsense poetry uses the English alphabet to represent nonsense, and I assume that the alphabet is used in the conventional way, there is no way to pronounce the symbol alone. There is a way to interpret the symbol, but the symbol alone does not convey a human sound.

Aside from mathematical symbols, the neologisms of the nonsense poetry data are not entirely phonological nonsense. Even nonsense words must be pronounceable by the reader of poetry, and typically these words fit within the structure of the poem, sometimes even rhyming with the natural language. There is no nonsense so outrageous that it cannot be rendered into human speech, completely devoid of meaning. As Holquist (1969) claimed about nonsense poetry, the neologisms are contained within the pre-ordered system of a language. Any meaning the nonsense might have is dependent upon the meaning of the natural language it is surrounded by. This tension between the sound and form of natural language and the creativity of neologisms comes through in the poems from which this data comes. None of the nonsense goes so far outside the constraints of English, or even human language, that it is rendered meaningless within the poetry.

References

Adams, D. (1980). *The hitchhiker's guide to the galaxy*. New York: Harmony Books.

Burgess, G. (1979). "A Radical Creed." In G. Grigson (Ed.), *The Faber book of nonsense verse* (p. 230). London: Faber and Faber.

Carroll, L. (1995). *Lewis Carroll: Selected poems*. Keith Silver, (Ed.). Manchester: Carcanet Press.

Clements, G. (1992). The sonority cycle and syllable organization. In W. Dressler, H. Luschutzky, O. Pfeiffer, & J. Rennison (Eds.), *Phonologica 1988.* Cambridge: Cambridge University Press.

Crystal, D. (1995). *The Cambridge encyclopedia of the English language*. Cambridge: Cambridge University Press.

Dickens, C. (1979). "The Cannibals' Grace Before Meat." In G. Grigson (Ed.), *The Faber book of nonsense verse* (p. 124). London: Faber and Faber.

Dinnsen, D. (1984). A re-examination of phonological neutralization. *Journal of Linguistics.21*(2), 265-279.

Flescher, J. (1969). The language of nonsense in Alice. *Yale French Studies*, *43*, 128-144.

George Mason University Speech Accent Archive. (2010) *Native phonetic inventory: English.* Retrieved from http://accent.gmu.edu/browse_native.php?function=detail&languageid=18.

Holquist, M. (1969). What is a Boojum? Nonsense and modernism. *Yale French Studies 43*, 145-164.

Imholtz, A. (1987). Latin and Greek versions of "Jabberwocky": Exercises in laughing and grief. *Rocky Mountain Review of Language and Literature, 41*(4), 211-228.

International Phonetic Association. *The international phonetic alphabet.* Retrieved from: http://www.langsci.ucl.ac.uk/ipa/ipachart.html.

Lindsay, V. (1979). "Two Old Crows" In G. Grigson (Ed.), *The Faber book of nonsense verse* (p. 270). London: Faber and Faber.

Merriam-Webster Online. (2010). Retrieved from www.merriam-webster.com

Seuss, Dr. (1955). *On beyond zebra.* New York: Random House.

Seuss, Dr. (1971). *The lorax.* New York: Random House.

Seuss, Dr. (1973). *Did I ever tell you how lucky you are?* New York: Random House.

Shires, L. (1998). Fantasy, nonsense, parody, and the status of the real: The example of Carroll. *Victorian Poetry*, *26*(3), 267-283.

Weinberger, S. (2005). Literary nonsense: Linguistics of neologisms. Handout.

Yip, M. (1988). The Obligatory Contour Principle and phonological rules: A loss of identity. *Linguistic Inquiry, 19*, 65-100.

Exceptionality of /s/: Evidence from Aphasia

SHANNA PHILLIPS

1. Introduction

This paper will look to aphasic speech production for insight on phonological properties of spoken language in general. Aphasia is a type of language deficit resulting from stroke, lesions, or other kinds of injury to speech processing areas of the brain. Its effects can devastate a person's ability to interact with others through verbal communication. Although aphasic speech can seem nearly incoherent in severe cases, the errors produced carry a wealth of meaning about how language is produced.

The particular point of interest in this paper, the /s/ consonant, has been highly scrutinized within the context of child language and second language acquisition, but less often as a focal point in aphasic error analysis. Borrowing from several studies investigating syllable structure and cluster treatment in aphasic speech, this study will attempt to determine a few generalizations in support of theories on the exceptionality of /s/.

First, this paper will provide background information about various types of aphasias that differ according to symptoms and location of injury in the brain. It will then review some of the unique phonological properties of the /s/ phoneme. A sample of studies examining the /s/ consonant in developing child speech and second language acquisition will then be covered. This paper will then go on to review aphasic research that discusses syllable structure and the treatment of consonant clusters in aphasic speech, including what has been suggested of /s/ clusters. Finally, data inclusive of /s/ cluster tokens gathered from various aphasia analyses will be presented, accompanied by an examination of the findings in terms of the phonological properties /s/.

2. Background

Aphasia

The study of aphasia recognizes several varieties of aphasia that are classified by symptoms and by areas of the brain where injury occurred. The Boston School of Aphasia provides a localization model and diagnostic test widely referenced in aphasic studies and rehabilitation programs (Damasio 1981). Some of the types of aphasia identified in this framework are discussed here.

Broca's aphasia, named after nineteenth-century anthropologist and founder of aphasic studies, Pierre Paul Broca, is a type of aphasia resulting from damage to the region of the brain called the anterior third frontal convolution. Broca's aphasia is characterized by slow, halted, agrammatic speech, often lacking function words, morphemes, and in some cases, verbs in general. However, the ability to comprehend speech remains intact in Broca's aphasia (Kearns 1997).

Wernicke's aphasia, named after its discoverer, Carl Wernicke, results from damage to another language processing area of the brain located in the posterior region of the superior temporal gyrus. Unlike Broca's aphasics, Wernicke's aphasics produce fluent, but somewhat incoherent speech comprised of paraphasias and neologisms. Paraphasias are aphasic utterances containing phonological modifications to a known target word, whereas neologisms are produced

independently of a target word. In addition to a decreased ability to comprehend speech, Wernicke's aphasics show a lack of self-awareness in their language deficit (Roth and Heilman, 2000). Impaired ability in writing, reading comprehension, and in repetition of words is also characteristic of Wernicke's aphasia (Graham-Keegan, Caspari 1997).

Conduction aphasia, a type of aphasia marked by fluent speech, results from a lesion that disrupts the connections between Broca's and Wernicke's areas of the brain. Unlike Wernicke's aphasia, grammar and comprehension remain intact, although repetition is impaired. Conduction aphasics are able to recognize their own speech errors, but correction and word retrieval is often labored (Simmons-Mackie 1997).

Transcortical aphasias form another class, including transcortical motor, sensory, and mixed transcortical aphasias. Transcortical motor aphasia occurs from damage to the right hemisphere of the brain, resulting in an inability to produce spontaneous speech, but a preserved ability to repeat words – an incongruity indicating that these two levels of speech are processed in different areas of the brain. Transcortical sensory aphasia exhibits similar characteristics, but with impaired comprehension. Mixed transcortical aphasia is a non-fluent aphasia with spared repetition, but hindered comprehension (Cimino-Knight, Hollingsworth, Gonzales-Rothi, 2005).

There are numerous other rare aphasias, some of which include: global and anomic aphasias, alexia with and without agraphia, and pure word deafness. Atypical aphasias include those which do not fit into any one category (Damasio 1981).

This paper will not be limited to any particular type of aphasia, but will rather focus on the behavior of /s/ and /s/ clusters in aphasic utterances where the target words are known (i.e. paraphasias). These paraphasias will be examined for their adherence to the phonological properties reviewed in the next section.

/s/ and Universal Violations

As a fricative, /s/ is the only obstruent that occurs before nasals /m/ and /n/ and in three consonant-clusters where the second segment is a stop and the third an approximant. As a coronal, /s/ violates the Obligatory Contour Principal (McCarthy, 1986), which requires distinction in adjacent segments, because it occurs next to other coronals in English onsets such as /st/, /sn/ and /sl/ and in codas, /ts/, /ds/, /ns/, and /ls/.

Most notably, /s/ violates the Sonority Sequencing Principle (SSP), which groups segments by class according to the level of noise they produce. The sonority hierarchy consists of vowels, glides /j, w/, liquids /l, ɹ/, nasals, and obstruents (including stops and fricatives). The SSP places constraints on the structure of a syllable so that sonority rises from the edges of the syllable and reaches a peak at its middle, or nucleus, usually consisting of a vowel. (Clements 1992, Roca & Johnson 1999). The Sonority Dispersion Principle asserts that the rise in sonority is sharper in the onset and first half of the syllable, or demisyllable, than in the second demisyllable (Clements 1992). These constraints place restrictions on the segment combinations that are permitted in onsets and codas in human languages. Therefore, while it is unlikely that an onset cluster would occur in the order /lp/ or /kt/, such clusters do occur in coda position since they fall in sonority. If these segment combinations were to occur at the beginning of a syllable, the consonants /l/ and /k/ would most likely constitute the nuclei of their own separate syllables – a feature that appears in languages like Berber and Bella Coola (Dell and Elmedlaoui 1985, Bagemihl, 1991).

Different means of ordering the segment classes in the sonority hierarchy have been proposed. Clements (1992) and others (including Roca and Johnson 1999) have suggested a hierarchy that includes the following classes, ranked in ascending sonority:

Obstruents < Nasals < Liquids < Vowels.

Many (among others, Barlow 2001, Broselow 1987, Geirut 1999, Morelli 2003, Weinberger 2002) specify fricatives in a category separate from stops within the obstruent category, accounting for the following sequence:

Stops < Fricatives < Nasals < Liquids < Vowels.

This ordering recognizes the higher sonority of fricatives and justifies /s/+stop coda clusters in English, but lends no better explanation than the first ordering for the exceptionality of /s/+stop onset clusters in violation of the SSP.

Having presented background information about the many varieties of aphasia and the peculiarities of /s/, this paper will proceed with brief reviews of literature on the uniqueness of /s/ clusters in the areas of child and interlanguage phonology.

3. Review of Literature

/s/ in Child Phonology

Several viewpoints are argued for the treatment of /s/ clusters in child language acquisition. These theories generally argue over appropriate underlying representations of /s/ clusters through analyzing deletion errors in child speech production. Four studies, which supply a sample of the range of viewpoints on this topic, are reviewed here.

By analyzing errors resulting from reductions in word initial consonant clusters in the Iowa-Nebraska Articulation Norms Project, Smit (1993) found that two-segment /s/-clusters typically reduced to the nasal, approximant, or stop. In very young age groups, /s/+nasal clusters were produced as nasalized /s/s or were substituted by other nasal-like sounds. In three element clusters /skw, spl, spr, str/, reduction to one element occurred sometimes to the approximants and stops, but rarely to /s/. Patterns of reduction to two segments were highly variant, but interestingly, the children rarely reversed the ordering of the /s/+stop clusters (e.g. in which /st(r)/ became /ts(r)/). In general, reduction to a single element occurred more often in two-segment /s/ clusters than in three-segment /s/ clusters. Smit concluded that due to markedness, /s/ had the highest deletion rates in onset clusters overall.

The assumed markedness of /s/ due to its violation of the SSP was challenged in Gierut's study (1999), which concluded that the /s/ in /s/+stop clusters /sp, st, sk/ is an unmarked adjunct. Smit's study noted that /s/ clusters are acquired relatively early in child speech at the age of 4, but did not distinguish between the acquisition of /s/+stop clusters and what Gierut calls "true /s/ clusters" - /sl, sw, sm, sn/. Gierut's study consisted of 2 experiments, the first one determining the markedness of adjunctive sequences in general through manipulation of sonority sequencing, and the second one which found differential patterning in acquisition between true /s/ clusters and /s/+stop clusters. With these findings, she concluded that in /s/+stop clusters, /s/ is an adjunct

attachment to the main syllable in its structural arrangement, thus supporting the theory that /s/+stop sequences, like other adjunctive sequences, are unmarked.

In their analysis of cluster development in disordered child speech, Barlow and Dinnsen (1998) addressed the /s/-cluster issue using an Optimality approach. Optimality Theory (Prince & Smolensky, 1993) provides a non-derivational account for grammatical preferences in surface output forms. In such a system, output forms are governed by the ranking of constraints that determine faithfulness to input forms and markedness of phonological features. As a child's grammar develops, constraints are re-ranked according to which features emerge and disappear. Given that several child language acquisition studies show conflicting evidence for underlying representations of /s/ clusters, an Optimality approach accounts for individual outliers of developmental norms. Such an approach also allows for different representations of a particular /s/ cluster to be referenced in the same system at different points in time in a continuously developing manner.

Barlow and Dinnsen's study (1998) followed the development of a child with a speech disorder at three different stages between the ages of 4 and 9. At stage one, no target /s/ clusters (/sw, sl, sm, sp/) were produced, and were determined to be represented as single complex segments in their underlying structures. At stages 2 and 3 /sw/ and /sl/ were produced as /w/ and /l/ while /sm/ and /sp/ remained unrealized in production. These findings suggest that /s/+nasal and /s/+stop clusters may be represented as affricates, in which the "onset node dominates a single root node that branches into a sequence of contrasting features…[or] in which a skeletal point branches into two separate root nodes, each dominating its own specification of the relevant feature" (p. 5)

Barlow (2001) took a similar, but revised approach in another study focusing primarily on the acquisition of /s/ clusters in the speech of a child with a phonological disorder between the ages of 3 and 4. Three stages of development were analyzed in which the child initially reduced all consonant clusters to singletons. During the second stage, the child produced only /s/ sequences correctly, but by the final stage, was able to produce all clusters correctly. Constraint rankings ultimately showed that by the third stage all /s/ sequences surfaced as adjuncts as opposed to affricates, as determined in the previous study. Again, this approach claims to account for asymmetries in cluster development in a continuous manner and allows for varying structural representations of /s/ clusters through the re-ranking of markedness constraints that disallow complex onsets.

/s/ in Interlanguage Phonology

Second language acquisition of English is marked by a tendency to insert elements, usually vowels, before or within consonant clusters in a process called epenthesis. This process is more likely to occur in speech where the first language is less complex in syllable structure than in the second language. Epenthesis may be attributed to language specific transfer, but may also occur between two similarly complex languages as a universal tendency to prefer unmarked structures in L2 production.

