

Comparison between Nikkor 50 mm f/1.2 Ai-S, AF Nikkor 50 mm f/1.4D and AF Nikkor 50 mm f/1.8D

By Romulo Lubachesky

The 50mm focal distance is, without any doubts, the most classic of all lenses. Its field of coverage, on the 35mm format, is close to what the human eye can view with relative clarity. So, it is no coincidence that these lenses are named normal.

On the APS-C digital cameras with a 1.5x field of view crop the 50mm will now have the same angle of a 75 mm lens, which means a short tele.

The goal of this article is to compare tests made with the 50mm focal distance lenses, the f/1.2, the f/1.4, and f/1.8, of the Nikon current line, 2008.

It will only be approached the differences between lenses; to feed your knowledge with the details of each lens I recommend the read of the specific reviews.

On the lens body it was studied the construction, the handling, the performance, and the auto focus. On the image quality it was analyzed sharpness, colors, chromatic aberration, flare, and bokeh.



Specifications

Maximum aperture: f/1.2
Construction: 7 elements in 6 groups
Closest focusing distance: 50 cm.
Maximum reproduction ratio: 1:7.9
Minimum aperture: f/16
Diaphragm blades: 9 blades
Lens hood: HR-2 (optional)
Filter: 52 mm
Size: 6.85 cm x 4.75 cm.
weight: approx. 380 gr



Specifications

Maximum aperture: f/1.4
Construction: 7 elements in 6 groups
Closest focusing distance: 45 cm.
Maximum reproduction ratio: 1:6.8
Minimum aperture: f/16
Diaphragm blades: 7 blades
Lens hood: HR-2 (optional)
Filter: 52 mm
Size: 6.45 cm x 4.25 cm.
weight: approx. 230 gr



Specifications

Maximum aperture: f/1.8
Construction: 6 elements in 5 groups
Closest focusing distance: 45 cm.
Maximum reproduction ratio: 1:6.6
Minimum aperture: f/22
Diaphragm blades: 7 blades
Lens hood: HR-2 (optional)
Filter: 52 mm
Size: 6.5 cm x 3.9 cm.
weight: approx. 155 gr

Body and Design

On this section you are going to find information about the material, functions, and accessories of the lenses bodies. It is attributed a mark in front of each feature, consider by me, superior between both lenses. Information about the specifications of each the lens will not be approached on this article.

Nikkor 50 mm f/1.2 Ai-S

- ✓ Metal body with black paint
- ✓ Rubberized focus ring with 15mm width
- Manual focus
- Complete rotation of the focus ring with approximately 110°
- The center of the frontal element is collected 2mm on the body
- Without electronic contacts CPU

AF Nikkor 50 mm f/1.4D

- Black polycarbonate body
- Rubberized focus ring with 8mm of width
- ✓ Automatic focus
- ✓ Complete rotation of the focus ring with approximately 150°
- The center of the frontal element is collected 4,5mm on the body
- ✓ With electronic contacts CPU

AF Nikkor 50 mm f/1.8D

- Black polycarbonate body
- Rubberized focus ring with 6.5mm of width
- ✓ Automatic focus
- Complete rotation of the focus ring with approximately 130°
- ✓ The center of the frontal element is collected 17mm on the body
- ✓ With electronic contacts CPU

Conclusion about construction

Besides heavier, a metal body is more resistant and stable. A heavier lens helps the balance with the camera improving the handling.

The large focus ring is better to hold.

The auto focus improves the agility when photographing. And adjusting the manual focus on a fast lens with so short depth of field is not very easy.

Bigger the rotation of the focus ring, more precise is the manual focus. When the focus ring has a short rotation the change of the focus distance is very abrupt, where any movement represents a huge change of the focus distance.

Elements that are very exposed are more susceptible to accidental damage.

The three lenses, besides having the same focal distance and still been manufactured, have very different construction characteristics.

The f/1.2 has the classic construction of the Manual focus professional lenses. It has great finishing and is very solid.

There also exists a big difference between the two versions with Auto focus: while the 50mm f/1.4 has characteristics of a more professional lens, the 50mm f/1.8 has a more fragile look. This is one of the things that justify the huge price difference; the f/1.8 version is about three times cheaper than the f/1.4.

Auto focus performance

To determine the auto focus speed the lens was attached to the DSLR camera Nikon D300. With the cap on and positioned on the focus distance correspondent to the infinite, the button was pressed and the time was chronometry till all the distances of focus were covered till it got back to the initial position.

It was measured 10 times to each lens and average out.

The Auto focus speed was very similar on both AF lenses, about 1.150 seconds.

It was also qualified the noise level when focusing. In an open environment it was measured the greatest distance needed to listen the noise generated by the auto focus.

There was no significant difference of noise produced during the auto focus (that was no more noticed on a 5m distance.)

One of the biggest limitations of the Nikkor 50mm f/1.2 Ai-s is the lack of auto focus, maybe it is impossible to make a 50mm auto focus lens with a f/1.2 to a Nikon mount, because the Nikon joint has a small diameter. With a big rear element, there is no much space to the CPU contacts.

Sharpness of the image

On this test I did 3 sets of photos. In all tests the camera used was the Nikon D300 attached on a tripod.

To guarantee the better accuracy the pixels contrast focus on the tripod mode from live view was used.

After doing the focus, the auto focus was turned off to certificate that the focal plane didn't change among photos.

The first photos set was taken to determine the sharpness on the center of the image on about 1m distance between the subject and the camera.

The red rectangle approximately represents the crop done on the original photo to demonstrate the center detail.

On the following page you will find this detail in several apertures. The first column corresponds to the Nikkor 50mm f/1.2 Ai-S lens, the second column to the AF Nikkor 50mm f/1.4D lens, and the last column corresponds to the AF Nikkor 50mm f/1.8D.

Different from the others, the 50mm f/1.8 goes till f/22, so the correspondent space of this aperture was divided with the f/16 aperture.



f/1.2



f/1.4



f/1.8



f/2



f/2



f/2



f/2.8



f/2.8



f/2.8



f/4



f/4



f/4



f/5.6



f/5.6



f/5.6



f/8



f/8



f/8



f/11



f/11



f/11



f/16



f/16



f/16



f/22



To verify the sharpness of the image corner it was used the same procedure of the center. Therefore, the focus point chosen was on the corner next to the crop showed on the image beside.

With a short focus distance the relative difference between the center and the border is considerable; therefore, this method was used to guarantee the smallest lost of quality, showing the higher sharpness possible on the corner of the photos.

