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Experimenting with the Sound/Color Chart for Pronunciation

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In the forward to *Teaching Foreign Languages in Schools: the Silent Way*, one of his earliest efforts describing the findings of his investigation into language teaching and detailing his proposals for a new approach in this field, the late educator Caleb Gattegno wrote: "While I believe that this new approach has much to commend it, and while I very much hope that it will be given as fair a trial as my previous suggestions to colleagues in schools, I must point out that it is a one man proposal based on one man's experience, of necessity limited, and that the most important contribution of this work is the opening of new vistas in education that should excite a new generation of people to investigate and to experiment with what they find behind doors that are now put ajar."

Many doors had indeed been "put ajar" with the publication of this small book in 1963, and the Silent Way has benefited from those who have found it worth their while to explore and contribute to this unique approach. One area that some teachers have been exploring in the Silent Way is the Sound/Color Chart and the modification of this powerful pronunciation tool. While the basic idea behind the Sound/Color Chart embodies fundamental principles of the Silent Way and provides great insight into the approach, the *specific forms* of the original charts created by Gattegno, I would argue, are open to investigation and may be changed without running counter to the underlying tenets of the Silent Way. The chart is simply "one man's proposal, of necessity limited," the most important contribution of which is to put doors ajar, that is, to open eyes and encourage inquiry. Indeed, to discourage experimentation with any of the Silent Way materials would be to rob the approach of its vitality.

In this paper, I will describe the original English Sound/Color Chart. I will discuss some of its strengths, and note some reasons why a focus on pronunciation is important in learning another language. I will recount how the Sound/Color Chart grew out of earlier materials that were originally developed to teach literacy, and explain how this resulted in a chart that presents some disadvantages to language teachers. I will describe how I have modified the chart to better serve my specific purpose of teaching ESL to Japanese students, and, to shine a little more light on both the chart and the Silent Way approach, I will describe a lesson using a Sound/Color Chart. Finally, I will list some questions that can be raised in response to the way the

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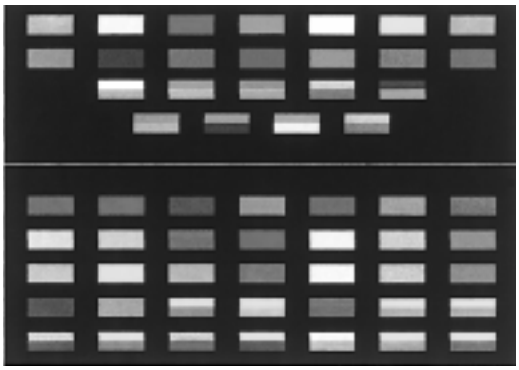
Sound/Color Chart has been rearranged.

The Sound/Color Chart

Sound/Color Charts have been created for many languages and have been used by teachers around the world for more than 20 years. Each Sound/Color Chart contains a certain number of colored rectangles, each rectangle representing a sound or sounds in the target language. The specifics of the given language determine the number of rectangles used as well as other features of the chart, such as the layout of these rectangles. The English Sound/Color Chart is a 40 x 55 centimeter wall chart with 58 rectangles of different colors. The vowels are placed above a line nearly halfway down the chart, and the consonants are placed below this line.



Above, a black and white reproduction of the original English Sound/Color Chart. ©1977, 1998 C. Gattegno. To see this in color, go to <http://www.hokuriku-u.ac.jp/d-cherry/sw_charts/> To the right are two keys to the chart, one using English words and the other a modified form of the International Phonetic Alphabet used throughout this paper.

at	up	in	pet	not	above	her
all	are	noon	eat	air	put	or
	high	may	owe	you	out	
		boy	memoir	one	your	
pup	at	is	us	azure	my	nice
fan	van	did	the	thin	yes	let
we	kit	run	by	hot	gum	she
chin	sing	little	fire	just	quite	ax
exit	anxious	luxury	Jones's	whale	rhythm	isn't

/æ/	/ʌ/	/ɪ/	/ɛ/	/a/	/ə/	/ə˞/
/ɒ/	/aɪ/	/uw/	/iy/	/ɛɪ/	/ʊ/	/ɔɪ/
	/ay/	/ey/	/ɔw/	/yuw/	/aw/	
		/ɔy/	/waɪ/	/wʌ/	/yʊ/	
/p/	/t/	/z/	/s/	/ʒ/	/m/	/n/
/f/	/v/	/d/	/ð/	/θ/	/y/	/l/
/w/	/k/	/r/	/b/	/h/	/g/	/ʃ/
/tʃ/	/ŋ/	/əl/	/ər/	/dʒ/	/kw/	/ks/
/gz/	/kʃ/	/gʒ/	/əz/	/hw/	/əm/	/ən/

Thirty-seven of the rectangles are of one color, 21 are of two. The two-colored rectangles are divided horizontally and are "read," or sounded out, from top to bottom. Thus, the color for the /a/ phoneme is combined with the color for the /y/ phoneme to produce the diphthong found in "high." On the consonant side of the chart, the "qu" sound found in "quite" is represented by a rectangle the top half of which is the color for /k/ and the bottom half the color for /w/.

The Sound/Color Chart is part of a larger system, which includes the Fidel and the word charts. The Fidel for English is a series of eight wall charts, each the same size as the Sound/Color Chart. On these charts are columns of possible spellings for each rectangle. These

spellings are colored to correspond with the rectangles. The /ay/ rectangle, for example, is represented by a list of 12 possible spellings, each of these spellings colored in the same way as the rectangle—white on the top half and light pink on the bottom. One of the possible spellings here, "i," is also found in five other columns, and consequently in five other colors. The Fidel indicates at a glance that a given sound in English can be realized by more than one grapheme, and a particular grapheme can be the realization of more than one sound.

