Frederic Chiu

# Gourmet care and feeding for the piano pedals

*Pedal uses and their regulation*

In my 35 years of touring, my relationship with piano technicians has always been a focal point. They are my partners in creating a memorable musical experience.

In looking together at the hundreds of pianos that I've encountered, in large and small venues, from super high-quality brand concert grands to older, smaller baby grands, one area of regulation that consistently requires the most attention is the piano pedals. A piano that is well tuned and well regulated will meet the needs of 90% of music being played. But to achieve the effects that are required by certain pieces, that final 10% needs to be in place. And most of that 10% is related to pedal regulation.

Very often these problems were not obvious to the piano technicians; they did not notice them, and no other pianist had raised the issues. However, once it was explained and demonstrated, they recognized the need for the work, and were often even able to provide remedies in the little time allotted them. They also promised to look at the pedal issues on a more long-term basis.

Let me say right away that this is not the fault of the technicians! While there are industry standards that I would like to change (some of which I describe below), for the most part, there is little demand on the part of pianists for the pedals to be well regulated. The confusion about how the pedals actually function to change the sound of the piano is based on entrenched traditions that need to be changed in order to exploit the pedals to their full potential, both through playing and regulating.

And so a vicious cycle is created, where pianists do not use the pedals to their full and true extent, so they don't notice regulation errors on the instrument they are playing. They don't ask the technicians for any adjustments, and so therefore the pedals function more and more poorly, thereby discouraging pianists from exploring the fuller use of the pedals.

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In order for technicians to know what to adjust, pianists need first to use the pedals correctly and fully in order to perceive problems in regulation. This is not such a simple thing; it actually requires some basic rethinking of how the pedals work on a basic level.

I feel that many pianists do not understand the deeper effects of the pedals. Even more, many actually misunderstand their functioning and use them counter to their nature, and thereby reduce their effectiveness. There is no excuse, however, for not using the pedals to their fullest extent; important composers such as Chopin, Liszt and Busoni, and performers such as Gieseking and Joseph Banowetz (*The Art of Pedaling*) have written in detail and in depth about the use of all the pedals.

What are the characteristics of the piano that are affected by the pedals? The piano is a percussion instrument: hammers hit tightly wound strings. It is also a polyphonic

instrument: it is one of the few instruments that can play more than one voice simultaneously. It has one of the largest tessitures among instruments, and also possesses a wide range of colors, thanks to its ability to play harmonies. It is also a solo instrument, with the huge repertoire that spans over 3 centuries of musical styles. Because of this range, the piano must be extremely fine-tuned, capable of reflecting the softest touch as well as conveying the harshest attacks.

The pedals play in important part in enhancing all of these characteristics. The Damper Pedal allows the mingling of harmonies that produces the wide range of color. The Shift Pedal increases the number of primary color choices. The Sostenuto Pedal helps to create the polyphonic levels of voices.

Traditional thinking about pedals tends to consider them something to add to the playing. However, even when the pedals are not used at all, a choice is being made to not use them. In fact, each pedal is a spectrum, not just an OFF and ON switch, but rather a range between OFF and ON. Some of the spectrums are smoothly graded; others are more step-like. More explanation will follow below.

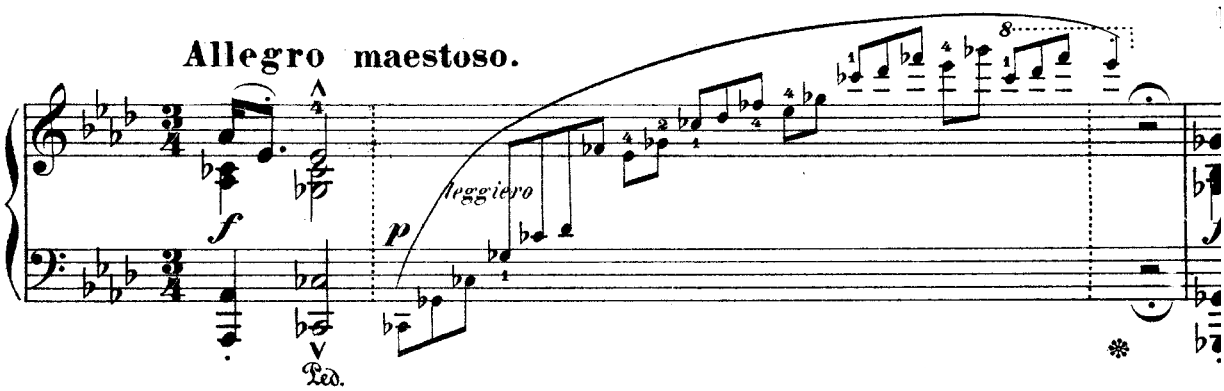
When used in a digital fashion (ON or OFF), each pedal doubles the capacity of the piano. You can choose the clean sound of no Damper Pedal, or you can choose the rich, washy sound of all colors intermingling. You can create a bright, clean tone with the Shift Pedal off, and a muffled, rounded sound with the Shift Pedal engaged. Without the Sostenuto, you are working in one plane of activity; with the Sostenuto, you create a second plane of activity by being able to hold notes independently.