The configuration of the images and the disposition follow the same model as the first test.



f/1.2



f/1.4



f/1.8



f/2



f/2



f/2



f/2.8



f/2.8



f/2.8



f/4



f/4



f/4



f/5.6



f/5.6



f/5.6



f/8



f/8



f/8



f/11



f/11



f/11



f/16



f/16



f/16



f/22

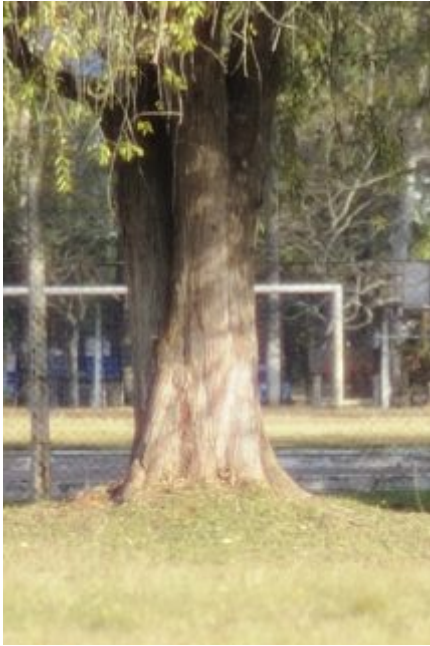


This last sharpness test establishes the level of details on the center and on the border of the image on a distance between the focal plane and the camera close to the infinite.

The red rectangle on the center represents approximately the crop done to the first set of details.

The configuration of the images and the disposition follow the same model as the first test.

f/1.2



f/1.4



f/1.8



f/2



f/2



f/2



f/2.8



f/2.8



f/2.8



f/4



f/4



f/4



f/5.6



f/5.6



f/5.6



f/8



f/8



f/8



f/11



f/11



f/11



f/16



f/16



f/16



f/22



To verify the sharpness of the image corner it was used the same procedure of the center. Therefore, the focus point chosen was on the corner next to the crop showed on the image beside.

Once again, the first column corresponds to the Nikkor 50mm f/1.2 Ai-S lens, the second column to the AF Nikkor 50mm f/1.4D lens, and the last column corresponds to the AF Nikkor 50mm f/1.8D.

On this border test I did not re-focused, because there is no big difference between the center and the border focus on this distant target.

f/1.2



f/1.4



f/1.8



f/2



f/2



f/2



f/2.8



f/2.8



f/2.8



f/4



f/4



f/4



f/5.6



f/5.6



f/5.6



f/8

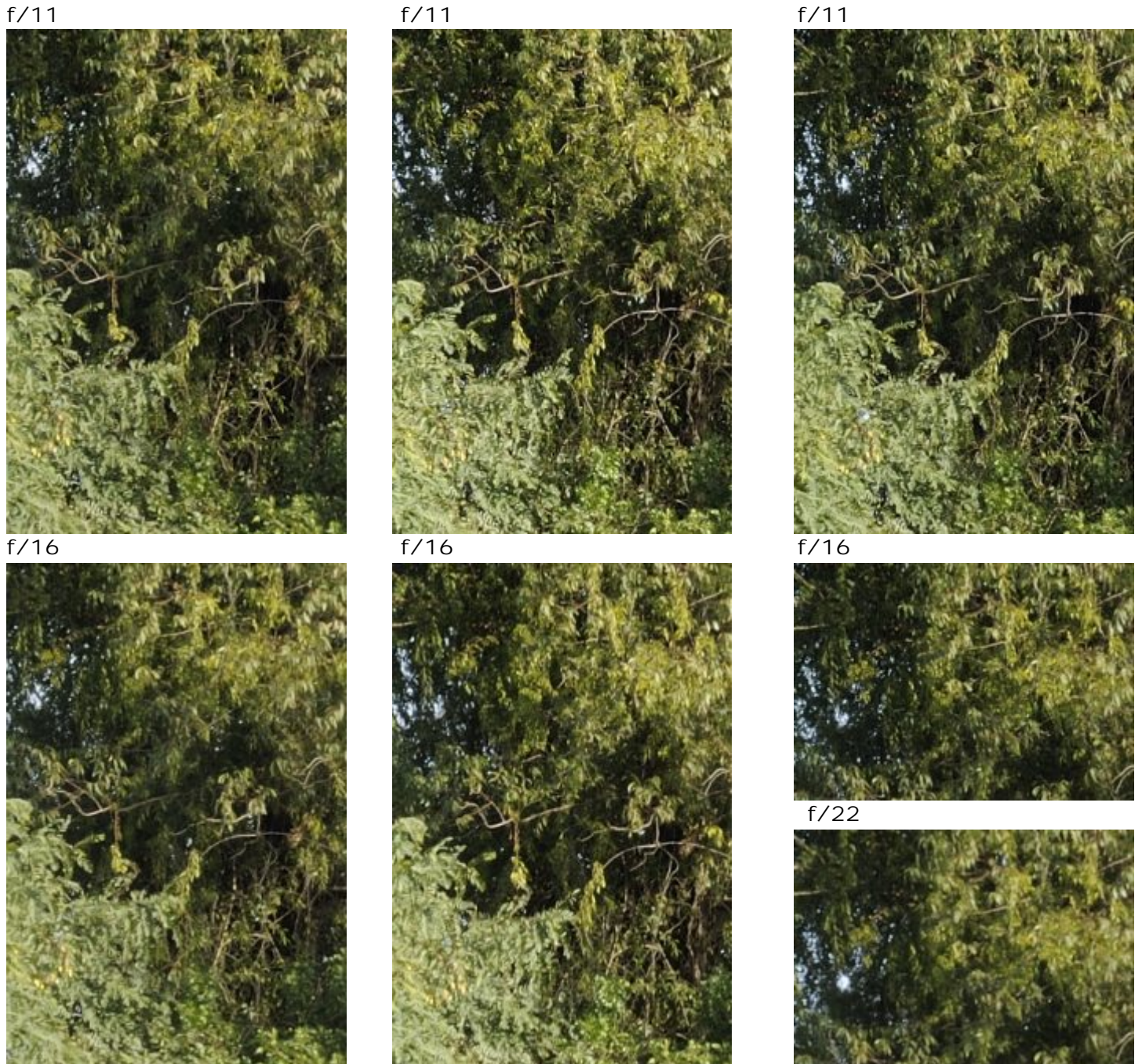


f/8



f/8





Conclusions about sharpness

All sharpness tests were made using the following RAW configurations:

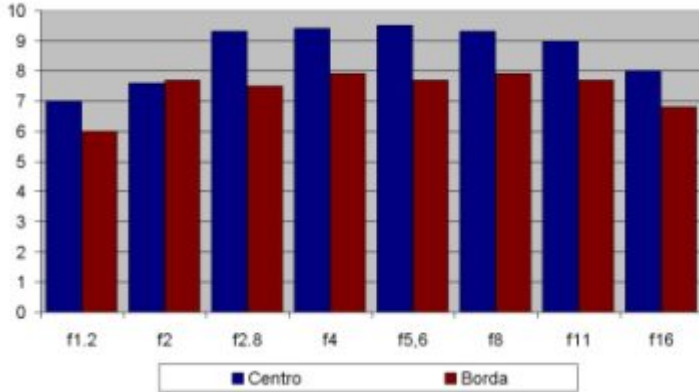
Image quality: lossless compressed 12 bits RAW
ISO: 200
Exposure mode: aperture priority
Metering: central-weighted
White balance: direct sun light
Color space: Adobe RGB
Sharpness: 4
Contrast: 0
Brightness: 0
Saturation: 0
Hue: 0

Converted to JPG using the Nikon Capture NX 2 software without any processing, only the cropping of the sample images.

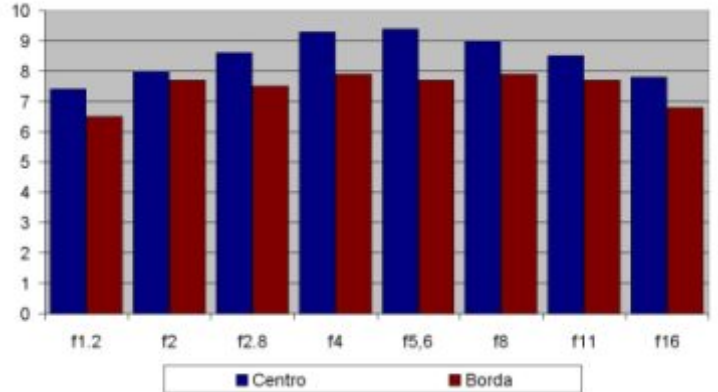
The charts ponder as 10 the maximum sharpness that a lens can get on the camera best resolution; consequently, its results are related only to this article. The sharpness index was credited to each lens on its respective apertures by direct observation of the detail level on the showed areas of the image.

Charts about the observed detail level on the sharpness test with the Nikon D300 from about 1m distant form the target.

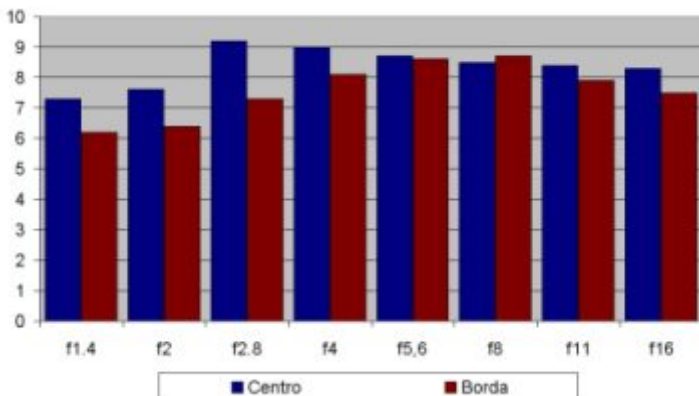
Charts about the observed detail level on the sharpness test with the Nikon D300 on a next to the infinite distance form the target.



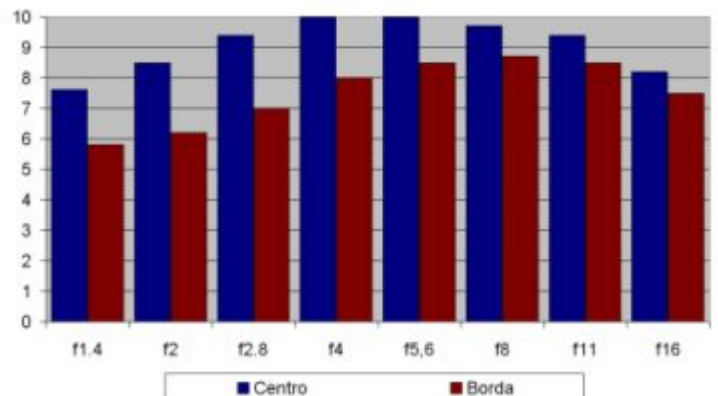
Lens Nikkor 50 mm f/1.2 Ai-S



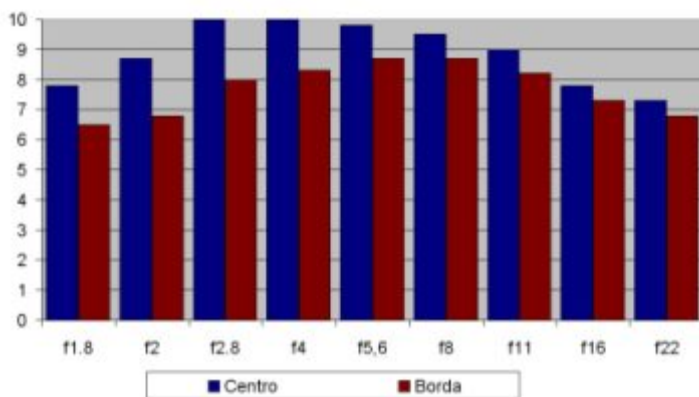
Lens Nikkor 50 mm f/1.2 Ai-S



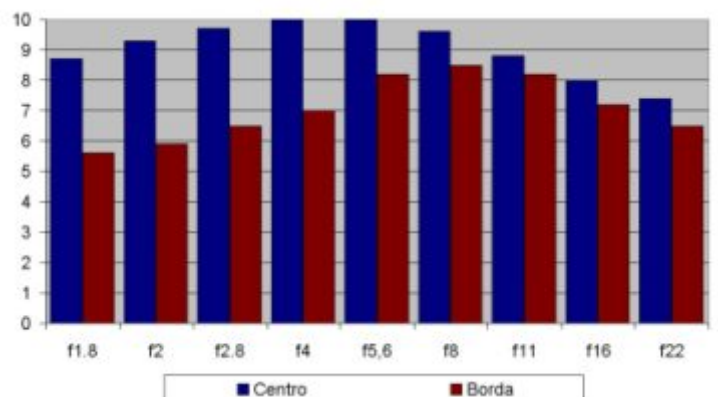
Lens AF Nikkor 50 mm f/1.4 D



Lens AF Nikkor 50 mm f/1.4 D



Lens AF Nikkor 50 mm f/1.8 D



Lens AF Nikkor 50 mm f/1.8 D

The f/1.8 version is sharper on the center; however, has an accentuated quality fall on the borders, principally on the infinite test.