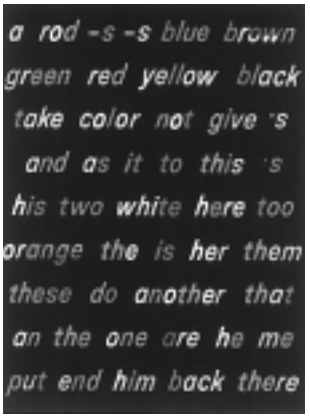
In addition to the Fidel, there is a series of 12 word charts representing a functional vocabulary of English. The words on these charts are printed in colors corresponding to the other charts, indicating their pronunciation. The word "my," for example, is printed with an orange "m" and a white and light pink "y."

As for the colors used in this system, Gattegno writes, "The learning principle involved in the use of color is to contrast or show similarities between the signs of spoken American English by using sharply contrasting or very similar colors; the choice of colors is obviously to a great extent arbitrary" (Gattegno, 1962: 10). One example of colors that seem to have been chosen to indicate similarity among sounds is the choice of those used for /iy/, /ɪ/, and /y/, which are, respectively, red, pink, and light pink. The /uw/ in "too," in contrast, is dark green. This procedure does not seem entirely consistent, however, probably because of the difficulty in assigning a limited number of commercially reproducible colors to so many sounds to represent such a complex system of relationships among those sounds. Regarding the arbitrary nature of the choice of colors, it has been suggested that some colors may have been more deliberately chosen. One example is the bright shade of yellow chosen to represent the schwa, perhaps to highlight this very important sound, so central to English pronunciation (Moyer, 1977, p. 18).

The Silent Way teacher and the students may play various kinds of games with the Sound/Color Chart. The rules or conventions for these games are generally as follows; 1) one color equals one sound; 2) when the teacher, or another student, taps a rectangle with a pointer, the sound(s) for that rectangle is/are uttered by the students; 3) when several rectangles are tapped, the sounds are uttered in that order; 4) a brief pause or lowering of the pointer may indicate a break between words or the end of a sentence; 5) stress may be indicated by tapping one rectangle more forcefully than the others; 6) phrasing may be indicated by tapping a series of rectangles very quickly or, once a sentence has been put into circulation with the chart, by using fingers to represent the words in the sentence, placing fingers together where the words link or separating them where there should be a pause.[1] In addition to these rules, teachers may devise their own conventions and gestures to indicate such things as intonation, rhythm, or any other aspect of the sound system they are teaching.

I will write more later on how the Sound/Color Chart is used. Let me briefly note here, however, that a teacher using the Sound/Color Chart must of course be familiar with the sound/rectangle correspondence, which takes some practice. In addition, the teacher should also be clear on how to use the chart properly, and this too takes some practice. The chart is not a memorization task, but a pronunciation game. The teacher should not tax the student's memory

Above, the English Fidel, and below right, Word Chart #1. ©1978 C. Gattegno. To see these in color, go to <http://www.hokuriku-u.ac.jp/d-cherry/sw_charts/>



by introducing too many new colors too quickly. Also, the colors introduced should be chosen for a reason, for example because they introduce a sound that is new to the student, or because they are necessary to work effectively with a sound already being, or soon to be, worked on. The sounds should be practiced thoroughly and playfully. They should be recycled, mixed, folded, and flipped into new words and sentences. In this way, the sounds are what get worked on, and the arbitrary sound/rectangle correspondences get retained in the process, which in turn allows the students to continue and extend their work *on the sounds.*

Why the Sound/Color Chart?

Let me describe a scene that may be familiar to some language teachers. A teacher of English, attempting to teach the pronunciation of “son” to his native Japanese-speaking student, stands in front of the student, says “son” loudly and clearly, then waits. The student says, “sung,” then waits. The teacher says “son” again, and once more the student replies “sung.” The teacher says “son” yet again, but this time holds the final /n/ for a long time. The student, understanding

now that something is wrong with his pronunciation and feeling a little nervous about that, smiles and nods his head to assure the teacher that he now understands, then says “sum,” with a long /m/ at the end. The teacher now nods his head, as if *he* understands what the problem is, then turns and writes “son” on the blackboard. The student is completely baffled now, so he smiles wider and nods his head more vigorously than before, but his shaky voice betrays his nervousness as he says something like “sungm.”

There are several challenges confronting this teacher and this student. I will describe some of them here, and suggest how they may be met using the Sound/Color Chart.

1. *Just because you say it, doesn't mean they're going to hear it.* Due to interference from his native language, the student's hearing is filtering an important sound in the new language, not allowing him to hear the final /n/ in “son.” The student here pronounced the word as he heard it - - “sung.” His ears are tuned, as it were, to the Japanese channel, where there is no final /n/.

The Sound/Color Chart addresses this problem by engaging the student visually. A teacher working with the Sound/Color Chart could, for example, respond to the student's initial attempt at “son” by tapping the rectangles corresponding to the word the student actually said, “sung,” then tapping the rectangles for “son,” and inviting the student to try again. The student could then literally *see* that the difference was in the final sound, and he could direct his efforts accordingly. Should the student respond with “sum” or “sungm,” the teacher could tap the rectangles corresponding to either of *these* utterances as well, then tap again the rectangles for “son,” inviting additional experimentation by the student.