Used in gradation, the two outer pedals provide a range of sounds that, when used effectively, not just double but grow the piano's palette infinitely. The Sostenuto Pedal can also be used in a more refined, precise way, which also expands its powers. However, many pianists limit their potential power, because of misunderstandings about the use of these gradations, which I would like to explore first.

## Current Common Practices with the Three Pedals

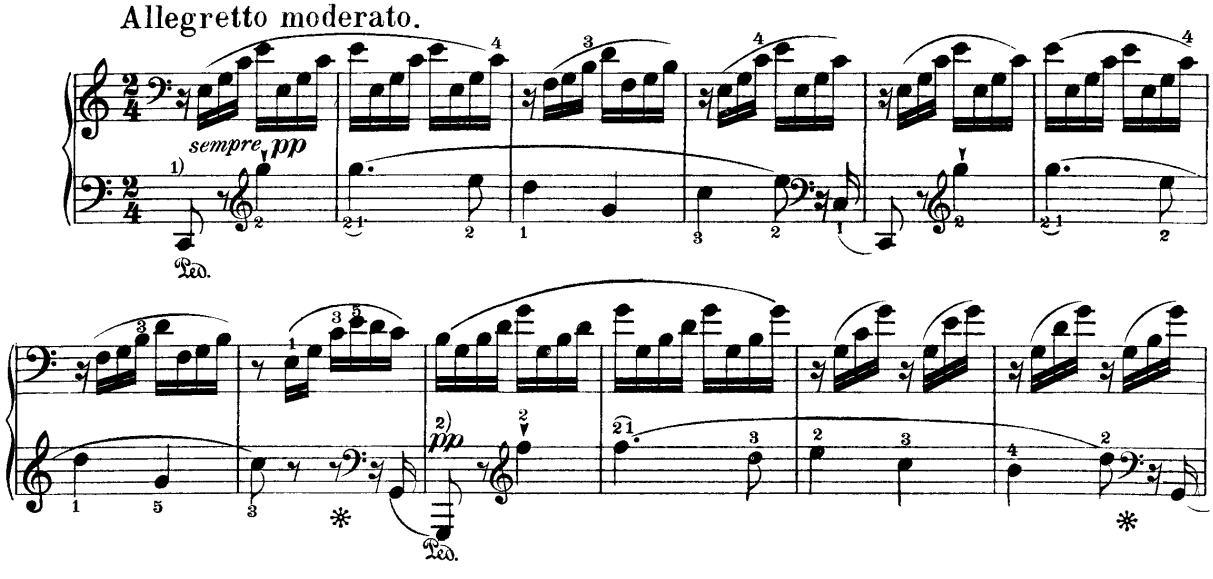
**Damper Pedal:**
Common approach: digital
Common placement: note-by-note usage.

This pedal is the most used, and the most obvious in its effect. The generally accepted approach to this pedal is on/off (i.e. "digital"). A special technique called "flutter pedaling" is a rapid alternation between on and off, creating an effect of slight blurring. The flutter pedal is also suggested to recreate the effect of the pedal on the earlier fortepianos, with their shorter durations and generally less powerful harmonic resonance. Take the opening of the Chopin *Polonaise Fantaisie*:




[Chopin *Polonaise Fantaisie*, Opus 61]

Or the opening of the last movement of the *Waldstein Sonata* of Beethoven:

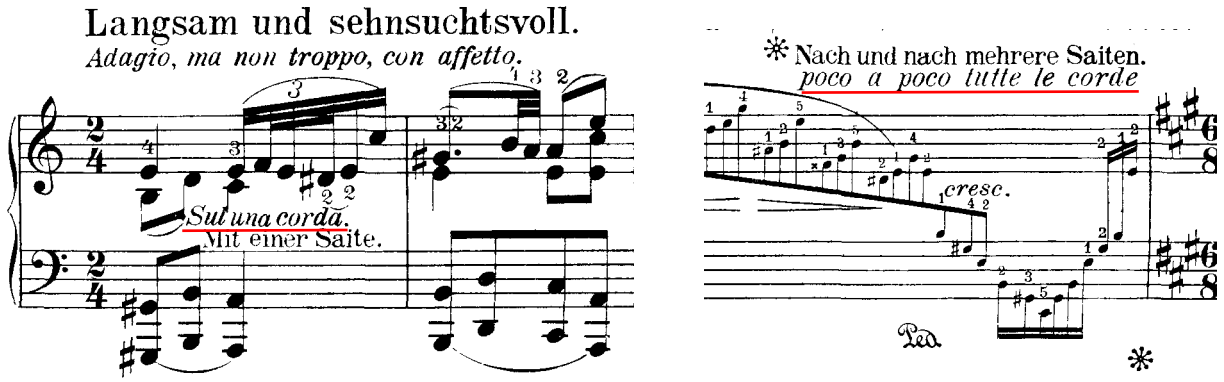



[Beethoven *Waldstein Sonata*, mvt III]

The flutter pedal allows the pianist to create a haze of sound by allowing the strings to resonate for short bursts, in a random pattern that enhances the haze effect.