Broselow (1987) found that the process of epenthesis in second language (L2) acquisition of English by Egyptian and Iraqi Arabic speakers occurred differently in sonority violating clusters (i.e. /s/+stop) than in other kinds of clusters. She found that in two element /s/ clusters, epenthesis occurred between the two consonants in /sl/ clusters, but before the cluster in /sn/ and /st/ clusters. In three element /s/ clusters Iraqi and Egyptians showed different patterns. Iraqis

split the clusters between the first and second segments in words such as ‘street’, ‘splash’, and ‘square’ whereas the Egyptians epenthesized in two places – before the entire cluster and between the stop and approximant segments. She then revisited two-segment /s/+stop clusters in Egyptian speech and found that epenthesis occurred between segments in /s/+approximant clusters, but before the segments in clusters including an /s/ and a stop. From these data she concluded that differences between Iraqi and Egyptian errors may have occurred due to influence of L1 transfer, and that the Egyptian propensity to not split /s/+stop clusters lent support to the theory that such clusters may function as a single consonant.

Karimi’s review (1987) of Farsi treatment of English clusters showed results contradictory to Broselow’s. She found that Farsi speakers treated all /s/ clusters in the same way – that is they epenthesized before all /s/ clusters, as she noted Spanish speakers of English also tend to do during English L2 acquisition. This kind of epenthesis, however, only occurred before /s/ clusters, as the speakers tended to split other kinds of clusters that do not include /s/. She also noticed that epenthesis in L2 Farsi did not occur in the same way as in L2 English. In Farsi, speakers epenthesized between clusters. Using this observation she argued that epenthesis was not an attribute of transfer as Broselow (1987) had determined. Karimi’s results suggested that /s/ clusters may be interpreted as single units or affricates in English, but as adjuncts in Farsi.

In a study conducted by Fleischhacker (2001) asymmetries in epenthesis before sibilant + stop clusters and between obstruent + sonorant clusters showed evidence for highly ranked faithfulness constraints in L2 speech. In regard to /s/ clusters, this evidence gives rise to the theory that they are ranked on a continuum of sonority as follows: ST < SN < SL < SW.

Finally, Weinberger’s accent archive survey of over 700 L2 English speakers (2009) gives compelling evidence for the following generalizations about /s/ clusters: adult L2 speakers treat all /s/ clusters similarly, although they treat all /s/ clusters differently from other types of clusters. Overall it shows that L2 speakers are attending to the exceptional nature of /s/.

The literature reviewed above covers a small sample of the arguments on /s/. Some child language acquisition research supports the viewpoint that /s/ is marked due to its violation of the SSP, which is indicated by high /s/ deletion rates in onset clusters. Another viewpoint argues that differential patterning in acquisition between /s/+stop clusters and other /s/ clusters suggest that /s/ is an unmarked adjunct in /s/+stop sequences like any other adjunctive cluster. Other studies assert that /s/+nasal and /s/+stop clusters may be represented as affricates, while others assert that all /s/ clusters act as adjuncts. What all these studies have in common, however, is that they find that /s/ clusters are treated differently from other kinds of clusters.

Second language acquisition studies arrive at a similar generalization. Some have found that /s/+stop clusters are treated differently from all other kinds of clusters not in violation of the SSP. Others find that all /s/ clusters are treated the same within their own class, but differently from other kinds of clusters. /s/ clusters have also been argued to follow a sonority hierarchy within their own class. Although discrepancies remain about the details of how /s/ is treated, the consensus in the studies reviewed here is that /s/ is unique in interlanguage phonology.

Syllable Structure in Aphasia

Linguistic studies in aphasia cover a broad range of topics with different goals in mind. Some studies focus on finding better measures for rehabilitation and assessment methods, and some look for possible explanations for anatomical connections to language. Other kinds of research observe aphasic speech production as a means of gaining further insight into the properties of

language in general; the following studies explore this avenue while also probing for patterns which reveal information about the nature of aphasic speech in its own right.

It has been argued that aphasic speech shows a general trend of movement towards the preferred syllable type (CV) in both paraphasic reduction and neologistic production. Studies focusing on neologistic productions (target word unknown) found the most common type of syllable structure to be in favor of the CV type, where the consonant is most often an obstruent. Christman (1992a,b) asserts that aphasic speech generally abides by the SSP. Stenneken et al. (2005) determined that German speaking aphasics preferred the CV syllable type and never used sounds from outside the German segment inventory.

Blumstein (1978) identified four major types of errors in aphasic speech: the substitution of one phoneme for another, syllabic and cluster simplification, addition of phonemes, and errors triggered by environmental influence of surrounding phonemes. The most common types of errors noted were phoneme substitutions, followed by syllable simplification and segment addition. Most simplification errors occurred around clusters, slightly over half of which were codas. Addition errors gave evidence for the influence of featural specifications of the segmental context within a target word. The simplification errors observed in this study give strong evidence for movement towards the preferred syllable type.

Stark and Stark, (1990) took a nonlinear metrical approach to analyzing syllable structure in Wernicke's aphasia, yielding several notable conclusions about paraphasic speech. They found that more errors occurred in relation to the complexity and number of syllables in a word, and that errors typically occurred in later syllables. The majority of errors produced within syllables affected syllable codas whereas nuclei remained least impaired. In neologistic speech, they found that subjects produced utterances that generally followed natural syllable organization, i.e., they abided by sonority sequencing (except in the case of /s/ or /ʃ/+stop violations).

In Baum's word game study (2002), control and aphasic speech was tested for sensitivity to sub-syllabic constituents. In other words, through word manipulation, Baum set out to determine if aphasics were sensitive to sonority sequencing and if they would treat onset and coda clusters in a similar manner as non-aphasic speakers. The game consisted of words starting with different clusters, in which participants were asked to insert a syllable (e.g. aez or ib) somewhere. Subjects most frequently preserved the integrity of clusters as opposed to inserting the syllable between clusters. The findings suggested that both right and left hemisphere damaged patients were still responsive to sonority sequencing. In cases where clusters were separated, fluent Wernicke's aphasics showed the highest rate of splitting onsets.

4. Data and Analysis

Data in this section are derived from studies on aphasia including some of those mentioned in the previous section. This analysis pulls data on /s/ from these studies to build an argument on the exceptionality of /s/.

The first set of data is derived from Valdois' 1990 study on the internal structure of clusters in aphasic speech. Samples were elicited from a group of French speakers with Wernicke's, Broca's, Conduction, and Anarthric Aphasia, and illustrate the highly variable nature of aphasic speech. This list pertains to reduction in /s/ cluster onsets in which the preservation of /s/ was

sometimes preferred over preservation of the stop. Clusters were also created by the attachment of /s/ to word initial stop onsets.

/S/-CLUSTERS

REDUCTION

ONSETS

reduction to /s/

target:	**production:**
/stasjɔ̃/	/sasjɔ̃/
/staty/	/səty:/
/elastik/	/elasik/
/estoma/	/esomo/

reduction to stop

target:	**production:**
/staty/	/taty:/
/spesjal/	/pesjal/

CREATION

target:	**production:**
/kulwaR/	/skulwaR/

Valdois asserted that "with respect to /s/ clusters, a trend for more omission errors in the C1 position becomes apparent word-initially when /st/ clusters are excluded from the analysis" (Nespoulous and Villiard 1990 p. 266). The variability in reduction of /st/ clusters seen in the list above is possibly explained by the coronal property of /s/ and /t/ as well as their proximity in sonority. Other stops, /p/ and /k/, do not share the coronal feature with /s/, thus are not as susceptible to deletion in either direction.

The deletion of /t/ instead of /s/ does not lend support to the sonority dispersion principle which would prefer /t/ in syllable initial position over /s/. Nor would the assumed deletion of the /s/ in clusters that do not violate sonority sequencing, /sw, sl, sn, sm/, follow the dispersion principle. The violation of the sonority dispersion principle in these deletion patterns provides another example of the exceptionality of /s/.

In the example of cluster creation above, the attachment of /s/ in C1 position as opposed to C2 position is again significant in that the resulting cluster violates sonority sequencing. Valdois states, "all created /s/ clusters result from the addition of a consonant in the C1 position" (Nespoulous and Villiard 1990, p. 265) and "no /s/ cluster was created by addition of a segment in the C2 position (p. 263). The creation of /s/ clusters that pattern in violation of sonority sequencing gives further evidence for the exceptionality /s/.

In OL cluster creation listed in the data below, variation in the position of the added element is exhibited in addition to segment substitution. However, note that sonority violation does not occur in these paraphasias. In contrast to the sonority violations produced in /s/ cluster creation, the creation of natural OL clusters does not violate sonority sequencing.

OL CLUSTERS

REDUCTION

ONSETS

reduction to obstruent		**reduction to liquid**	
target:	**production:**	**target:**	**production:**
/tRibynal/	/tibynal/	/glas/	/la:s/
/pRɔblɛm/	/pRɔbɛ:m/	/vRɛ/	/Rɛ/
/pyblik/	/pybɪk/	/telegRam/	/teneRamœ/

CREATION

target:	**production:**
/Rɔbinɛ/	/pRobinɛ/
/lãg/	/glãg/
/tabuRɛ/	/kRabuRɛ/
/maRekaʒ/	/makRakaʒœ/
/tRiko/	/tRiklo/
/flakɔ̃/	/flaklɔ̃/

Like /s/ cluster reduction, the OL cluster reduction listed here show varying patterns of C1 and C2 deletion. Some are reduced to the obstruent while others are reduced to the liquid. However, in reference to all data covered in this study, Valdois concluded that "with respect to OL clusters, a consonant is more often omitted…in C2 position" (p. 265) This finding contradicts the pattern found in /s/ clusters as mentioned earlier, with exception to the /st/ clusters featured in the data set.

The reduction and creation patterns in this study indicate that while deletion patterns may not result in maximal onset dispersion, creation patterns follow natural sonority contouring – that is, non-violation of sonority in OL clusters and violation in /s/ clusters. In general, this study demonstrates that /s/ clusters are clearly treated in a different manner than other kinds of clusters in aphasic speech.

Like Valdois' study, Blumstein's study (1978) shows a peculiar pattern involving /t/ in the creation of /s/ clusters (e.g. /sawθ/ → /stawθ/) as opposed to their reduction. Blumstein notes, "of the possible addition errors which could occur in the environment of initial /s/ (i.e. /p t k m n w l/) the addition of /t/ occurred 50 percent of the time" (Bell and Hooper 1978, p. 197). The frequency of the addition of /t/ in this environment would have been only 14.3 percent if the probability were distributed evenly among the possible segments in /s/ combinations. It is argued that the high rate of the addition of /t/ may be due to its featural similarity in place of articulation and voicing to /s/. In a sense, /s/'s features are what attract /t/ in the creation of a complex onset. However, this process of cluster creation does not imply the random combination of featurally similar segments, but abides by the sequential constraints of the particular language spoken by the aphasic.

While the creation of /st/ and other /s/+stop clusters violates sonority sequencing, the same trend does not occur in other cluster creations. Hence, in examples like:

target:	**production:**
/tami/	/trami/
/beisbɔl/	/beisbrəl/

sonority sequencing is still obeyed in the addition of the new segments. Again, this contrast shows that aphasic speech is sensitive to sonority sequencing, and that /s/ is treated differently from other consonants, just as it would be treated in non-aphasic speech.

Finally, a study conducted by Ouden and Bastiaanse (2003) is reviewed here, which gives a comprehensive account of /s/ cluster deletion patterns. The study argues that phonemic paraphasias are a result of articulatory impairment whereas fluent aphasia is affected at the phonological level. Using evidence from cluster deletion Ouden and Bastiaanse make several important claims about this argument and about the treatment of /s/. In /s/+stop onset clusters, they found that /s/ was not as vulnerable to deletion as others have claimed in regards to the Sonority Dispersion Principle. Government Phonology claims that /s/ belongs to the previous syllable and is "licensed" by the following stop. In /s/ clusters, where the second segment is more sonorant than /s/ (e.g. slip), the more sonorant segment is more likely to be deleted, which is considered in this model to be a "dependent" of /s/. In codas, deletions between sonorant and non-sonorant segments are relatively equal in fluent speech, while the sonorant segment is more likely to be deleted in non-fluent speech.

Overall, onset and coda deletion patterns are found to be equivalent between non-fluent and fluent aphasics. This study assumes that /s/ is phonologically unique in terms of sonority. It reviews this factor by observing the different deletion patterns between sC[-son] and sC[+son] clusters. While /s/+stop clusters prove unique at the phonological level, they are assumed here to not involve articulatory difficulty. Given this, Ouden and Bastiaanse posit that the processing of non-fluent aphasic speech not only occurs at a phonetic level, but may also occur earlier at a cognitive or phonological level.

5. Conclusion

This paper has presented sufficient evidence for the special treatment of /s/ in aphasic speech. Having reviewed similar processes in child language and interlanguage phonology, it suggests that aphasic speech, although impaired, still retains the phonological properties found across languages and other exceptional grammars. In turn, it confirms theories about certain phonological propensities – in this case, the curious sonority violations of /s/ - and other fundamental constructs of language.

References

Barlow, J. A. (2001) The structure of /s/-sequences: Evidence from a disordered system. *Journal of Child Language* 28: 291–324.

Barlow, J.A. & Dinnsen, D. (1988) Asymmetrical Cluster Development in a Disordered System. *Language Acquisition,* 7(1), 1-49.

Bagemihl, B. (1991) Syllable Structure in Bella Coola. *Linguistic Inquiry,* 24(4): 589-646.

Baum, Shari R. (2002) Sensitivity to Sub-Syllabic Constituents in Brain-DamagedPatients: Evidence from Word Games. *Brain and Language* 83: 237-248.

Beland, R. (1990) Vowel epenthesis in aphasia. In: Nespoulos, J.L. & Villiard, P. (Hrsg.) Morphology, Phonology and Aphasia. New York: Springer.

Blevins, J. (1996) The Syllable in Phonological Theory. In. J. Goldsmith (ed), *TheHandbook of Phonological theory.* Oxford: Blackwell.

Blumstein, S.E. (1978) Segment structure and the syllable in aphasia. In: Bell, A. & Hooper, J.B. (Hrsg.) Syllables and Segments. North Holland: PublishingCompany.

Boyd, J. (2006) On the Representational Status of /s/-Clusters. *San Diego Linguistic Papers* 2: 39-84.

Broselow, E. (1987) Non-Obvious Transfer: On Predicting Epenthesis Errors. In G. Ioup and S. Weinberger (eds.) *Interlanguage Phonology.* Rowley: Newbury House.