Another approach might be for the teacher to tap the rectangles corresponding to the word, “sunny,” a word in which this Japanese student could easily pronounce the medial /n/, then gradually work with the student to reduce the final /iy/, thus leaving the /n/ in the final position. This could be done by slowly moving the pointer from one rectangle to the next, having the student pronounce each sound long and slow, blending it gradually into the next. As the pointer slowly approached /iy/, the student would naturally glide into an /n/ in preparation for saying this next sound, but here the teacher would stop the pointer just short of the /iy/ rectangle, leaving the student much closer to a final /n/. This might sound something like /ssssʌʌʌʌŋŋnnnnı/, a considerable improvement that could then be refined by working to eliminate the /ŋ/ and /ı/.

In addition to these two techniques using the chart, the teacher could silently draw the student's attention to the different places of articulation required for /m/ /n/ and /ŋ/. To further sensitize the student to these different places of articulation, the teacher may have him produce the three nasals while holding his forefinger against the tip of his tongue. Or a teacher might attach an invisible string to the tip of the student's tongue and, as the student went about speaking, make a show of pulling this string to help the student move from an /ŋ/ to an /n/ when necessary. Indeed, there is no end to the kind of visual feedback a sensitive and creative teacher may come up with in response to careful observation of his student's work.

2. *Just because you think you're saying it doesn't mean you are.* Another problem the student is

faced with in the lesson above is the difficult task of trying to match two sounds that come to him in two very different ways, one he is hearing from the teacher through air conduction alone and the other that he is hearing from himself through both air and bone conduction. Most people can appreciate how different these two hearings are if they think about how strange their voices sound to them on an audio recording. This phenomenon can interfere with learning the new sounds and melody of a foreign language.

The student above needs someone to lend him an ear. He needs someone to listen carefully to what he is saying, and then to let him know what it sounds like outside his head. Using the Sound/Color Chart as described previously, the teacher is freed from modelling, allowed to listen more carefully to students, and supplied with a tool to provide extremely precise *visual* feedback. With this precise feedback, students may more productively place their attention on the voluntary muscles of their vocal tract rather than on the involuntary functioning of hearing. In doing so, they can sensitize themselves to how the new sounds feel in their mouth and throat, and they can develop greater control and accuracy in their production.

3. *Letters and sounds.* Seeing the word he was trying to pronounce did not help this student's pronunciation, and perhaps made matters worse. A common error among native Japanese speakers is to see "n" as equivalent to ん, a generalized nasal in Japanese which is realized as /n/ or /m/ in a medial position, and as /ŋ/ in a final position. If the sound of this final position /ŋ/ is lengthened, the speaker will usually close his lips at the very end, producing a final /m/, which would explain this student's "sung," "sum," and "sungm."

If the student's incorrect assumptions about English letter/sound correspondences were the only challenge, we would need only to improve the student's pronunciation of the letter "n" so that it is a proper /n/, and we could use the letter rather than a color. But then we would have a very unusual pronunciation of the word "longer" or "thank," where "n" is actually /ŋ/. And how would we explain "know," where /n/ is realized as "kn"? The presence of different spellings for the same sound, and different sounds for the same spelling is especially evident in the case of the vowels, where for example the /uw/ sound in "you" can be spelled in at least a dozen ways, one of which is with "o" (as in "do"), and this "o" can in turn be used to spell another ten sounds. The Sound/Color Chart effectively addresses this feature of English by replacing letters with colors so students may more effectively work on pronunciation by postponing the additional challenge of English spelling.

4. *What does /θr/ mean?* In addition to allowing students to focus on pronunciation without the distraction of spelling, the Sound/Color Chart can also be used to free them to work on pronunciation in the absence of meaning. After all, what does the consonant cluster /θr/ in "three" really *mean?* What it *is* is pair of phonemes that require many non-native English speakers to practice a set of gymnastics within their vocal tract. Students need to do the physical work required to learn how to produce new sounds and new sound combinations. They can do this physical work while at the same time attending to the meaning of what they're saying, but what they will have to do to produce their first /θr/ has nothing to do with the meaning of

"three." Even above a phonemic level, there is value to working on prosodics such as rhythm, stress, and phrasing in the absence of meaning, again just to get at the gymnastics of the task.

5. *Removing the mystery.* The Sound/Color Chart also provides a clear summation of all the sounds that will be required in the new language, a summation I have tried to make even clearer by rearranging the chart. The chart allows students to see exactly how many sounds there are, and as their work progresses, it provides a constant visual touchstone for them to see how many sounds they have mastered and how many remain. It takes the mystery out of pronunciation and puts it all into a limited number of colored rectangles. Having myself studied French and Chinese using their respective Sound/Color Charts, I can say the dispelling of this mystery was especially welcome in these languages commonly thought of as particularly difficult to pronounce. I knew where I stood with the sounds I was making - - which ones I definitely had and which needed further work - - and I also knew exactly how many sounds were left to be dealt with.

Why teach pronunciation at all?

Taking the very simple situation described earlier, "sung" is close enough to "son," especially once it is put into a larger context. People would certainly be able to make sense of the sentence "The one on the right is my oldest sung." They would probably also guess correctly in the sentence, "I have two daughters and one sung." Things could get dicey though if this problem winds up somewhere else, like "Give him fifteeng units of this new anesthesia, and we'll begin the operation," where "fifteeng" can easily be mistaken for "fifty." Most likely, however, it will come along with a few other problems, and could even wind up in something like: "Zeya yeezu sahmseengu wong fhaya ahnda ahsahzu cheya." Arthur will probably smell the smoke and move to a new chair before anyone figures that sentence out.