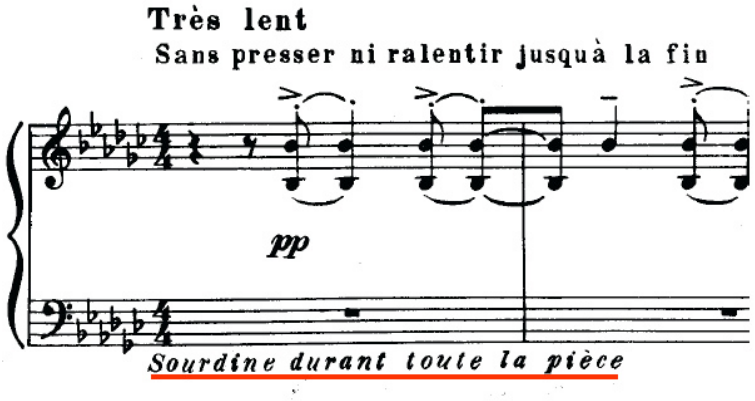
**Shift Pedal:**
Common approach: Analog
Common placement: Used in sectional blocks.

The Shift Pedal shifts the keyboard to the right, theoretically enough so that the hammers hit only 2 of the 3 strings, thereby creating a less powerful sound. The most timid piano students, afraid of imposing their sound, keep the Shift Pedal depressed to its deepest level during their entire performance or practice sessions! While these students would agree that the use of the Shift Pedal is also generally “digital”, i.e. either disengaged or fully engaged, it is widely accepted to use the Shift Pedal in gradation: the softer the sound you want, the more you depress the Shift Pedal. Or, as in this example from Beethoven’s *Sonata* Opus 101, lifting the pedal accompanies a crescendo:




[Beethoven *Sonata* Opus 101]

In some pieces the composer specifically demands that a passage is to be played with the Shift Pedal engaged. Ravel's *Le Gibet* from *Gaspard de la Nuit* is supposed to be performed with the pedal engaged for the entire piece – "*Sourdine durant toute la pièce"*



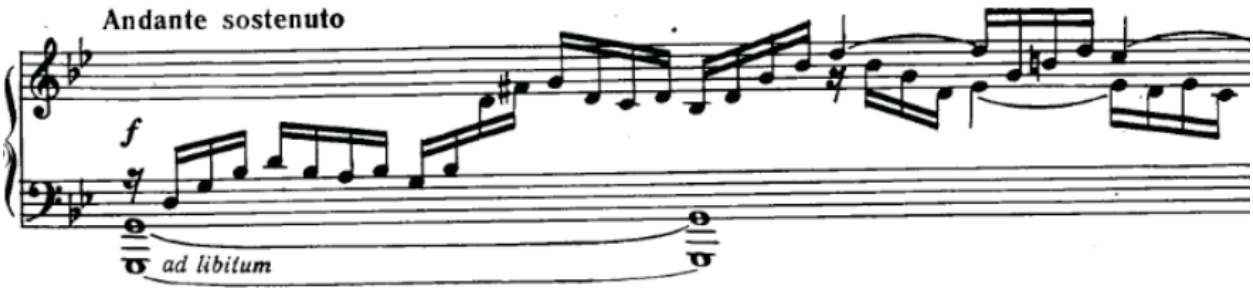

[Ravel *Le Gibet*]

The change of sound creates an unfocused, otherworldly effect that creates a certain atmosphere that the composer is looking for.

**Sostenuto Pedal:**
Common use: Vertical, rather than horizontal.
Common placement: Holding long bass notes.

The middle pedal is a conceptual pedal, complex in its functioning and its execution. Invented in the mid 1800's by Boisselot, its acceptance has been discrete because of its conceptual nature. Composers that were aware of the pedal have rarely demanded its specific use. A rare composer who did was Busoni, who used all three of the piano's pedals freely, especially in his transcriptions of Bach. He said, "Real organ-effects can be obtained only by the combined action of the three pedals."

The most common use of the Sostenuto Pedal is to hold singly played bass notes so that the Damper Pedal can be used selectively to "clear the air" without losing the tonal foundation. The opening of Saint-Saëns' *Piano Concerto* #2 is a proto-typical example.



[Saint-Saëns *Piano Concerto* #2 mvt 1]

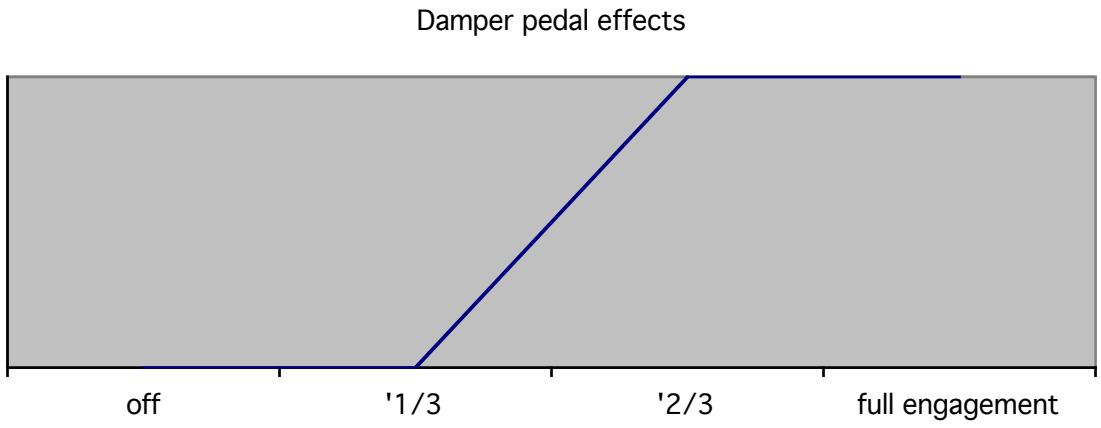
## Potential Uses of the Three Pedals

Now I would like to present what I feel is the true potential of each of the pedals, based on the physical functions of the pedal and how that can be used to enhance the natural qualities of the piano.