The 50mm f/1.4, by its turn, shows a superior quality when photographs distances close to the infinite, relating to short distances.

And the Nikkor 50mm f/1.2 test shows a more homogeneous lens, with little difference between the center and the border. Despite the excellent resolution in f/1.2, on a general manner it demonstrates the weakest results of the three lenses.

Colors

All the other quality tests of the image give evidences about the color behavior, but a specific test was done to compare the skin tones on the wide open aperture, and on f/2, and f/2.8.

The images are originally taken with the following configuration: lossless compressed 12 bits RAW on ISO 200; aperture priority on the exposure mode; central-weighted metering; direct sun light white balance; Adobe RGB color space; Sharpness 4; Contrast 0; Brightness 0; Saturation 0; Hue 0;

Converted to JPG using the Nikon Capture NX 2 software without any processing.



100% image showing the approximated area of the crop with the red rectangle.

Lenses on wide open aperture



50 mm
f/1.2

50 mm
f/1.4

50 mm
f/1.8

Lenses on f/2



50 mm
f/1.2

50 mm
f/1.4

50 mm
f/1.8

Lenses on f/2.8



50 mm
f/1.2

50 mm
f/1.4

50 mm
f/1.8

Conclusion about color

The taste for colors is very particular. There is no way to determine which one is the best to all photographers.

There is saturation and contrast increasing on the fastest lens, Nikkor 50mm f/1.2 Ai-S, to the slowest one, the AF Nikkor 50mm f/1.8D.

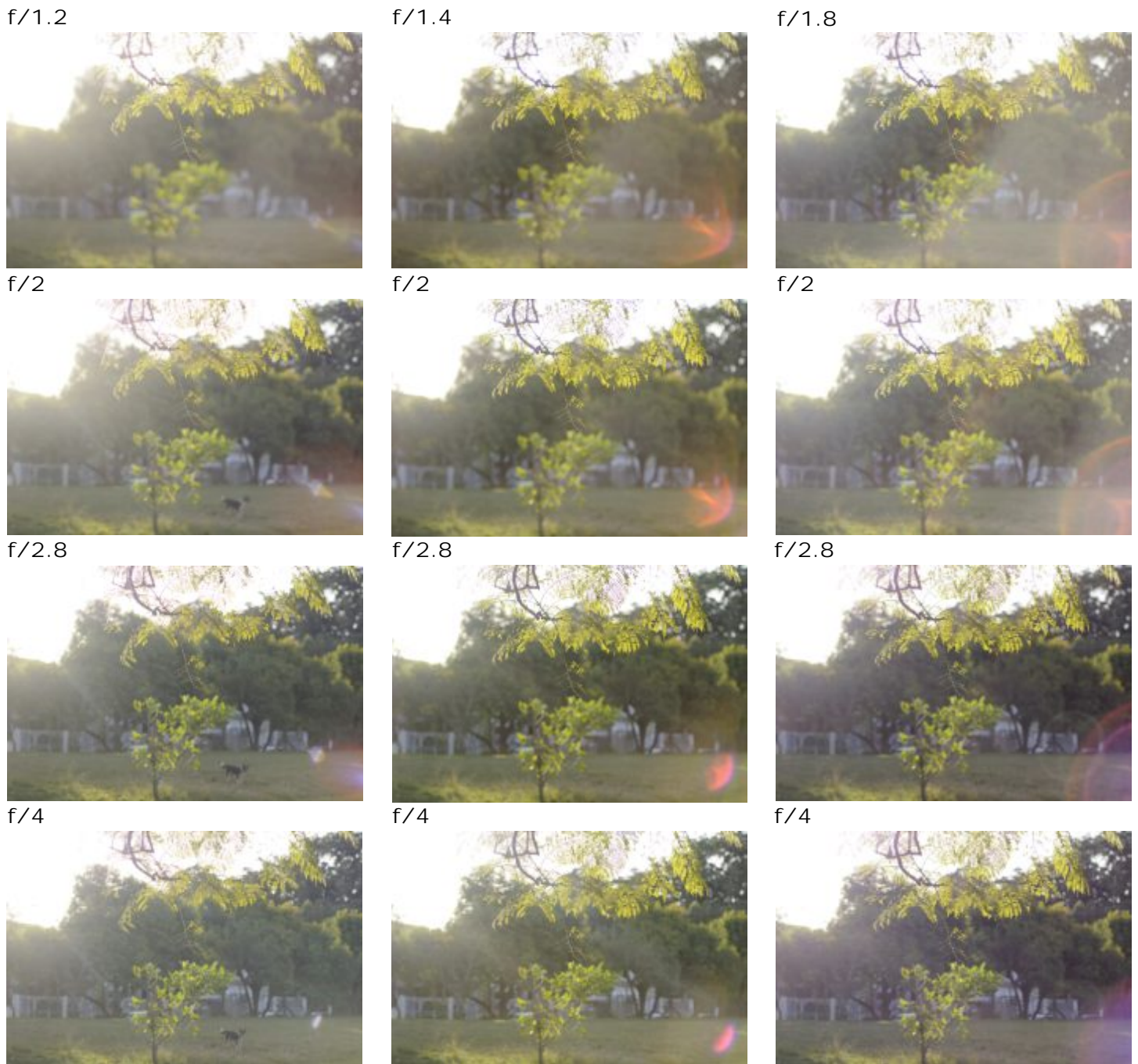
It is also possible to identify difference on the skin tones between a lens and another.

The skin tones of the 50mm f/1.2 pleases me more because is more homogeneous. However, to landscapes photos the high contrast of the 50mm f/1.8 could be more indicate.

Chromatic Aberration and Flare

On this flare test the camera was positioned in a way that the sun hits the frontal element of the lenses.

The first column corresponds to the Nikkor 50mm f/1.2 Ai-S lens, the second column to the AF Nikkor 50mm f/1.4D lens, and the last column corresponds to the AF Nikkor 50mm f/1.8D.



f/5.6



f/5.6



f/5.6



f/8



f/8



f/8



Conclusion about flare

None of the lenses reveal great resistance to flare, yet there were various results.