But why work expressly on pronunciation? Won't students just "pick it up?" Certainly there are those who will seem to "pick up" the pronunciation of a new language more effortlessly than others, but most people have considerable difficulty. The great English phonetician Henry Sweet recognized more than 100 years ago the limitations of trying to learn sounds through the ear. He recommended the focus instead be on developing greater sensitivity to the tactile sensations in the vocal tract associated with sounds. "Those who try to learn new sounds by ear along, without any systematic training in the use of their vocal organs, generally succeed only partially" (1877, p. 21). Quoting Sweet in his excellent *A Practical Introduction to Phonetics*, J.C. Catford adds to this, "Considerable experience (and at least one small experiment—see Catford and Pisoni (1970)) confirms Sweet's view" (1988, p. 124). For pronunciation to improve it must become a focus of students' work, whether or not that work be facilitated, or even recognized, by the teacher.

In addition to making speech more intelligible, another goal of pronunciation practice can be to improve listening comprehension. Penny Ur (1984, p. 12) asserts "it is certainly true that if the learner learns to pronounce . . . sounds accurately . . ., it will be much easier . . . to hear them correctly when said by someone else." It has been my experience that, by having students work on *producing* troublesome phonemes, they were able later to better hear these sounds, correctly

identifying words from minimal pairs when spoken by the instructor. While the idea of working on listening comprehension through working on pronunciation may seem odd to some, I would suggest for reasons already stated that it is arguably a more sensible idea than that of working on pronunciation through listening. At any rate, it should not be terribly controversial to suggest at the very least that we can work on pronunciation by working on pronunciation, which is what the Sound/Color Chart helps us do.

Perhaps the most compelling reason to teach pronunciation is to help students "acquire a feeling for the language . . ., to experience what is characteristic of it, to begin to grasp the spirit of the language." (Moyer, 1977, p. 5) Gattegno sees an attention to the melody of a language as one very good avenue to its spirit. "Since babies learn to talk their mother tongue first by yielding to its 'music,' I think that we can trace the first elements of the spirit of a language to the unconscious surrender of our sensitivity to what is conveyed by the background of noise in each language. This background obviously includes the silences, the pauses, the flow, the linkages of words, the duration of each breath required to utter connected chunks of the language, the overtones and undertones, the stresses as well as the special vowels or consonants belonging to that language." (Gattegno, 1963, p. 22) Re-connecting students with the sensitivity they had as babies to the "music" of language can allow them to playfully discover the distinctive melody of a language they choose to learn as adults.

Finally, working on pronunciation in a systematic way from the beginning helps free the student from anxieties at this most basic level of sound that could hinder their learning later in other areas of the language. Gattegno says it well, "Since (sentences and words) need the sounds of a language to be objectified, they will be better founded if the sounds are first well established . . . moreover, it is obvious that a neglect of the basic foundation leads from a shaky contact with the language in the beginning to a continuing uncertainty into the future." (1976, p. 15)

Optimizing the Sound/Color Chart for Language Learning

The original English Sound/Color Chart is an insightful and imaginative response to the challenges pronunciation poses to language learners. There are, however, a few ways I feel the chart can be changed to optimize it for teaching ESL. First, it may help to know something of how the chart came into being.

The original English Sound/Color Chart is based on the Fidel, which was originally created, along with a separate set of word charts, to help speakers of English learn to read and write by showing the relationships between English sounds and spelling. It was not until later that this "literacy" Fidel was used without modification to teach ESL. When the more compact Sound/Color Chart was later made from the Fidel, each column of spellings on the Fidel was carried over to its own rectangle on the Sound/Color Chart. Consequently, the original Sound/Color Chart wound up reflecting not only the sounds of English but the spelling as well, and would more accurately be described as a sound/color/spelling chart (Young, 1999, p. 89).

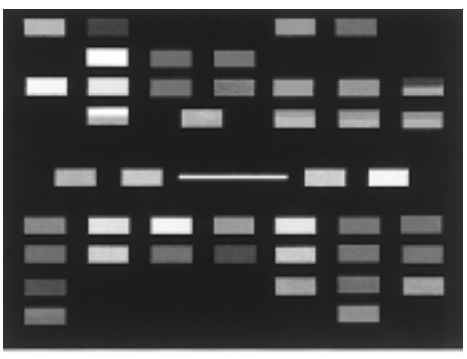
The influence of the Fidel, and thus English spelling, on the Sound/Color Chart can be seen

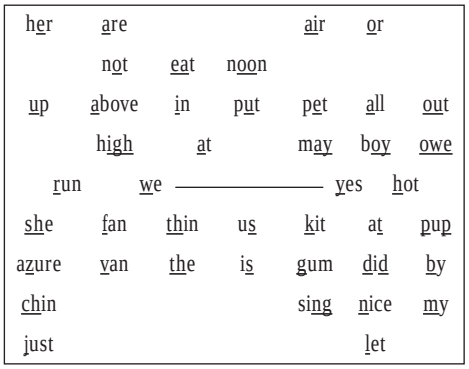
in the large number of two-colored rectangles. Four of these 21 rectangles represent the various phonemic combinations for “x” (like /ks/ in “fox” or /gz/ in “example”), five represent syllabic consonants (like the “le” in “little,” the “m” in “rhythm,” or the “‘s” in “James’s”), one is there for the /kw/ of “qu,” one for the /hw/ that is possible for the “wh” of “when,” one for the /dʒ/ at the beginning and end of “judge,” and the remaining nine are found in the vowel portion of the chart as diphthongs.