Christman, S. (1992) Uncovering phonological regularity in neologisms: Contributions of sonority theory. *Clinical Linguistics & Phonetics* 6: 219-247.

Cimino-Knight, A., Hollingsworth, A. & Gonzalez Rothi, L. (2005) The Transcortical Aphasias. In LaPointe, L. *Aphasia and Related Neurogenic Language Disorders,* 3rd ed. New York: Thieme.

Clements, G. (1992) The Sonority Cycle and Syllable Organization. In W.Dressler, H. Luschutzky, O. Pfeiffer, & J. Rennison (eds.) *Phonologica 1988.* Cambridge: Cambridge University Press.

Dell, F. & Elmedlaoui, M. (1985) Syllabic Consonants and Syllabification in Imdlawn Tashlhiyt Berber. *Journal of African Languages and Linguistics.* 7: 105-130.

Demasio, A. (1981) The Nature of Aphasia: Signs and Syndromes. In Sarno Taylor, M. (ed.) *Acquired Aphasia.* New York: Academic Press, Inc.

Fleischhacker, H. (2001) Cluster Dependent Epenthesis and Asymmetries. In Albright, A. and Cho, T. (eds.) *UCLA Working Papers in Linguistics* no. 7:71-116.

Gierut, J. A. (1999) Syllable onsets: clusters and adjuncts in acquisition. *Journal of Speech*, *Language*, *and Hearing Research* 42, 708-26.

Graham-Keegan, L. & Caspari, I. (1997) Wernicke's Aphasia. In LaPointe, L. (ed.) *Aphasia and Related Neurogenic Language Disorders,* 2nd ed. New York:Thieme.

Karimi, S. (1987) Farsi Speakers and the Initial Consonant Cluster in English. In G. Ioup & S. Weinberger. Rowley: Newbury House.

Kearns, K. (1997) Broca's Aphasia. In LaPointe, L. (ed.) *Aphasia and Related Neurogenic Language Disorders,* 2nd ed. New York: Thieme.

McCarthy, J. (1986) OCP Effects: Gemination and Antigemination. *Linguistic Inquiry* 17: 207-263.

Morelli, F. (2003) The Relative Harmony of /s+stop/ Onsets. In Fery, C. and van de Vijver, R. (eds.) *The Syllable in Optimality Theory.* Cambridge: Cambridge University Press.

Ouden, D. & Bastiaanse, R. (2003) Syllable structure at different levels in the speech production process: Evidence from aphasia. In J. Maarten van de Weijer, V. van Heuven, & H. van der Hulst (eds.) *The Phonological Spectrum: Suprasegmental Structure.* John Benjamins Publishing Company.

Prince, A. & Smolensky, P. (1993) Optimality Theory: constraint interaction in generative grammar. MS, Rutgers University and University of Colorado.

Roca, I. & W. Johnson. (1999) *A Course in Phonology.* Oxford: Blackwell.

Roth, H. & Heilman, K. (2000) Aphasia: A Historical Perspective. In Nadeau, S., Gozalez Rothi, L., and Crosson, B. *Aphasia and Language.* New York: The Guilford Press.

Smit, A., &, L., Freilinger, J. Bernthal, J., and Bird, A. (1990) The Iowa Articulation Norms Project and its Nebraska Replication. *Journal of Speech Language and hearing Research* 55: 779-798.

Stark, K.H. & Stark, J.A. (1990) Syllable structure in Wernicke's aphasia. In: Nespoulos, J.L. & Villiard, P. (Hrsg.) *Morphology, Phonology and Aphasia*. New York:Springer.

Stemberger, J. &Treiman, R. (1986) The Internal Structure of Word-Initial Consonant Clusters. *Journal of Memory and Language* 25: 163-180.

Stenneken, P., Bastiaanese, R., Humber, W., & Jacobs, A. (2005) Syllable Structure and Sonority in Language Inventory and Aphasic Neologism. *Brain and Language* 95: 280-292.

Valdois, S. (199) Internal structure of two-consonant clusters. In: Nespoulos, J.L. & Villiard, P. (Hrsg.) *Morphology, Phonology and Aphasia*. New York: Springer.

Weinberger, S. (2002) Alien Phonology: Science or Fiction?

--- (2009) George Mason Accent Archive. accent.gmu.edu.

Derrida's Questionable Logic

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In Linguistics and Grammatology, Derrida (1976) presents his rationale for deconstructing the "metaphysical presupposition" which favors speech before writing. He asks, "Is not the lifting of that presupposition an overthrowing of the landscape upon which the science of language is peacefully installed?" (Derrida, p. 29). He claims that the science of linguistics has as its declared purpose the "subordination of grammatology . . . to the rank of an instrument enslaved to a full and originarily spoken language" (Derrida, p. 29) and he intends to deconstruct this relationship.

My understanding of Derrida's Destruction Theory is that he seeks to undermine the hierarchy of certain natural relationships in metaphysics that are set up as dualisms. According to the biography of Derrida written by J. Reynolds in the Internet Encyclopedia of Philosophy (2002), Derrida himself has suggested that metaphysics can be defined as "[t]he enterprise of returning strategically, ideally, to an origin or to a priority thought to be simple, intact, normal, pure, standard, self-identical, in order then to think in terms of derivation, complication, deterioration, accident, etc." (Reynolds, Sec. 2a). If this natural dualism is taken to be that of the metaphysical original form and its more complex form, as with black to white, negative numbers to positive numbers, and nothing to something, then I would suggest that Derrida has taken aim at the wrong target: the correct pairing of speech and its opposition is not speech to writing, but non-speech to speech, or non-verbal communication to verbal communication. While black is the absence of color, negative numbers are the absence of positive integers, and nothing is the absence of something, the logical intact, normal, pure, original form of speech is the absence of speech - or non-speech; it is not writing. In this paper I will present reasons why I believe Derrida's pairing was wrong and his argument was misdirected.

Virtually all verbal communication is speech. However, while writing is one form of non-verbal communication, it is certainly not the only form. As Derrida sought to find the relationship between the "inside and the outside" of a natural dual relationship (Derrida, p. 35) involving speech, he took only one form of non-verbal communication, writing, and used it to represent the whole. In setting writing up as the inside or outside to speech, he neglected many other forms of non-verbal communication that share the category with writing. These other types of non-verbal communication include many active and inactive forms of expression. Examples include facial expressions, touch, art, dance, photographs, and signals. Certainly a scowl, a punch in the nose, a kiss, Picasso's Guernica, an Indian war dance, photos of concentration camp survivors, semaphore, and sign language are all capable of conveying messages effectively without speaking.

In addition, Derrida neglected to consider a unique and interesting form of inactive non-verbal communication: the concept of silence. Indeed, just as someone who falsely says that the natural pairing of integers is positive and negative instead of positive and non-positive misses the very number of zero, by pairing verbal with non-verbal communication, we do not want to miss the important form of communication analogous to zero: silence. Certain instances of silence are possibly the ultimate form of non-speech. While silence sometimes is merely nothingness, when silence is used to communicate a rebuke or anger, for example, its message is strong, clear, and unambiguous.

In summary, Derrida based his deconstruction on the false premise that writing is the natural opposition to speech. In setting up the ideal, or originary form, against its natural derivative form, he should have paired all non-verbal communication, not just writing, with speech. As shown by Aristotle's Principle of Contradiction, the correct opposites should be either "A or not A": either verbal communication or non-verbal communication. Because writing is only one example taken from the larger category of non-verbal communication -- which includes a variety of expressive forms and even silence itself -- Derrida was inaccurate when he portrayed speech and writing as the "interior and exterior" (Derrida, p. 35) of the same relationship. Thus, I believe that Derrida's faulty logic compounded a self-indulgent cerebral frolic masked as an attempt to establish the superiority of writing over speech.

References

Derrida, J. (1976). *Of grammatology*. Baltimore: The Johns Hopkins Univ. Press.

Reynolds, J. (2002). "Jacques Derrida" in *The internet encyclopedia of philosophy*. University of Tennessee. Retrieved from http://www.iep.utm.edu/derrida

Looking for Searle's Black Swan

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Any categorical statement is false if there is at least one exception. If, for example, one states that all swans are white, it only takes the sighting of one black swan to disprove the statement. Searle (1969) assumes that illocutionary speech acts are preceded by intentions and intentional behavior (Searle, pp. 16-17). In this paper, I will show that there is at least one possible exception to his assumption.

For Searle, the basic unit of linguistic communication is the speech act described by Austin as the "illocutionary act." This speech act is a form of communication that conveys implied intentions for action. Searle explains that "When I take a noise or a mark on a piece of paper to be an instance of linguistic communication . . . I must assume that the noise or mark was produced by a being more or less like myself and produced with certain kinds of intentions" (Searle, p. 17). He differentiates between utterance acts, "which consist simply in uttering strings of words" (Searle, p. 24) and illocutionary acts, which "consist characteristically in uttering words in sentences in certain contexts . . . with certain intentions . . ." (Searle, p. 25). In Searle's revision of the Gricean analysis of meaning, the S (speaker) always intends (i-I) to produce an illocutionary effect (IE) by recognition or awareness of the intent by the hearer (H) (Searle, pp. 49-50). Thus, in Searle's world, there exists no acknowledgement of unintended speech acts. For Searle, what is said in an illocutionary speech act is always preceded by the intent to say it. I would suggest that there are several categories of illocutionary speech acts that are not addressed by Searle and where there is no intent, or a different intent, preceding the act.

Searle's illocutionary speech act is characterized by: 1) prior intent, 2) a conscious decision by the speaker, 3) specificity, and 4) adherence to linguistic rules (Searle, pp. 16 -21). The relationship of intent to a specific utterance is illustrated in Table 1 below, where "X" represents a specific utterance and "~X" represents something other than the specific utterance. Searle's speech acts reside in quadrant 1, where there is both intent to speak and actual uttered speech.

Table 1 Relationship of intent to speak to utterance

		Actual Speech Act	
Intent to Speak	Yes	1 X	2 ~X
	No	3 X	4 ~X

However, Searle made a categorical statement saying that he assumed an illocutionary speech act was produced as a result of intentional behavior. Since a categorical statement must either be all true or it is not true, it is interesting to look at quadrants 2, 3, and 4 to see how they fit into Searle's theory. In quadrant 2, there is prior intent to say X, but something other than X is said. In quadrant 3, there is no prior intent, but X is said. In quadrant 4, there is no prior intent and something other than X is said. Thus, once what is actually said is unbundled from what is intended to be said, as is done in Table 1, it becomes clear that whatever utterances fall into quadrants 2 and 3 may be exceptions to Searle's theory. Quadrant 4 allows for too many ambiguities and will not be

addressed in this paper. What types of speech acts might fall into quadrant 2, where a person intends to speak, but doesn't say what he intends to say; and into quadrant 3, where a person speaks but doesn't intend to?

All slips of the tongue and Freudian slips belong in quadrant 2. While arguments can be made for the role of intent in Freudian slips, many run-of-the-mill slips of the tongue, called "spoonerisms," are caused by an unintentional exchange of sounds, usually from the beginnings of two words. Spoonerisms are defined as "unintentional, non-habitual deviations from a speech plan" (Dell, 1986, p. 284). A person intends to speak, but what he says is not what he intended to utter. In the case of slips of the tongue, having intent and then speaking does not always produce the desired speech act, although the sentence is grammatical and there is successful communication. The speaker will produce an entirely different effect on his audience when he says "You have hissed all my mystery lectures" rather than "You have missed all my history lectures" (Erard, 2007, p. 15). Thus, we have a situation where there was intent to speak, but no intent to say what was actually said. The speech act was grammatical and the purpose of the utterance was to produce some effect on the hearer; however, while there was an effect on the hearer, it was different from the intended effect. Was this spoonerism an illocutionary speech act?

Certain spontaneous and unconscious utterances spoken without prior intent belong in quadrant 3. This category includes somniloquy (sleep-talking) where there is the "utterance of speech or sounds during sleep without awareness of the event" ("Sleep Talking," 1999, para. 1). "Lack of awareness," by definition, implies no intent. However, the sleep-speaker can successfully carry on a conversation. My husband reports that I once said, while napping in the afternoon, "I'm going to mop the floor." Of course, I had no intention of mopping the floor, but I did convey my message to him. However, I stated, or promised, to mop the floor in correct rule-governed grammatical form and my husband understood the communication. Since he didn't know if I was really awake or still napping, he had no way to evaluate my intentions. Was this promise an unintended illocutionary speech act?

While the above examples of somniloquy and slips of the tongue raise questions as to the necessity of intent in illocutionary speech acts, it is in the area of interjections and exclamations in quadrant 3 that Searle is most vulnerable. The argument can be made that there is a class of interjections and exclamations that are not premeditated, but have the same effect on the hearer as intended speech. For example, if I burn my finger on the stove and spontaneously exclaim "Ouch!" my husband will hear the screamed word and run into the kitchen. Did I intend for him to come into the kitchen? No. I was responding to sudden pain. My husband, however, interpreted my cry and understood I was in trouble. Thus, it appears that I unintentionally committed an illocutionary act. In addition, because my husband ran into the kitchen, there was also an unintentional perlocutionary act - the consequential actions of an illocutionary act. While perhaps some spontaneous utterances such as "Help!," "Run!," and "Fire!" do have intent which leads to certain consequences, my speech act produced an effect on my husband, but it was not intentional.

In summary, according to Searle, intent is an integral part of the illocutionary speech act; to perform the successful speech act, rule-governed speech must be produced with the intent to elicit a specific effect on the hearer. I have presented three cases- slips of the tongue, somniloquy, and spontaneous interjections- where it is questionable whether the intent criterion was met. While all three examples raise questions, the category of spontaneous cries of pain is the blackest swan in Searle's theory -- although there is no intent involved in the sudden outburst, I believe these cries do perform a successful illocutionary speech act.

References

Dell, G. (1986). A spreading activation theory of retrieval in sentence production. *Psychological Review, 93*, 283-321.

Erard, Michael. (2007). *Um . . .slips, stumbles and verbal blunders, and what they mean*. New York: Pantheon Books.

Searle, John. (1969). *Speech acts*. Cambridge: Cambridge University Press.

What is sleep talking? (1999). Retrieved from http://www. Stanford,edu/~dement/sleeptalk.html

A Study of Monopthongization of /aj/ -> /a:/ in Rural Eastern Kentucky and West Virginia Appalachian Regions.