While the 50mm f/1.2 showed the most discreet ghosting, it had also the biggest fall of contrast because of the flare.

The 50mm f/1.4 though, has the smallest flare index, but showed a well visible ghosting until f/5.6.

The 50mm f/1.8 demonstrated the most compromised image by flare and ghosting of all, especially on the open apertures.

It is easier to fix the flare by post processing than the ghosting, so I would choose the 50mm f/1.2 to photograph with the lens wide opened. And the 50mm f/1.4 to photograph on f/4 and on.

Chromatic Aberration

The same flare images were used to verify the chromatic aberration. Crops without compression are displayed on the same order as the anterior test.

f/1.2



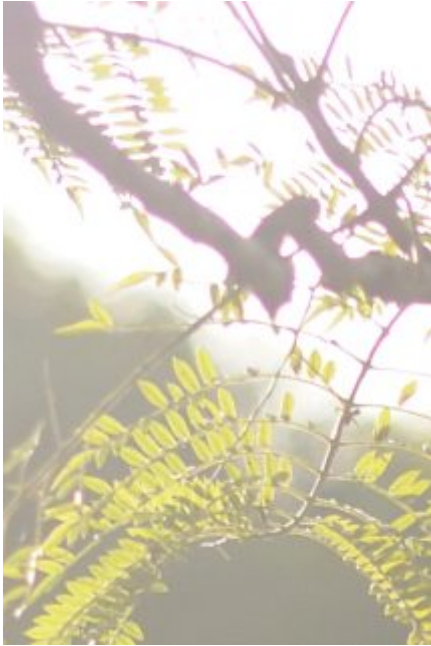
f/1.4



f/1.8



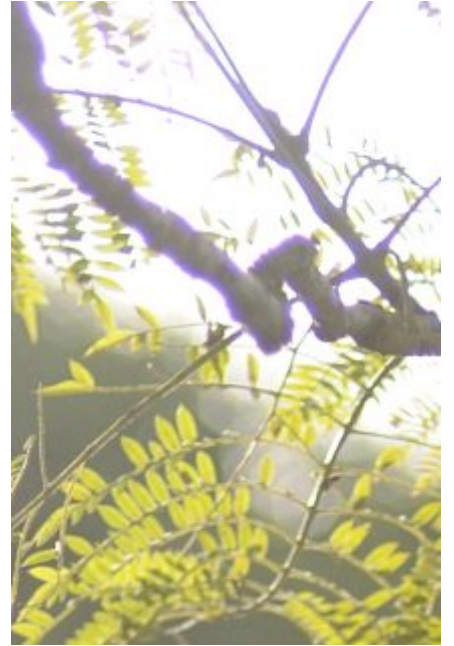
f/2



f/2



f/2



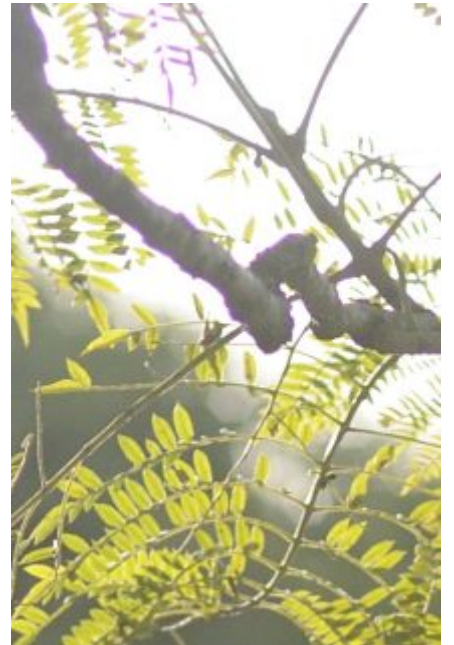
f/2.8



f/2.8



f/2.8



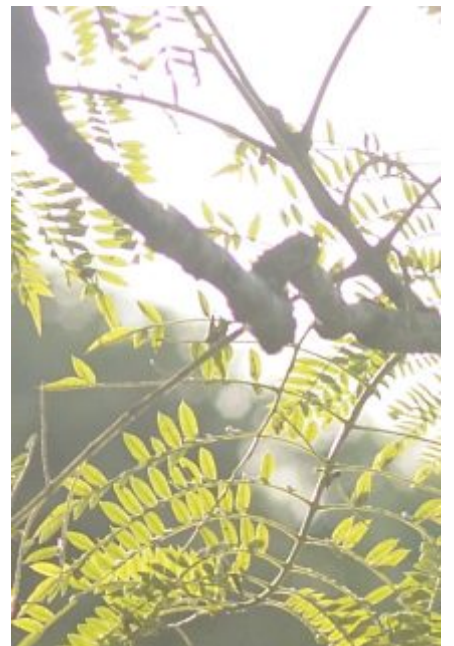
f/4



f/4



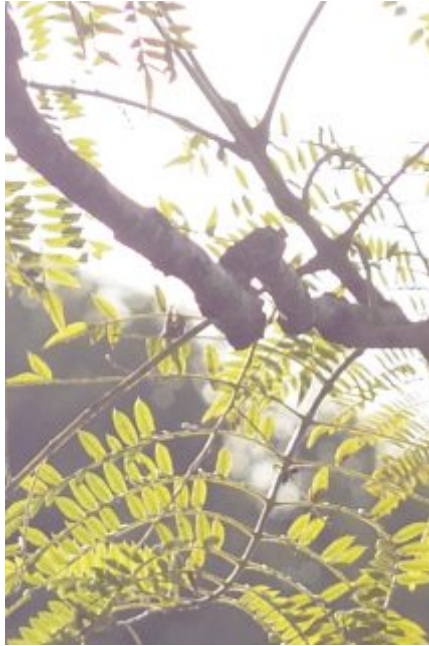
f/4



f/5.6



f/5.6



f/5.6



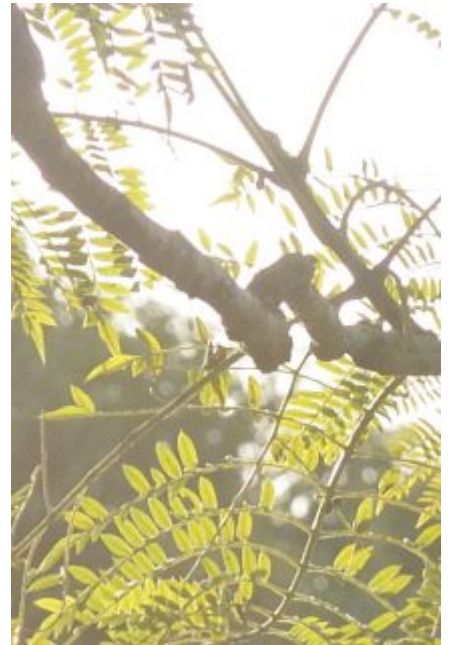
f/8



f/8



f/8



Conclusion about chromatic aberrations

On the maximum aperture, the three lenses revealed chromatic aberration (CA) fringe with similar width; however, the 50mm f/1.2 had a more subtle result. And it keep this situation on f/2, where it is possible to notice more clearly the big color difference of the CA, the 50mm f/1.2 demonstrate a reddish color while the other two 50mm have a bluish one.