### The Damper Pedal

Ideal use: Analog rather than digital.

The right pedal is the most simple in its function: it lifts the entire row of dampers off the strings, which allows them to vibrate freely.
The effect of the Damper Pedal is more analog than digital. The changes in sonority evolve smoothly from dry to resonant, from focused to sympathetic as the pedal is depressed through the sensitive range where the dampers are disengaged, and an equally smooth evolution from resonant to dry when the pedal is released and the dampers recontact the strings. There are two areas of no effect: at the beginning of the pedal trajectory where the mechanism has not engaged the dampers yet, and at the end of the pedal trajectory, where the dampers are traveling in mid-air with no effect on the strings.




It is obviously important for the dampers to be regulated so that they move in synchronization with each other. The lack of precision is the most prevalent issue I come across concerning this particular pedal. The effects of the imprecision are most

heard in the releases, as the pedal is often used as a conductor coordinating the cutoff of an orchestra. The slow disengagement of the pedal will reveal that certain dampers that are descending later than the majority. By testing with clusters, one can quickly locate the late dampers.

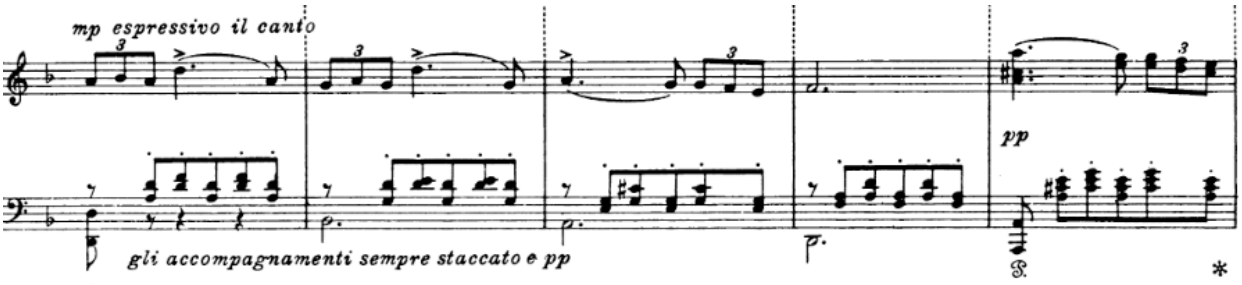
Just as prevalent, but more difficult to perceive, are the notes that dampen BEFORE the majority. By limiting the number of notes played in your cluster, it becomes easier to hear which note dampens first, and which one dampens last. I use three notes at a time (similar to tuning the three strings of a unison note).

In earlier versions of the instrument, pianos had split damper controls, for different sections of the keyboard. This gave the pianist the ability to hold bass notes by lifting the lower dampers without needing to also blur the treble, or to let the weaker strings vibrate by lifting the treble dampers without creating a murky sound in the bass.

On the modern instrument, this finer control is lost, as a single pedal controls all the dampers, but this selective control can be partially recreated by permanently regulating the height of a section of the dampers. Given the increased strength of the upper register of the modern piano, it becomes more generally useful to be able to dampen the treble without clearing out the bass. This would suggest a regulation of the bass dampers, those in the first section of the frame, to lift slightly sooner than the rest of the damper row. In this way, pianists are equipped to play complex layered music such as the Schubert/Liszt lieder transcriptions with more differentiation of the voices.

Another possible development that would add another layer of control would be to have some play at the bottom of the release of the damper. Therefore, a key that is released quickly would let the damper fall quickly, going lower in its trajectory before “bouncing” back up. This would allow notes that are released slowly to avoid this bounce and avoid the sudden damper stop.

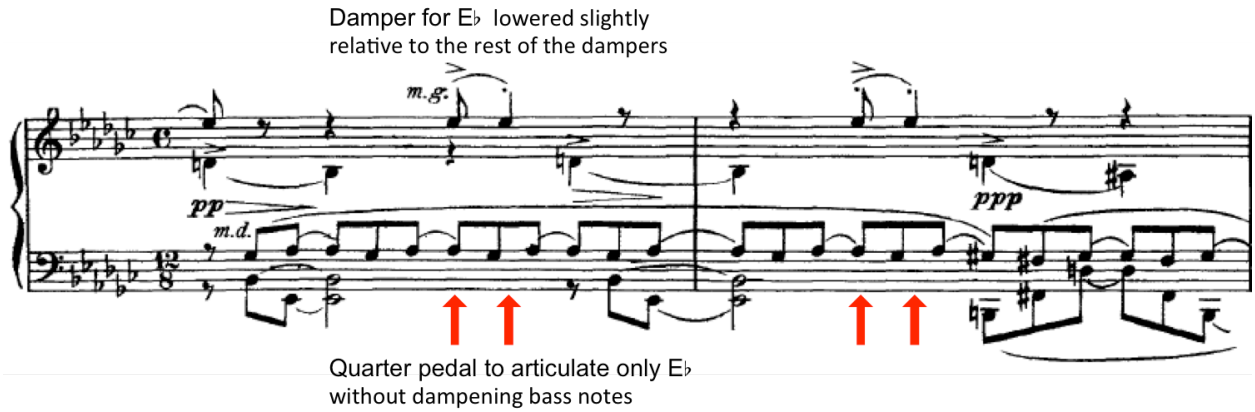
The Schubert/Liszt *Ständchen* is also a good example for this kind of usage. The elevated bass dampers would allow the bass note to ring without affecting the staccato of the middle register accompaniment. This pedal regulation and use has the added advantage of avoiding the use of the Sostenuto Pedal to catch the bass, which would also catch the first melodic note of each measure. All of this is controlled by the right foot, which then allows the left foot to be able to control the Shift Pedal if needed.