If we were to make the Sound/Color Chart truly a sound/color chart, we could eliminate all the two-colored rectangles, as each color in each two-colored rectangle can be found elsewhere on the chart, occurring by itself as a one-colored rectangle. If, however, we were to accept, as most analyses do, the five falling diphthongs (illustrated in the sentence, “Now, they go buy toys.”), and /dʒ/ as minimal units of sound, or phonemes, and therefore better represented by their own rectangle, we could still eliminate 15 of the two-colored rectangles. I believe removing these rectangles makes the chart a more efficient tool for pronunciation. Additionally, with these rectangles gone, we have room to make one more improvement, and that concerns the placement of the rectangles on the chart.

The order of rectangles on the Sound/Color Chart follows the order of the columns on the Fidel, and the order of those follow the order of the introduction of sounds that Gattegno felt was the best way to help speakers of English learn to read and write. For the different purpose of teaching ESL, however, we may consider a different arrangement of the rectangles.

The first modified English Sound/Color Chart that I am aware of was created by a team of language teachers in Besancon, France. This chart had 17 fewer rectangles than the original Sound/Color Chart, and the rectangles were arranged to reflect relationships among the sounds. Voiced consonants were placed just above their unvoiced counterparts, for example.[2] Since then, there have been other modified Sound/Color Charts created for English as well as other languages. After seeing one of the language teachers from Besancon use a modified Sound/Color Chart about six years ago, I began experimenting with the Sound/Color Chart myself. In the end,





My reworking of the English Sound/Color Chart. ©D. Cherry, 2001. To see this in color, go to <http://www.hokuriku-u.ac.jp/d-cherry/sw_charts/>

much of what I did was just to reinvent the wheel. There are some features, though, in the Sound/Color Chart that I finally settled on that may make it more suitable to my Midwestern American English and my Japanese students.

Again, my rearrangement of the Sound/Color Chart is not pioneering, precious little of it is unique, and it could probably stand improvement. It does meet the needs of my situation reasonably well, however, and since it is after all my chart, it is the one I am most qualified to talk about. I will explain here some of the rationale behind my rearrangement of the Sound/Color Chart. I will avoid technical terms like "semi-vowel" or "dorso-palatal" in describing the sounds and the relationships among them. I didn't really know these terms while I was rearranging the chart, and I believe that forced me to be more sensitive to the sounds and how they are produced, which in turn allows me to be more sensitive while working with students on their production of these sounds. While these technical terms are useful shorthand, they can sometimes obscure what they describe, lead us to find what isn't there, or make us think we've found something when we haven't. Besides, it may be interesting to hear the sounds described in a different way. Plain English, if you will.

I began with 15 fewer rectangles than the original chart, removing most of the two-colored ones for reasons discussed earlier. I put four consonants even with the line dividing the chart into vowels and consonants - - /r/ and /w/ on the left, and /y/ and /h/ on the right. I did this for a couple reasons. First of all, these four sounds may be consonants but none of them is *much* of one. If you look at the other consonants, those firmly on one side of the line, you have sounds exploding from lips, snapping between tongues and roofs of mouths, and sputtering through teeth. But /y/ and /w/ are just like short, nervous little vowels, /r/ is just a scary /u/, and /h/ is a breeze (except maybe for some French speakers). These sounds are clearly of a different quality than the consonants below them. Secondly, putting /y/ and /w/ here keeps them close to the diphthongs they help form with the vowels just above. Likewise, having the /r/ here keeps it close to the so-called "r-colored" vowels up above, so the students can see and feel these deeper vowel sounds move down into something that's nearly, but not quite, a consonant, even for a Midwestern American like me.

I put /r/ next to /w/ to emphasize the similarity /r/ has to *this* sound and not to /l/, which I've placed way over on the other side of the chart. This is done to address the legendary r/l pronunciation problem common among Japanese speakers. I often draw attention to the similarity between /r/ and /w/ by tapping /w/ and /a/, then mouthing /wa/. I ask the students to say what they saw me mouth, and they usually reply with /wa/. I then tap /r/ and /a/, then mouth /ra/. Since the students can't see beyond my puckered lips, this looks exactly like /wa/. They know a different color cannot yield the same sound, so they have to experiment with their vocal tracts to find another consonant that gets puckered like a /w/. Sometimes they find it, sometimes they don't. If they don't, I will say it once, just to get them pointed in the right direction, then let them search some more.

In the end, very few students will not be able to produce an acceptable /ra/. It is interesting

to note that often many of them are not aware at this point that they are even producing /r/ when they are indeed producing it, and producing it very well. This is for them an entirely new sound, one that they probably would not have discovered had they begun with the letter "r," which might have led them right back into an incorrect, fossilized pronunciation.

The /l/, wrenched free now from /r/, is placed over in a row with the other three sounds that are made by touching the tongue to somewhere just behind or on the back of the upper front teeth. I will often introduce this group by pointing to each of the four colors followed by a vowel we have already worked with. For example, I may tap the following sequence: /t/, /a/, /d/, /a/, /n/, /a/, /l/, /a/. I then mouth this, /tadanala/, allowing the students to see my tongue come up to roughly the same place with each consonant. I leave it to them to say what they saw me "say." They usually come up with the utterance in bits and pieces and out of the order. I accept whatever they say, tapping the colors to match each utterance. This exercise becomes an awareness-raising treasure hunt, with the students trying to come up with the four consonants that are made in this area of the vocal tract. Usually, the last one to be discovered is /l/. It is particularly helpful for my students to realize that /l/ is made way up at the front of the mouth, and not back where the most similar Japanese sound to it is produced.

The /t/ at the top of this row just described and /d/ just below it are part of the chart's pattern of unvoiced consonants placed above their voiced counterparts that stretch from one side of the chart to the other. The /n/ is below the /d/, and finds itself with /m/ on the right and /ŋ/ on the left, illustrating the nasals and how they move back, from the lips, to the front and then the back of the tongue.