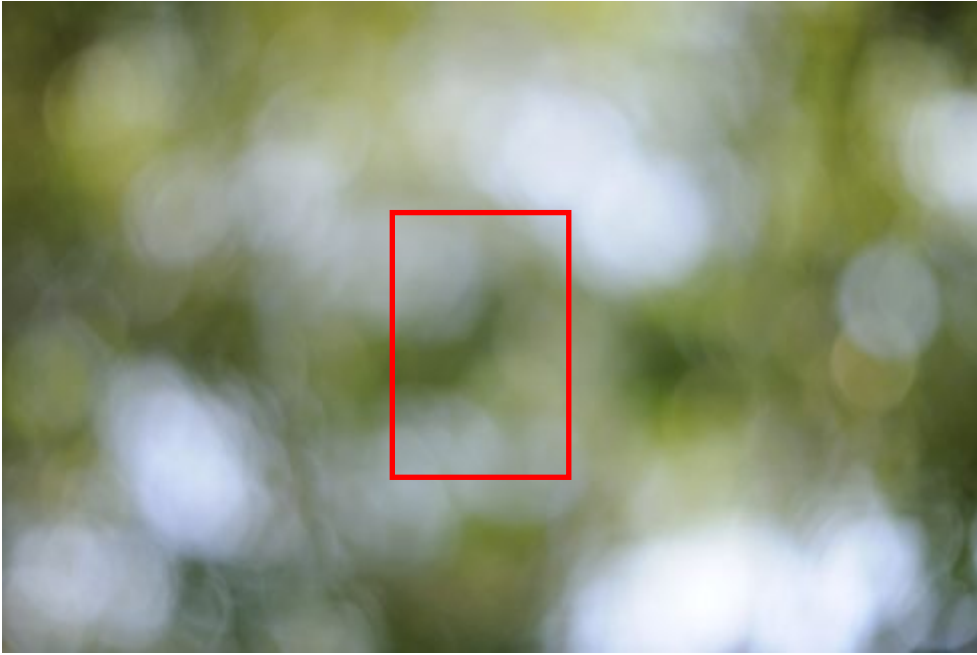
And stopping down beyond f/2.8 the 50mm f/1.4 chromatic aberration becomes redder, like the 50mm f/1.2. And this tendency is followed by the 50mm f/1.8 beyond f5.6 too.

The 50mm f/1.2 advantage is clear, followed by the 50mm f/1.4, on this test.

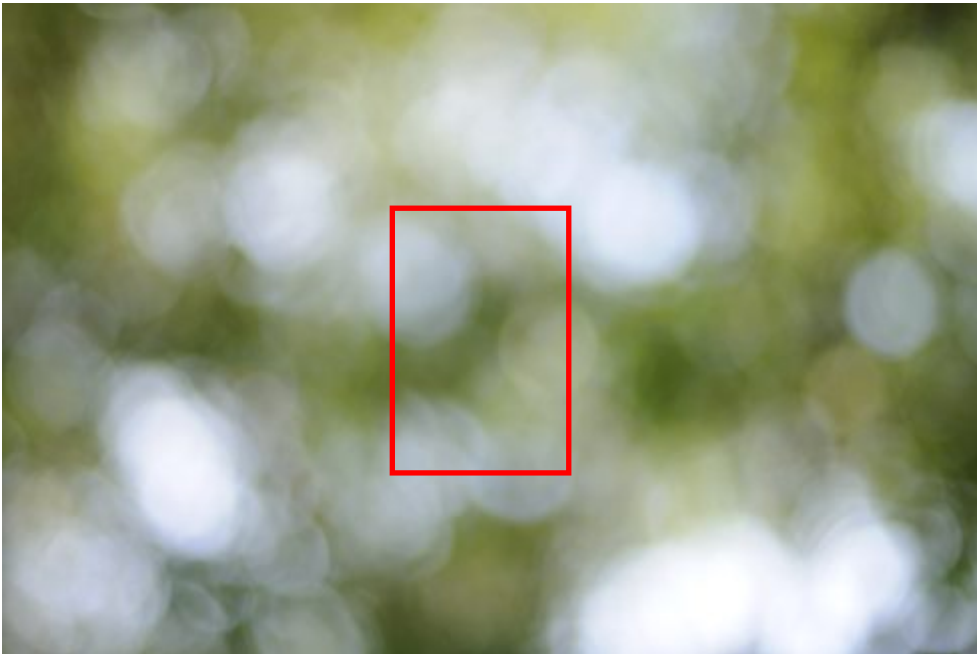
Bokeh

To perform this test the camera was set on the manual focus and the distance on the lens was 0.7m, because is a common distance for both lenses. On the background are branches and leaves of a tree with small light entrance. The distance between the tree and the camera is about 2 meters.