[Schubert/Liszt *Ständchen*]

A simple technique to raise the lower dampers is illustrated in this photo. Notice the thin wooden slat inserted under the damper bar, which raises the entire section temporarily.


Beyond the general regulation of the Damper Pedal, other specific, temporary damper regulations can aid specific pieces. In Ravel's *Oiseaux Tristes* or *Le G*ibet, a repetitive two-note figure unifies the piece with its imperturbable presence. It is important that this figure be presented in the same way each time, regardless of the changing activity around it. By regulating the damper for that particular note to dampen just slightly before the others, we have a selective pedaling effect that singles out that note.




[Ravel *Oiseaux Tristes*]

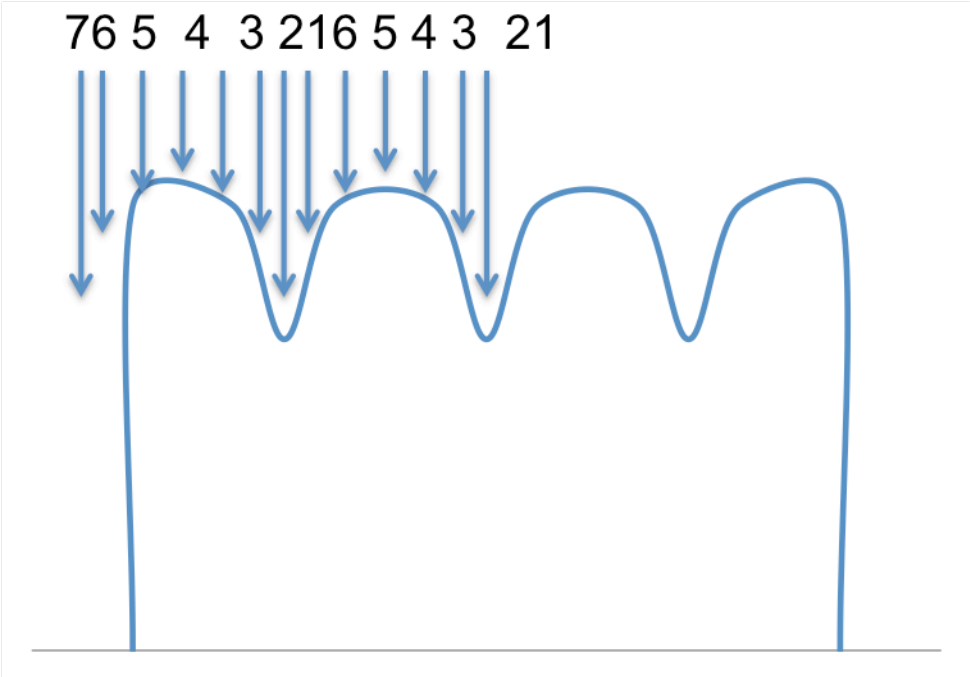
**Shift Pedal**
Ideal use: Digital rather than analog.
Ideal placement: note-by-note use.

The earlier indications by Ravel in *Le Gibet* – "*Sourdine durant toute la pièce"* – reveals a curious misunderstanding of the Shift Pedal by the French in general, a vestige of the piano's history. Previous iterations of the "soft pedal" applied a mute – *une sourdine* – to muffle the sound, akin to the mutes used by string instruments. The upright piano moves the hammers closer to the strings, thus preventing the hammers from reaching the same velocity and thereby producing a softer sound. Both of these systems actually are analog, presenting a smooth line between ON and OFF.
However, it is not just the French who have hold similar misconceptions about the Shift Pedal's function and effect. By Beethoven's time, the standard Shift Pedal on the grand piano was established, and it works in a completely different way: shifting the keyboard to the right so that the hammers hit a different part of the hammer, eventually hitting only 2 of the 3 strings in the top 2/3 of the piano. In the lower third, where there are only

2 or 1 strings per note, the effect comes entirely through hitting the hammer in different areas of the head.

This is what Busoni wrote about the use of the Shift Pedal:
“It may be used not only for the last gradations of “pianissimo,” but also in “mezzo forte” and all the intermediate dynamic shadings. The case may even occur, that some passages are played more softly without the soft pedal than others with it. The effect intended here is not softness of tone, but the peculiar quality of tone obtained.”