TANJA SZABO

Abstract
The linguistic phenomenon of monopthongization is one feature of the Appalachian dialect of Standard American English. The dipthong /ai/ has characteristically been shown to be pronounced as /a:/ in various regions of Appalachia. Some evidence, however, suggests that this manifestation of monopthongization is slowly receding in the area. In this paper, several sources of recorded speech from speakers in rural Eastern Kentucky and West Virginia Appalachia shows that monopthongization is far from receding.
This paper reviews select literature as regards this feature, analyzes transcribed samples of 12 speakers of the dialect, by means of three documentary video sources. The data is then analyzed against the current literature and discussed. I hypothesize that the diphthong /aj/ is still quite monopthongized and prevalent in many rural speakers, though there may be a slight phonemic receding in females over males (for reasons unclear).

1. Introduction

While regional dialects play an important role in defining socioeconomic status in many language communities, it has been observed that Americans generally pay little attention to regional dialects (Labov, Ash, & Boberg, 2005). People are of course aware that there ARE different dialects, but most would be hard-pressed to identify or imitate different variations, or to be able to articulate the differences from the standard. However, there are two exceptions to this precept of non-awareness: African-American English (AAVE), and Southern English. Focusing on the latter, ask any non-Southern American to produce a Southern accent and immediately, words like 'ain't' and 'y'all' quickly come up, followed by an attempt at drawl, a lengthening of vowels; these are the stereotypical renditions of aspects of Southern English. And, though most dialects play little if any role in judgments of socioeconomic status or measurements of intelligence, this stereotype of dialect does carry discrimination with it, in that speakers of Southern American English (SAE) are often considered to be poor, uneducated, rural, and isolated (Hazen & Fluharty, 2004). Because of this dialect discrimination, rural migrants to urban areas of the south (and other urban centers) are faced with the choice of adapting their dialect to a more standard form of English, or potentially enduring prejudice from city denizens because of the southern shibboleth. As a result, some linguists have documented that select features of SAE appear to be receding, meaning that younger speakers are slowly beginning to change their speech patterns to more Standard English. However, this research has been largely focused on urban speakers who demonstrate greater conformity with Standard English, and not in extreme rural contexts. Just as the great Southern writer Mark Twain quipped that rumors of his death were greatly exaggerated, so too may be the receding of the Appalachian dialect.

This project focuses on one feature of the Appalachian dialect of SAE, reviews select literature as regards this feature, analyzes samples of 12 speakers of the dialect, and analyzes the

acquired data against the current literature. Specifically, I hypothesize; based on documentary evidence, the diphthong /aj/ is still quite monopthongized and prevalent in many rural speakers, though there may be a slight phonemic receding in females over males (for reasons unclear).

2. Background

Linguists have meticulously charted the phonology of regional variations of English across North America. Early linguistic studies of the 'Appalachian region' placed the Appalachian dialect in the Midlands region. However, phonological data supplied in the 2005 Atlas of North American English (ANAE) identifies at least portions of West Virginia, Kentucky and Tennessee squarely in the modern Southern Appalachian regional dialect, called 'Inland South'. This is based on phonological similarities in 7 categories of 22 distinct characteristics which are featured in, though not limited to, Southern phonology. One of the most salient and wholly distinct features of these is what linguists call the monopthongization of the phoneme /aj/, which renders the standard dipthong /aj/, as in 'time'à/taim/ (ta+im) (sounds glide into one another) to /ta:m/ (the second vowel sound /i/,'the glide', is deleted). With the off-glide absent, an item like 'pie' may be pronounced something like 'pah '(Wolfram & Christian, 1976). This is one part of the Southern Vowel Shift (SVS) (Labov et al., 2005), and one which is most advanced in rural areas of the Appalachian regions of the upland south[1].

Some evidence suggests that the SVS is slowly receding in apparent time (Sankoff, 1986)(Fridland, 1998)(Thomas, 2003)(Hazen & Fluharty, 2004)(Labov et al., 2005). However, as these studies of the SVS in (respectively) Atlanta, Memphis, St. Louis, Charlotte, and the general region demonstrate, "much of the work in understanding the pattern of change focuses on urban speech, and as a result, the advancement of SVS is not easily determined or well-understood"(Irons, 2007, p. 121). Some researchers, in fact, highlight precisely this, in the linguistic and social division between rural and urban speakers:

> "Growing up in West Virginia may or may not mean that you have Southern language variation patterns, depending on whether you grew up in suburban Charleston or Logan County. Around the state capital of West Virginia, high school students maintain strict social divisions between the suburbanites and those who live in more rural areas. The more rural Creekers follow southern language patterns (monopthongized/aj/) [whereas] the Hillers display more northern language variation patterns (full off-glide with /aj/)…the Hillers group contains the children of professionals from other states and counties; the Creekers are all native-born West Virginian whose families have been in the area for generations. The creekers want to live in Appalachia, while the hillers want out of their local community and Appalachia in general. "(Hazen & Fluharty, 2004, p. 55)

Therefore, it seems clear that while southern Appalachian urban speakers modify to, or simply learn, Standard English, their rural brethren are not so quick to give way to urbanized vowels. And yet, some researchers suggest that "although /ay/ ungliding before voiceless obstruents is certainly a feature of many southern regions for older speakers, its rates are greatly declining for middle-aged speakers of these regions (Hazen & Fluharty, 2004).

[1] It should be noted that though only the /a:/ variant of /aj/ is being examined in this project, this is only the first stage of the SVS, according to Labov et al. In this first stage, the /aj/ phoneme is removed from the subsystem entirely, along with backing of the long nucleus. In the second stage, the nucleus of /ey/ centralizes and moves in the space previously occupied by /aj/, and the short /e/ subsequently raises into the space vacated by /ey/. Finally, in stage 3, /iy/ lowers, and /i/ is fronted and raised, resulting in the complete reversal of /ey/, /e/, /iy/ and /i/.

My hypothesis postulates otherwise. I believe /aj/ is still quite monopthongized and prevalent in rural speakers, of all ages, and of both genders. To test this hypothesis from a distance, I sought samples of authentic, documented, rural speech to analyze for evidence of preference of /a:/ in /aj/ contexts. The samples include independent variables of age and gender, as indicated in Table 1, to test against the dependent variable of Standard English /aj/.

Table 1. Independent Variables: Gender and Age (number of samples)

	Age >30	Age < 30
Male	2	4
Female	4	2

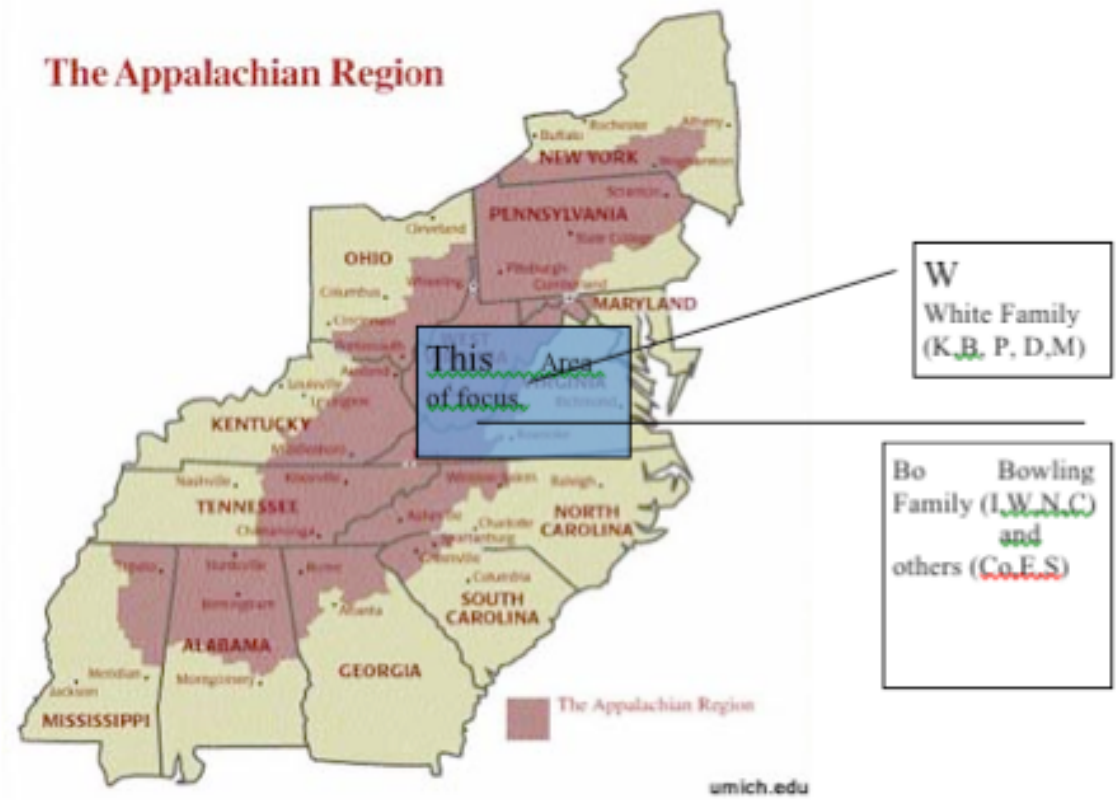
3. Method and Participants

Data on 12 participants (6 males and 6 females) was collected from documentary source recordings from the following sources:

- 'A Hidden America: Children of the Mountains"' Diane Sawyer Reports on America's Children Living in Poverty in Appalachia. Abc.com 2009.
- "American Hollow". Documentary directed by Rory Kennedy. HBO, 1999.
- "The Wild and Wonderful Whites of West Virginia". Documentary directed by Julien Nitzberg, 2009

These sources were chosen because each featured authentic documentary footage of white, rural speakers of Appalachian English. To be clear, the terms "white", "rural" and "Appalachian" are as follows: "White" means that the sample includes only Caucasian speakers. "Rural" is conventionally defined as large and isolated areas of an open country with low population density. For the purposes of this report, the participant rural speakers live in remote areas, which are primarily accessible by one-lane roads. Finally, Appalachia is traditionally defined as a cultural region in the eastern United States that stretches from the Southern Tier of New York state to northern Alabama, Mississippi, and Georgia (through the Appalachian Mountain range). For the purposes of this report, the participants all come from one area of Appalachia: Eastern Kentucky and West Virginia[2].

[2] Note: 'Appalachian' is not a term used by most people who are native to the region. When asked, they are indifferent to the term, and it may be important for us to remember that not only is 'Appalachian' a purely academic term for referring to this population, but that given the wide area of encompassed by this mountain range, it is perhaps more appropriate to refer to Appalachian English**es** (Hazen & Fluharty, 2004)**.**



(Marshall, 2008)

(Marshall, 2008)

Each of the participants' documentary dialogue segments of more than 20 seconds was transcribed from the recordings (see Appendix 1 for transcriptions). This was an attempt to capture natural, unscripted speech as opposed to testing for formal/informal speech, or testing words in isolation in reading lists. The idea was to get the most natural day-to-day speech of the speakers. Each of the 12 participants' segments were analyzed for instances in natural speech of the /aj/ variable. The /aj/ variables in the recordings were compared to the standard /aj/variant, and a determination as to the speakers' conformity with the standard was made.

A total of 335 samples were collected from 12 speakers. 197 samples were collected from speakers of both genders over the age of 30 (both genders), and 175 collected from those younger than 30 (both genders). The data includes 163 samples from females, and 211 from males. The number, age and gender of samples are broken down further in Table 2 below (Initial of participant, followed by number of samples of /aj/ variant logged for that participant). Subjects ranged in age from 11 to 68 years old, with an average age of 30.

Table 2. Summary of Number of Data Samples by Age and Gender

	Age >30	Age < 30
Male	N: 32 P: 27 Total samples for males over 30 years old: 59	C: 67 B: 38 D: 9 S: 38 Total samples for males under 30 years old: 152
Female	I:32 K: 79 W: 10 M: 27 Total samples of females over 30 years old: 138	Co: 5 E: 18 Total samples for females under 30 years old: 23

4. Potential problems with the data

Disproportionate numbers: The number of female samples drawn under the age of 30 is quite low (20) related to the other samples. This is because two of the documentaries simply did not feature younger females, and the one which did had limited dialogue for the speakers. Similarly, the sample for males over 30, though not as small as the young females, was also low (59), as the male speakers in the documentaries were often featured for very short clips, or, the clips were not clear. However, the decision was made to include at least 2 speakers in each category, and to ensure that there were at least 20 samples drawn among the speakers. I believe this provides enough representation of the /aj/ phoneme in a variety of words to be able to make a determination of variation.

Heavy sampling of specific lexis: One problem with the scripts was the nature of the recordings, which were often centered on the story of an individual, speaking in the first person. While clearly the speakers did talk about others in their segments, the samples did draw out a preponderance of "I", I've", "I'll" and "I'm", all "/I/-formed" words which contain the /aj/ phoneme. Such a marked input must be noted and discussed for its potential to affect the data analysis. Therefore, two decisions were made about "I". First, for each participant, at least 50% of the /aj/ samples had to come from non /I/-formed words. This holds true for 11 of the 12 speakers. In one sample (Co, 5 samples), the sample was so small, that an exception was made in her case to be 40%. Second, the samples of /I/-formed words, though repetitive, are in fact samples of the monopthongization of the phoneme, and will be treated as such in the results. The mere fact of its over-representation does not change the results in that had all instances of /I/-formed words been factored out, there would have been no change to the analysis.

5. Analysis

Analysis of the 335 samples yielded results in keeping with the hypothesis. Of the samples collected, 100% samples of /aj/ from males and 95% of samples from females were monopthongized to /a:/.

Table 3. Gender, First Initial: number of /aj/ samples/ number of /a:/ monopthongizations

	Age >30	Age < 30
Male	N: 32/32 P: 27/27 Total: 59/59	C: 67/67 B: 38/38 D: 9/9 S: 38/38 Total: 152/152
Female	I:32/31 K: 79/73 W: 10/10 M: 27/27 Total 138/131	C: 5/5 E: 18/18 Total: 23/23

Only two speakers, both in the same group, had any other variation of /aj/, which will be discussed below. In fact, I found that for the other ten speakers, the /aj/ was consistently reduced to /a:/ not only before voiceless obstruents, as has been cited by numerous linguists (Wolfram & Christian, 1976)(Labov et al., 2005)(Hazen & Fluharty, 2004) but in all environments. According to the established pattern, words such as "ride" and "why" pose no problem (ra:d, wa:), but in words such as 'like' and 'white', the /aj/ phoneme is not followed by voiced obstruents (/b/,/d/, or /g/),or in an open syllable and therefore should not be pronounced as 'la:k' and 'wa:t' – but they are, time and time again. In many cases, the samples were listened to several times. However, this result it not as entirely at odds with linguistics patterns as initially thought: "Whereas for AAVE, Native American Vernacular English and lowland Southern European-American varieties, ungliding before voiceless obstruents is rare, Appalachian English has had at it masthead of marked socio-linguistic features /aj/ ungliding before voiceless obstruents"(Hazen, 2006). With 98% of the entire project sample of /aj/ conforming to monopthongization to /a:/, the hypothesis that the /aj/ phoneme is not receding among rural, white Appalachian speakers, according to these data, is quite definitively confirmed.