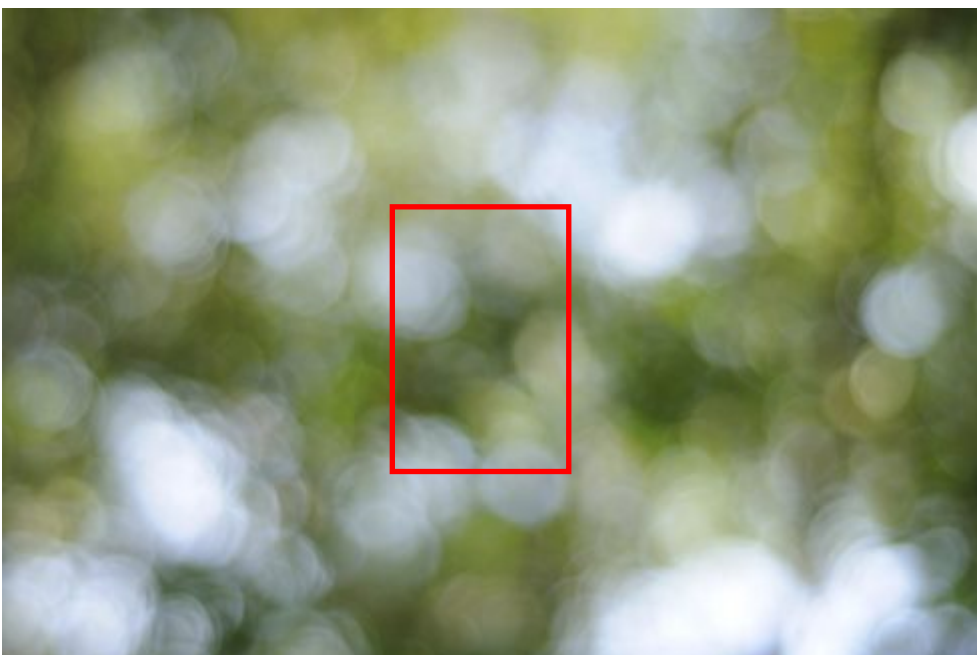
First, the whole images with wide open aperture are displayed above. The red rectangles indicate the approximated crop of the details, which follow the aperture sequence. Where the first column corresponds to the Nikkor 50mm f/1.2 Ai-S lens, the second column to the AF Nikkor 50mm f/1.4D lens, and the last column corresponds to the AF Nikkor 50mm f/1.8D. And, different from the others, the 50mm f/1.8 goes until f/22, so the correspondent space of this aperture was divided with the f/16 aperture.



Nikkor 50 mm f/1.2 Ai-S
on f1.2.

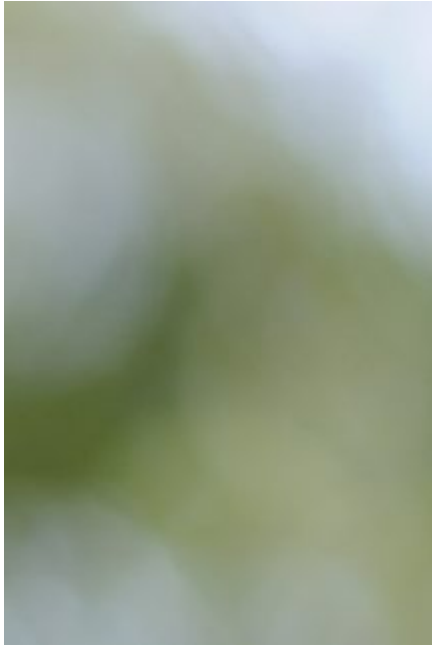


AF Nikkor 50 mm f/1.4 D
on f1.4.

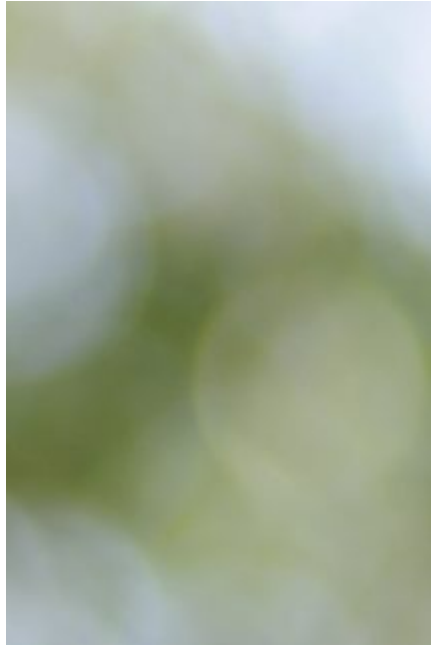


AF Nikkor 50 mm f/1.8 D
on f1.8.