In order to be accurate, Busoni should have said “tones” in the plural. In the small span of the hammer head, there are many different types of areas, all producing different sounds that do not evolve directly from hard to soft. Instead of following a smooth line or curve, the color on some pianos changes abruptly and dramatically as the hammers shift, depending on the state of the hammers.
Here is one example of some of the kinds of sounds possible on certain instruments.



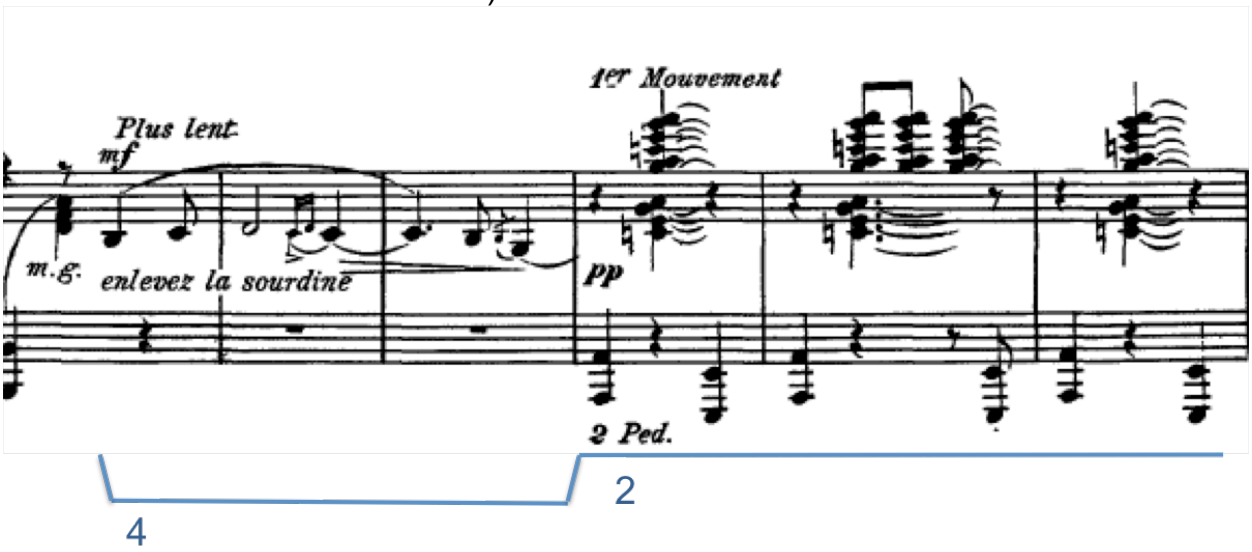
Hammer cross-section

1. Defined (3 strings hitting the most compact part of the hammer)
2. Zing (3 strings hitting the most vertical part of the hammer, with a soft brushing effect)
3. Rounded (3 strings hitting a soft part of the hammer)
4. Tubby (3 strings hitting the softest part of the hammer)
5. Rounded, less volume (2 or 3 strings hitting a soft part of the hammer)
6. Zing, less volume (2 strings only hitting the most vertical part of the hammer)
7. Quieter defined (2 strings only hitting the most compact part of the hammer)

Viewed this way, one sees that the Shift Pedal functions much more in a digital manner. The transition from level 1 to level 7 passes through 7 different phases of color, with

some transitions (level 1 to level 2) quite jarring. The pedal needs to be depressed to specific levels and kept there.

One can think of the different kinds of sounds resulting from using a different “mallet” to hit the strings. Think of playing a xylophone with a wooden stick, a felted stick, a leather-bound stick, even a brush, etc. By combining this with different dynamic levels, one multiplies even more the variety. Sometimes one needs to play loudly with the roundest sound, and softly with the sharpest, most defined sound, as in Ravel’s *Alborada del Gracioso*. (I would suggest the opposite use of the “*sourdine*” than what Ravel suggests, i.e. playing the *mf* with the Shift Pedal engaged to level 4, and the *pp* with the Shift Pedal at level 1 or 2.)




[Ravel *Alborada*, middle section]

The most important element is the level of usage sustained by the hammers. A freshly filed or conditioned hammer has hardly any differentiation between the grooves and the hills, and the change of colors is very limited. A piano that has very deep grooves offers the most widely ranging palette of colors.
A “terrible” piano, one that has never been voiced, which has been pounded to the point of being almost unbearably metallic in sound with the Shift Pedal disengaged, often produces the most exhilarating and unworldly sounds with the Shift Pedal barely depressed, to level 2. “Practice pianos” that have been played consistently with the Shift Pedal depressed (students afraid of making too much noise in small spaces) will often develop a second set of grooves, thus making the same kind of harshly defined sound produced by not using the Shift Pedal at all!

Each piano is different, and each piano, over time – even the short time span of a single concert – will see its Shift Pedal palette evolve. The ear must be conscious of which note sounds how at what pedal level, and must be the final judge of when to use certain sounds.

Because this voicing is so difficult to keep consistent, some may think it is a waste of time to voice for the Shift Pedal. However, there are certain regulation guidelines that

can only enhance the function of this pedal, regardless of the basic condition of the hammers.