Of the outliers, the following /aj/phonemes were manifested as 3 other phonemes than /aj/ or /a:/, /ɜ:/, /o/ and / ə/. All outliers were samples from two female speakers, over 30 years old.

6. Possible Analysis of the Outliers

The entire sample of outliers is in Table 4.

Table 4. Outliers and Phonemic Transcriptions of /aj/

Sample Number	Speaker	Utterance	Phonemic Transcription	Single Instance? (Were there other instances of the same word pronounced with /a:/?)
1	I	set it a-fire	sedit a-fɜ:r	Single
2	K	many times	Tomz	Multiple
3	K	Fightin	fot'n	Single in this form
4	K	its hyping you up	hop'n	Single
5	K	the night	Not	Single
6	K	hid the knife	Nof	Single
7	K	my cousin	mə cousin	Multiple

Theory 1

Samples 1, 4, 5, 6, as single instances of these words spoken by these speakers, can be explained by either phonemic slips or by transcription error. However, samples 2,3 and 7 become problematic, as there are other instances in the sample in which the same speaker pronounces the /aj/ phoneme as the monopthongized /a:/. This inconsistency leads to curiosity of which the underlying phoneme form is. However, given the overwhelming evidence that most other /aj/ phonemes are monopthongized, we can be relatively sure that /a:/ is the underlying and surface form. Sample 7 can alternately be attributed to being a non-content word, and facing similar reduction that other non-content words face in English in unstressed syllables (theà th@; ofà@v). Samples 2 and 3, however, might require alternate explanation.

Theory 2:

Theory 2 retains the explanation of single instance slip for Sample 1. Samples 2-7, however, could be attributed to another factor. Given that ALL of the outliers 2-7 were spoken in the same scene by a single speaker, one has to wonder if perhaps the speaker had some kind of impairment in her speech in the scene. It is entirely possible that the speaker was under the influence of drugs or alcohol at the time (she is quite open about her use of inebriants), which may have impaired her pronunciation of /aj/ to the more back /o/ phoneme. The problem with this theory, however, is that there are other samples in the same frame of the outliers in which the speaker does monopthongize the /aj/ phoneme.

Therefore, neither explanation of the outliers seems wholly satisfactory, and no definitive conclusions can be drawn. My preference is for Theory 1 if pressed to choose. I do not find that the variation of these two speakers supports the second half of the hypothesis, which held that women are reducing /aj/ more than men. Only two female speakers had a small number of instances of not monopthongizing /aj/, and only one of those, in the small outlying sample, had any consistency in alternate forms. The pattern of monopthongization in the rest of their samples was too strong to suggest that the outliers were evidence of recession.

7 Discussion

The results of this analysis open three interesting avenues of discussion. First, why do we find that monopthongized /aj/ is not receding in these speakers? Second, what is it about /aj/ that portends other linguistic changes? And third, where does the data on this linguistic community fit in the larger scheme of sociolinguistic studies?

Why isn't /a:/ receding?

The current study is a small sample of speakers in this region, and as such, it cannot claim to be representative of a larger phenomenon without further data. However, the results are significant in that there appears to be virtually no reduction whatsoever of the monopthongized /aj/. As noted in the introduction, reports of the reduction of the SVS appear to be largely focused on urban populations at the expense of those speakers who have little, if any, contact with urban centers. A criticism has been lobbied against people who deliberately seek out "those who fit the stereotype of the Appalachian Drawl, ignoring nine-tenths of the community; these reporters then represent the community as comprised of strictly that one-tenth"(Hazen & Fluharty, 2004). To be fair, the criticism is legitimate, if the intention of the reporters is merely to exaggerate negative stereotypes of all Appalachian speakers. However, it can also be said that by suggesting that this 10% is NOT what should be considered when assessing Appalachia runs the risk of saying that the other 90% better represents the region. This may be true, if the percentages are correct. Hazen goes on to discuss rural families whose language has evolved/changed because some adult members have left the region for university or work, and come back with different language patterns (Hazen, 2006). However, the participants in this study for the most part, do not show signs of leaving their communities, whether by choice or by inability. Of the current sample, only two had left the region for any reason. 'P' moved to Minnesota to better his work chances, and works in construction (and still retains the monopthongized /aj/); 'S', a high school football player, tried to attend college but was unable to afford the cost of living despite having a scholarship, so he left his urban university and returned home. One other participant, 'C', considered leaving, but chose to stay in the area. The other participants expressed no interest in leaving their communities. Perhaps 'rural' is too broad a term to comprise the different socioeconomic groups of non-urban residents of these areas; one which has aspirations of upward mobility, and the other which doesn't. Given the strong family ties, sense of identity and comfort in familiarity, I suspect that there are many in this region who will not leave. For people who are unable or unwilling to venture out from their communities, and little to no chance of an influx of outsiders moving in, there is little chance of language change in this area. Therefore, it is not surprising that /aj/ has not receded among these speakers, nor do I imagine it will anytime in the near future.

What's so special about /a:/?

The Southern Shift (SVS), according to the ANAE, unfolds in three stages (see footnote 1), and the deletion of the /aj/ is the first step. It is this deletion that theoretically makes space for the others vowel shifts to take place. Therefore, if the /aj/ is entirely monopthongized in this community, the second and possible third stages of this larger shift should be underway in this linguistic community. In addition, the absence or reduction of /a:/ monopthongization in different rural and urban centers should be retarding the progress of the subsequent stages of the vowel

shifts in those areas. Although it is beyond the scope of this paper to discuss the advancement of the second and third stages of SVS, the research for this project did seem to indicate that this was in fact the case: Stages 2 and 3 are well underway in the sample community, and less so in the urban or upwardly mobile rural centers.

How do these white rural Appalachian speakers fit into larger sociolonguistic studies? Perhaps the most interesting part of this project is what it can tell us about sociolinguistic methods. Being able to sample a community with apparent time (a sample of the current population over many age groups) and real time (samples collected with the same speakers, possibly over generations of families over time to chart the linguistic progression over decades) are both valuable resources for sociolinguistic research. However, while apparent time samples are relatively easier/less time-consuming to obtain, real time samples are difficult for a variety of reasons, the most salient of which are the mobility and linguistic influences which enter the community of the speakers. If speakers have general mobility, they do no stay in isolated communities – they may live in urban centers in their own regions or in any number of other linguistic communities for a period of time, which can change their linguistic patterns. In addition, the language of speakers can change due to changes in life circumstances; different life demands (jobs, families) can have an effect of linguistic patterns in the course of one's life. For example, we may want to model language for our children in different patterns from what we learned, or we may try to sound more 'standard' in our jobs to reduce stigmas or to sound more professional. Families, particularly intergenerational families, are ideal for both apparent and real time studies, but it is only in areas of relative isolation that families tend to stay together and avoid the trend of temporarily living elsewhere, such as in other linguistically 'isolated' communities in Martha's Vineyard, MA, Tangier Island, VA. or in Ocracoke, NC. (Labov et al., 2005) (Wolfram & Schilling-Estes, 2005). The rural speakers in this study sample are not only intergenerational families with little propensity to leave, but are also seemingly unaffected by outside influence unlike the communities in Martha's Vineyard, Tangier Island and/or Ocracoke. The current sample charts two families in the region, and there several are other family studies of speakers in this region (Hazen, 2006)(Irons, 2007). Therefore, there appears to be a ready-made database for tracking linguistic patterns in this region with a special purity of form.

8 Conclusion

In "The Final Days of Appalachian Heritage Language" (Hazen, 2006), Hazen not only suggests that the time of the Appalachian regional dialect(s) is coming to an end as the language quickly changes over time, but that the language (or dialect) should be considered a heritage language to preserve its form and structure. I would suggest that the most salient threat to the language is a precipitous decline in population in the region, not the influence of the speakers themselves. The speakers in this study seem unfazed by linguistic differences, and unaware that could be any reason to change their language patterns.

References

Fridland, V. (1998). The Southern Vowel Shift:Linguistic and Social Factors. Michigan State, Michigan.

Hazen, K., & Fluharty, E. (2004). Defining Appalachian English. In M. Bender (Ed.), Linguistic Diversity in the South: Changing Codes, Practices, and Ideology. Athens, GA: University of Georgia Press.

Irons, T. L. (2007). On the Southern Shift in Appachian English. U Penn Working Papers in Linguistics, 13.2, 121-134.

Kennedy, R. (1999). American Hollow. Documentary, HBO.

Labov, W., Ash, S., & Boberg, C. (2005). The Atlas of North American English: Phonetics, Phonology, and Sound Change: A Multimedia Reference Tool. New York: Mouton de Gruyter.

Marshall, J. (2008, May 13). Upcountry | Talking Points Memo. Talking Points Memo. Retrieved May 3, 2011, from http://www.talkingpointsmemo.com/archives/194870.php

Hazen, K. (2006). Language Variation And Change in the American Midland: A New Look At "Heartland" English. (T. Murray & B. L. Simon, Eds.). Amsterdam/Philadelphia: John Benjamins Publishing Co.

Nitzberg, J. (2009). The Wild and Wonderful Whites of West Virginia. Documentary, MTV Studios, Dickhouse Productions.

On Assignment. (2004, October 4). Camera Works: American Hollow (washingtonpost.com). Washingtonpost.com. Newspaper. Retrieved May 3, 2011, from http://www.washingtonpost.com/wp-srv/photo/galleries/hollow/intro.htm

Sankoff, D. (Ed.). (1986). More Evidence for Major Vowel Change in the South. Diversity and Diachrony (pp. 83-95). Amsterdam: John Benjamins Publishing Co.

Sawyer, D. (2009, February 13). "Children of the Mountains": Full Show Video - ABC News. abc.com. Broadcast News, . Retrieved May 3, 2011, from http://abcnews.go.com/2020/video/history-appalachia-6885766

Thomas, E. (2003). Secrets Revealed by Southern Vowel Shifting. American Speech. 78, 150-170.

Wolfram, W., & Christian, D. (1976). Appalachian Speech. Arlington, VA: Center for Applied Linguistics.

Wolfram, W., & Schilling-Estes, N. (2005). American English: Dialects and Variation. Hoboken, NJ: Wiley-Blackwell.

Appendix

Transcripts:

All Instances of /aj/ in BOLD; outliers from monopthongization in red
Names, and ages/approximate ages of participants

1. American Hollow

Iree, (68) :

"I been around here 68 years , been gone 'bout five months out the whole time. I've got 30 grandchildren and 7 great grandchildren. Now I told you I been married forty nine years , and forty nine children! (music) Now we got the hard times, we've had good times, and we've had sad times, and sometimes, we catch up ground squirrels, clean 'em up, row em' and eat 'em up. It ain't been easy, but we survived"

"I'm sixty eight, he's sixty nine and we still work. I plan on working as long as my hands'll work, and my legs'll go"

"They live aside a' me…and David Bowling, he lives in Ohio…all the children live within an hours drive away from us"

"Sometimes I get so tired myself I don't feel like staying and feeding, but Ill stay here a while"

" You playing hide and seek? Well, you are all cleaned up. Wanna show 'em your little house? Yeah, its cleaned out now. She lives in the dark house. Joanie called and asked how you're doing, I told him you were getting ready to put your garden out."

"Her husband when he was living treated her real bad. He treated her in ways that he oughta been killed for. He had an old stick he kept behind the door. He'd beat her with that stick and then she'd say that he loved her. "

"Jody tied a curtain around her, set it a-fire and wanted her to burn".

"Me and Bass work and makes the garden every summer and provide the food for the winter. There be somebody hungry we don't need to turn 'em away. Never have. I think it's the right thing to do is teach 'em children they have to work if they have to live in this world, they sure have to work"

Wanda Bowling, @35

"This is how we get to bath, every night, ain't got no tub, Gotta use what you got. …Anything we wear in the hills, that's the way they come out, socks clothes… I use rain water because I don't like to use wellwater, got salt in it. I use the rainwater. I catch it in buckets…(to sister) Looks like getting your last load up here"

"There's nothing here for children. There is lot of kids here who has got their high school diploma they're doing nothing"

"Now they had him in jail a long time. I don't know how he got out."

Cliff , 17 (talking to his family)

"I'm getting married next summer. She's going on to school. That's not what I'm saying. What I'm saying is who's going to support her while I'm in school? I'm going to her support her while she's in school. See, that's my problem. I can't go to school and make money that I need now. See I can go back later, maybe, you're not listening to me. Everybody wants to say that I don't do shit around here, but I fucking try….and until you say you're gonna help me, you can't say nothing. …well, I don't want to be like him. Sure, he got his own ride when he was eighteen but he ain't doing nothing now, 'cept livin month to month, getting a check, digging roots, that's great living, right? And everyone one of my uncles, 'cept a couple, is doing the same damn thing, nothing. "
"I might just do that. …He thinks a lot like me. And for him to come and offer me a chance like that when no one else would made me feel like someone wanted to give someone else a chance"
Apparently, you don't live my life. Really we're just waiting till she's 18, and a lot of there people was married before they was even 15, 14… I know that without her, I can't make it.

"I miss her and stuff and it hurts cuz I think about it and all, but I can go do stuff because I don't have all the shit that I did have to worry about…its' over, its done, I don't want to think about it. I can't go nowhere cuz I'm broke. You can't go nowhere without money. Why would we get in a big f'ing argument about that? Why?

"I want to know why you'd do that to me? For real. I don't want no damn lies. If you love in the first damn place, then you wouldnta done something so stupid like that. I'm ripping my jeans in half . Why? Cuz I'm mad…could be a new style or something, I don't know. I did everything I could for you, Shirley. There's no way I ever done you wrong. Tell me one time that I didn't love you more than you loved me."