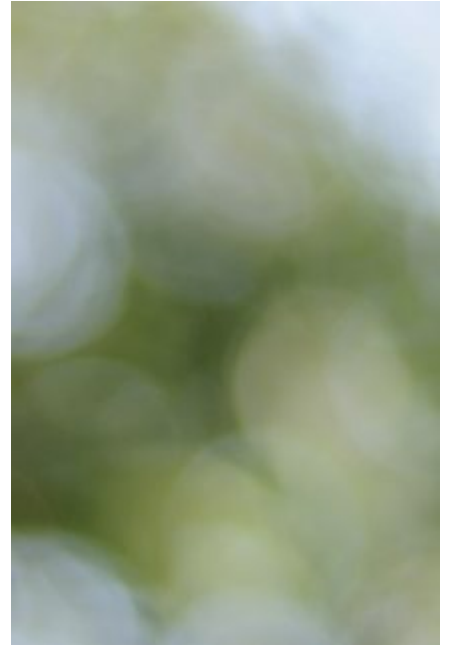
f/1.2



f/1.4



f/1.8



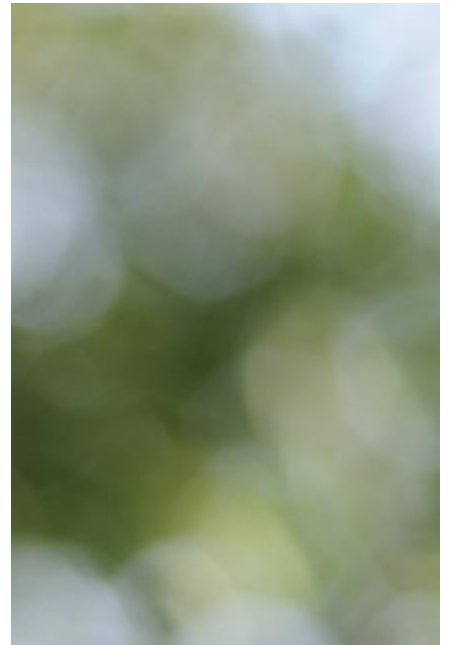
f/2



f/2



f/2



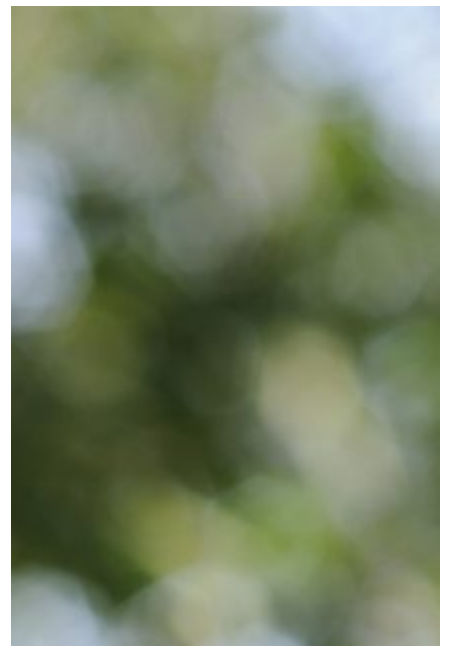
f/2.8



f/2.8



f/2.8



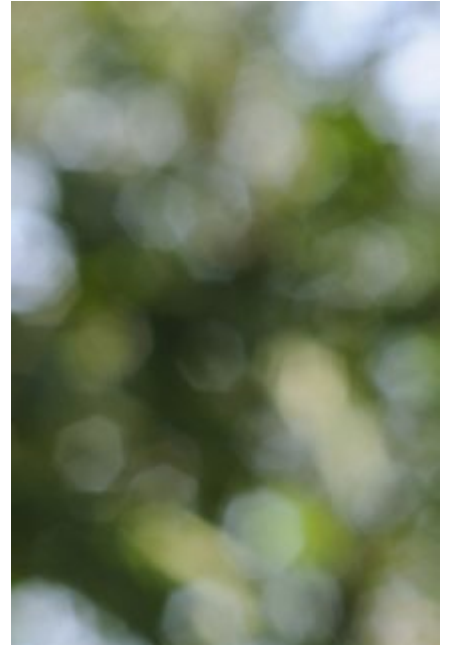
f/4



f/4



f/4



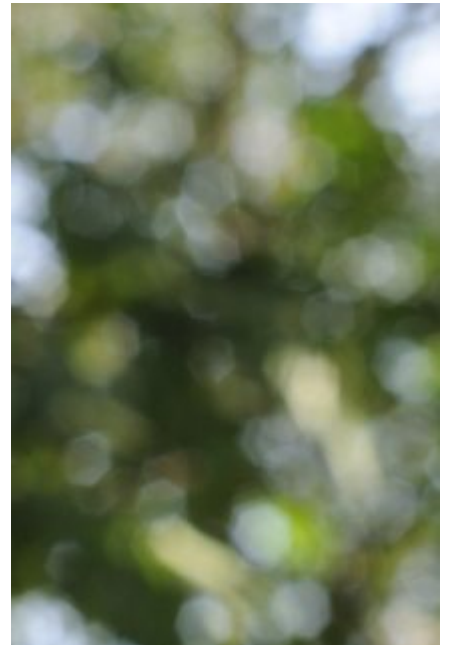
f/5.6



f/5.6



f/5.6



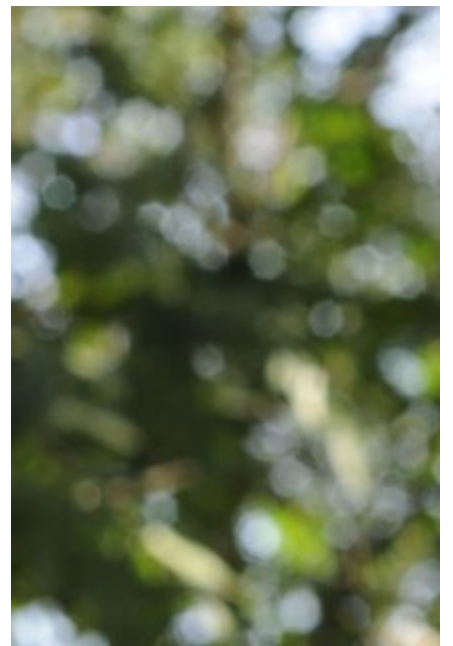
f/8



f/8



f/8



f/11



f/11



f/11



f/16



f/16



f/16



f/22



Conclusion about bokeh

The measuring light mode and the exposure mode were the same on the three lenses, pondered central measure, and the aperture priority were used. Practically, there is no difference between the lenses exposition, so this made me believe that: the 50mm f/1.2 bokeh prove to be smoother on all apertures. And that the nine blades, despite not perfectly rounded, show a less angular shape of the blurred discs.

The 50mm f/1.8 has the same number of blades as the 50mm f/1.4, but the 50mmf/1.4 is more neutral.

Overall conclusion

The conclusions are divided on the three columns below. At my observation, based on my professional use and particular taste, It will be attributed a mark on the best lens of each listed category.

	Nikkor 50 mm f/1.2 Ai-S	AF Nikkor 50 mm f/1.4 D	AF Nikkor 50 mm f/1.8D
Building	Heavier and bigger, but I don't think this is a problem, since the balance and handling are great. But it lack precision on the focusing ring, because the rotation is too short.	✓ Besides the plastic body, it has great steadiness and resistance. Apparently the internal pieces are made of metal, increasing the durability.	Light and compact, is easier to carry and draw less attention. Well built, but not with the quality of a professional lens.
Auto Focus performance	Without auto focus.	✓ Auto focus with good speed and average noise.	✓ Auto focus with good speed and average noise.
Sharpness	Homogeneous sharpness between the apertures, with great results when totally opened, considering the huge f/1.2 aperture.	Good sharpness on the intermediary apertures, mainly on big distances.	✓ Great sharpness on the center of the image with an abrupt fall on the corners.
Colors	✓ Subtly less contrasted, but with beautiful and natural colors.	Normal contrast and saturation.	High contrast and saturation.
Flare	Good resistance to ghosting, but excess of flare on extreme apertures.	✓ It shows low flare, but the ghosting is clearly visible until f/4.	Very visible flare and ghosting until f/4.
Chromatic aberration	✓ It shows a reddish and less bright CA.	Besides bluish, the CA is relatively smooth and do not bother much beyond f/2.8.	Its blue chromatic aberration is really large and bright.
Bokeh	✓ The bokeh is very smooth and the blurred discs are more rounded than the others.	The bokeh is beautiful on f/1.4, but with visible geometrical shapes on other apertures.	The bokeh is harder and the geometrical shapes of the blurred discs are very visible.

Without pondering features, the results are very balanced. Each lens seems to have a specificity.

I would recommend the 50mm f/1.2 for low light situations, to portraits - where there is no rush to photograph, and for defocus effects. It requires skill and experience to take the best advantage.

The 50mm f/1.4 has similar function to 50mm f/1.2, but is most appropriate when the auto focus is needed to speed up a photo.

The 50mm f/1.8 though is more suitable to close-ups and landscape. This lens is great for travels, because it is light and compact. Excellent price and highly recommended to beginners.