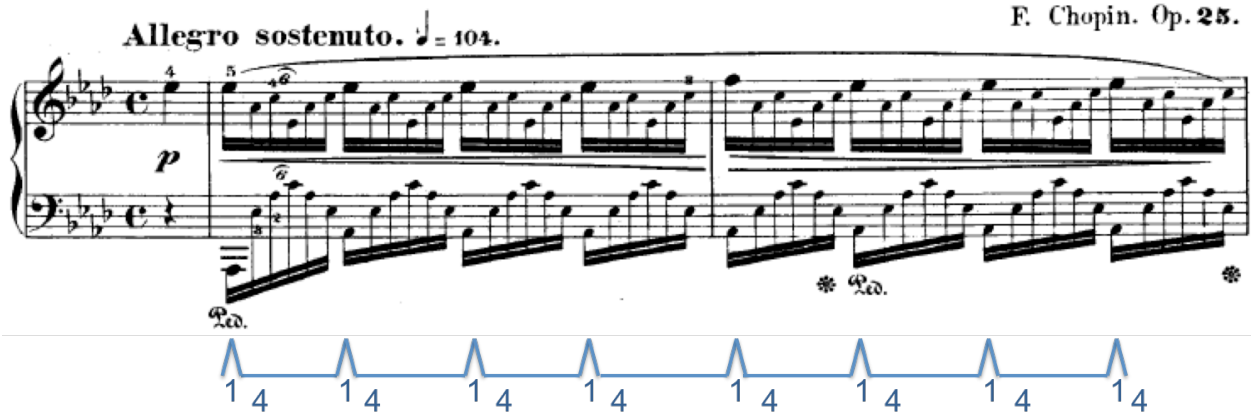
In order to present the most variety of colors on the hammer surface, it is important that the maximum shift of the keyboard brings the strings in line with the existing grooves. Ideally, the hammer should hit 2 of the 3 strings in exactly the same groove of the hammer. If the shift brings the strings to any other location, the hammer face begins to develop two sets of grooves, thereby minimizing the surface available for the softer hills.

It is important to remember that voicing for maximum effect of the Shift Pedal means keeping as much as possible the contrast between the grooves and hills of the hammer profile. When needling the hammer for voicing, the grooves should be aerated, but even more so the hills, to keep their contrasting relationship the same if possible. By needling just the grooves, their surface begins to resemble more the hills, thus reducing the difference of their colors.

Equally, any attempt to harden the face, through hammering or lacquering, must treat the grooves and hills differently. I suggest using a stick with grooves that mimic the three strings, 3, 2 and 1, instead of a flat surfaced stick. Or perhaps an invention that combines stick and needle like this:

Besides the voicing, the Shift Pedal itself needs to be regulated carefully for a quick, easy and quiet shift. The squeaking pedal is the most notable culprit here. The quick and quiet action allows one to make the most use of the differentiating colors of the pedal, using it selectively from note to note. By giving individual notes different colors, one can distinguish layers of activity through color rather than only through touch and dynamics. This kind of Shift Pedal technique is called Surgical Pedaling.

Here is an example of using the Shift Pedal to bring out the top line of a series of chords without any use of dynamic changes or touch changes.



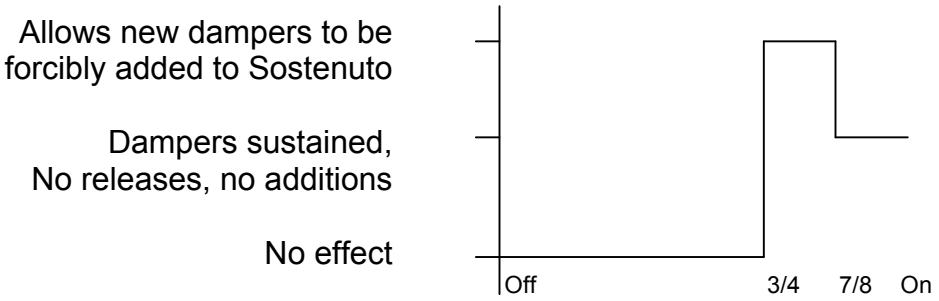

[Chopin *Etude* Opus 10 #11]

**Sostenuto Pedal**

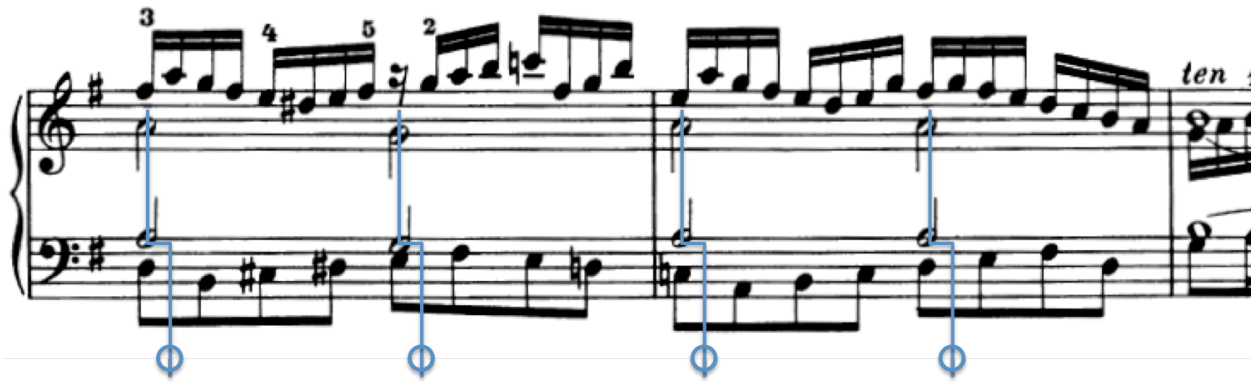
Ideal use: Horizontal (melodic), rather than vertical (harmonic).
Ideal placement: Used where one would like to hold with an extra hand, in any register.