It would break my heart if you couldn't accept someone I love as a family. She is going to be the one to make you grandkids. You never even took the time to talk to her. I'm trying to be calm, Mommy, I'm trying to talk to you, man to mother, Mommy.

"I have thought. Yes, that's what she wants to do. I'm going to get a job and live my ife. Im going to work. Its easy done if I set my mind to it. Wont be the first big mistake I've made. I wish you'uns and the family would have a little faith in me for once. Hell I'm not the only one in this family to make mistakes. It'll be my mistake.

"I'm moving away today. I bet big money on it. I aint coming back here. This bad check's gonna stick. "

<u>Neil, @45 (talking about and with his brother Edgar, in jail)</u>
"Sometimes somebody'll tell you the truth no matter how bad a liar they are and whatever, but you know, I've never known him to go in nobody's house and do this sort of thing. Cuz he's always done like the rest of us, you know, dug roots for money or whatever" We's gonna put it up for bond to get Edgar out of jail, which I'd do for any of 'em, I mean dirt's dirt, your brother's your blood. You can get more dirt, but, uh, I got seven brothers, but still yet I'd like to keep em all, I've not got one to spare…the deed is only 2000 dollars but I got five hundred cash … it needs to be worth five thousand dollars to go a 25 thousand dollar bond; I brought my ID and five hundred and they wouldn't take it – its gotta be worth twice the amount, see right there"
"I tried to pay her 100 dollars not to marry him but she did. He's a type of guy they show on TV that shows that men like that wind up killing their women, beating them to death or something. "
"Got your pills here… come in from Cardinal Hill. Why did you buy some ? This stuff will straighten you right out".
"He always had sort of a temper on him. You'd mind him. "

"Well, it can get tough. I mean, heck, they put a man walk on the moon years ago and I don't have running water. I mean ain't that way behind? Seem like it might never change.

1.The Wild and Wonderful Whites of West Virginia

Kirk, @35

"My name's Susan Ray White but everybody calls me Kirk. They tried to charge me with accessory, and I told 'em, I said just go ahead and send my ass to jail cuz I'm not a snitch, I wouldn't snitch nobody out. And I've been in trouble many times, fightin, cussin out the cops, I been to jail so many times I couldn't count 'em. If you started some shit with me, I'd fight you. I love to fight, I really do. "

"I think six cans of pop is too much, its hyping you up. …Now I met Dennis. I liked him cuz he let go around me. And you know, he aint goin away he got a job, and I love eighteen wheelers and he drove an eighteen wheeler, and then he ends up screwing m@ cousin, and then I end up stabbin his ass. But the night I stabbed him, it was cool, cuz my grandma, she cleaned up the blood and hid the knife so they's no evidence and they coulnd't take me to jail. I meant to slit his throat, and that's for real… I mean I'm a people person I can get along with anyone but I hate that son of a bitch. "

"I got pregnant before I stabbed Dennis. And when my baby gets older, I'd like for her to go in a totally different direction than what mine went. You know, finish school, do the right things, stay away from the wrong people… to stay in Boone county, I don't care how many dreams you have, its not going to happen. I'm trying so hard to stay out of trouble, and its, every time I turn around its hitting me the face worser and worser. "

"Now what? Some strange person might be holding her. (inaudible). I'll just run up into traffic and they can just kill me. "

"My favorite verse is Matthew 21:2 "and whatever thing you ask in prayer by believing you will receive but you got to believe it. And that's what I'm going now no matter how hard things is down on me. I'm still believing. I believe God is saying hey look how much you love this baby, 3 days, but try three months three years, get your shit together."

"Regardless of one thing about it, I like to fight and I'm half a fighter. And I'm not going to give up. I don't give up this easy.
I don't care where I do it. That doesn't matter to me, as long as I do it…She's going to get me straight in on Monday. If there was a pill laid out there, I'm going to do it, cuz I know I only got 48 hours to do it in."

"I could stay three months, I could stay 6 months, I could stay up to two years. [who decides the time] Me. I aint got no other choice. "

"I'm not going to leave you. I'm not going to leave you! Why do you always remind me of that? I said I'm sorry like a million times! Ok, I'm really really sorry for ever leaving you anywhere. I'm really sorry for never playing your game with you. Mom's really sorry… will you ever

forgive me?...Boone County's my downfall. I love it, but if I'm there too long, it's like a hole, and it sucks me in….Kirk's got some problems, and that's it. Thank you Tyler, saved by Tyler. "

Derek, 17
"I killed a deer with this this year. It aint loaded; I just kicked it around a few times…oh I know that! Let me get some shells we're going to go blasting…that's how the rednecks done…mom can you get me some alcohol please? I need a butter knife. "

"What it was, Billy says it's over a broken down truck – no. Brandon sold him a gun for a truck, and uh, well, Brandon come back up here, you know, we was high, we was taking pills, you know, and Billy called back up here, he said, I tell you what you little bony bastard, and you know, Brandon's dad had just passed on. Billy called up here and basically said you know, I'll bury you next to your cold dead daddy, you mother fucker. And Brandon said, ok, we'll see. He hung that phone up, walked right out that door, and fifteen minutes later, Billy was sitting there trying to put his face back together. So you tell me, who got the better end of that deal, you know what I mean?"

Mousie, 28
"No more. I do not belong to the state no more. Let me show you my no good son of a bitch husband. His names Charles, he's a bastard and a cheater. Well I'm a hop out and finish smoking real fast. This time I'm free, no parole, no shit. See I was only out three and a half months when I got locked back up. Why you say I'll be back? I'm not on parole now, I'm free! Let me see your phone, Sue, for a minute…When I went to jail, he moved in with the lady he left to marry me for - he moved back in with her because of his little girl, and then I guess he cheated on her with another lady and got her pregnant, she's going to have this baby. When I was in prison a second time, he cheated on me with my cousin, moved her in my apartment for two months and then when I made parole he made her move out, cut up all my wedding pictures, all my clothes, destroyed my apartment before she left. I gotta a lot of things I gotta do this week, I've got to go get a picture ID made, contact my husband Charles, and discuss our divorce."
"Well, we're in Lincoln County on Bodger Road, going to pick up Charlie Green, which could be my husband, which is my husband, and here is the commandment he broke! I want to kill him is what I want to do."
"Well we went to Lincoln County looking for Charles, we did not find him (You don't tell me what to do, bitch!). So when we come back to Madison, we find **, the one which he has the baby by…(on phone) Is Charles over there? Hi. The funs just getting ready to start, honey. Believe that."

"C'mon, we're getting ready to take you in the store where we got married in. (we picked up) Lorzin 19 and 60 purple Xanax, we get the medicine, we come out here to the truck and crush four up, snort 'em. The pharmacist was a preacher, a pastor or whatever, and they took us over to the flower department and married us. What the fuck, I wanted to get married. Do you regret it? He thinks he's going home when we get back to Boone County but I got news for him, he's not. Holding him hostage."

Poney, @40

"Hey I'm Poney White, Minnesota bound. Raven Street. Don't get no better no less. Highway to heaven. I'm from Boone County, WV, that's where I was born and raised, and I thought, well, I've gotta go. So I come to Minnesota, where I really like to work I been working on my life, and I always work till I leave this earth. And I dropped out of school in 7th grade, Van High, I learnt more in the streets than I did in school. …[didyou ever get arrested?] Yeah a few times; I did eighteen months over at Charleston work release, and three years probation and I pleaded everything. That's why I come to Minnesota, I have a better life for myself, and for my kids. I want them to have better than what I had."

(About mining): "When you go in that hole, man it's going cave in or could have blown in or I could have drowned or get electrocuted. That's four things that may could happen to you."

Brandon, 18

"It's a long story, but I'll let you know. Pretty much what happened was I was buying my drug of choice, Xanaxes, a little bit of coke, and weed, and I was buying a shitload of guns….Yeah, after my dad died, I got on the hard stuff. I was doing it all, coke, pills, whatever I could get my hands on pretty much. I thought I killed Billy, and I didn't know for sure where I shot him. But I thought he was dead, so, I thought, no, they aint going to take me out alive. I ended up shooting at the cops, from Nov 21st to the 22nd, till 4:30 that morning when they apprehended me. It was one hell of a night. I just went on a rampage pretty much. You Know I wasn't thinking, my family, I don't know why I did it really. I, it just happened. They say they forgive me, but you know, I shot dude in the face, and then again, you know, they helped, I been around them all my life, so I'm sure they still got love for me, but I terrorized them pretty much, and I'm sure they hate me for that. I'm getting sentenced on the 16th and its really up to the judge what happens to me. But my judge likes me, we get along good, and I think somethings good gonna happen, I think I'm gonna go home on an alternative sentence."

3. Hidden American: Children of the Mountains (eastern KY and West Virginia)

Shawn Grim, 17

"These are all my clothes for school in my truck cuz I aint got nowhere to go right now. Got my jersey, some jogging pants. My toothbrush and toothpaste are in my glovebox. The whole entire hollow is just family and all of them hate each other, so its all fighting. If they own a chicken or who thinks they are the god of the hollow its all fighting about it. I want to go ahead and make everybody proud of me and I want to make everybody happy that I am actually trying something and doing something with my life and I don't want to mess up. Its in the middle of nowhere, you know this, right? I swear to you. Everything that's outside, they'll steal it. Yeah, there's thieves around here. That's the reason you don't leave your purse down. "

"I drink one beer, to flush out my kidneys, and that's it. It cleans them, I guess. Its what I was told, and I read it in a magazine. "

"Oh, they hate me. With a passion. Her daddy told me if I ever set foot on that porch of his, he'd bust my jaw. I hold all my anger in until Friday nights, I go out and give it my all and release it on the field."

" I don't know the dance, seriously, I don't. "

"Us hillbillies don't want to do nothing, but drink and do drugs the rest of their life? Is that what you're saying? Stereotype?"

"I aint got a lot of money. What did you live in back home? I slept wherever I fell asleep. Failing is probably the biggest thing to ever scare me. I guess I'm just going to have to work harder and try harder. Found out I couldn't pay for the college, had to come home. No one's perfect. "

Courtney, 12

"Can I be honest? Our mommy used to be hooked on drugs, and we did not like it one bit. There's 12 people living in this house altogether. Honestly, I would love for me, my mom, Bill and us girls to have our own home but we do not have the money to do that. Bill is wanting to get a job but we can't because we aint got a car to get him back and forth. Honestly, we can barely afford food. Whenever her food stamps are all gone, we run out of food. We don't have bread, we don't have meat. Last week we was out of food; the only thing we had in our fridge was butter and ranch. We're not like other people, we can't afford food after food after food."

Erica, 11

"She drinks sometimes but that's not right for me. But I love it. She's almost 50, and if I don't get her out of this town soon, then she'll probably die any day. Our relationship is like, oreo and ice cream. "

"The reason I go on these walks is because I want to get away from my mom when she's like that. I had an F before, then I brought it up to a C, and now its two points away from an A."

"No, she wouldn't let me see her. But I knew it was happening. She had that look in her eyes when she lied to me. [why do you think she does it] Pain, misery. You gotta make the better of it. She's still alive. Just keep holding on tight. "

"Its just a wake up call from God, saying it's a new start."

Why Not "Spop"? OCP and Prominent Position Effects on the English Lexicon

BENJAMIN F. TAYLOR

1. Introduction: "A hole in our dictionary"

In 1969, E. C. Fudge discovered that the English lexicon is conspicuously void of words like "spop," having the syllable structure *s*CVC, where the two consonants are specified for the same place of articulation (Fudge, 1969). Davis (Paradis & Prunet, 1991) conducted a computerized search of nearly 20,000 words in *Webster's Pocket Dictionary* and found that "no monomorphemic sCVC sequences were found in which the two C's were identical noncoronal consonants."[1] Words like *spop*, *spep* and *skik* are underrepresented in our vocabulary. In contrast, morphemes having the sequence *s*CVC when the two C's are different noncoronals, or where one C is coronal and the other is noncoronal, are common: we have words like *speak, skip, scaffold, scuba, stake, stop, stable*, and *stagger* (Table 1; Interestingly, both exceptions have only recently been added to the English lexicon).

Table 1: Occurrence of identical place of articulation in English morphemes

	C=labial	C=palatal	C=velar
spVC	**1** (spam)	216 (spit)	56 (speak)
skVC	58 (skip)	151 (skate)	**1** (skag)[2]

What's more, Davis observes that sequences of the form *s*NVN (where N = any nasal) and CLVL (where L = any liquid) are rare (Paradis & Prunet, 1991). We don't have words like *smom*, *smen*, or *snun*; and only a few identical liquids like *slalom* and *flail* make it into the English lexicon. We can generalize these trends into a composite statement.

(1) There is a resistance to $C_1C_2VC_3$ clusters where C_1 and C_2 are any allowable consonant cluster, and where C_2 and C_3 are specified for the same place of articulation.

[1] Davis observes that this underrepresentation does not apply when both C's are coronal. There are over 300 words having the structure "*st*VC" when C is a coronal. Typical examples he offers include *stud*, *study*, *astound*, *stadium*, *stash*, *stitch*, and *stone*. He argues that coronals are underspecified for the Place Node, in a model of feature geometry like the one proposed by (Sagey, 1986), and are therefore exempt. This has been challenged by Frisch (S. Frisch, 1997), who argues that the plentitude of coronals is due rather to frequency effects. This issue is tangential to the issue I am raising. Whether coronals appear frequently due to combinatorial likelihood or underspecification, the absence of labials and velars alone is conspicuous enough to demand explanation.

[2] Three velar nasals (ŋ) also occur, *skink*, *skank* and *skunk*, an exception that invites further inquiry. right! but shouldn't all constraints take place at surface level, like OT suggests?

2. Literature Review and Rationale

The Obligatory Contour Principle

What's wrong with these kinds of words? Why are there so few of them? The Obligatory Contour Principle (OCP) can account for the hole in the lexicon. The OCP identifies a general tendency in human languages: they "prefer adjacent sounds to be different if possible" (Weinberger, 2002).[3] This tendency affects segmental place of articulation in the form of the constraint "OCP-Place," a regulation against similarity of place of articulation in nearby segments. Evidence for OCP-Place can be found in languages such as English, Cantonese, Arabic, Modern Hebrew and Kikuyu (Weinberger, 2011), to name a few. Much work has been done analyzing Arabic trilateral root morphemes, which resist adjacency of homorganic segments (S. A. Frisch, Pierrehumbert, & Broe, 2004). OCP-Place has been shown to affect non-adjacent but nearby segments, separated by vowels (Davis, 1989). Many consider the strength of OCP-Place constraint to be a gradient that decreases with the number of intervening segments, rather than an absolute "on/off" (Frisch, 1997); (Guy & Boberg, 1997). The import of the OCP on words like *spop* can be clearly stated by (2).