In the vowel part of the chart, I began with the three English vowel sounds that I feel have equivalents in Japanese. I placed these rectangles left to right, in the natural Japanese "alphabetical order." They are, from left to right, the American English vowel sounds found in "on," "see," and "do" (/a/, /iy/, and /uw/). The next two spaces I left blank for the next two Japanese vowels, え and お, which I feel have no equivalent in English. The first is a sound tenser and higher than /ɛ/, and the second a sound higher and less rounded than /ɒ/). Below this line of Japanese vowels, I've placed rectangles representing lax form of the vowels above -- /ə/ below /a/, /ɪ/ below /iy/, /ʊ/ below /uw/, /ɛ/ below the blank space representing え, and /ɒ/ below the blank space representing お.[3] I've placed /ʌ/ to the left of /ə/, thus pairing these two sounds that are quite similar in American English, the /ʌ/ stressed and produced just a bit further back in the mouth.

There are a total of four r-colored vowels on the chart.[4] Each is above the sound it "r-colors." I have found that the best way to introduce these sounds is to begin with the vowels below them, the ones not r-colored, and suggest to students that they say these sounds deeper in their belly, or further back in their throat, or even with their top teeth bucked. I saw a teacher who often had students buck their teeth like this to get at the r-colored vowels. I don't know why, but it worked. In the end, you can draw pictures of tongues and teeth all you want, the student has to eventually find what has meaning for him, no matter how strange it may seem. I had one student who

couldn't produce /æ/ until I asked him to try singing it. At any rate, by saying these deeper and/or buck-toothed r-colored vowels, students seem more able to then glide into the American final /r/.

The vowel section of the chart is then made complete with the addition of the diphthongs and /æ/ in the bottom line. I've placed the diphthongs below the vowels that help make them up, and I've placed /æ/ equidistant to /a/ and the /ɛ/ in the lines above for a reason described in the lesson that follows.

A Lesson

I will now briefly describe a lesson using the Sound/Color Chart. I do this to give readers an idea of what a lesson using this tool might look like so that they may better understand the tool itself. There are, however, some problems with doing something like this. First of all, the lesson I describe isn't a real lesson but one based on many I have taught. I will try to illustrate how the chart is used without overly distorting reality. Another problem is that I can only approximate the experience of being present in the classroom, of actually being able to see and hear all that is to be seen or heard. I write only what I feel is important and ignore things that either I don't think are important or I didn't notice in the first place. Despite these problems, I will describe the lesson if for no other reason than it is the only way that occurs to me to throw some more light on the Sound/Color Chart and how it is used.[5]

The students for this lesson are twenty 19-year-old Japanese university students. They are seated in two horseshoe-shaped rows before my modified Sound/Color Chart, described earlier. After allowing some time for the students to observe the chart, the teacher writes the Japanese character い on the blackboard next to the chart. He waits. One student reads the character aloud (/iy/). Without changing his expression the teacher simply nods his head in a matter-of-fact way. A few other students also read the character aloud. The teacher acknowledges each effort with a nod.

The teacher produces a pointer and quickly taps a space just above the い. A few students say い. The teacher appears shocked. He taps the space again. Some students say い again, but one or two say the sound for あ (/a/). The teacher turns to a student who said あ and invites him to say it again. The student says あ again, then several other students say the same. The teacher taps い then the space for あ. Several students say these in the order tapped. The teacher taps the space for あ, the character い, and three more blank spaces in a vertical row below い. A few students produce the five sounds for the first five hiragana characters each student in the room learned as children - - あいうえお (respectively, /a/, /iy/, /uw/, a sound tenser and higher than /ɛ/, and a sound higher and less rounded than /ɒ/).

The teacher then taps the random order, あおあえい. Some students produce the correct utterances in the correct order, some don't, and some say nothing. The teacher elicits a correct response from one student. He has another student come to the front and tap the utterance. He waits while some students practice by themselves and with their neighbors. The teacher taps

other random series of hiragana, and the class continues this game for a minute or so.

The teacher now turns his attention to the Sound/Color Chart. He taps three rectangles in a row from left to right, then two more spaces to the right of these. He waits. There is silence. He asks a student to tap the same thing. The student tries unsuccessfully, but the teacher does not indicate through word or gesture that this is incorrect. He asks another student to try, and this student also tries unsuccessfully. The teacher takes the pointer and holds it over the chart for a moment. The students sit up straight and appear to be paying close attention. The teacher taps the same three rectangles and two spaces, in the same order. He offers the pointer to a student, who successfully taps the same thing. The teacher notices that the other students are uncertain and looking to him to see if this is correct. He offers the pointer to another student, who taps incorrectly. This continues a few more times, with some students tapping correctly and some not. All the while, the teacher does not indicate through word or gesture whether a particular effort is correct or incorrect. Instead, he closely observes the class to determine their ability to judge the correctness of each effort. He tries to read the level of certainty on each face.

Finding this level of certainty lacking, the teacher takes the pointer, pauses a beat, then taps the same three rectangles and two spaces. He then offers the pointer to a student. The student taps correctly, as does the next student and the one after him. The other students watching seem quite confident that each effort is correct. The teacher gestures for the class to say something. After a few seconds, somebody hesitantly produces the sounds for the five characters they had practiced earlier - - あいうえお. The teacher indicates this is a correct guess, and the next minute is spent tapping and uttering these five sounds in different combinations, similar to what had been done previously using the characters on the blackboard.