The Sostenuto Pedal is the one least attended to, by players and by piano technicians. This is unfortunate, because it allows the pianist to create the magical effect of playing as if with three hands; having a malfunctioning Sostenuto is like playing with one of those three hands tied behind your back.
The Sostenuto Pedal should also be used in place of the Damper Pedal in passages where a legato connection is necessary without the added sonority or diffusion of sound that the Damper Pedal creates.

A finely regulated Sostenuto Pedal allows the pianist to selectively extract notes from a web of sound, creating an extra layer of activity for the ear to follow. This pedal has the least number of gradations, but it is more complex than a simple on-off switch.

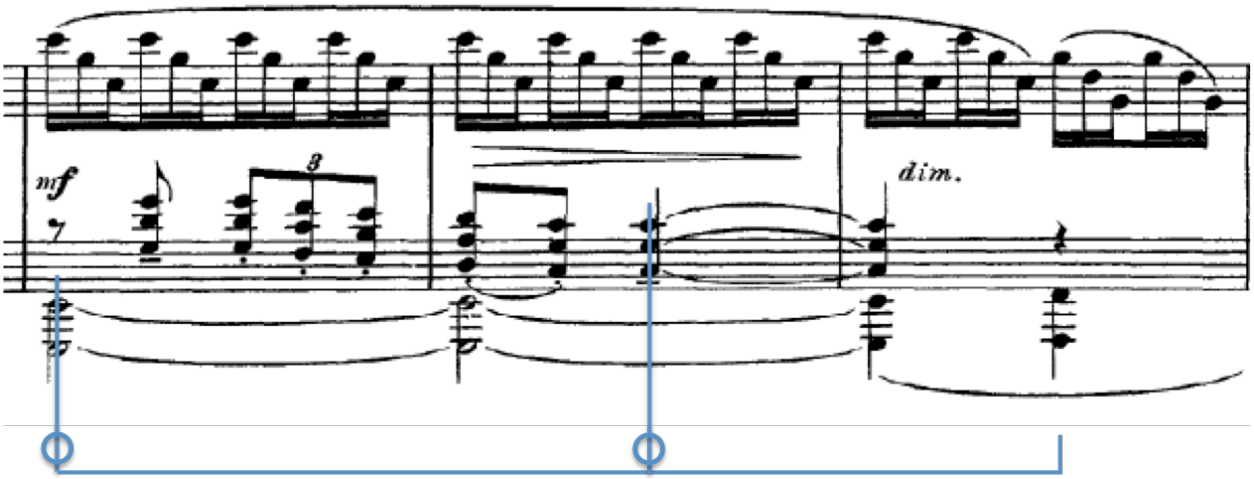



In general usage, the pedal is used for holding singly played bass notes. However, one can also use it to sustain a melody line or a secondary melody line.
If one has developed a precise timing, it is possible to sustain single notes played together with other notes. Here is an example of the degree to which activity can be filtered with the Sostenuto.




[Bach/Busoni *Nun Freut Euch, Lieben Christen*]

In order for this to function correctly, it is imperative that the tabs be regulated totally evenly. It is not enough that the individual dampers sustain when the keys are completely depressed and the pedal depressed to the lowest level. It should also pick up the dampers with the notes engaged only to the escape level. Also, the pedal should be able to be released slightly without losing any effect of the sustain. The blockage of the pedal at the bottom of the trajectory is only for the convenience of the pianist, to remove the need to aim for a particular level of depression: a quicker foot action that does not descend to the bottom with full force should still activate the function.
It is important also that notes whose dampers are not sustained with the Sostenuto do not *become* engaged when played subsequently if the pedal is completely depressed. However, one should be able to catch extra notes when the pedal is slightly raised, to add to the notes that are already sustained without having to release them.
In the Debussy example below, the Sostenuto Pedal first catches the low E octave, and then later the C major chord is added to it by a slight lift then depression of the Sostenuto Pedal. The C Major chord is played at a slightly louder dynamic than the right hand triplets, allowing the former to be caught and the latter to continue uncaught in the Sostenuto Pedal.




[Debussy *Mouvement*]

To test the correct functioning of this pedal, notes should be played loudly at various pedal levels, and they should become caught at the same pedal level, about 1/8 of the way from the bottom.

In addition, the piano should be checked for noise when the Sostenuto is depressed, then the Damper Pedal depressed, then the Sostenuto released. The bar should not scrape the tabs of the non-sustained notes. This creates not only noise, but also a jarring concussion that can be disturbing during more concentrated, softer music.

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To piano technicians, let me say that I hope to encourage my fellow pianists to explore the use of the pedals, and to have more of us ask you for these finer pedal regulations. When I began to understand their true nature and potential, used separately and in coordination, I began asking my piano technicians to regulate accordingly. And I have since had numerous happy moments coming back to a piano to find it in much better pedal shape than during my previous visit! The vicious cycle turned virtuous!