(2) The OCP blocks the co-occurrence of the feature [place] inside a morpheme.

The two stops in *spop* are too similar, even when they are separated by a vowel. Problem solved—the missing words are accounted for by way of a parsimonious constraint.

But what about "pop"?

However, if we hold to our explanation in (2) for $C_1C_2VC_3$, we encounter a challenging obstacle: when C_1 is absent, there appears to be no resistance to place similarity between C_2 and C_3. Take away the cluster, and the OCP effects vanish. We have plenty of words exemplifying homorganic CVC, like *pop* (stops), *none* (nasals), and *lull* (liquids, although possibly fewer). Davis is aware of this:

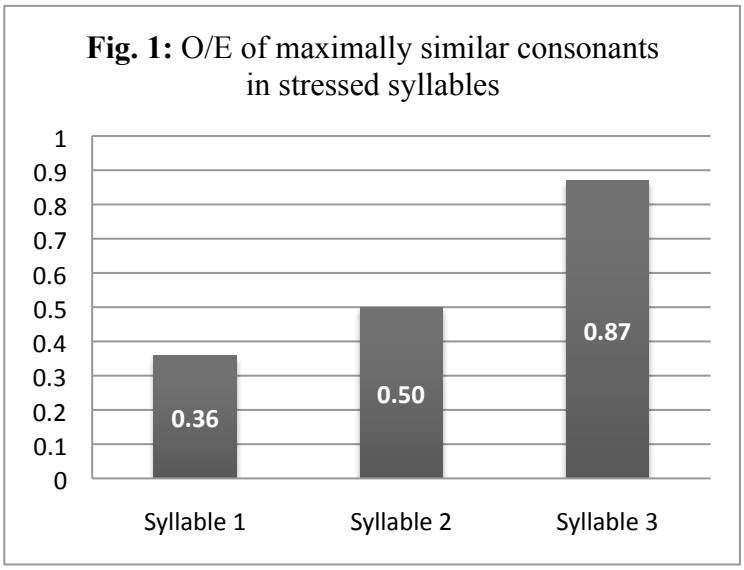
> *It is interesting to note that while English has a MSC on sCVC sequences, there appear to be no systematic constraints on CVC sequences. Such monosyllables as pip, kick, tight, pub, cog and toad, with homorganic consonants flanking both sides of the vowel, occur in CVC sequences. I repress the temptation to speculate on why the MSC only holds for sCVC sequences*…. (1991, 59) !!!

Stefan Frisch's dissertation (S. Frisch, 1997) succumbs to Davis' temptation and probes the lexical data further. Frisch conducted a study of the CELEX dictionary, a large online dictionary of British English that contains phonological, morphological, syntactic, and semantic information. He observed that there actually is a co-occurrence restriction against homorganic onsets and codas—even when they are not part of a cluster—when they occurred in unstressed syllables. The observed/expected (O/E) ratio for homorganic onset and coda segments in unstressed syllables is .28 (S. Frisch, 1997), that is, words like "papoon" (with emphasis on the

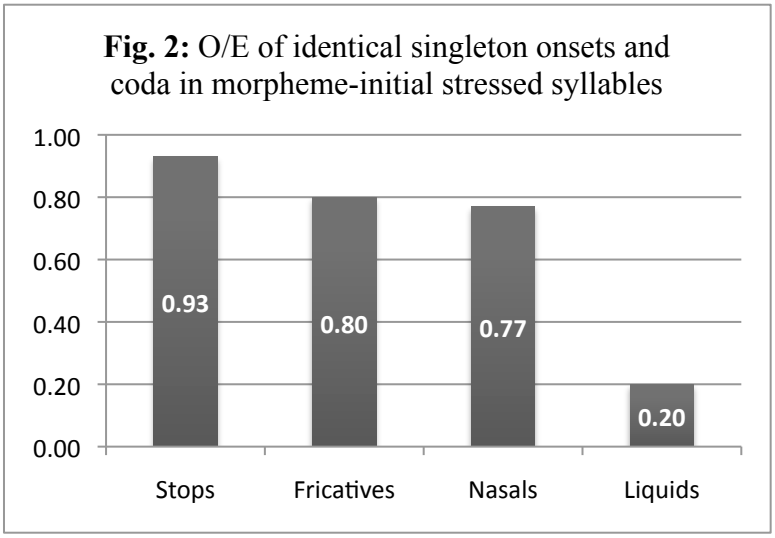
[3] Theoretically, this stems from language's overall purpose of communication—signals are best understood when they provide contrast. Consider computer programming's binary "on-off."

second syllable) occur only 28% as often as we would expect based on the number of possible combinations.

Berkeley (Berkeley, 1994b) found that co-occurrence is also restricted in stressed syllables, among homorganic segments that are *maximally similar*. Maximal similarity is defined as differing in only one feature, such as *bop*, where [voice] differs between onset and coda (See Fig. 1; see Appendix for complete data).



Additionally, Frisch (S. Frisch, 1997) noted that, in word-initial stressed syllables, identical (not maximally similar) singleton onset/coda pairs with *high sonority* do not co-occur as often as they are predicted to (Fig. 2.; see Appendix for complete data). Liquids only occur 20% as often as they are predicted to; nasals and fricatives are more frequent but still not as copious as we would expect. The class of segments that throw off the consistency of the OCP the most are the stops. We can generalize that lexical frequency is inversely proportional to sonority. Segments of a higher sonority class are less likely to surmount the OCP-Place constraint and "make it into the lexicon."



Considering these trends, several factors must converge into our account of why English allows words with CVC syllables that violate the OCP. We know that two tautomorphemic segments will probably obey the OCP according to the following general tendencies.

(3) a. Unstressed syllables do not violate the OCP
b. Syllables with onset clusters do not violate the OCP
c. High-sonority segment pairs are less likely to violate the OCP
d. Maximally similar pairs do not violate the OCP

Therefore, two tautomorphemic segments will most likely bypass the OCP only if they are low-sonority, are identical, not maximally similar, are located in a stressed syllable with a simplex onset. Almost all of our token words like *pop* and *kick* are of such form.

Why do these factors produce violations of the OCP? Frisch (1997) references evidence that stress catalyzes natural articulatory differences between stops in onset and coda positions (such as aspiration). He proposes that "the perceived similarity of onset and coda consonants, particularly those of low sonority, is reduced by the positionally dependent allophonic variation in stressed syllables".

However, Frisch does not attempt to prove this proposal; he mentions it only in passing, acknowledging that "an articulatory and acoustic analysis of the differences between consonants of different degrees of sonority in onset and coda position of stressed and unstressed syllables is needed to verify or disprove the hypothesis." He calls for further research into the nature of this dissimilarity.

Objectives

I believe Frisch is onto something, and I believe the universality of the OCP ought to be defended against this large corpus of threatening anomalies. I will attempt to unite his ideas to the theory of Augmentation in Prominent Positions championed by Smith (2005). I will begin with an "articulatory and acoustic analysis" examining the perceptual differences of consonants in onset and coda positions of stressed and unstressed syllables. I will then motivate the lexical behavior in terms of a phonological constraint acting to augment those differences. We will find that there are indeed phonetic distinctions, for stops at least, and that these are acted upon by a high-ranked faithfulness constraint for prominent positions, such that prominent positions license violations of the OCP. The constraint accounts for the underoccurrrence data. Ultimately we will see an example of the effects of phonological forces on which words the English lexicon contains and does not contain.

3. The Positional Phonetic Variation of Stops

Obstruents take different phonetic forms depending on where they are located in a syllable. The phenomena that vary include release bursts, aspiration and devoicing.

Unreleased codas

One of the clearest phonetic differences between obstruents that occur in syllable- or morpheme-initial positions has to do with the release burst, which will be our primary focus. The release burst is the air that escapes the vocal cavity immediately following the release of the closed position of the articulators when making a plosive. It is very brief (around 20 ms), and helps to give acoustic shape to the plosive. The actual instant of stop closure cannot provide perceptual information because no air is projecting out of the mouth (Silverman, 1997). The perturbed airflow of the release burst helps clarify voicing and place of articulation contrasts (Hudson, 1995). In short, since the total closure of a stop gives no sound, stops are identified by the small intervals of sound before and after closure, on the approach from a preceding vowel (in VC positions) or the ascent to a subsequent vowel (in CV positions). Release bursts are key to perceiving the identity of the stop.

In word-final, postvocalic positions (VC), stops do not always have a release burst. The presence of release burst is very unpredictable in English. Kent and Read (1992) note that "The burst is not a reliable acoustic cue for word final stops" (Kent, 1992); that is, a speaker will sometimes choose to produce a release burst in formal speech, or when attempting to increase intelligibility, but not always. For example, a frequent realization of /pop/ is [p^hop̚]. This follows the trend that syllable-final obstruents are generally "weak," that is, less acoustically salient and subject to neutralization (Hudson, 1995). Obstruents in codas have weak release bursts.

Aspirated onsets

Obstruents in onsets, on the other hand, are always released. Syllable-initial position requires increased perceptual salience; in fact, the formant transient by which the consonant shifts into the vowel (C→V) contains some of the most perceptually distinct characteristics of a syllable. Ohala and Kawasaki(1984) concluded that "it is generally the case that the most salient acoustic modulations in a syllable occur near the CV interface". Articulation is generally more prominent in onsets. For example, the length of stop articulation is longer (Keating, Wright, & Zhang, 1999). Byrd, et al. affirmed that consonants occurring syllable initially had longer total durations, constriction durations, and time-to-peak velocities than those that occurred syllable finally, concluding, "The notion that consonants are more prominent in word- or syllable-initial positions holds on a temporal level," i.e. they are longer (Byrd et al. 2005, 3872).

A key feature that aids the perceptibility of the initial consonant is aspiration. Aspiration, a period of voiceless breath in the formant transitions of a stop, cues both place and voicing features to the hearer. In fact, in tests when aspiration was replaced by silence, the hearer's accuracy at identifying the place of articulation dropped by 24% (Just, Michaels, Shockey, & Suskick, 1978). This perception is most helpful for consonants in onsets, because aspiration causes a momentary devoicing influence on the following vowel (Steriade, n.d.). Aspiration also appears to have an augmenting effect on the release burst. Irrespective of other variations, bursts tend to show more strength when they are accompanied by aspiration, according to the hierarchy *voiceless aspirated* > *voiceless unaspirated* > *voiced* (Coleman, n.d.). Aspiration also lengthens the Voice Onset Time (VOT), the crucial period before the vibration of the vocal chords that helps characterize stops as voiced or voiceless. Unaspirated stops have a VOT of around 30 ms, whereas aspirated stops can have VOTs of 50-120 ms (Kent, 1992).

Thus aspiration helps stops become more perceptible by reinforcing the strength of the release burst and lengthening the VOT, and creating a clearer distinction with their "sister" voiced stops. Thus aspiration amplifies the natural phonetic differences in stop release that occur in onset and coda positions. Therefore, whereas obstruents in codas are often weakened (e.g. unreleased), obstruents in onsets are augmented (e.g. aspirated).

Aspiration occurs in English only in the formant transitions of voiceless stops when they are in the onsets of stressed syllables, except when those stops are preceded by /s/ (Kent & Read, 1992). In English, voiceless stops are *not aspirated in the non-initial positions of onset clusters* (e.g. *[sp^{h}ike]). This will prove crucial to our analysis.

Partial devoicing of voiced onsets

Voiced stops are not aspirated, yet they too are allowed, in the face of the OCP. How can we account for words like "bob" and "gag"? There are differences between onset and coda positions for voiced stops too. The general characteristic that distinguishes voiced stops is glottal vibration (voicing) during the period of stop closure (Liberman, Delattre, & Cooper, 1958). However, in the initial position of a word, voiced as well as voiceless stops are often produced with silent closure intervals (Lisker & Abramson, 1964). Smith notes that voiced stops at the head of a phrase experience voicing at the moment of release, not during closure, making them "actually voiceless unaspirated stops, like those in French" (J. Smith, n.d.).[4] Lisker and Abramson admit that /b, d, g/ are somewhat "voiceless" syllable-initially and commonly appeal to the aspiration in /p, t, k/ to differentiate them. Thus, voiced as well as voiceless stops experience a difference in initial positions too—they are partially devoiced.

[4] Smith specifically mentions the "phrase initial" position but I suggest that this generalizes for word-initial stressed positions. For example,

Problem solved: dissimilarity

Therefore there are at least three phenomena that affect the allophonic variation of stops based on their location in the syllable.

(4) a. *Release bursts* are not equally characteristic of codas.
b. *Aspiration* occurs in onsets, when in a stressed syllable, and not a part of a cluster.
c. *Partial devoicing* occurs in voiced stops in initial position.

Let's put it together: in a typical C_1VC_2 syllable, C_2 is likely to be marked [-release], whereas C_1 will be marked [+aspirated] if it is voiceless, or, if voiced, will have a shifted VOT/be partially devoiced compared to C_2. Thus C_1 and C_2 aren't phonetically identical as they appear on the surface. If they aren't entirely identical, then they are less opposed by the OCP, which disfavors *similarity*. Perhaps the OCP accepts same place of articulation, *if* there are other features to distinguish the two segments. We know that the OCP behaves as a gradient that grows increasingly strong as similarity between the segments increases (Frisch et al., 2004), so this concept is not hard to accept. We can take the assumption (5).

(5) OCP-place violation between two segments in CVC is permissible if they contain perceptible allophonic variation.

This generalization can account for words like gag and pop.

4. Positional Faithfulness

We would like to account for our observations in terms of some constraint in the phonological grammar—without a constraint acting on the phonology, allophonic variation would have no affect on the English lexicon. If our idea about similarity is true, we must be able to observe some constraint that refers to similarity and interacts with the OCP-Place constraint. To discover this constraint we must look at the concept of the prominent position.