The teacher points to the rectangle representing (/iy/) and makes a face exaggerating a very tense, high vowel. He then drops the pointer to the rectangle below that, and changes his face to a more open, relaxed expression. He gestures for the class to try this new sound. The students begin experimenting. The teacher waits a bit, then goes quickly from student to student eliciting the sound and nodding yes or shaking his head no. He comes back to some students a second and third time. After about half a minute, most of the students can produce (/ɪ/) reasonably well. The teacher works a little with those who are having some trouble, giving them feedback either through gestures or simple directions in Japanese (for example: “relax more,” “pretend you're drunk,” or “move your tongue further up”).

The teacher then taps the rectangle below /uw/. A few students say /ʊ/. The teacher nods his head and waits. The students practice saying /ʊ/. They do so individually and with the students seated near them. The teacher lets this continue for a while, then he goes from student to student, giving each feedback on their pronunciation. A similar procedure is followed for the rectangle below the empty space representing え, introducing /ɛ/, and the rectangle below the space for お, introducing /ɒ/.

After the class plays for a while with the sounds they have, the teacher taps the rectangle below /a/, and the students produce a lax /a/. The teacher directs them to make this sound even

more lax in order to get closer to the very lax /ə/. The teacher then has the students give the sound much more energy, gesturing them to produce the sound in a sharp, short burst. They do, and he taps the rectangle representing /ʌ/. They practice this sound for a while, the teacher silently drawing their attention to the fact that /ʌ/ and /ə/ are produced with a lax, "small" mouth, and /a/ with a much more open mouth.

The teacher introduces /æ/ by pointing to /ɛ/ with one hand and /a/ with the other, then drawing two invisible lines of about the same length down to /æ/. He tells the students to say /ɛ/ with a mouth positioned to say /a/. This gets the students close to /æ/, and with a little more visual feedback from the teacher, their pronunciation improves.

After the students practice these vowel sounds in different combinations of varying length, the teacher introduces, in a way similar to how he introduced あいうえお, the rectangles needed to make あかさたな (/akasatana/), which is equivalent to another kind of alphabetical order found in Japanese. With these consonants introduced, the teacher helps the students build many words and sentences. The class focuses on consonant stops, consonant clusters, and vowels especially challenging to Japanese speakers. Utterances include "one suit," "eat stew," "it costs six cents," and "Ken can't taste any sauce." The class gradually increases the length of their utterances, eventually practicing such sentences as, "two nuts cost two cents, so one nut costs one cent." Individual phonemes as well as rhythm, stress and phrasing are worked on.

Other sounds are gradually introduced. The voiced counterparts to /k/, /s/, and /t/ are easily introduced as each is below the unvoiced version. The /r/ and /w/ sounds are introduced as previously described, showing the similarity between them in the way the lips are shaped. The r-colored vowels are introduced, and students work on sentences such as "She heard she hurt his hard heart." Other sounds particularly difficult for Japanese speakers are introduced, such as /ð/, /θ/, /f/, /v/, and /l/. These are worked into words and sentences. The focus moves back and forth from individual sounds to suprasegmental aspects according to the moment-to-moment needs of the students.

After perhaps two or three 90-minute classes similar to the one described above, the teacher introduces word chart number one. As described earlier, the words are color coded for pronunciation. The teacher taps "the" (with a red "e," indicating /ðiy/). Not yet fully appreciating the significance of the colors or the fact that there are two occurrences of "the" on the chart, most of the students say /ðə/. The teacher then taps *that* "the" (with a bright yellow "e") and the students express some surprise. A few say /ðə/. When the teacher returns to the first "the" tapped, the students read this correctly as /ðiy/, understanding now the relationship between the Sound/Color Chart and the word charts. The class goes on to practice long and short sentences and phrases tapped on the word chart, such as "as it is, it is, is it not?" "His back's black and blue" and "Take two there and put one here and the other one there." The class occasionally returns to the Sound/Color chart to correct the pronunciation of a word from the word chart or work on a troublesome sound.

Meaning is gradually introduced. The teacher has the class work first on the pronunciation

of the sentence “his are blue and hers are white.” Students work on natural phrasing, linking (“hizare” “herzare”), sentence-level stress, and elision (for “are,” not /ar/ but /ər/). Then, while one student says this sentence, the teacher takes the student's hand, extends the index finger and points it first to the blue shoes of a male student then the white ones of a female student. Several meaningful sentences are then elicited by having students point and create appropriate sentences. With the introduction of just a little more vocabulary, students produce such sentences as, “His pants are black and her shoes are too” “Her shoes are not as white as his are” and “One of hers is not as white as the other one.” Here again, the focus moves back and forth from individual sounds to suprasegmental aspects according to the students' needs.

In following classes, the teacher introduces more word charts, more situations, more structures, and more realia. Realia includes a box of Cuisenaire rods, wall pictures, toys, *kamishibai* (Japanese picture story cards), and all kinds of simple, everyday items from home or school. This realia, in conjunction with simple gestures and mime, is used to both elicit language and make clear the meaning of language produced. Students speak to each other in pairs and groups. The teacher observes the students carefully, providing feedback on language produced and watching for natural opportunities to introduce additional situations or language that would allow the students to extend their work.

A Conclusion and Some Questions

The Sound/Color Chart provides a unique and elegant entry to the pronunciation of a new language. It allows teachers and students to temporarily isolate and work on the challenge of producing the new sounds and melody, independent of the meaning and the script, incorporating these challenges when appropriate, and the chart respects and makes use of what can be done visually, recognizing the problems that can result by introducing new sounds and new combinations of sounds aurally. The Sound/Color Chart does all this simply and concisely: I have just tried to make it even more simple and concise by, first, eliminating unnecessary rectangles to make it more of a “pure” Sound/Color Chart, as opposed to a Sound/Color/Spelling Chart, and second, arranging the remaining rectangles in a more logical order to help students work more efficiently with the chart.