Prominent positions

In (3a), we note that a place of articulation co-occurrence will be allowed in a stressed syllable, but the same form is unacceptable in an unstressed syllable. This requires us to acknowledge that languages have "prominent positions" which receive special attention (Beckman, 1998). Beckman lists onsets, stressed syllables, root-initial syllables, and word initial syllables as prominent positions—in other words, these are the very positions where we find our exceptions. Smith notes that prominent positions are subject to unique markedness and faithfulness constraints, for example, ONSET/σ_1 which requires the presence of a syllable onset in the initial

syllable, and the [*ONSET/X]/σ_1 subhierarchy, which favors low-sonority onsets in this positions. Positional constraints have the ability to "resist neutralization of processes that affect other positions" (J. L. Smith, 2005). If the OCP eliminates "fatally similar" consonantal features from the English lexicon, constraints that designate prominent positions might have the license to resist, preserving sub-optimal forms.

A new positional constraint

We know that stressed syllables are phonetically prominent positions; let us suppose that stressed syllables also have psycholinguistic strength in English. Smith argues that positional faithfulness constraints that apply to stressed syllables do so for phonetic reasons, such as enhancing the accuracy of the output (2005). For example, a heavy syllable is a phonetically strong position because its weight needs more attention to be accurately realized. The problem is that, as Smith argues, such constraints cannot address consonantal features (which sensitivity we need for the two C's in our CVC).

On the other hand, faithfulness constraints that apply to psycholinguistically strong positions (i.e. those that are important for recognizing the word) can license the preservation of consonantal features (Smith, 2005). Morpheme-initial and word-initial positions are included in this set. I would like to suggest that stressed syllables are also treated as psycholinguistically strong in English, i.e. that they are more important for processing and word recognition in English; for example, prosodic meter depends only on stressed syllables, not on the total number of syllables; and significant V→ə reduction occurs in unstressed syllables. However, a detailed analysis is outside the scope of our discussion. If stressed syllables are of psycholinguistic salience in English, we can modify our assumption in (5) into a prominent position constraint that especially licenses OCP violations.

(6) **FAITH(Δ)/σ´ -** Preserve two segments C_1 and C_2 in $(C_1VC_2)_\sigma$ if σ is a stressed syllable, and they vary perceptibly.

This constraint looks for a stressed syllable and the presence of perceptible allophonic variation, and licenses the word only in the case of both. The precedent comes from a combination of two factors: the existence of faithfulness constraints, especially of those that apply to prominent positions, and the proposed significance of perceptual variance. With the ranking (7), this positional faithfulness constraint accounts for the stressed/unstressed differences, and will also be able to account for our exceptional data.

(7) FAITH(Δ)/σ´ » OCP-Place » FAITH

The following tableau demonstrates the acceptability of the four CVC contexts according to FAITH/$\sigma_{1!}$, if we consider Ø to be the option whereby no forms are optimal enough to receive a lexical entry.

Table 2: Stressed syllable (voiceless)

/pɔp/	FAITH(Δ)/σ´	OCP-Place	FAITH
pɔp	!*	*	
☞$p^hɔp$		*	*
Ø	!*		*

The final [p] may be unreleased, but unreleased is by nature "inaudible," which does not produce distinction; rather the lack thereof. Therefore the unaspirated form violates FAITH(Δ)/σ´ since the two [p]s do not differ perceptibly. Needless to say, the null entry violates faithfulness.

Table 3: Stressed syllable (voiced)			
/bɔb/	FAITH(Δ)/σ´	OCP-Place	FAITH
bɔb	!*	*	
☞b̥ɔb		*	
Ø	!*		*

The "voicing during closure" that makes voiced stops distinct is present in the final [b], and in the initial [b] of the first entry, making them fatally similar. The selected initial [b] lacks voicing during closure, which produces acceptable asymmetry. Needless to say, the null entry violates faithfulness.

Table 4: Unstressed syllable			
***/pɔp.ˈtun/**	FAITH(Δ)/σ´	OCP-Place	FAITH
pɔp.tun		!*	
☞Ø			*

In Table 4, since the homorganic CVC does not occur in a stressed syllable, FAITH(Δ)/σ´ does not apply. Therefore the OCP is the highest acting constraint, and no lexical entry is selected.

Table 5: Stressed syllable with an onset cluster

*/**spɔp**/	FAITH(Δ)/σ´	OCP-Place	FAITH
spɔp	*	!*	
☞Ø	*		*

In Table 5, aspiration is not an option (English never aspirates after [s]), and the two [p]s are therefore not perceptually distinct. Therefore, FAITH(Δ)/σ´ is inevitably violated, and the OCP becomes the next highest violation; no lexical entry is selected.

We have thus accounted for why homorganic CVC is allowed, only in stressed syllables, whereas sCVC clusters are never allowed regardless of stress. Let us now consider other CCVC clusters, the high-sonority clusters, like *sNVN.

5. Sonority

Recall that the OCP evidences gradient effects. It will gradually alleviate with decreasing similarity between segments (or distance between segments). Within the exceptions to the OCP in stressed syllables (Figure 2), it can be seen that more sonorant pairs violate the OCP less. From our “fatal similarity” approach, we must ask whether more sonorant pairs are more similar to each other. This is the case. Phonetic distinctions between onset and coda, such as aspiration and partial devoicing, cannot be seen in highly sonorant clusters—they are naturally distinctive of obstruents. Saussure attributed the sonority scale to the potential of the phone types for distinguishing “explosion” and “implosion,” that is, the acoustic effects of closure versus release that characterize onsets/codas, since the two movements become less distinct as aperture increases (Hudson, 1995). High-sonority pairs like in “smum,” being approximate in their articulator contact, are inherently incapable of producing a sharp distinction in their articulators. Therefore, only segments in low-sonority ("obstruent-like") onsets are capable of having the kind of sharp allophonic variation that causes perceptual dissimilarity between their initial and final

versions.[5] Without those hints of dissimilarity, a constraint which appeals to them (in our case FAITH(Δ)/σ´) doesn't take effect. This accounts for why high-sonority segments violate OCP-Place less, as in Figure 2.

6. Maximal similarity

We have to explain why maximally similar data does not follow the other data (Figure 1)—this poses a bit of a problem, because maximally similar pairs seem to vary perceptibly. (Most English speakers know the difference between the final [p] in *pup* and that in *pub*.) Since fricatives cannot appear as the co-occurring C in CCVC (*[pfaf]), there are only two kinds of maximal similarity that deal with obstruents: we can have a voiced onset and voiceless coda, or a voiceless coda and voiced onset. For example, in the case of labials:

(8) bVp

(9) pVb

Example (8) suggests a phonetic explanation. Recall from section (3.3) that initial voiced consonants are partially devoiced so that they become "actually voiceless unaspirated stops" (Smith, n.d.), and that stops in coda position are often unreleased, decreasing their perceptual distinctiveness. (Similarly, voiced stops are also somewhat devoiced word-finally.) This renders the narrow transcription of the word bop as [b̥ɔp̚] Additionally, [p] is aspirated in stressed onset position, which augments its perceptual distinctiveness. Therefore I suggest that [b̥] and [p̚] are actually more perceptually similar than [ph] and [p̚]. This is a testable statement that requires further research; however, such a test is outside the scope of the current paper. The results of such tests have the capability to narrow and simplify the cause of this otherwise-difficult data.

In example (9), no such explanation is forthcoming, since certainly the initial [p^h] is more distinct from the final [b] than from [p̚]. To the extent that words like *pub* occur, the OCP violation is inexplicable. I suggest a more detailed analysis of the English lexicon to determine whether this type of maximally similar words have higher representation in the English lexicon than the type in (8). I predict so, but such analysis is outside the scope of this argument.[6] We may alternatively point out that all of type (9) are also of the highly marked form of having a voiced final obstruent—which may be entering the constraint ranking, something like:

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[5] I consider the "dark l" to be an exception, since it often occurs post-vocalically; but the contextual predictability of dark l varies too much between dialects of English.

[6] I ran an unscientific test on the CELEX dictionary for English lemmas containing every possible pVb, bVp, kVg, and gVk combination (we've been excluding coronals). I generated 48 words that complied to the normal English spellings for producing these phonetic combinations (see Appendix for the list). The results returned only five entries *beep, bop, cog, keg*, and *pub*. Furthermore, all of these except pub had low frequency of use in the lexicon: beep, bop, cog and keg all had an occurrence of only 1-2 times per million. (Pub occurred 30 times per million.) Compare this with pop's rate of 55 per million—only pub is a common word. However, this preliminary analysis needs to be corroborated by better studies.

(10) *CODA$_{+VOI}$ » FAITH(Δ)/σ´ » OCP-Place » FAITH

This and our phonetic explanation of type (8) would satisfy the maximally similar data.

7. Conclusion

In Section (2) we observed that homorganic consonants are allowed to violate the OCP in stressed syllables, especially when they are obstruents. In Section (3) we followed Frisch and confirmed perceptual variance for obstruents in onset vs. coda positions, including release/nonrelease, aspiration, and partial devoicing. We also showed that this variation depended on the phonetic nature of low-sonority segments. Assuming the stance that stressed syllables are important to English psycholinguistic perception, I attempted to motivate the lexical gaps by a faithfulness constraint on stressed syllables, FAITH(Δ)/σ´. The data for maximally similar segments shown by (Berkeley, 1994a) can be accounted for by perceptual similarity between [b$_o$] and [p͡] and the possible involvement of the *CODA$_{+VOI}$ constraint. In the end, this accounts for our original question, "Why not *spop*?" The answer is: The OCP blocks *spop* and not *pop* because the two segments in *spop* are more perceptually similar, so perceptually similar that they cannot be protected by the faithfulness constraint that protects the allophonically varied *pop*.

The overall rationale is simple: like all languages, English values perceptual salience, and the grammar reflects this. Stressed syllables are the most important for perception, so they get special preference. This preference allows constraints that would reduce lexical variation to be broken. But since the OCP is a gradient, some forms may be able to trump it, whereas some similar, more severe violations may not be able to. That is exactly what we find in English, and that's why there's nothing in the dictionary for "spop."

Appendix

O/E of maximally similar consonants in stressed syllables			
	Syllable 1 O/E	**Syllable 2 O/E**	**Syllable 3 O/E**
Labial	.22	.26	.98
Coronal Obs.	.49	.73	.75
Coronal Son.	.46	.63	.67
Dorsal	.26	.36	1.08
Average	**.36**	**.50**	**.87**

Table 10.5: Identical singleton onset and coda in word initial stressed syllables.

Stops				Fricatives			
	Observed	Expected	O/E		Observed	Expected	O/E
/p/	11	8.8	1.25	/f/	2	3.0	0.66
/b/	6	3.6	1.68	/v/	0	1.2	0
/t/	13	13.8	0.94	/s/	7	9.1	0.77
/d/	4	6.0	0.67	/z/	1	0.7	1.44
/k	11	17.0	0.65	/ʃ/	2	0.9	2.19
/g/	3	2.3	1.32	/ʒ/	0	0.0	0
Total	48	51.3	0.93	Total	12	15.0	0.80
Nasals				Liquids			
	Observed	Expected	O/E		Observed	Expected	O/E
/m/	15	15.2	0.99	/l/	4	16.3	0.25
/n/	9	16.0	0.56	/r/	4	24.6	0.16
Total	24	31.2	0.77	Total	8	40.9	0.20

References

Beckman, J. (1998). *Positional faithfulness*. University of Massachusetts, Amherst.

Berkeley. (1994a). The OCP and gradient data. *Proceedings of FLSM V. Studies in the Linguistic Sciences* (Vol. 24.1/2, pp. 59-72).

Berkeley, D. (1994b). Variability in obligatory contour principle effects. *Papers from the 30th regional meeting of the Chicago Linguistics Society* (pp. 1-12). Chicago: University of Chicago Press.

Coleman, J. (n.d.). Acoustic structure of consonants. Retrieved April 3, 2011, from http://www.phon.ox.ac.uk/jcoleman/consonant_acoustics.htm

Davis, S. (1989). Cross-vowel phonotactic constraints. *Computational Linguistics*, *15*, 109–110.

Frisch, S. (1997). *Similarity and frequency in phonology*. Northwestern University.

Frisch, S. A., Pierrehumbert, J. B., & Broe, M. B. (2004). Similarity avoidance and the OCP. *Natural Language & Linguistic Theory*, *22*(1), 179–228.

Fudge, E. C. (1969). Syllables. *Journal of Linguistics*, *5*(2), 253-286.

Guy, G. R., & Boberg, C. (1997). Inherent variability and the obligatory contour principle. *Language Variation and Change*, *9*(02), 149–164.

Hudson, G. (1995). Consonant release and the syllable. *Linguistics*, *33*(4), 655-672.

Just, M., Michaels, S., Shockey, L., & Suskick, R. (1978). Acoustic cues and psychological processes in perception of natural stop consonants. *Department of Psychology*. Retrieved from http://repository.cmu.edu/psychology/320

Keating, P., Wright, R., & Zhang, J. (1999). Word-level asymmetries in consonant articulation. *UCLA Working Papers in Phonetics*, 157–173.

Kent, R. D. (1992). *The Acoustic Analysis of Speech*. San Diego, Calif: Singular Pub. Group.

Kent, R. D., & Read, C. (1992). *The Acoustic Analysis of Speech*. San Diego, Calif: Singular Pub. Group.

Liberman, A. M., Delattre, P. C., & Cooper, F. S. (1958). Some cues for the distinction between voiced and voiceless stops in initial position. *Language & Speech*, *1*(3), 153-167.

Lisker, L., & Abramson, A. (1964). A cross-language study of voicing in initial stops: acoustical measurements. *Word*, *20*(3), 384-423.

Ohala. J., & Kawasaki, H. (1984). Prosodic phonology and phonetics. Phonology Yearbook, 1, 113-127.

Paradis, C., & Prunet, J.-F. (Eds.). (1991). *The Special Status of Coronals: Internal and External Evidence*. San Diego: Academic Press.

Sagey, E. (1986). *Representation of Features and Relations in Non-linear Phonology* (Doctoral Dissertation). MIT, Cambridge, Massachusetts.

Silverman, D. D. (1997). *Phasing and Recoverability*. Outstanding dissertations in linguistics. New York: Garland Pub.

Smith, J. (n.d.). Voice Onset Time. University of North Carolina. Retrieved from http://www.unc.edu/~jlsmith/ling520/handouts/vot.pdf

Smith, J. L. (2005). *Phonological Augmentation in Prominent Positions*. Outstanding dissertations in linguistics. New York: Routledge.

Steriade, D. (n.d.). Alternatives To Syllable-Based Accounts Of Consonantal Phonotactics. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.16.9358

Weinberger, S. (2002). Alien Phonology, 37.

Weinberger, S. (2011). *Obligatory Contour Principle*. Linguistics 692 Class Document, George Mason University.