There are some questions that may be raised regarding this type of rearrangement. For example:

1. *Am I overteaching?* By placing rectangles in such a way to reflect the relationships among them, am I doing for the student what he would be better off doing for himself? Would it be better for the student to make the connections that I make for them?

2. *Am I lying?* I am already aware of some “white lies” in the chart - - for example, representing the typical U.S. pronunciation of the vowel in “caught” as a lax counterpart to a tenser Japanese sound, when in fact this is not really a lax vowel. Are there other features of this chart that are dishonest or misleading?

3. *Does my arrangement of sounds have meaning for my students?* The relationships I see

among the sounds may not be the kind of relationships that make sense to students. They may see more of a connection between /ɪ/ and /ɛ/ than between /ɪ/ and /iy/. Am I interfering with them making these connections for themselves?

Here are some thoughts on the questions above, and a few more questions:

1. Even the original Sound/Color Chart was divided in two to reflect the division of vowels and consonants. It seems unduly demanding on students not to place such a large number of rectangles in *some* kind of order, reflecting *some* aspect of the sound system of that language. Nevertheless, does my chart do too much? Does it go beyond making the task more manageable and, in giving so much to students, wind up taking too much from them?

2. I am lying a little, but perhaps just enough to make the chart more accessible to students without detracting from the ultimate goal. Nevertheless, are there features in this chart that simplify the presentation of English sounds at the expense of hindering students' work on pronunciation?

3. The arrangement of the chart is always open to change should I feel it necessary. It is still possible, of course, to indicate relationships among sounds without actually moving the rectangles. For example, it may help some students to see /ɪ/ as a higher /ɛ/, rather than as a lax /iy/. This is already reflected to some degree by the placement of /ɪ/ and /ɛ/ in the same row, and I can emphasize this relationship in a number of ways during class if it seems to help some students. Still, any sort of attention I draw to such a relationship is fleeting compared to the ever-present fact of the rectangle's placement. Does the arrangement of rectangles on my chart prevent students from seeing other relationships among sounds that would help them in their work?

The search for answers to questions like these will continue to set doors ajar, leading not only to further refinement of the Sound/Color Chart to suit specific teaching situations, but also to a deeper understanding of the teaching of pronunciation.

Endnotes

1. For a detailed, practical discussion on how to use this kind of finger phrasing, as well as finger correction, see Adrian Underhill's *Sound Foundations* (1994). There is also an interesting description in this book of another kind of pronunciation chart that makes use of phonetic symbols rather than colors.
2. This team of teachers has recently revised their chart, moving the schwa to a new section at the bottom of the chart and adding to this section a "schwiy" and a "schwuw" to represent the unstressed /ɪ/ and the unstressed /ʊ/ respectively. They have also developed a new Sound/Color Chart for French. There is a very good article describing these modified Sound/Color Charts, and the rationale behind them, on the website of Une Education Pour Demain, at http://assoc.wanadoo.fr/une.education.pour.demain/artcilesrrr/sw.ros.htm.
3. In the U.S., it is more common to pronounce the vowel in words like "caught" and "saw" not as /ɔ/ but as /ɒ/, which is an /a/ produced further back in the mouth and with the lips rounded. As such, it really isn't a lax sound. I keep it here for the sake of simplicity, but it doesn't really fit and causes some problems for students initially.
4. I refer to all four of these vowels as "r-colored," or "rhotacized." Actually, except for the r-colored vowel in a word like, well, "word," the other three vowels may more accurately be described as "retroflexed,"

the front part of the tongue moving up and back rather than just the main body of the tongue bunching up and pulled back as is the case with a truly "rhotacized" vowel. In fact, it is probably a bit of both. At any rate, I use the term "r-colored" because it seems to describe these vowels so well in such plain English.

5. For another good description of a lesson using the Sound/Color Chart, see the chapter on the Silent Way in Diane Larsen-Freeman's excellent *Techniques and Principles in Language Teaching* (1986).

References

Catford, J.C., and Pisoni, D.B. (1970), Auditory vs. Articulatory Training in Exotic Sounds. *Modern Language Journal*, 54/7, 477-481.

Catford, J.C. (1988). *A Practical Introduction to Phonetics.* New York: Oxford University Press.

Gattegno, C. (1962). *Words in Color, Background and Principles.* Chicago: Encyclopedia Brittanica Press.

Gattegno, C. (1963). *Teaching Foreign Languages in Schools the Silent Way*. New York: Educational Solutions.

Gattegno, C. (1976). *The Common Sense of Teaching Foreign Languages*. New York: Educational Solutions.

Larsen-Freeman, D. (1986). *Techniques and Principles in Language Teaching.* New York: Oxford University Press.

Moyer, B.M. (1977). *Pronunciation and the Silent Way Fidel.* Master's thesis: School for International Training, Brattleboro, VT.

Sweet, H. (1877). *Handbook of Phonetics.* Oxford: Clarendon Press.

Underhill, A. (1994). *Sound Foundations.* Oxford: Macmillan Heinemann.

Ur, P. (1984). *Teaching Listening Comprehension*. Cambridge: Cambridge University ?Press.

Young, R. (1999). Experimenting with the Sound/Color Charts in English and French. *"Caleb Gattegno's Science of Education: Ten Years After" Conference Proceedings.* New York: The Association for the Science of Education. (note: this article is reprinted with additional images of Sound/Color Charts on the website of Une Education Pour Demain, at <http://assoc.wanadoo.fr/une.education.pour.demain/articlesrrr/sw.ros.htm>